JAVA NOTES Java is an Object Oriented programming language developed by Sum Microsystems of USA in 1991 It was originally called Oak by James Goslin one of the inventors of Java! AVA = Purely Object oriented How JAVA Works? Java is compiled into the bytecode and then is interpreted to machine code Compiled by te code Interpreted Machine code JAVA Installation Go to Google & type "Install JDK" => Installs JAVA JDK Go to Google & type "Install Intellid Idea" => Installs JAVA IDE JDK -> JAVA Development Kit = Collection of tools used for developing and running Java programs JRE -> JAVA Runtime Environment = Helps in executing programs developed in JAVA

| • | |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| | Basic Structure of a Java Program |
| | |
| . 15 1 1 | backage com-company; -> Groups classes! |
| E P | Entrypoint into the application |
| | huldie class Main & |
| | buldic Glatic Void main (String [] args) } |
| 1 | Sustem out hintly ("Hello World"); |
| N. S. W. | public class Main & public Static Void main (String [] args) & System out println ("Hello World"); |
| | 3 inhaire hydo phont = AVAL |
| | |
| | Namina Conventions |
| | Naming Conventions For classes, we use Pascal Convention First and Subsequent Characters from a word are Capital letters (uppersse) Example: |
| | Characters from a word are Capital letters (ubberuse) |
| | Example: |
| | Example: Main, My Scanner, My Employee, Code With Harry |
| | Michael Land Land Land |
| \rightarrow | For functions and variables we use camellar convention. |
| | For functions and variables, we use camelCase Convention. Here first character is lowercase and the subsequent |
| | Characters are uppersone like holowing AVAI |
| Har | Characters are uppercase like below: main, my Scanner, my Marks, Code With Harry |
| () (a) | in design we take the last thinks a doct to decide a single |
| | |
| | in to notable = in transletoval AVAL + XMI |
| A Lordin | well welcomes have additive and him to |
| 6 4 | |
| I I JAY | 18E - MAVA Runting Forgoment = 26/25 10 9 |
| | AVAL of historical American |
| | |

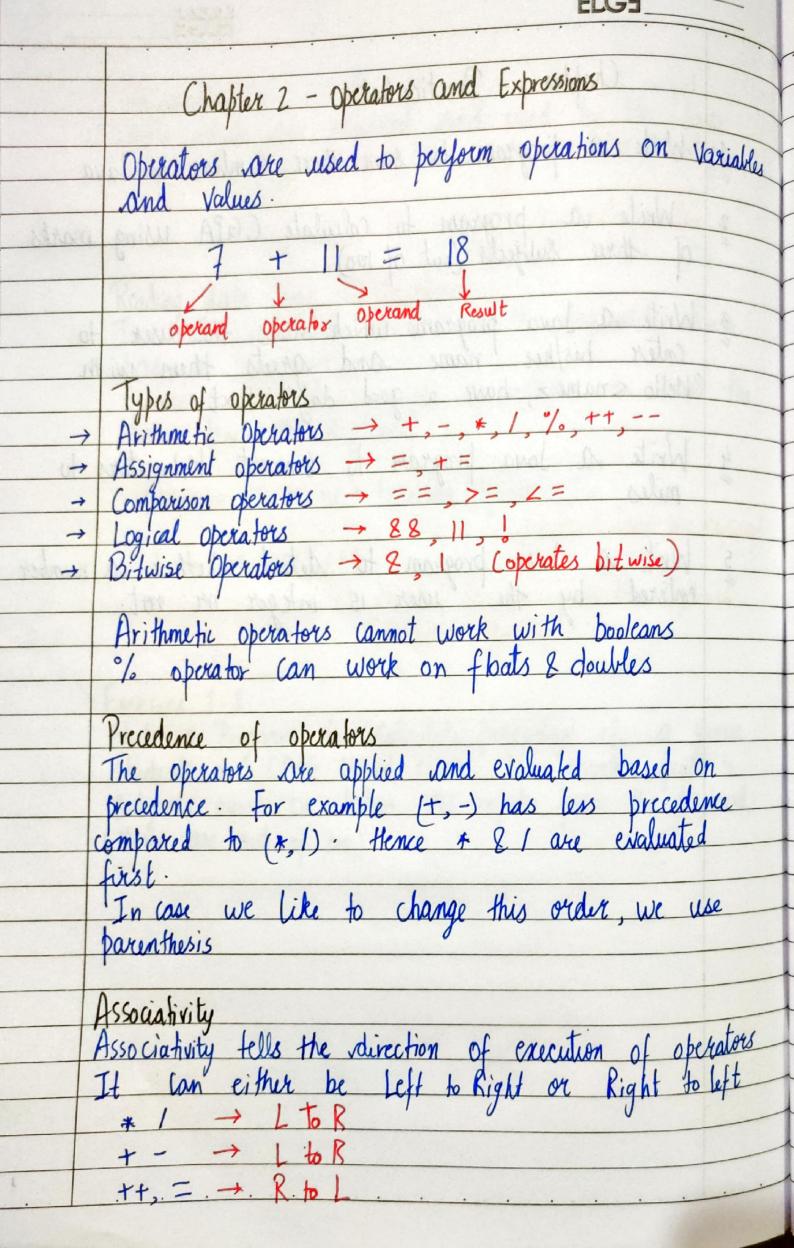
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| | Chapter 1 - Variables and datatypes |
| Timbs. | |
| | Just like we have some rules that we follow to |
| | Steak english (the grammar), we have some rules to |
| | Just like we have some rules that we follow to speak english (the grammar), we have some rules to follow while writing a Java program. The set of these rules is called syntax. Vocabulary & Grammar of Java |
| | of these rules is scalled syntax. |
| | Vocabulary & Grammar of Java. |
| | 2 - 6 - 1-6 - 6 - 6 - 100 H 305 H 30 - 100 H 3 |
| | Variables |
| | A variable is a Container that Stores a Value |
| | This value san be changed during the execution |
| | A variable is a container that stores a value. This value can be changed during the execution of the program. |
| | Luamila Solution Solution |
| 74 | Data type variable name |
| | Data type variable name |
| Later 1 | To reach the later of the later |
| 2 | Rules for declaring a variable name. We can choose a name while declaring a Java variable if the following rules are followed: |
| | We can choose a name white accepting it lava variable |
| 31 | if the following rules are follower: |
| | Must not begin with a digit - int larry; is invalid! |
| | Must not begin with a ought |
| 77 | Name is case sensitive -> harry and Harry are different! |
| 27 | Should not be a keyword (like Void) White Space not allowed int Code With Harry: is invalid |
| 5- | Con all holate & character and digits if |
| | Can contain alphabets, & character, _ character and digits if the other conditions are met |
| | The orient community was the |
| P. J. | Data Tubes of a mark mount what & + sad at |
| Photo | Data Types Data types in Java fall under the following Categories Primitive Data Types (Intrinsic) Non-Primitive Data Types (Derived) |
| 17 | Primitive Data Tubes (Intensic) |
| 27 | Non-Primitive Data Types (Derived) |
| | |
| | |

| · | Primi five Data Types Many |
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| , | Primitive Data Types Java is Statically typed> Variables must be declared There are 8 primitive data types Supported by Ja byte -> Value ranges from -128 to 127 • Takes 1 byte |
| - 129 | hute - Nahus ranges Gram -128 for 127 |
| Set | · Takes 1 byte |
| | · Default value is 0 |
| C TI | Short - Value ranges from (21/2) to (2)/2-1 |
| 7.7 | · Takes 2 Kyles |
| - 91 | Short - Value ranges from - (2 1/2 to (2)/2 -1 · Takes 2 byks · Defoult value is 0 |
| mill | land and a someth beautiful, and make a solution of |
| 3, | int -> Value ranges from (232)/2 to (23/2-1 Takes 4 byks De fault Value is O |
| | Da Coult Value is Day |
| | be full yard for any start of the start of t |
| 4 > | float -> · Value ranges from (See Docs) · Takes 4 bytes |
| 11. | |
| A Miller | Default value is 0.0f ward in |
| 5, | long -> Value ranges from - (2 1/2 to (2 1/2 |
| 1). | · Takes 8 by les |
| larial! | 1 Standard Control Value 1600 Cas V V 2 84 Man V |
| | hould not be a beginned like toil) . |
| 67 | double > Value ranges from (sec docs) • Takes 8 bytes • Default Value is 0.0d |
| - | steel has estates 8 bytest almost mindred mindred mindred |
| | · Default Value 15 0 od |
| 7, | char → • Value ranges from 0 to 65535 (21-1) • Takes 2 bytes → because it supports • Default Value is '\u00000' |
| la la | · Takes 2 bytes → because it supports |
| | · Default Value is '100000' |
| | thought some of all strings - wall |

| , | |
|---------|----------------------------------------------------------------------------------------------------|
| | Keywords and regarded as a modern as |
| | Words which are reserved and used by the Java Compiler. They cannot be used as an Identifier. |
| | Compiler. They cannot be used as an Identities. |
| | |
| 1 | Go to clocs oracle Com for a |
| | Go to clocs.oracle.com for a comprehensive list! |
| | Reading Lata from the Keyboard |
| | In order to read data from the keyboard, Java |
| | has a scanner class. |
| | Scanner class has a bit of methods to read the |
| | data from the keyboard |
| | |
| | 5 canner 5 = new Scanner (System in); int 0 - 9, next Tot 1): |
| | Read from the keyboard |
| | THE U. S. INC. |
| o h | Method to read from the Reyboard |
| toh | (Integer in this case) |
| sat his | in need to making the Miney Max Jalua of hear of |
| | Exercise 1.1 |
| | Write a Program to Calculate percentage of a given Student in CBSE board exam. His marks from 5 |
| dely | student in CBSE board exam. His marks from 5 |
| | subjects must be taken as input from the purposed |
| | (Marks are out of 100). |
| 4 | land from + 101. |
| | Jakhil tool 7 6 7101 |
| | Comment on a desired stands of the formation of the stands |
| | A - r Character Liver |
| | May be worked by the |
| | Janin music to "mantel" |
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| | EDG = | |
|-----|--------------------------------------------------------------------------------------------------------------------------|---------|
| | Chapter 1 - Practice Set | |
| 1 | Write a program to sum three numbers in Jav | (a |
| 2 = | Write a program to calculate CGPA Using of three subjects (out of 100). | marks |
| 3 = | Write a Java program which asks the user enter his/her name and greets them with "Hello < name >, have a good day" text. | to n |
| | Write a Jova program to convert Kilometers miles | |
| 5 = | Write a Java program to detect whether a entered by the user is integer or not. | number |
| | | |
| | | |
| | | |
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|---|---------------------------------------------------------------------------------------------------------------------------------------|
| | Quick aug: How will you write the following expressions in Java? |
| _ | expressions in Java? |
| _ | $\frac{x-y}{2}$, $\frac{b^2-4ac}{2}$, $\sqrt{2}u^2$, $u*b-d$ |
| | 2-2, b-4ac, V-u, a*b-d |
| | 2 2a (x 10 m/s) |
| | Resulting data tube after arithmetic operation |
| | following table summarises the resulting data types after |
| | Resulting data type after arithmetic operation following table summarizes the resulting data types after arithmetic operation on them |
| | |
| | $R = b + 5 \rightarrow int$ $b \rightarrow byk f \rightarrow float$ |
| | $R = G + L \rightarrow Int$ S -> Short d -> double |
| | R = l + f -> float i -> inkger c -> character |
| | $R = i + f \rightarrow float$ $l \rightarrow long$ |
| | $R = C + i \rightarrow int$ $R = C + i \rightarrow int$ |
| | $R = C+5 \rightarrow int$ $R = L+d \rightarrow double$ |
| | $R = f + d \rightarrow double$ |
| | |
| | Increment and Decrement Operators |
| | a++, ++a -> Increment operators -> Data type |
| | Increment and Decrement Operators a++, ++a → Increment operators → Data type a,a → Decrement operators → remains some |
| | |
| | These will operate on all data types except bodeans |
| | Quick Quiz: Tu increment and decrement operators |
| | Quick Quiz: Ty increment and decrement operators on a Java Variable |
| | |
| | a++ -> first use the value and then increment |
| | a++ → first use the value and then increment ++a → first increment the value then use it |
| | |

| Char a = 'B' summer with out had and well at a the and a the and well at a the and a | 9 | Quick Quiz: What will be the value of the following expression (2). int y = 7: int x = ++y * 8: |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---------------------------------------------------------------------------------------------------|
| Part out of the state of the st | | Value of 2? |
| Start the start of the total of the sound of | 104 | Char $a = 'B';$ $a + + ; \rightarrow a \text{ is } mw'C'$ |
| South the state of | 1,01.1 | |
| 2 - L+ L + Hoat 2 - L+ L + Hoat 3 - L+ L - Long 4 - L + L - Long 4 - L + L - Long And - L + L - Long And - L + L - Long A + L + L - Long A + L + L - Long And - Long | | 8 = 8 + C - put. S + Short |
| to the state of the second of the internet of the second o | therein -) | |
| P = (+5 - in+ P = 1 + 1 - double P = 1 + 2 - double P = 1 + 2 - double O + + + + O - Incurrent operators - District O O - Descript operators There will operate on all data type excipt booms Out on a law yourse on the incurrent | | YIBU A |
| P = 1 + d - double Remaint and Decrement appropria - Table O + + + + 0 - Increment appropria - Table O 0 - Devention appropriate of the secret appropriate appropriat | | |
| P = 1 + d - double Anument and personent abundance - Debugger - D | | |
| 1 the will operate on all data types except for every force of a long to have been force on a long to have been force on a long to have been force on a long to have been and then increased. | | |
| 1 the will operate on all data types except for every force of a long to have been force on a long to have been force on a long to have been force on a long to have been and then increased. | | Increment and Decrement Oberalans |
| Then will operate on all data types except too and Duick One in soment and decrement when there Out a first water to your and then increment | | |
| Quick and the value and then increment | 303 | |
| 0 to 1 was few yours and then increment | Ausco | |
| the rest west the value and then increment to the part was it |) Arph | on a love variable |
| | | the part was the volue and then increased the true to the desire the |

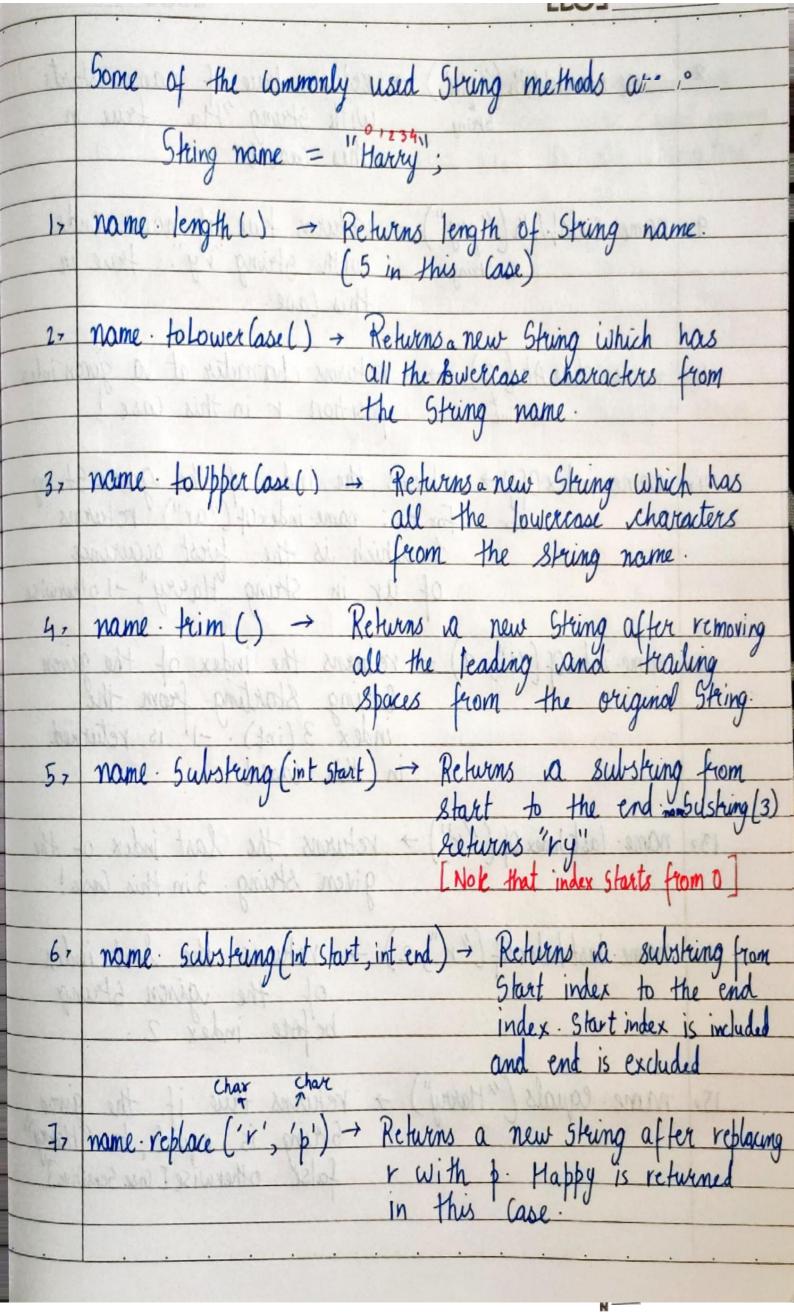
| | Chapter 2 - Practice Set |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------|
| 1 | What will be the result of the following expression |
| | float a = 7/4 * 9/2 |
| 211 | Write a java program to encrypt a grade by adding 8 to it. Decrypt it to Show the correct grade. |
| 3 ===================================== | Use Comparison operators to find out whether a given number is greater than the user entered number or not. |
| 4 2 | estered number or not. Write the following expression in a java program: |
| * 1 | $\frac{\sqrt{2}-u^2}{295}$ |

find the value of the following expression:

int x = 7int a = 7+49/7 + 35/7

Value of a?

| | Chapter 3 - Strings |
|--------|-------------------------------------------------------------------------------------------------------------------|
| | |
| naise | A string is a sequence of characters |
| | A string is a sequence of characters A string is instantiated as follows: |
| | |
| A.A. | String name; name = new String ("Harry"); |
| trees | mane = new stang (navy); |
| | Gleing is a class but can be used like a data type: [Strings are immutable and cannot be changed] |
| | data type: [Strings are immutable |
| 0 | and (cannot be changed] |
| * | String name = "Harry"; Reference Deject |
| | Reference Deject |
| | Dillowed the 1 list in 1 |
| 108250 | late care ways to print in Java |
| | Different ways to print in Java. We can use the following ways to print in Java: |
| 17 | System. out . print () -> No newline at the end! |
| 27 | System. out print () -> No newline at the end! System. out print In () -> Prints a new line at the end |
| 37 | Sustem out brint (1) |
| 4, | System.out. format() |
| - | f er to |
| | System out printf (3/20", ch) |
| | |
| | % f for float |
| | % c for Char |
| | % 5 for string |
| | String Methods |
| | String methods operate on Java Strings. They can be used to find length of the string, Convert to lowercase, etc. |
| | Can be used to find length of the string, |
| | Convert to lowercase, etc. |
| | |



| 8, | name starts with ("Ha") -> returns true if name starts String with strung "Ha" true in this case! |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | String with String "Ha" true |
| | this case! |
| | nw me |
| 0 | non endell'4 /4 mill & relient less if nome of |
| 77 | name ends With ("ry") -> returns true if name ends string with string "ry" true in |
| | String With String ry. Frue in |
| | this case. |
| 100 | windly among their test of the trans there is their |
| 107 | name charAt (2) -> returns character at a given index int position r in this case ! |
| | bosition r in this case |
| | The formal of the control of the con |
| Section. | name into NGA volume the into all the augus al |
| 117 | name index Of(s) returns the index of the given string. str For ex: name index Of ("ar") returns 1 which is the first occurance Of ar in String "Harry", -1 otherwise |
| 9.18176 | str for ex. name index of ("ar) returns |
| | I which is the first occurrince |
| | of ar in String "Harry", -1 otherwise |
| Page 9 | |
| 12, | name index Of ("5", 3) -> returns the index of the given |
| Seine | Grung Starting from the index 3 (int)1 is returned in this case! |
| V | index 3 (int) -1 is returned |
| moud. | in this case! |
| (m) | In this time. |
| 10 | man latel of (1/411) - values the last ide of the |
| 137 | Thatle last maex of (r) - returns the hast man of the |
| 1 10 | name last Index of ("r") -> returns the last index of the given string. 3 in this case! |
| The second second second | |
| 14, | name last Index Of ("r", 2) -> returns the last index of the given string before index 2. |
| A Line | of the given string |
| 1111 | before index 2. |
| | The Park of the Pa |
| 15, | name equals ("Harry") -> returns true if the given |
| Mark Land | name equals ("Harry") -> returns true if the given String is equal to "Harry" false otherwise [case sensitive] |
| 1 | Cles of the size of the combine of |
| | jaise ofnerwise i was sensitives |
| | - SAA CONT. AL |

name equals Ignore lase ("harry") -> returns true if two

Grings are equal ignoring

the case of characters. Escape Sequence Characters
Sequence of characters after backslash '\'

= Escape sequence Characters Escape Sequence Characters Consist of more than one characters but represents one character when used within the Strings. Examples: In, It, etc.

newline Tas singlequote backslash letter = "Dark Horry This Java Course is rice

| | ELG3_ |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ourt M. issues | Chapter 3 - Practice Set |
| 1 | Write a Java program to convert a string to |
| 2 | Write a Java program to replace spaces with underscores. |
| 3 = | Write a Java program to fill in a letter template which books like below: |
| | letter = "Dear < name 1>, Trans a lot" |
| | Replace 4/ name / with a string (some name) |
| 4 | Write a Java program to detect double and triple spaces in a string |
| 5 | Write a program to format the following letter using escape sequence characters. |
| | letter = "Dear Harry, This Java Course is nice Thanks" |
| | The ball and the second of the |
| | Land to the second seco |
| | The state of the s |
| | The Control of the Co |

| (1.11 1. (-1.1. 1. : 1.4. |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Chapter 4 - Conditionals in Java |
| |
| Sometimes we want to watch comedy videos on you lube |
| if the day is bunday. |
| Sometimes, we order junk food if it is our friend's |
| birthday in the hostel |
| You might want to buy an Umbrella if its raining |
| Sometimes we want to watch comedy videos on youTube if the day is Sunday. Sometimes, we order junk food if it is our fewend's birthday in the hostel You might want to buy an Umbrella if its raining and you have the maney. You order the meal if also or your favorite bhindi is listed on the menu. |
| You order the meal if also or your favorite |
| bhindi is listed on the menu. |
| The tourne of house some was to emphasis and |
| All these are decisions which depends on a |
| Certain Condition being met |
| In Java we can execute instructions on a |
| All these are decisions which depends on a certain Condition being met. In Java, we can execute instructions on a condition being met. |
| |
| Decision making Instructions in Java |
| Decision making Instructions in Java If - Else Statement Switch Statement |
| Switch statement |
| SWITCHE 191Wasses |
| If-else Statement |
| The syntax of an If-Else statement in C looks like that of C++ and Java Script Java has a Similar Syntax too It looks like: |
| that al C++ and Java Script. Java has a similar |
| Syntax too. It looks like: |
| OVOL AL STOLANSON |
| if (condition - to - be - checked) { |
| if (condition - to - be - checked) { Statements - if - Condition - true; |
| 3 MA - 22 |
| P. S. 2 d d 1 1 2 2 0 - 11 |
| Statements - if - Condition - false; |
| 3 |

| Code Example: |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| int a = 29; if (a > 18) \(\frac{2}{5}\) System out println (" You can drive"); |
| if (a 7 18) } |
| System. out printing you can out to |
| I would at them was and |
| Note that the else block is optional |
| Relational Operators in Java |
| DILL A TORK ORD LINED TO PATHURIL PATHURIN |
| (true or false) inside the if statements. Some examples of relational operators are: |
| Some examples of relational operators are. |
| D. The Many Market Mark and J. L. J. J. L. J. J. J. L. J. J. L. J. J. J. L. J. J. L. J. J. J. L. J. |
| Not equals |
| or eq. to |
| Note: '=' is used for assignment where as '==' is used for equality check. |
| is used for equality check. |
| [1] 10. 10. 10. 10. 10. 10. 10. 10. 10. 10. |
| The condition can be either true or false. |
| at some of an I-less statement in a sature |
| Logical Operators |
| Logical Operators 88, 11 and! are most commonly used logical operators in Java These are read as: |
| operators in Java |
| These will read us. |
| RR -> AND |
| 11 -> OR > Used to provide logic to |
| 11 → OR ⇒ Used to provide logic to NOT our AVA programs |
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| |
| |

| - | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | |
| - | AND operator |
| | AND operator Evaluates to true if both the condition are true |
| | 2000年1月1日 1000年 1 |
| | $Y & 2 & Y = Y$ $Y \rightarrow true$ |
| | $Y & B & N = N$ $N \rightarrow false$ |
| | N & & Y = N |
| | N = N = N |
| | Il Sintennia; dimensial II |
| | OR Operator |
| | OR Operator Evaluates to true when at least one of the conditions |
| - | is true. noticular latine and latine |
| | builth lose is used when the howe of make |
| | A TOY III Y = IIY TO A THINK I Y + KNE |
| | $Y \mid N = Y$ |
| | $N \parallel Y = Y$ |
| | NIIN = N |
| The second | AT ALL THE PROPERTY OF THE PARTY OF THE PART |
| The second second | Not Operator Negates the given logic (true becomes false and false becomes true) |
| | Negates the given 10912 (tale becomes faces with faces |
| The same of the sa | becomes full |
| | $! y = N$ $y \rightarrow true$ |
| | i N = Y N → false |
| | CONTROL OF THE PROPERTY OF THE |
| The state of the s | else if clause |
| | Instead of using multiple if statements, we can also |
| The Paris | use else if along with if thus forming an if-else- |
| - | else if clause Instead of using multiple if statements, we can also use else if along with if thus forming an if-else- if-else ladder |
| | |
| | Using such kind of logic reduces indents last else is executed only if all the conditions fail. |
| | 15 executed only if all the conductions fail. |
| | |

| | LLG3 |
|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | |
| if (condition) & | schorodo no |
| if (condition) & 11 Statements; | d li met of literal |
| 3 | the less the make with the second |
| else if ? | V = Y & & Y |
| 115takments; | 1 = 4227 |
| 3 | N = V 90 I |
| else { | 1 / or 1/ 99 1 |
| 11 Statements; | |
| 3 | I IA IA |
| an of least and at the topolities | de la suel |
| Switch Case Control Instruction | THE PART OF CHARLES |
| Switch - Case is used when | n lile logica L |
| Switch - Case is used when Choice between number of | allerentines for |
| given Variable | MITOURATIVES for a |
| g water | V = V |
| Switch (Vax) { | |
| Case C1: | N = N II N |
| 11 Code; | |
| | TO SUPPLIED |
| | V / V |
| | (Just sugged |
| 11 Code bycak; | |
| Dytak; | V = X |
| Case C3: | V = N |
| 11 Code | |
| | A SURVI (LONGE |
| | |
| 9000 | w prola fi 2/4 w |
| 11 Code | 3/260 V3-1 |
| al doub 3 d la day | |
| - 1219 Jan Stanhar anubah sipoh | Using Said Rund II |
| all the tanklessy tack. | the executive only if |
| | |

| System out profite ("I am not II") With a program to find out winther a study and at teat 33% in (ach switch to bear Possess to bear to be profite and to be profite as and Consider around the profite and to be profite as and Society to be there as no too bear the story oned to Above 10:01 30% Note that there as no too bear the size. | A switch can is rearrely | n occur within another but in practice this done |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| System pulsers on the subject of the service of the | 13.4 | The second of th |
| System and property of the most 11) I have a program to trad out winther a Study and bet for subject to be to the most as an open a careful a subject out to the most as an open a careful a subject to be the subject to be a open a careful a subject to be the subject to be a open a careful as the subject to be the subject to be a subject to be subject to be a subject to be a subject to be a subject to be a | | ("It was I") returned the material |
| Shirts a program to find out whether a Shirted for hear and be heard 33% in early subject to hear program to hear marks as an appearance to hear the shorts man himself to hear the short from the size to hear the size of the start of hear the size of the start of the start of the size of th | | making the same of |
| April a provious to tool whether a shot and a subject to be served and take marker as an object to be served and take marker as an object to be tool tool tool tool tool tool tool too | | Jon on I" altrical has more |
| per per per toil it tequered to the personal of the personal o | CARLES AND | 的 自然是一种自然的。在1965年,在1965年,在1965年,在1965年,在1965年,在1965年,在1965年,在1965年,在1965年,在1965年, |
| a contrate income for four by an employed to accomment as the stokes mentioned to a sold the stokes and the stokes are to be a sold to a sold the stokes are to be a sold to a sold the stokes are to be a sold to a sold the stokes are to be a sold to a sold the stokes are to be a sold to a sold the stokes are to be a sold to a sold the stokes are to be a sold to a sold the stokes are to be a sold to a sold the stokes are to be a sold to a sold the stokes are to be a sold to a sold the stokes are to be a sold to a sold the stokes are to be a sold to a sold the stokes are to be a sold to a sold the stokes are to be a sold to a sold the stokes are to be a sold to a sold the stokes are to be a sold to a sold the sold to a sold the sold the sold to a sold the sold | top pase. | and by teat 33% in each subject that 33% in each subject the subject to the property of the pr |
| Accomment as text the states minimed to State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State S | A 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | - NOON AND PROPE |
| Accomment as per the Islate minimed to Interest blat the Islate minimed to 251 - 5.01 5% Sol + 10.01 20% Above 10.01 30% Note that there as no tax below 9.61 Take Amount as no tax below 9.61 Take Amount as no tax below 9.61 Take | - of myddons | on ud hind not marin statusla) & |
| Aby 10:01 20's 10 10 Tele Aby 10:01 Tele About 10:01 Tele | | |
| Not that there is no tox below 961 Tele Amount or an input from the species | | Taran long the becomes face the long |
| April 10.01 20% 1. 1001 April 1000 1000 1000 1000 1000 1000 1000 10 | le de la lace | |
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| Not that there is no tox below 9 to Take April 10 to Company the continue of the state of the st | | |
| lateral add mary tight has a through | | |
| a the test hit als consequenced or sticked of | | |
| | winds to | hit of magnet and a still of |
| of the used given the number of the Mar | | |

| | Chapter 4 - Practice Set |
|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | |
| 1 | What will be the output of this program: |
| | |
| | int $a = 10$; |
| | if (a = 11) |
| | if (a = 11) System.out.println ("I am 11"); else System.ouk.println ("I am not 11") |
| | else " ["Trant II"] |
| | System out println (I am not 11) |
| | Write a program to find out whether a student is pass or fail; if it requires total 40% and at least 33% in each subject to pass. Assume 3 subjects and take marks as an input from the user. |
| 2 | Write a program to find out whether at student |
| , | is base or fail; if it requires total 40% |
| | and at least 33% in each subject to pass. |
| | Assume 3 Subjects and take marks as an input |
| | from the user. |
| | |
| 3 | Calculate income far paid by an employee to the government as per the slabs mentioned below: |
| " | sovernment as per the slabs mentioned below. |
| | |
| | Income Slab Tax |
| | 2.5L - 5.0L 5% |
| | 5.0 L - 10.0 L 20%. |
| | Above 10.0L 30% |
| | |
| | Note that there is no tax below 2.5L. Take input somount as an input from the user. |
| | amount as an input from the user. |
| | |
| 4 | Write a Java brogram to find out the day |
| 1 | of the week given the number [I for Monday |
| | Write a Java program to find out the day of the week given the number [1 for Monday) 2 for Tuesday and 50 on!] |
| | |
| | |
| | |

| - | Write a Java program to find whether a year entered by the user is a leap year or not. |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Write a program to find out the type of website from the Url |
| श्रुवे | · Com → Commercial website · org → organization website · in → Indian website |
| | Tupes of Loops Principally there are these types of loops in Java |
| | dool alinka 1 2 dool alinka 1 dool ali |
| | ly will look into these one by one. |
| | (noitibna) mustard) glistu |
| 8 | It Statement - Loss freight translater at land the land them. Freight - Loss freight translater at land them. |
| | Leap Reals getting courted Such a loop is know |

| | ECUS |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| year of . | Chapter 5 - Loop Control Instruction Sometimes We Want our programs to execute a few set of instructions over and over again for example - print 1 to 1000, print multiplication table of 7, etc. Loops make it easy for us to tell the Computer Loops make it easy for us to tell the Computer that a given set of instructions need to be executed repeatedly. |
| | Types of Loops Primarily. There are three types of loops in Java: |
| 7 27 37 | for loop |
| | While loops |
| | While (booken (ondition) 11 Statement This keeps executing as long as the condition is true. |
| | If the condition never becomes false, the while loop keeps getting executed Such a loop is known as an infinite loop. |
| | |

| | Quick Quiz: Write a program to print natural numbers from 100 to 200. |
|-------------------|----------------------------------------------------------------------------------------------------------------------|
| | from 100 to 200. |
| I | THE PROPERTY OF LAND AND AND AND AND AND AND AND AND AND |
| | do while loop This loop is similar to a while loop except the fact that it is guaranteed to execute at least once. |
| | This loop is similar to a while loop except the fact |
| | that it is guaranteed to execute at least once. |
| | This for loop Recho Rumming until 1 becomes |
| | do 3 |
| | 11 code ₹ while (condition); → Note this Semicolon |
| | ₹ while (condition); -> Note this Semicolon |
| | |
| | while > checks the condition & executes the code |
| | while > checks the condition & executes the code do-while > Executes the code & then checks the condition |
| ı | i novi had add advisored in miladageri |
| | Quick Quiz: write a program to print first n natural numbers using do-while loop. |
| | natural numbers using do-while loop. |
| | loop the south is part outside the loop. |
| | for loop |
| | The syntax of a for bop looks like this: |
| The second second | Light American State of Light State of Light Colors |
| | for (initialize; check book expression; update) { |
| | 11 Code: At at most it lastral and |
| The second second | Thus skipping everything below "Continue" & inside |
| | the loop for that iteration as |
| | A for loop is usually used to execute a piece of |
| | A for loop is usually used to execute a piece of Code for specific number of times |
| | |
| | Quick aug: Write a program to print first node numbers using a for loop. |
| | odd numbers using a for loop. |
| | |
| | |

| Srodmunt 85 | Decrumenting for loop |
|-------------|------------------------------------------------------------------------------------------------------------------------|
| | |
| | for (i = 7; i!=0; i) { System out println (i); |
| | System-out-println (i); |
| to | - it to a deal aline of the sale of the |
| | That it is Augmented to execute at least one |
| | This for loop keeps running until i becomes o. |
| | Quick Quiz: Write a program to print first n natural numbers in reverse order |
| | bush etat met |
| Fin | break statement. The break statement is used to exit the loop irrespective of whether the condition is true or false. |
| 1190 | is sushed in a land thou the condition is less |
| | or Else. |
| · · · das | whomewo o "break" is encountered inside the |
| 10 | Whenever a "break" is encountered inside the loop, the control is sent outside the loop. |
| | dool rol |
| | Continue statement |
| | The continue statement is used to immideately |
| | move to the next iteration of the loop. |
| | The control is taken to the next iteration |
| | thus skipping everything below "Continue" inside the loop for that iteration. |
| | the loop for that iteration. |
| 10 | A per loop is usually used to execute a piece |
| | In a Nut Shell break statement Completely exits the loop |
| 17 | break statement completely exits the loop |
| 27 | continue statement skips the particular iteration |
| | of the loop. |
| | |
| | |
| | |

| - | |
|----------|--------------------------------------------------------------------------------------------------------------|
| | Chapter 5 - Practice Set |
| | and ten the |
| 1 | Write a program to print the following pattern |
| " | 8 x At most once |
| | * * * * |
| | * * * |
| | * * |
| | * |
| 2 | Write a program to sum first n even numbers using while loop. |
| - 1 | using while loop. |
| | |
| 3 | Write a program to print multiplication table of a given number n. |
| - | a given number n. |
| | |
| 4 | Write a program to print multiplication table of |
| | 10 in reverse order. |
| <u> </u> | Write a program to find factorial of a given number using for bops. |
| - | number using for loops. |
| | |
| 6 | Repeat 5 using while box |
| | |
| 7 | Repeat 1 using for/while loop |
| Q | Lithat can be done using one tube of loop |
| 8 | can also be done using the other two types |
| | What can be done using one type of loop can also be done using the other two types of loops - True or False. |
| | |
| 9 | Write a program to calculate the sum of the numbers occuring in the multiplication table of |
| " | numbers occurring in the multiplication table of |
| | 8. |
| - | |

| - | ELG3_ |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| lo | 17 At least once |
| | 2> At least twice 3> At most once |
| 11 | Repeat 2 using for loop. |
| | |
| 2) | 2 White a program to sum first in even number |
| 40 | est thit is program to print multiplication table |
| P | a little a program to print multiplication talks |
| 1000 | 5 Write a program to find fortarial of a district state of a distr |
| | fed alide prize 2 totals |
| | 3 Report 1 using for furfule loop |
| AS | of to stut one anisu and ad man tatal of the total total and also man talk the state two transports and also man talk the state two our transports and also man talk the state two our transports and also man talk the state two our transports and also transports and a |
| - 11 | Alast to our True extractor of exports of |

| URBAN | |
|-------|--|
| EDG3 | |

| | Chapter 6 - Arrays |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | that have a former home that the delical date |
| | Array is a collection of similar types of data |
| | Use Case: Storing marks of 5 Students |
| | |
| | int [] marks = new int [5] => [data Type ArrName;] reference object |
| | reference object |
| | $0 1 2 3 4$ $\rightarrow 5 \times 4 = 20$ bytes |
| | marks object |
| | for inties is another brook it. |
| | |
| | Array elements can be accessed as follows |
| | marks [0] = 100 |
| | marks [1] = 70 |
| | => Note that index Starts from 0 |
| | the character of the aprile in |
| | marks [4] = 98 |
| | |
| | So in a nut shell, this is how array works: |
| | THOUGH CHANGE AND AREA DO LOURS AND A LINE OF |
| 17 | int[] marks; -> Declaration! |
| | int[] marks; \rightarrow Declaration! marks = new int[5]; \rightarrow Memory Allocation! |
| | int [] marks = new int [5]: -> Dechration + Memory Allocation! |
| | |
| 37 | int[] marks = { 100, 70, 80, 71, 98} - Dedare + Initialize! |
| | A CONTRACTOR LANGUAGE STATE OF THE STATE OF |
| 11 | Array indices starts from 0 and goes till (n-1) where n is the size of the array. |
| | where n is the size of the array. |
| | |

Arrays have a length property which gives the length of the array marks length > gives 5 if marks is a reference to array with 5 elements Displaying an Array
An varray can be displayed using a for loop: for (int i=0; i < marks length; i++)

Sout (marks [i]): => Array Traverse

7 Quick Quiz: Write a Java program to print the elements of an array in reverse order. For-each bob in Java Array elements can also be traversed as follows: for (int element: Arr) {
Sout (element); => Prints all the elements

Multidimensional Arrays are Array of Arrays
Each element of a M-D array is an array itself
marks in the previous example was a 1-D array.

Multidimensional 2-D Array A 2-D array can be created as follows: int [][] flats = new int [2][3] L> A 2-D array of 2 rows +3 Columns We can add elements to this array as follows & 50 on! This 2-D array can be Visualised as follows:

[0] [1] [2]

Col 1 (col 2 (col 3) [0] Row 1 (0,0) (0,1) (0,2) [1] Row 2 (1,0) (1,1) (1,2) Similarly a 3-D array can be created as follows: String [1[][] arr = new String [2][3][4] drite a lora program to find whether an

| enanger of | CAND |
|------------|------------------------------------------------------------------------------------------------------------|
| • | Chapter 6 - Practice Set |
| 1 | Create an array of 5 floats and calculate their Sum. |
| 2 | Write a program to find out whether a given integer is present in an array or not. |
| 3 | Calculate the average marks from an array containing marks of all students in Physics using for each loop. |
| 4 | Create a Java program to add two matrices Of Size 2 x 3. |
| 5 | Write a Java program to reverse an array |
| 6 | Write a Java program to find the maximum element in an varray. |
| 7 | Write a Java grogram to find the minimum element in a Java array! |
| 8 | Write a Java program to find whether an array is sorted or not. |
| | |
| | |

Chapter 7 - Methods in Java Sometimes our program grows in size and we want to separate the logic of main method to other methods other methods for instance - If we care calculating average of a number pair 5 times, we can use methods to avoid repeating the logic. DRY = Dont Repeat Yourself. Syntax of a Method A method is a function written inside a class. Since Java is an Object Oriented language, we need to write the method inside some class data Type name () { Following method returns sum of two numbers int my Sum (int a, int b) { int c = a+b; Calling a Method A method can be called by creating an object of the class in which the method exists followed by the method call: Calc obj = new (alc(); -> Object Creation obj. mySum (a, b); -> McHod call upon an object

The values from the method call (a and b) are copied to the a and b of the function my sun. Thus even if we modify the values a and b inside the method, the values in the main method will not change.

When we don't want our method to return anything, we use void as the return type

Static keyword is used to associate a method of a given class with the class rather than the object. Static method in a class is shared by all the objects

Process of method invocation in Java Consider the method Sum int Sum (int a, int b)

return atb;

The method is called like this:

(alc obj = new (alc();

c = obj. sum (2,3)

The values 2 and 3 are copied to a and b and then a+b=2+3=5 is returned in c which is an integer.

Note: In case of Arrays, the reference is passed. Same is the case for Object passing to methods.

Method Overloading Two or more methods can have same name but different parameters. Such methods are called Overloaded methods. Void foo () Void foo (int a) => Overloaded function foo int foo (inta, intb) Method overloading cannot be performed by changing the return type of methods Variable Arguments (Varargs)
A function with vararg can be created in Java
using the following Syntax: public Static void foo (int ... arr) 11 arr is available here as int [] arr for can be called with Zero or more arguments like this: foo (7) foo (7,8,9) foo (1,2,7,8,9) We can also create a function bor like this public static void bar (int a, int arr) 1/ code Alkast one integer is required now bar can be called as bar(1), bar(1,2), bar(1,7,9,11) etc.

A function in Java can call itself Such calling of function by itself is called recursion.

Example: Factorial of Example: Factorial of a number factorial (n) = n * factorial (n-1) Quick Quiz: Write a program to calculate (recursion must be used) factorial of a number in Java?

| · I | ELG3 |
|-------|---------------------------------------------------------------------------|
| saate | Chapter 7 - Practice Set |
| 1 | Write a Java method to print multiplication table of a number n. |
| 2 | Write a program using functions to print the following pattern: |
| | * |
| | * * |
| | * * * * |
| | |
| 3 = | Write a recursive function to calculate sum of first n natural numbers |
| 4 = | Write a function to print the following pattern |
| | * * * |
| | * * * |
| | * * |
| | |
| 5 | Write a function to print nth term of fibonacci Sexus using recursion. |
| | |
| 6 | Write a function to find average of a set of numbers passed as varguments |
| 7 | Repeat 4 using Recursion. |
| 8 | Repeat 2 using Recursion |

| 9 10 | Write a function to convert Celsius tempera into fahrenheit. Repeal 3 using iterative approach. | iture |
|---------|--------------------------------------------------------------------------------------------------|-------------|
| the | Write a program using functions to print | 200 |
| | | 22 m |
| 40 | List a ratural numbers | 8 |
| 1070 | Write a function to print the following tatt | 20 |
| 1770 | Write a function to trint not term of fine series series recursion. | 105 |
| and and | Write a function to find source of a stranger of state of markets passed as surgements | 1011 |
| | Repeat 4 Using Parunking Repeat 2 Using Recursion | 11/20/11/20 |

| | Chapter - 8: Introduction to OOPs |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | a puncolo art primati No |
| | Object Oriented programming files to mab Code |
| | instructions with real upuld making the code |
| | Object Oriented programming tries to map Code instructions with real world making the code Short and easier to understand |
| | STIPL WING COSTOL TO WINDOWS JURIAL |
| | 1.11 at : 11 D |
| | What is Object Guented Programming |
| | What is Object Oriented Programming Solving a problem by creating objects is one of the most popular approaches in programming. This is called Object Oriented Programming. |
| | of the most popular approaches in programming. |
| | This is called Object oriented Programming. |
| | manufactured through the same and the same a |
| | What is DRY? |
| | DRY stands for Don't delat consult |
| | DIN 5 stands for - No not repeat yourself |
| | DRY Stands for - Do not repeat yourself Focuses on code remability |
| | TOTAL IN ALL TOTAL |
| - | Class |
| | A class is a blueprint for creating objects. |
| | Land shows a my score of a make book |
| | JEE => Filled by an Student => Application for |
| 1 | JEE => filled by an Student => Application for that Student |
| 1 | The Torne WHATE WORD STAND THE STANDER |
| 1 | traine data can be redden from the Userla |
| 1 | Class > Object Instantiation > Object |
| - | Create a valid |
| | Object. |
| | |
| - | Object Runfels S - S - enough of |
| - | An Object is an instantiation of a class Johan a class |
| | is defined a template (info) is defined Monage |
| 1 | An Object is an instantiation of a class. When a class is defined, a template (info) is defined. Memory is allocated only after object instantiation. |
| 1 | my mit object instantiation. |
| 1 | All the Union to the total and a south and the |

| | How to model a broblem in OOPs |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | How to model a problem in OOPs We identify the following: |
| | alal do de and parameters to the doctor |
| 1 | Noun -> Class -> Employee |
| | Noun → Class → Employee Adjective → Attributes → name, age, Salary Verb → Methods → get Salary (), increment () |
| | Verb -> Methods -> get Salary (), increment () |
| | AND STATE COLORS AND STATE CONTINUES |
| 3 | OOPs Terminology Abstraction - Hiding internal details [show only essential info!] |
| 17 | Abstraction - Hiding internal details [show only essential infol] |
| | A STATE OF THE STA |
| | > Use this phone without bothering about how it was made |
| | about how it was made |
| | C 13 Stands for of - 10 not repeat yourself |
| 2, | Encapsulation - The act of putting various components together (in a capsule). |
| | together (in a capsule). |
| | ablababic of Chale of the with with |
| | > Laptop is a Single entity with Wifi + Speaker + Storage in a Single box! |
| | and more with a small control of the desired of the |
| | In Java encapsulation simply means that the |
| | In Java, encapsulation simply means that the Sensitive data can be hidden from the users |
| | |
| 37 | Inheritance - The act of deriving new things from |
| | Inheritance - The vact of deriving new things from existing things. |
| | |
| | Rickshaw => E-Rickshaw |
| 275 7 | Phone => Smart Phone |
| 4 | Implements DRY! |
| 1. | Polymonthiam - One entity was (|
| 47 | Polymorphism → One entity many forms |
| | Smartphone -> Phone Smartphone -> Calculator |
| | indication of the street of th |
| | |

Writing a Custom Class
We can write a custom class as follows: public class Employee 2 int id; → Attribute 1 String name; → Attribute 2 3 Any real world Object = Properties + Behaviour
Object in OOPs = Attributes + Methods. A class with Methods We can add methods to our class Employee as public class Employee & public int id; public String name; public int get Salary () 3 1/code public void get Details () {

// code

| | Chapter 8 - Practice Set |
|----|----------------------------------------------------------------------------------------------------------------------------------|
| | Cruipus o |
| 1 | Create a class Employee with following properties and methods: |
| - | and makeds: |
| | Charles (1) |
| 0 | Salary (property) (int) |
| 0 | get Jalary (method returning int) |
| 0 | name (property) (String) |
| _ | get Name (method returning string) |
| 0 | get Salary (method returning int) name (property) (String) get Name (method returning String) Set Name (method changing name) |
| | Create a class cellphone with methods to print |
| 2 | create a class comprise with the many |
| | Create a class cellphone with methods to print "ringing.", "Vibrating." etc. |
| 20 | 1 + a class so are with a mathed to initialize its |
| 3 | create a class square with a method to introduce to |
| | Create a class Square with a method to initialize its side, calculating area, perimeter etc. |
| 1. | THURS CALL |
| 4 | Create a class Rectangle 8 repeat 3 |
| - | Cat a class Tom Vac H: Con Packets Games |
| 5 | Create a class Tommy Vecetti for Rockstar Games Capable of hitting (print hitting.), running, fixing ek |
| | Capable of hitting (print hitting), hunning, fixing ex |
| 1 | 01.1, 6. 6. 1. |
| 6 | Repeat 4 for a Circle. |
| | S () 21 ma LIAD abov and |
| | 36011 |
| | |
| | |
| | |
| | |
| | |
| | |

Chapter 9 - Access Modifiers & Constructors Access Modifiers Specifier where a property/method is accessible There are four types of access modifiers in Java: 1. Private 2> Default 3, Protected - About house a new Employed I 4, Public Getters and Setters Getter - Returns the Value [accessors] Setter -> Sets/Updates the value [mutators] L'and swel 12 = amos public class Employee & private int id; private String name; public String get Name () { return name; public void Set Name () { this name = "Your-name"; public void SetName (String n) { this name = n;

Quick Quiz: Use these getters and setters from the main method. Constructors in Java
A member function used to initialize an object
While creating it. Employee harry = new Employee(); harry Set Name ("Harry Bhai"); In order to write our own constructor, we define a method with name same as class name public Employee () {

name = "Your Name"); Constructors can be overloaded just like other methods in Java. We can overload the Employee public Employee (String n) {

name = n; Note: 1 Constructors can take parameters without being overloaded. 3 There can be more than two overloaded constructors

| Quick | auiz: | Overload initialize | the the | Employee Salary | Construto Rs 10 | uchor 0,000 | to |
|-------|-------|------------------------|---------|--------------------|-----------------|----------------|----|
| | | | | 0 | | | |
| | | | | | | | |
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| -61 | Chapter 9 - Practice Set |
| 1 | Create a class Cylinder and use getters and Setters to Set its radius and height. |
| 2 | Use 1 to calculate surface area and Volume of the cylinder. |
| 3 | Use a constructor and repeat 1 |
| 4 / | Overload a Constructor used to initialize a rectangle of length 4 and breadth 5 for using custom parameters |
| 5 | Repeat O for a sphere |
| | Constitution of the consti |
| | |
| | |
| | |
| | to the control of the state of |
| | |
| | The same of the sa |

| _ | |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Chapter 10 - Inheritance |
| | Inheritance is used to borrow properties & methods from an existing class |
| | Phone] -> [Smort Phone] |
| 11 | Super Class -> Gub Class Subclass extende Super Class |
| | Declaring Inheritance in Java Inheritance in Java is declared using extends keyword |
| 200 | Superclass |
| | Subclass catends the superclass |
| | More Examples Vehicle Animal Animal Vehicle |
| la | Car Dog Mat Truck |
| (s) | When a class inherits from a superclass, it inherits |
| | When a class inherits from a superclass, it inherits parts of superclass methods and fields. Java doesn't support multiple inheritance ie hub classes Commot be super classes for a subclass. |
| | Code Example Inheritance in Java is declared using extends keyword |
| | public class Dog extends Animal & Inheriting Dog from Animal Class! |
| _ | 11 Code Animal Class!! |

| | Quick Quiz: Create a class Animal and ? |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Quick Quiz: Create a Class Animal and Derive another class Dog from it. |
| 11101 | white is the property of the state of the st |
| | Constructors in Inheritance |
| | When a Derived class is extended Genn H ? |
| | the Constructor of the Base day is the base days |
| | first followed by the complexistor of |
| | When a Derived class is extended from the Base class the Constructor of the Base class is executed first followed by the constructor of the derived class. |
| | For the following Inheritance hierarchy, the constructors are crecuted in the order (1) + (2) + (3) |
| | are crecuted in the order (1) + (2) |
| boo | |
| | C1 -> Parent |
| | (anatricture over to : ti |
| | C2 - child Constructors execute in top to bottom order! |
| Malagy | Grand child |
| | |
| | Constructors during Constructor Overloading |
| | When there are multiple constructors in the basent |
| | class, the constructor without any parameters |
| | Called from the child class. |
| | When there are multiple constructors in the parent class, the constructor without any parameters is called from the child class. If we want to call the constructor with parameters from the parent class, we can use super keyword |
| | from the parent class, we can use suber keyword |
| | |
| | Super (a, b); -> calls the constructor from the |
| 35556 | Super (a, b); -> Calls the constructor from the parent class which takes 2 Variables |
| | I be when heart for a substance |
| | This Reyword |
| | This is a way for us to reference an object of |
| J. Jurgi | this is a way for us to reference an object of the class which is being created/referenced. |
| | |
| foots | this area = 2 > this is a reference to current object |
| | The Copy of the co |
| | |

Super Reyword
A reference variable used to refer immediate parent class → Can be used to refer immediate parent class instance variable

→ Can be used to invoke parent class methods.

→ Can be used to invoke parent class constructors. Method Overriding

If the child class implements the same method present in the parent class again, it is known as method overriding

Redefining method of super class!

(in sub class) When an object of subclass is created and the overrided method is called, the method which has been implemented in the subclass is called a its code is executed. Dynamic method dispatch Consider the following inheritance hierarchy Super > meth 2 1 Sub - meth 2 (overriden) @ Scenario 1 → Super obj = new Sub() → Allowed (Obj. meth 2() → ② is called (Method of object)

obj. meth 3() → Not Allowed (Object) Scenario 2 > Sub obj = new Super () > Not Alburd (8) This is known as Dynamic method dispatch and is used to acheive run time polymorphism in Java.

| | EDG3 |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | |
| | Chapter 10 - Practice Get |
| class | Institute similar refer to velen institute saland |
| 1 | Create a class Circle and use inheritance to un |
| salyle | Create a class Circle and use inheritance to create another class Cylinder from it. |
| | and to invoke sayant chas methods. |
| 2 | Create a class Rectangle and use inheritance to create another class cuboid. Try to keep it as close to real world scenario as possible. |
| - | another class cuboid. Try to keep it as class |
| 1 | real world Scenario as possible. |
| | Tenthe hild class independs he same method |
| 3 | Create methods for area and volume in 1 |
| 1. | |
| 4 | Create methods for area & volume in (2). Also create getters and setters |
| 11-1 | getters and setters |
| 1+6 | lation an opicit of subclass is recorded and the orn |
| | what is the order of Constructor execution for the (1): |
| | What is the order of Constructor execution for the following inheritance hierarchy: |
| | 1 Control of the cont |
| | TWISTIA I THE STATE OF THE STAT |
| | Derived 1 Derived 1 |
| 9 | DCSIVCE 1 |
| | Derived 2 |
| | yerrived 2 |
| | Derived 2 Obs - man Doi 101) |
| | Derived 2 Oby = new Derived 2(); Which constructor(5) will be executed 8 in what order? |
| 1 | wishings) will be executed & in what order? |
| | D I THE |
| | Objected to Hart Allowed (D) |
| - |) laurelle toll a () and) |
| | Sunding the Chipter of a new Enterior + Not Albard C |
| et h | |
| | Thirds known as Dynamic method dispatch, and is no |

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Note - It is possible to create reference of an abstract class.

It is not possible to create an object of an abstract class

We can also assign reference of an abstract class to the object of a concrete subclass. Interfaces in Java
Interface in english is a point where two systems meet and interact TV Buttons [Human] (3) In Java interface is a group of related methods with empty bodies An Example I would while the Void apply Brake (int decrement);

Void speed up (int increment);

3 class AvonCycle implements Bicycle & int speed = 7: void apply Brake (int decrement) {

Speed = Speed - decrement; Void Speed Up (int increment) {

Speed = Speed + increment; Abstract class vs Interfaces We can't extend multiple abstract classes but we can implement multiple interfaces at a time. Interfaces are meant for dynamic method dispatch

and run time polymorphism Is multiple inheritance allowed in Java?
Multiple inheritance face problems when there exist
methods with same signature in both the super Due to such problems, Java does not support multiple inheritance directly but the similar Concept can be acheived using Interfaces

A class can implement multiple Interfaces and extend a class at the same time. Note: 10 Interfaces in Java is a bit like the Class Dut with a significant difference.

The Interface can only have method signatures,

constant fields and default methods. 3 The class implementing an Interface needs to On declare the methods (not fields)

(3) You can create a reference of Interfaces but

not the Object 3 Interface methods are public by default Default methods An interface can have static and default methods. Default methods enable us to add new functionality to Existing Interfaces.

This feature was introduced in Java 8 to ensure backward compatibity while updating an Interface.

Classes implementing the interface need not implement the default methods. Interfaces can also include private methods for default methods to use.

Inheritance in Interfaces Interfaces can extend anothe interfaces: bublic interface Interface 1 & Void meth 1 (); public interface Interface 2 extends Interface 1 \(\frac{1}{3} \) Remember that interface cannot implement another interface, only classes can do that! Polymorphism using Interfaces @ Cell Phone @ GPS D Camera @ Media Player Similar to Dynamic method dispatch in Inheritance GPS g = new Smart Phone (); → Can only use GPS methods

Smart Phone s = new Smart Phone (); → Can only use Smart Phone methods Implementing an Interface forces method implementation.

| • | EDG3 |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Chapter 11 - Practise Set |
| 1 = | Create an abstract class Pen with methods Write() and refill() as abstract methods |
| 2 | Use the Pen Class from Q1 to create a Concrete class Fountain Pen with additional method change Nib() |
| 3 = | Create a class Monkey with jump () and bite() Methods Create a class Kuman which inherits This Monkey class and implements Basic Animal interface with eat() and skep methods |
| 4 | Create a class TelePhone with ring () lift() and disconnect () methods as abstract methods. Create another class Smart Telephone and demonstrate polymorphism |
| 5 / | Demonstrate polymorphism using monkey class from dus. |
| 6 | Create an Interface TV Remote and use it to inherit Another Interface Smart Tv Remote. |
| 7 | Create a Class Tv which implements Tv Remote interface from Q6 |
| | |

Chapter 12 - Packages

| | maple 12 manges |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Interpreter ve Compiler |
| | Interpreter translates one statement at a time into mache Code: |
| | Code! |
| | Compiler scans the entire program and translates who of it into machine code. |
| | mathetachanachisco seven enterin |
| | Interpreter Compiler |
| ikel | 3 (vote a class Monkey with sumply and I |
| 141 | * One statement at a time |
| 10 | * One statement at a time |
| | * Partial execution if * No execution if an error occurs |
| 779 | 8 |
| hadz mm | # Easy for programmers * Vsually not as easy as Interpreted ones |
| | maindremulat |
| | Is Java Compiled or Interpreted? |
| 4 | Is lava Compiled or Interpreted? Java is a hybrid language -> both compiled as well as interpreted |
| | NIS WELL TUS INTEGRICAL |
| Rode | Compiled To the state of the st |
| | Java file Class file Class file of Can be used harry class by Java interpreter |
| 1 | tang sant by koode |
| ns N | 26 mass |
| - | A JVM can be used to Interprete this bytecode |
| - | A JVM can be used to Interprete this bytecode This bytecode can be taken to any platform (Win/Mac/Linux) for execution Hence Java is platform independent (write once run everywhere) |
| | for execution |
| > | Mence Java is platform independent (write once run excrywhere) |

| | Executing a Java Program |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | MAIN WHAT ENAMED DEAN WARD TOWN |
| | Javac Harry Java -> Compiled Java Harry Class -> Interpocked |
| 1000 | Jara Harry Class -> Interpreted |
| | The state of the s |
| 33531 | So fare the execution of our program was being managed by intelly Idea. We can download a source and editor like VS Code to Compile 8 execute our Java programs. |
| | managed by intelly Idea. |
| | We can download a source code editor like |
| | VS (ade to Compile & execute our bus programs. |
| | To the to which the contract of the state of |
| | Packages in Java |
| ελ 11 | A hackage is used to agout related classes. |
| | A package is used to group related classes. Packages help in avoiding name conflicts. There are two types of packages: Built in packages - Java API Vser defined packages - custom packages |
| 1 | There are by Liliand backson |
| CRE | Q:11 is backers of packages. |
| * | Duit in packages - Java Hr |
| * | Vser defined packages - custom packages |
| | |
| | Song. mp3 photos Songs photos |
| | photo 2. If g song 3 mp3 => videos |
| | photo 2. Jpg Song 3 mp3 Vides mp4 Video 2 mp4 os folders |
| | |
| | |
| | 1. class this Java my mp3 => |
| | 1. class this. Java my.mp3 => Song Java harry. Java as packages |
| | |
| | Vsing a Java package |
| | |
| | import java larg * -> import everything from Java larg |
| | import java larg * \rightarrow import everything from Java larg import java larg String \rightarrow import String from Java larg 5 = new Java larg String ("Harry") \rightarrow Use Without importing |
| | 5 - new Java long String (" Harry") - Use Without importing |
| | |
| | |

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|----------------------------------------------------|---------------------|----------------|---------------------------------------------|-----------|
| Creating a pa Javac Harry ja Javac - d . Har | ckage | la Progre | ial a pa | aturi |
| Javac Harry 10 | $va \rightarrow Cr$ | ceates Harr | y-class | |
| javac - d. Har | July lova -> | creates a f | ackage fold | et |
| | | 1 We | cackage fold can keep w va package li | adding |
| | | to | va pockage li | ke this |
| We can also cree | ate inner | backages | by adding | packag |
| as backage nar | ne | of O Market | | Glden |
| These parkages | once creat | ed can be | used | A J |
| by other classe | s . suo atur | bile 1 eas | ma et | sho) a |
| | | | | |
| Access Modylers | in Java | | n in Java | nchage |
| Access modifiers | determine | whether | other class | ses Can |
| a particular | field or | invoke va | particular | method |
| Access modifiers a particular Can be put | lic, private | , protected | or default | (no ma |
| | 4114 | awills attack | FORTHURS - 1 | H FILLY |
| Modifier | Class | Package | Subclass | World |
| Public Proketed | y | 7 | У | у . |
| Tokaled | y | У | Model | No. |
| Default (no) | V kanifori | = y | Fem No of | N |
| Privak | D'allo | - CAO - 1 | tim solly to | N |
| Z Ave | | | - 4 | |
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| | | and | hua ta | owin |
| | | Acres V | TO TOWN | - 6 |
| man much man and | warus treday | ÷ + | Lava · Inco | treduc |
| and west board | Maria Hara | . 10 | and mad | + parlies |
| and and man had | anna Tredni | * > String > i | Java long | to t |

| | LDG1 |
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| | Chapter 12 - Practice Set |
| 1 | Create three classes Calculator, Sc Calculator and Hybrid Calculator and group them into a package. |
| 2 | Use a built-in package in Java to write a class which displays a message (by using sout) rafter taking input from the user. |
| 3 | Create a package in class with three package levels folder, folder 1, folder 12 |
| | Folder Folder L2 |
| 4 / | Prove that you cannot access default property but can access protected property from the subclass |
| | |
| | |
| | |
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| | EDGE |
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| | Chapter 13 - Multithreading |
| · M | Multiprocessing and multithreading both are used to acheive multitasking |
| 28.0 | Process 2 Process 3 Thread: |
| | (05) Riocess |
| | In a nut Shell |
| → · | Threads use shared memory area. |
| → → | Threads as Faster Content Switching A Thread is light-weight whereas a process is heavyweight |
| • | is heavyweight |
| | |
| 1 | For Example -> A word processor can have one thread |
| | running in foreground as an editor |
| 2 | For Example > A word processor can have one thread running in foreground as an editor and another in the background auto saving the document! |
| | |
| | flow of control in Java |
| 7 | Without threading: |
| | main() -> func1() -> func2 -> END |
| 2, | With threading: |
| | (main c) |
| | [funci()] END |
| | [func 2()] |
| | |

| - | | | |
|-----|----------------------------------------------------------------------------------------------------------------------------------|--|--|
| | Creating a Thread | | |
| | There are two ways to create a thread in law. | | |
| 17 | Creating a Thread There are two ways to create a thread in Java. By extending Thread class By implementing Runnable interface | | |
| 27 | By implementing Runnable interface | | |
| | | | |
| | Life cycle of a Thread | | |
| | tion 1 | | |
| | O New L | | |
| | × (2) (1) (1) | | |
| | ② Runnable (5) Non Runnable (5) C Blocked) | | |
| | 3 Running | | |
| | | | |
| | (5) Terminated | | |
| | | | |
| 0 | New -> Instance of thread created which is not yet started | | |
| | by invoking start() | | |
| | | | |
| (2) | Runnable -> After invocation of start () & before it is selected to be run by the scheduler. | | |
| | selected to be run by the scheduler. | | |
| | | | |
| (3) | Running - After thread scheduler has selected it. | | |
| | | | |
| 4) | Non Runnable -> Thread alive, not eligible to run. | | |
| (3) | Terminated -> runc) method has exitted | | |
| 3) | TOTALISMENT - TWILL THE MAN CHARLE | | |
| | The Thread class | | |
| | Below are the commonly used Constructors of Thread class: | | |
| (1) | Thread() | | |
| (2) | Thread (String name) & Thread (Runnable r, String name) | | |
| 3 | Thread (String name) G Thread (Runnable r, String name) Thread (Runnable r) | | |
| | | | |

| lava: | Methods of Thread class Thread class offers a lot of methods Such as runc), Starte, joine, get Priority, Set Priority), et. More can be found on visiting Java docs |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Life type of a Trend and a life style of the |
| | Teighto |
| | (5) Rungolds (8) Non Rungold (8) Non Strongle (8) |
| | O Running 1 resident to the second se |
| | (3) Terminabel Maria Mar |
| baten | O New - Instrume of thereat created which is not yet a |
| 8 | (2) Runmahlo - After involation of start is & before it is subuler able to be sum by the scheduler. |
| | 3 Burning - After threat scheduler has selected it. |
| | (a) Non Rumable - Treed alive not eligible to rum. |
| | (5) Temminated + run(1) method has existed |
| : wal | The Thread class Below are the lawronly used Constructors of Thread |
| (00 | (a) Thread (String rame) (a) Thread (Surgnotte v. Glaring me) |
| | |

| | EDG3 |
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| | Chapter 13 - Practise Set |
| 1 | Write a program to print "good morning" and "welcome" Continuously on the screen in Java Using Threads. |
| 2 | Add a sleep method in welcome thread of grestion 1 to dealay its execution for 200 ms. |
| 3 | Demonstrate get Priority () and Set Priority () methods in Java Threads. |
| 4 = | How do you get state of a given thread in Java? |
| 5 | How do you get reference to the current thread in Java? |
| | |
| | |
| | |
| | |
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| | Chapter 14 - Errors & Exceptions |
|---------|-------------------------------------------------------------------------------------------------------------------------------------|
| 1, | |
| 10 Llan | No matter how smart we are, errors are our constant companions. With practice, we keep getting better at finding & correcting them. |
| | atting better at Girding & contracting them |
| | yeung dever all finding to covering ment. |
| witson | There are three types of errors in Java. Syntax errors |
| 17 | Syntax errors |
| 27 | Logical errors |
| 37 | Logical errors Runtime errors -> Also called Exceptions! |
| | |
| | Syntax Errors |
| - 17 | When compiler finds something wrong with our program, |
| | Syntax Errors When compiler finds something wrong with our programs it throws a syntax resor. |
| Aberry | |
| | int a = 9 	No Semirolon, Syntax error! a = a+3; |
| | |
| | d = 4; -> Variable not declared, Syntax error! |
| | - Marian, symux eviet; |
| | Logical errors |
| | A logical error or a bug occurs when a program |
| | A logical error or a bug occurs when a program compiles and runs but does the wrong thing. |
| | 1000 d 1 d 1 d 1 |
| 7 | musage delivered wrongly |
| | income time of Chats being displayed |
| 7 | message delivered wrongly wrongly time of chats being displayed incorrect reducets! |
| | Runtime Expans |
| | Java may sometimes except |
| | brogram is running. There an error while the |
| | Runtime Extors Java may sometimes encounter an error while the frogram is running. These are also called exceptions! |
| | |

| T | |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Truse are encountered due to circumstances like |
| | bad input and low resource constraints. |
| | Ex: user supplies '5'+8 to a program which |
| | adds 2 numbers. |
| | furt 1 |
| | by the programmer where as Runtime errors are encountered by the users. |
| | by the programmer where as Runtime errors |
| 10 | are encountered by the users. |
| | and final of the state of the s |
| | Exceptions in Java |
| | An Exception is an event that occurs when a program |
| | is executed disrupting the normal flow of instructions. |
| | There are mainly two types of exceptions in Java: |
| 17 | Checked Exception -> Compile time exceptions (Handled by Compiler) |
| 27 | An Exception is an event that occurs when a program is executed disrupting the normal flow of instructions. There are mainly two types of exceptions in Java: Checked Exception -> Compile time exceptions (Handled by Compiler). Unchecked Exception -> Runtime exceptions |
| | |
| | Commonly Occurring Exceptions |
| | Following are few commonly occurring exceptions in Java: |
| 17 | Null Pointer Exception |
| 27 | Ari thmetic Exception |
| 3, | Array Index Out of Bound Exception |
| 4, | Ikgal Argument Exception |
| 51 | Number format Exception |
| | 369180 |
| | try-catch black in Java |
| | In Java, exceptions are managed using try-catch blocks |
| 1 | Syntax: |
| | try ? |
| | 11 Lode to try 3 |
| - 1 | |
| | catch (Exceptione) { |
| - | Catch (Exception) { 1/ Code if exception |

Handling specific Exceptions
In Java, we can handle specific exceptions by typing
multiple catch blocks. 1/Code Catch [IoException e] Catch (Arithmetic Exception e) & - Handles all Exceptions of
Wode Arithmetic Exception Catch (Exception e) { - Handles all other Exceptions Nesked try-catch
We can nest multiple try-catch blocks as follows: (atch (Ex. c) { Hested try- atch blocks Similarly, we can further nest try catch blocks inside the nested try catch blocks.

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| | Quick Quiz: Write a lava program that allows you to |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| net. | Rest accessing an array until a |
| 4, | Volid index is own hu the use |
| A | Quick Quiz: Write a Java program that allows you to keep accessing an array until a Valid index is given by the user. |
| 3,0 | THE STATE OF THE S |
| | Tolo Con with our and [11] |
| 7 | Exception class in Java We can write our custom Exceptions using Exception class in Java: |
| \$ 0 | M Java . There I say I say alaborat trov sibiling |
| | 111: 1 11 5 6 |
| | public class My Exception extends Exception { No verridden methods |
| | No verriddin methods |
| | Java finally block - |
| aks. | Finally block contains the costs which is always |
| | The Exception class has following important methods: |
| 13 | ALL CLEAR THE CANADA CAN A STATE OF THE CANADA CANADA CAN A STATE OF THE CANADA C |
| (1) | String to String () -> executed when sout (e) is van |
| (2) | Void brint Stack Trace() -> brints stack trace |
| (3) | String to String () -> executed when sout (e) is van Void print Stack Trace () -> prints Stack trace String get Message () -> prints the Exception message |
| | |
| | The throw Remisord |
| | The throw keyword is used to throw an exception explicitly by the programmer |
| | explicitly by the programmer |
| | vapating by the programmer |
| | |
| | if (b==0) { throw new Arithmetic Exception ("Div by 0"); |
| | Throw new Arithmetic Exception [Div by 0); |
| | 3 |
| | else { |
| | return a/b; |
| | 3 |
| | |
| | In a similar manner, we can throw user defined exceptions: throw new My Exception ("Exception thrown"); |
| | exceptions: |
| | through near My Exception (" Exception thrown"); |
| | The state of the s |

The throws exception

The Java throws keyword is used to declare an taution.

This gives an information to the programmer that there might be an exception so its better to be parepared with a try which block! public Void Calculate (int a, int b) throws 10 Exception { Java finally block finally block contains the code which is always execute whether the exception is handled or not.

It is used to execute code containing instructions to release the system resources, close a connection etc.

| | EDG3 |
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| | |
| | Chapter 14- Practice Set |
| | |
| 1 | Write a Lova program to demonstrate syntax, logical & runtime errors |
| 1 | 8 runtime cross. |
| | |
| 2 | Write a Java program that prints "Haffa" during Arithmetic exception and "HeHe" during an Illegal argument exception |
| 1 | Arithmetic exception and "HeHe" during an Illegal |
| | argument exception |
| | |
| 3 | Write a program that allows you to keep accessing an array until a valid index is given. If max retries exceed 5 prind "Error". |
| 1 | an array until a valid index is own. If max |
| | refries exceed 5 print "Error". |
| | |
| 4 | Modily program in Q3 to throw a custom Exception |
| 1 | Modify program in Q3 to throw a custom Exception if max retries are reached. |
| | |
| 5 | Wrap the program in Q3 inside a method which throws your custom Exception. |
| - | throws your custom Exception. |
| | |
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Advanced Lava - 1 Collections transmork A collection represents a group of object. Java collections provide Classes and Interfaces for us to be able to write code quickly and efficiently Why do we need Collections We need Collections for efficient storage and better manipulation of data in JavaFor ex: We use arrays to store integers but what if we want to -> Resize this array? Insert an element in between? → Delete on element in Array? Apply certain operations to change this array? How are collections available Collections in Java are available as Classes and Interfaces. Following are few commonly used Collections in Java: Arraylist -> for variable size Collection Set -> For distinct collection Stack -> A LIFO data structure HashMap + For Storing key-value pairs Collection class is available in java-util package Collection class also provides static methods for Sorting, searching etc.