**JAVA**

**Classes and Methods**

**Lab Exercise No:**14

**Exercise Objective(s):***Construction of an object*

**Exercise:***Create a class called Calculator which has 4 different methods add, diff, mul and div which*

*accepts two numbers as parameters. Create an object to access these methods and invoke*

*these methods with two numbers and display the result in the corresponding methods.*

**Recommended duration:***20Mins*

**Solution Guidance (if applicable):** *NA*

**Lab Exercise No:**15

**Exercise Objective(s):***Construction of an object, constructors*

**Exercise:***Create a class called Sample. Write a program to display the no of objects created for that*

*class or the no of times that class is instantiated.*

**Recommended duration:***15Mins*

**Solution Guidance (if applicable):** *Use a static int variable and increment that variable inside the*

*constructor.*

**Lab Exercise No:**16

**Exercise Objective(s):***Construction of an object, this keyword, accessors(getters) and mutators(setters),*

*public and private access specifiers, instance and class member variables*

**Exercise:***Create a class called Student with the following details: RollNo, StudName, MarksInEng,*

*MarksInMaths and MarksInScience. Write getters and setters for the all variables. RollNo*

*should be automatically generatedwhenever a newstudent is added.*

*Create a class called Standard with 8 students’ details and write separate method for each of*

*the following tasks and invoke the same.*

1. *To display the entire roll no and the name of the students in the class in the ascending order of roll no.*
2. *To display the roll no and the name of the student who has got the highest percentage.*
3. *To display the roll no and the name of the student who scored highest mark*

*inmathematics.*

1. *To display the roll no and the name of the student in the ascending order of the total marks in mathematics and science alone.*
2. *To display the roll no, name, total marks, percentage and rank of all the students in the descending order of rank.*

**Recommended duration:***40Mins*

**Solution Guidance (if applicable):** *NA*

**Lab Exercise No:**17

**Exercise Objective(s):***String class, String immutability*

**Exercise:***Write class that declares the following String.*

***“The quick brown fox jumps over the lazy dog”.***

*Perform the following modifications to the above string using appropriate methods.*

1. *Print the character at the 12th index.*
2. *Check whether the String contains the word “is”.*
3. *Add the string “and killed it” to the existing string.*
4. *Check whether the String ends with the word “dogs”.*
5. *Check whether the String is equal to “The quick brown Fox jumps over the lazy Dog”.*
6. *Check whether the String is equal to “*THE QUICK BROWN FOX JUMPS OVER THE LAZY DOG*”.*
7. *Find the index position of the character “a”.*
8. *Find the last index position of the character “e”.*
9. *Find the length of the String.*
10. *Check whether the String matches to “The quick brown Fox jumps over the lazy Dog”.*
11. *Replace the word “The” with the word “A”.*
12. *Split the above string into two such that two animal names do not come together.*
13. *Print the animal names alone separately from the above string.*
14. *Print the above string in completely lower case.*
15. *Print the above string in completely upper case.*

**Recommended duration:***30Mins*

**Solution Guidance (if applicable):** *NA*

**Lab Exercise No:**18

**Exercise Objective(s):***String class, String immutability*

**Exercise:***Write a program to demonstrate the difference between equals and == operator with*

*appropriate example.*

**Recommended duration:***15Mins*

**Solution Guidance (if applicable):** *NA*

**Lab Exercise No:**19

**Exercise Objective(s):***Arrays*

**Exercise:***Write a program to declare an array with 8 elements and copy the 8 elements into another*

*array and display the same.*

**Recommended duration:***15Mins*

**Solution Guidance (if applicable):** *NA*

**Lab Exercise No:**20

**Exercise Objective(s):***Arrays*

**Exercise:***Write a program to display the sum and the average of elements in the array.*

**Recommended duration:***15Mins*

**Solution Guidance (if applicable):** *NA*

**Lab Exercise No:**21

**Exercise Objective(s):***Arrays*

**Exercise:***Write a program to construct two matrices and display the sum of those.*

**Recommended duration:***20Mins*

**Solution Guidance (if applicable):** *NA*

**Lab Exercise No:**22

**Exercise Objective(s):***Arrays*

**Exercise:***Write a program to display the square of the elements of a two dimensional array.*

**Recommended duration:***20Mins*

**Solution Guidance (if applicable):** *NA*

**Lab Exercise No:**23

**Exercise Objective(s):***Arrays*

**Exercise:***Write a program to construct an array with 10 elements and to find the number of*

*occurrences of each element in the Array.*

**Recommended duration:***20Mins*

**Solution Guidance (if applicable):** *NA*

**Lab Exercise No:**24

**Exercise Objective(s):***Overloading*

**Exercise:***Create a class called shape with the following methods*

1. *area*
2. *perimeter*

*Overload the area and perimeter method to calculate for both square and rectangle.*

*Create a main class and invoke the area method to calculate the area of the square and*

*rectangle. Also invoke the perimeter method to calculate the perimeter of the square*

*and rectangle.*

**Recommended duration:***20Mins*

**Solution Guidance (if applicable):** *NA*

**Lab Exercise No:**25

**Exercise Objective(s):***Overloading*

**Exercise:** *Create a class called employee with the following data members*

1. *empName*
2. *empId*
3. *empAge*
4. *empdesgn*
5. *empLocation*
6. *empExpInYrs*

*All these data members should be initialized using constructors. Use constructor overloading*

*and demonstrate by creating different employee objects with*

1. *Employee name alone*
2. *Employee name and id*
3. *Employee name, id and age*
4. *Employee name, id and designation*
5. *Employee name, id, age and designation*
6. *Employee name, id, age and location*
7. *Employee name, id, age and experience*
8. *Employee name, id, designation and experience*
9. *Employee name, id, designation, location and experience*
10. *Employee name, id, age, designation, location and experience*

**Recommended duration:***20Mins*

**Solution Guidance (if applicable):** *NA*

**Lab Exercise No:**26

**Exercise Objective(s):***Overloading*

**Exercise:***Create a class called Calculator which has 4 different methods add, diff, mul and div which*

*accepts two numbers as parameters. Overload the methods such that the parameters can be*

*of the following pattern.*

1. *Both are of int data type.*
2. *Both are of double data type.*
3. *First parameter is of int data type and second parameter is of double data type.*
4. *First parameter is of double data type and second parameter is of int data type.*

*Create anobject to access these methods and invoke these methods with different type of*

*numbers and display the result in the corresponding methods.*

**Recommended duration:***20Mins*

**Solution Guidance (if applicable):** *Re-use the code from Lab Exercise 14*

**Lab Exercise No:**27

**Exercise Objective(s):***Initializers*

**Exercise:***Write a class called Computer such that the object of that class should be created only when*

*the class is loaded.*

**Recommended duration:***20Mins*

**Solution Guidance (if applicable):** *NA*

**Lab Exercise No:**28

**Exercise Objective(s):***Var-args*

**Exercise:***In the calculator (Lab exercise - 14) program, make the add and diff method to accept var-args*

*and demonstrate.*

**Recommended duration:***20Mins*

**Solution Guidance (if applicable):***NA*