**JAVA ASSIGNMENT - CLASS AND OBJECTS**

1.Write a program to store price of items and to print the largest price as well as the sum of prices.

2.Write a program to hold the details of 10 students and provide the facility of viewing details of the topper as well as of specific student by providing his/her roll number.

3.Design a class to represent a bank account. Include the following members.

Data Members

* Name of the depositor
* Account Number
* Type of account
* Balance amount in the account

Methods

* To assign initial values
* To deposit an amount
* To withdraw an amount after checking balance

To display the name and balance

4.Pattern printing using the concepts of class and objects.

\*

\*\*

\*\*\*

\*\*\*\*

\*\*\*\*\*

5.Printing UNICODE from 0-100.

6.Program to display all the prime numbers upto n using single loop.

7.Write a program to print scoreboard of a cricket match in real time. The display should contain batsman’s name, runs scored, indication for caught, bowled, or run out, bowler’s score (overs bowled, maiden overs, runs given, wickets taken). As and when the ball is thrown, the score should be updated.

8. A college maintains a list of its students graduating every year. At the end of the year, the college produces a report that lists the following :

Year \_\_\_\_\_\_\_\_\_\_\_

Number of Working Graduates :

Number of non-Working Graduates :

Details of the Top-most Scorer

Name :

Age :

Subject :

Average Marks :

x% of the graduates this year are non-working and n% are first divisioners.

Write a program for it that uses the following inheritance path:

Person -----🡪 Student ------🡪 Graduate Student

(name ,age) (rollno,average) (subject , employed)

marks

9.Imagine a publishing company that markets both books and audio-cassettes versions of its works. Create a class **Publication** that stores the title and price of a publication. From this class derive two classes :  **Book**, which adds a page count; and **Tape**, which adds a playing time in minutes. Each of these classes should have a getdata() function to get its data from the user at the keyboard, and a putdata() function to display its data.

Write a **main()** program to test the **book** and **tape** classes by creating instances of them, asking the user to fill in their data

With **getdata()** , and then displaying the data with **putdata()**.

10. Define a class called Triangle with three integer data members a, b, and c as the lengths of its three edges. This class should have the following methods:

(a) a constructor with 3 parameters representing the 3 edges

(b) a method isTriangle() which returns true if the 3 edges are all positive and they satisfy the triangle inequality where a+b > c, a+c > b, b+c > a.

(c) a method getAngle() with 1 parameter, an edge, which returns the angle in degrees of the angle facing the given edge.

The signature of these methods are given below:

public Triangle(int newa, int newb, int newc)

public boolean isTriangle()

public double getAngle(int edge)

Note: getAngle() should return zero if the triangle is not really a triangle. Also, here are a few formulas to help you define the class:

FYI, if A is the angle facing side a, then the following formula should help:

cosA = (b2 + c2 – a2)/2bc

11.For this question you are provided with the class Student that has at least three methods available to you. **getScore()** returns the student’s score. **isAttendanceGood()** returns true if the student has good attendance, false otherwise. **isTalkative()** returns true if the student is talkative in class, false otherwise. The signature of these methods are given below:

public int getScore()

public boolean isAttendanceGood()

public boolean isTalkative()

Note that the class may have more data members or methods that are not reflected here. You are asked to write a method printGrade with the following signature:

void printGrade(Student s1);

As the name suggests, this method takes an object of type Student and prints out the final grade for that student. The grade is assigned following these guidelines.

(a) There are only 3 possible grades A, B or C.

(b) If a student has a score of more than 80, they have an A.

(c) If a student has a score of more than 60 but less than 80, they have a B.

(d) If a student has a score of less than 60 they have a C.

(e) Students that fall on the boundary of an A and a B (i.e., a score of exactly 80) receive an A only if they have good attendance, and a B otherwise.

(f) Students that fall on the boundary of a B and a C (i.e., a score of exactly 60) receive a C only if they are talkative in class, and a B otherwise.

12. A palindrome is a word or phrase that reads the same forward or backwards. Write a recursive method that returns a boolean value indicating if its only String argument is a palindrome or not.

13. Several design properties for a problem are presented below. Use these properties in order to write all the necessary classes and/or interfaces for a solution to the problem. Focus on class structure and interaction. You may implement your solution however you wish, but you will be graded on the appropriateness of your solution to the requirements. Note the use of capitalization and parentheses for clarification. You may use whatever constructors or additional methods you wish.

You must define a structure that can represent Animals. Animals have two behaviors; they can speak() and they can move(). By default, when an animal moves, the text ”This animal moves forward” is displayed. By default, when an animal speaks, the text ”This animal speaks” is displayed. A general Animal should not be able to be instantiated.

Define also two classes, Goose and Lynx, that are Animals. Both Goose and Lynx behave such that where ”animal” is displayed in speak() or move(), ”goose” or ”lynx” is displayed by the appropriate classes.

Finally, any instance of Goose can fly(), just as any Flying object can. An Airplane is also a Flying object. Define the Airplane class such that it is Flying and make sure that any instance of Goose is also Flying. The specific behaviors when instances of either class fly() are up to you. Instances of either Goose or Airplane should be able to be stored in a variable of type Flying.

14. Write a class, call it GradesCount, to read a list of grades from the keyboard (integer numbers in the range 0 to 100). Prompt the user with “Please enter a grade between 0 to 100 or -1 to quit: ” each time before reading the next integer. Store each grade in a A, B, C, D or F Vector as follows: 90 to 100 = A, 80 to 89 = B, 70 to 79 = C, 60 to 69 = D, and 0 to 59 = F. (Hint: You cannot store ints as Vector elements, but you can store Integers.)

Output the total number of grades entered, the number of A, B, C, D and F, and a list of the A’s. For example, if the input is...

38

86

92

55

83

42

90

-1

then the output should be:

Total number of grades = 7

Number of A = 2

Number of B = 2

Number of C = 0

Number of D = 0

Number of F = 3

The A grades are: 92, 90

15.Pattern printing using the concepts of class and objects.

\*

\* \*

\* \* \*

\* \* \* \*

\* \* \* \* \*

16.Pattern printing using the concepts of class and objects.

\*

\* \*

\* \* \*

\* \* \* \*

\* \* \* \* \*

\* \* \* \*

\* \* \*

\* \*

\*

17.Pattern printing using a single for loop.

\*

\* \*

\* \* \*

\* \* \* \*

\* \* \* \* \*

18.Pattern printing using the concepts of class and objects.

\*\*\*\*\*

\*\*\*\*

\*\*\*

\*\*

\*

19. Write a program to reverse the string word by word.

Eg: “My name is Dipanshu”

Output should be : “Dipanshu is name My ”

20.Write a program to calculate surface area and volume of the

given figure:

