School of Information Technology & Engineering

Fall 2018-19

Assessment I Practice Problems

Programme : B.Tech **Due Date : 18th Jan 2019**

Course Title : Java Programming Lab **Course Code : CSE1007**

1) Write a program that uses println() to produce this pattern:

```
          '__'
          (@@)
  /========\/
 / || %% ||
*  ||----||
   ¥¥    ¥¥
   ""    ""
```

2) Write a program to read the first and last name from the user through command line arguments and display a greeting message.
Example
Hello!
FirstName LastName
Good Morning.. Welcome to "Java Lab" :)

3) Write a program to read the First name and Last name of a person, his weight and height using command line arguments. Calculate the BMI Index which is defined as the individual's body mass divided by the square of their height.

Category	BMI Range-Kg/m^2
Underweight	<18.5
Normal (healthy weight)	18.5 to 25
Overweight	25 to 30
Obese Class	Over 30

Display the name and display his category based on the BMI value thus calculated.

4) Write a program called NumberGuess to play the number guessing game. The program shall generate a random number between 0 and 99. The player inputs his/her guess and the program shall response with "Too higher", "Too lower" or "Congratulations! You got it.." accordingly.

5) Write a program to generate the Tribonacci sequence.
(*Tribonacci numbers* are a sequence of numbers T(n) similar to *Fibonacci numbers*, except that a number is formed by adding the three previous numbers, i.e., T(n)=T(n-1)+T(n-2)+T(n-3), T(1)=T(2)=1, and T(3)=2.)

6) Write a program to accept an integer number and separate the digits with a $ sign.

7) Write a program to display the Hailstone sequence for a given number. Also display the total count of numbers in the sequence.
(There is a sequence of numbers in mathematics that is sometimes known as the hailstone sequence. The German mathematician, Lothar Collatz, proposed that for any number it's possible to make a sequence of numbers that will eventually end in one by following a simple rule; if the number is even halve it by two, if it's odd multiply it by three and add one (e.g., starting with the number 5 the sequence would be 5 16 8 4 2 1).)

8) Write a program to print all numbers divisible by 7 between 1 and 200.

9) Write a program to continuously read input values from the user. The program should terminate if exactly three String values have been inputted. Display the count of integer values and float values entered so far. Also display the average of all integer values and all float values individually.

10) Write a program to print the following patterns using loops.

a)

```
1
1  2  1
1  2  3  2  1
1  2  3  4  3  2  1
1  2  3  4  5  4  3  2  1
```

b)

```
1  2  3  4  5  6  7
   2  3  4  5  6  7
      3  4  5  6  7
         4  5  6  7
            5  6  7
               6  7
                  7
               6  7
            5  6  7
         4  5  6  7
      3  4  5  6  7
   2  3  4  5  6  7
1  2  3  4  5  6  7
```

11) Write a program to define a static method sum_Squares( ) to find the sum of the squares of the first 'n' natural numbers and a non-static method square_Sum( ) to find the square of the sum of those 'n' natural numbers. Invoke these methods from main( ) method to evaluate the difference between the values returned by them.

i.e., $(1^2 + 2^2 + 3^2 \ldots + n^2)$ → sum_Squares( )

$(1 + 2 + 3 \ldots + n)^2$ → square_Sum( )

12) The following list gives the amount of rainfall (in cms) recorded at a particular place for 12 months.

10.2, 11.9, 8.0, 11.2, 10.8, 6.9, 8.2, 11.5, 10.4, 8.7, 7.8, 7.5.

Store these values in an array. Find the average rainfall and display the count of the number of months in which the rainfall is more than the average.

13) If there are 4 batches in BTech learning 'CSE1007' course, read the count of the slow learners (who have scored <25) in each batch. Tutors should be assigned in the ratio of 1:4 (For every 4 slow learners, there should be one tutor). Determine the number of tutors for each batch. Create a 2-D jagged array with 4 rows to store the count of slow learners in the 4 batches. The number of columns in each row should be equal to the number of groups formed for that particular batch (Eg., If there are 23 slow learners in a batch, then there should be 6 tutors and in the jagged array, the corresponding row should store 4, 4, 4, 4, 4,3). Use for-each loop to traverse the array and print the details. Also print the number of batches in which all tutors have exactly 4 students.

14) Create a class Film with string objects which stores name, language and lead_actor and category (action/drama/fiction/comedy). Also include an integer data member that stores the duration of the film. Include parameterized constructor, default constructor and accessory functions to film class. Flim objects can be initialized either using a constructor or accessor functions. Create a class FilmMain that includes a main function. In the main function create an array of objects that stores the information about the film. Also write suitable methods to display the following

a. The English film(s) that has Arnold as its lead actor and that runs for shortest duration.
b. The Tamil film(s) with Rajini as lead actor.
c. All the comedy movies.

15) Create a class **StudentGrade** with member –
determineGrade( ) that accepts register number (String) and marks (float-type) of a student in all courses he has registered for a particular semester. If the length of marks is 0 display – "You have not registered for any course" else the method should display the mark and the grade obtained in each course and a count of 'S' grade.

Note: The method should accept variable length argument for marks, because one student might have registered only for 5 courses, the other for 7 courses and so on.

Use the following criteria to determine the grade

Mark between 90.0 and 100.0 - Grade 'S'
between 80.0 and 89.0 - Grade 'A'
between 70.0 and 79.0 - Grade 'B'
between 60.0 and 69.0 - Grade 'C'
between 55.0 and 59.0 - Grade 'D'
between 50.0 and 54.0 - Grade 'E'
less than 50.0 – Grade 'F'

Create a main class that calls the above method for 5 students.