JAVA Assignment-1 Questions:

- Write a Java program to read your roll number, name and percentage in HSC (12th standard)
- 2. Write a Java program that displays the result of the following expression:

(a) (b)

$$\frac{9.5 \times 4.5 - 2.5 \times 3}{45.5 - 3.5}$$
 $4 \times \left(1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} - \frac{1}{11}\right)$

3. Write a program to print the area and perimeter of a circle based on the value of radius entered by the user. Use float variables and Math. PI.

Perimeter of circle = 2*PI*radius Area of circle = PI * radius * radius

4. Write a compound interest-based program to find the maturity amount of fixed deposit done in the bank based on principal amount, rate of interest and number of years entered by the user. Display the principal amount, rate, years and maturity Amount on the console.

Use the Compound Interest Formula: MaturityAmount = P (1+r/100)ⁿ

P = principal amount, r =rate of interest, n=number of years. Display the formatted maturity amount 2 digits after the decimal point.

- **5.** Assume a runner runs 14 kilometres in 45 minutes and 30 seconds. Write a Java program that displays the average speed in miles per hour. (Note that 1mile is 1.6 kilometres.).
- **6.** Population projection program. The Census Bureau projects population based on the following assumptions:

One birth every 7 seconds
One death every 13 seconds
One new immigrant every 45 seconds

Write a program to display the population for 2021 and 2022. Assume the current population (as on 2020) is 312,032,486.

Hint: In Java, if two integers perform division, the result is an integer. The fractional part is truncated. For example, 5 / 4 is 1 (not 1.25) and 10 / 4 is 2 (not 2.5). To get an accurate result with the fractional part, one of the values involved in the division must be a number

with a decimal point. For example, 5.0 / 4 is 1.25 and 10 / 4.0 is 2.5.

7. (Financial application: calculate interest) If you know the balance and the annual percentage interest rate, you can compute the interest on the next monthly payment using the following formula:

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interest = balance * (annual interest rate/1200)
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Write a program that reads the balance and the annual percentage interest rate and displays the interest for the next month.

Hint: Here is a sample run:

Enter balance and interest rate (e.g., 3 for 3%): 1000 3.5 The interest is 2.91667

8. (Cost of driving application) Write a Java program that prompts the user to enter the distance to drive, the fuel efficiency of the car in miles per gallon, and the price per gallon, and displays the cost of the trip. Here is a sample run:

Enter the driving distance: 900.5 Enter miles per gallon: 25.5 Enter price per gallon: 3.55 The cost of driving is \$125.36

- **9.** Write a program that takes the input of 3 subjects marks out of 150. Count the percentage. Print the Grade/Class based on the following conditions:
 - For 70% or more than 70% display DISTINCTION.
 - For percentage between 60 and 69 display FIRST CLASS.
 - For percentage between 50 and 59 display SECOND CLASS.
 - For percentages between 40 and 49 display PASS CLASS.
 - For percentage, less than 40 display FAIL.
- **10.** Accept the marks (out of 70) for 3 subjects (Maths, physics, chemistry) from the user and check if the student is eligible for admission based on the following criteria:
 - i) Mathematics >= 50%, Physics >= 45%, Chemistry >= 60%, and Overall

Percentage >= 65% **OR**

- ii) Total marks of Mathematics + Physics >= 120
- 11. Considering three numbers provided by the user as the length of sides of a triangle, first

check, if the values are valid for representing the sides of a triangle (i.e. whether a triangle can be drawn using the given values). If the lengths of sides are valid, print the type of the triangle.

Hint: The sum of lengths of any two sides of a triangle is always greater than the length of the third side. A triangle with all three sides having the same length is known as an "Equilateral" triangle. A triangle is called an "Isosceles" triangle if only two sides have equal lengths. If all the sides of a triangle have different lengths, then it is called a "Scalene" triangle.

12. Accept the basic salary of an employee from the user, and calculate the gross salary using: Gross Salary = Basic Salary + DA + HRA – PF

DA = 30% of Basic Salary If Basic Salary < 5000 otherwise DA = 45% of the Basic Salary. HRA = 15% of Basic Salary.

PF = 12% of Basic Salary.

13. Read an employee name (NAME), overtime hours worked (OVERTIME), hours absent (ABSENT) and determine the bonus payment (PAYMENT).

Bonus Schedule	
OVERTIME – (2/3)*ABSENT	Bonus Paid
>40 hours	0.50
>30 but ≤ 40 hours	\$50
>20 but ≤ 30 hours	\$40 \$30

14. Write to a program to print the following series using the looping concept (use

D. 2, 4, 8, 16, 32, 64

15. Write a program to print the following pattern. (hint: nested for loop)

Α

ВВ

CCC

DDDD

16. Write a program to print the following pattern. Sample output on-screen (if the user enters N=4).

10987

654

3 2

1

17. Write a program to print the following pattern (if user enter N=6)

000000

00000

0000

@@@

@@

@

18. Print multiplication table of a number entered by the user. Validate that the number must be between 1 and 20. E.g.

5 X 2 = 10

5 X 3 = 15

5 X 10 = 50

19. Accept a number N from the user and print the first N elements of the

Fibonacci series. Hint: The Fibonacci sequence: 0, 1, 1, 2, 3, 5, 8, 13, 21

Fibonacci series is defined as a sequence of numbers in which the first two numbers are 1 and 1, or 0 and 1, depending on the selected beginning point of the sequence, and each

subsequent number is the sum of the previous two. So, in this series, the nth term is the sum of (n-1)th term and (n-2)th term.

Mathematically, the nth term of the Fibonacci series can be represented as: tn = tn-1 + tn-2

20. An equation of the form

$$ax^2 + bx + c = 0$$

is known as the quadratic equation. The values of x that satisfy the equation are known as the roots of the equation. A quadratic equation has two roots.

Write a program that requests the user to input the values of a, b, and c and outputs **root1** and **root2**.

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