MID-SEMESTER Project Questions
(Individual Work) Avoid Plagiarism
Due Date: 28th November 2022
Submission Type is ZIP(.java and Screenshot of your code)

1. Write a java program that takes 10 integer values from the user in the form of an array and generates another 30 integer values between 1 and 120. The program adds both arrays together and implements

I.   Quick Sort
II.   Bubble Sort
III.   Insertion Sort
IV.   Selection Sort

V.   Heap Sort.

The program asks the user for any of the above sorting algorithms and returns the sorted form of the merge arrays alongside the time taken to sort them.

2. Universal Conversion, this program displays the units conversion units and asks the user to choose the service they want.
I.   Weight – grams to an ounce, grams to kilograms and lbs. to kg (vice versa)
II.   Length – ft to meter, kilometres to Mile, kilometres to Yard (vice versa)
III.   Temperature – Celsius to Kelvin, Celsius to Fahrenheit, Kelvin to Fahrenheit (vice versa)
IV.   Volume -   Milliliter to Liters, Teaspoon to Milliliters and Teaspoon to Liters(vice versa)
V.   Area – Square meters to the square foot, square meters to square kilometres and square meters to acres. (vice versa)

3. Write a program in Java that takes a user's birth date and provides the day of birth (Monday, Tuesday, Wednesday…) and the day their 50th birth will fall on.

4. Write a Java program that takes student GPA in percentage for every semester and Calculates the GPA (4.0) for the semester, year and CGPA. It also shows the honour of the person. Use the University of Regina grading system.

5. Mortgage Calculator for Saskatchewan, write a program that calculates the interest and monthly payment and the total amount (including PST and GST) depending on the credit score.
   • The program will request mortgage amount, credit score, and down payment percent.

- Minimum mortgage is $100,000, and the highest is $ 10,000,000.
- Credit score must be between (600- 900), Credit of 600 incurs +3% interest, 700 (+2), 800(+1), 900 (0). ***The default interest rate is 5%.***
- Down payment of below 20% incurs mortgage insurance which is 3% of the total mortgage.

6. You will write a client-server java program for transferring some files from the server to the client. The server and the client are separate programs and may be running on different computers. The server program runs and waits for requests from the client. The client program takes a file name X as a command line parameter and asks the server if it has the file X. After receiving the request, the server checks if the file X is in its current directory and lets the client know. In addition, the server tells the client some statistics regarding the visits by all previous clients. Specifically, the server sends 2 numbers <N, M>, where N is the total number of requests so far, and M is the number of successful requests. The statistics include the current request, and the server must update the statistics at every request. After the initial response, if the file was available, the server sends the file to the client. The client program displays three pieces of information it receives from the server – whether the file was found and the two numbers M and N. If the file X was found, the client receives the file from the server and stores it in the current directory. After the file transfer is complete, the client displays the message "file transfer complete" and terminates. The server program keeps running forever and displays a log of current requests (including client IP address and the requested file) and the statistics.