

### 1. Array Assignments:

Create a Java program that performs various operations on arrays, such as finding the maximum element, calculating the sum and average, and sorting the elements in ascending order.

Tasks:

- a. Implement a method to find the maximum element in an array.
- b. Implement a method to calculate the sum of all elements in an array.
- c. Implement a method to calculate the average of all elements in an array.
- d. Implement a method to sort the elements of an array in ascending order using any sorting algorithm of your choice (e.g., bubble sort, selection sort).
- e. Write a main program to demonstrate these operations:
- f. Create an array of integers and initialize it with some values.
- g. Call the methods implemented in steps 1 to 4 to perform the respective operations.
- h. Display the results of each operation.

### 2. Matrix Operations Assignment:

Create a Java program that performs various operations on matrices using 2D arrays.

Tasks:

- a. Implement methods to add, subtract, and multiply two matrices.
- b. Write a method to transpose a matrix.
- c. Implement scalar multiplication of a matrix.
- d. Create a method to check if a matrix is symmetric.
- e. Write a main program to demonstrate these operations by taking input matrices from the user.
- f. Display the results of each operation.

### 3. Bank Account Management System

Create a simple Bank Account Management System that allows users to perform basic operations such as depositing money, withdrawing money, and checking their account balance.

Tasks:

- a. Define a class named BankAccount with the following attributes:
  - i. accountNumber: Unique identifier for each bank account.
  - ii. accountHolderName: Name of the account holder.
  - iii. balance: Current balance in the account.
- b. Implement appropriate constructors and methods for the BankAccount class:
  - i. Include methods to deposit money into the account, withdraw money from the account, and check the account balance.
  - ii. Ensure that the balance cannot be negative after a withdrawal.
- c. Create a main program to interact with the BankAccount class:
  - i. Allow users to perform operations such as depositing money, withdrawing money, and checking their account balance using a simple menu-driven interface.
  - ii. Prompt users to enter the necessary information for each operation (e.g., account number, account holder name, amount to deposit/withdraw).
  - iii. Display appropriate messages to indicate the success or failure of each operation.