

# Java Programming Assignment Questions

## Q1. String Analysis

Write a Java program that reads a line of text from the keyboard and displays the following:

- Number of uppercase letters
  - Number of lowercase letters
  - Number of digits
  - Number of whitespace characters
  - Number of words in the string
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## Q2. Password Validator

Write a Java program to validate a password entered by the user. The password must satisfy the following conditions:

- Must be at least 8 characters long
  - Must contain at least one uppercase letter
  - Must contain at least one lowercase letter
  - Must contain at least one digit
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## Q3. Tuple-Like Operations Using Java Collections

Write a Java program to perform the following operations on a list (used in place of a tuple):

- Find repeated items
- Check whether an element exists
- Remove a specific item

- Convert the list to a dictionary-like map (index as key, element as value)
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## Q4. Binary Search

Write a Java program to implement the Binary Search algorithm on an array of integers. The program should:

- Accept a sorted array from the user
  - Accept a key to be searched
  - Display whether the key exists or not, and if yes, its position
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## Q5. Linear Search

Write a Java program to implement the Linear Search algorithm on an array. The program should:

- Accept an array from the user
  - Accept a key to be searched
  - Display the position of the key if found
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## Q6. Selection Sort

Write a Java program to perform Selection Sort on an array of integers. The program should:

- Accept input from the user
  - Display the sorted array
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## Q7. Merge Sort

Write a Java program to implement Merge Sort recursively on an array. The program should:

- Accept input from the user
  - Display the sorted output
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## Q8. Quick Sort

Write a Java program to implement Quick Sort recursively on an array. The program should:

- Accept input from the user
- Display the sorted array after applying Quick Sort

## Q9. Shell Sort

Write a Java program to implement Shell Sort on an array. The program should:

- Accept input from the user
- Display the sorted output after using Shell Sort

## Q10. Matrix Operations (Menu Driven)

Write a menu-driven Java program to perform the following matrix operations:

- Addition of two matrices
- Subtraction of two matrices
- Multiplication of two matrices
- Exit from the menu