**Java Programming**
**CSPC 23**
**Assignment 1**

1. Write a method that counts the number of letters in a string using the following header:

   **`public static int countLetters(String s)`**

   Write a test program that prompts the user to enter a string and displays the number of letters in the string.

2. Some websites impose certain rules for passwords. Write a method that checks whether a string is a valid password. Suppose the password rules are as follows:
   - A password must have at least eight characters.
   - A password consists of only letters and digits.
   - A password must contain at least two digits.

   Write a program that prompts the user to enter a password and displays Valid Password if the rules are followed or Invalid Password otherwise.

3. Write a program that prompts the user to enter two strings and displays the largest common prefix of the two strings. Here are some sample runs:

```
Enter the first string: Welcome to C++
Enter the second string: Welcome to programming
The common prefix is Welcome to

Enter the first string: Atlanta
Enter the second string: Macon
Atlanta and Macon have no common prefix
```

4. Write a program that prompts the user to enter a Social Security number in the format DDD-DD-DDDD, where D is a digit. Your program should check whether the input is valid. Here are some sample runs:

```
Enter a SSN: 232-23-5435
232-23-5435 is a valid social security number
Enter a SSN: 23-23-5435
23-23-5435 is an invalid social security number
```

5. Write a program that prompts the user to enter two strings and reports whether the second string is a substring of the first string.

```
Enter string s1: ABCD
Enter string s2: BC
BC is a substring of ABCD

Enter string s1: ABCD
Enter string s2: BDC
BDC is not a substring of ABCD
```

6. Write the following method that tests whether the array has four consecutive numbers with the same value.

```
public static boolean isConsecutiveFour(int[] values)
```

Write a test program that prompts the user to enter a series of integers and displays if the series contains four consecutive numbers with the same value. Your program should first prompt the user to enter the input size—i.e., the number of values in the series. Here are sample runs:

```
Enter the number of values: 8
Enter the values: 3 4 5 5 5 5 4 5
The list has consecutive fours
Enter the number of values: 9
Enter the values: 3 4 5 5 6 5 5 4 5
The list has no consecutive fours
```

7. Write a method that returns a new array by eliminating the duplicate values in the array using the following method header:

```
public static int[] eliminateDuplicates(int[] list)
```

Write a test program that reads in ten integers, invokes the method, and displays the result. Here is the sample run of the program:

```
Enter ten numbers: 1 2 3 2 1 6 3 4 5 2
The distinct numbers are: 1 2 3 6 4 5
```

8. The arrays **`list1`** and **`list2`** are identical if they have the same contents. Write a method that returns true if **`list1`** and **`list2`** are identical, using the following header:

```
public static boolean equals(int[] list1, int[] list2)
```

Write a test program that prompts the user to enter two lists of integers and displays whether the two are identical. Here are the sample runs. Note that the first number in the input indicates the number of the elements in the list. This number is not part of the list.

```
Enter list1: 5 2 5 6 6 1
Enter list2: 5 5 2 6 1 6
Two lists are identical

Enter list1: 5 5 5 6 6 1
Enter list2: 5 2 5 6 1 6
Two lists are not identical
```