FR. CONCEICAO RODRIGUES COLLEGE OF ENGINEERING
Fr. Agnel Ashram, Bandstand, Bandra (W) Mumbai 400050

PROGRAMMING ASSIGNMENT 1

Class: S.E. Computer (Division A and B)
Date of Assignment: 26-09-2023
Date of Submission: 30-09-2023

NOTE: Solve the following questions using Java. Submit code along with appropriate output cases.

CSL304.1	**Demonstrate fundamental programming constructs**
CSL304.2	**Illustrate the concept of packages, classes, and objects**
CSL304.3	**Apply the concept of strings, arrays, and vectors**

Q.	Description	CO mapping
Q1	Write a Java method to check whether a string is a valid password. Password rules: A password must have at least ten characters. A password consists of only letters and digits. A password must contain at least two digits. Expected Output: 1. A password must have at least eight characters. 2. A password consists of only letters and digits. 3. A password must contain at least two digits Input a password (You are agreeing to the above Terms and Conditions.): abcd1234 Password is valid: abcd1234	CSL304.3
Q2	Write a Java method that accepts three integers and checks whether they are consecutive or not. Returns true or false. Expected Output: Input the first number: 15 Input the second number: 16 Input the third number: 17 Check whether the three said numbers are consecutive or not!true	CSL304.1

Q3	One class data member of another class
	class Department{
	}
	class College {
	private Department dt;
		CSL304.2

FR. CONCEICAO RODRIGUES COLLEGE OF ENGINEERING
Fr. Agnel Ashram, Bandstand, Bandra (W) Mumbai 400050

	//Constructor
	}
	Department class can have the fields dept_id, dept_name and dept_hod College class can have the fields college_id, college_name, college_principal, college_departments as data members of college class.
	
	Provide a constructor in College class which can receive object of Department class as parameter and assign it to the data member and also provide a method in College class which can print the data related to College and Department object
	
	Consider to have Department class in com.p1 package, College class in com.p2 package, Main program in com.p3 package	

Q4	Write a Java program to remove duplicate elements from an array.	CSL304.3
Q5	Write a Java program that reads a floating-point number. If the number is zero it prints "zero", otherwise, print "positive" or "negative". Add "small" if the absolute value of the number is less than 1, or "large" if it exceeds 1,000,000.	CSL304.1

RUBRICS for Programming Assignment Grading:

Sr. No	Performance Indicator	Below average	Average	Good	Excellent	Marks
1	On time Submission (2)	-	Submitted after deadline (1)	Early or on time submission(2)		
2	Test cases and output (4)	Incorrect output (1)	Expected output is verified only for few test cases (2)	Expected output is Verified for all test cases but is not presentable (3)	Expected output is obtained for all test cases. Presentable and easy to follow (4)	
3	Coding efficiency (2)	The code is not structured at all.(0)	The code is structured but not efficient (1)	The code is structured and efficient. (2)	-	
4	Knowledge(2)	Basic concepts not clear (0)	Understood the basic concepts (1)	Could explain the concept with suitable example (1.5)	Could relate the theory with real world application(2)	
Total Marks						10

****

FR. CONCEICAO RODRIGUES COLLEGE OF ENGINEERING
Fr. Agnel Ashram, Bandstand, Bandra (W) Mumbai 400050

Q1 Password checker

```
import java.util.Scanner;

public class PasswordCheck {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.println("Enter a password: ");
        String password = scanner.nextLine();

        if (isValidPassword(password)) {
            System.out.println("Password is valid: " + password);
        } else {
            System.out.println("Invalid password. Please make sure it
meets the criteria.");
        }
    }

    public static boolean isValidPassword(String password) {
        // Check if the password has at least ten characters
        if (password.length() < 10) {
            System.out.println("1. A password must have at least ten
characters.");
            return false;
        }

        // Check if the password consists of only letters and digits
        if (!password.matches("[a-zA-Z0-9]+")) {
            System.out.println("2. A password consists of only letters
and digits.");
            return false;
        }

        // Count the number of digits in the password
        int digitCount = 0;
        for (char c : password.toCharArray()) {
            if (Character.isDigit(c)) {
                digitCount++;
            }
        }
```

FR. CONCEICAO RODRIGUES COLLEGE OF ENGINEERING
Fr. Agnel Ashram, Bandstand, Bandra (W) Mumbai 400050

```
        // Check if the password contains at least two digits
        if (digitCount < 2) {
            System.out.println("3. A password must contain at least two
digits.");
            return false;
        }

        return true;
    }
}
```

```
PS C:\Users\Mark Lopes\Desktop\java> cd "c:\Users\Mark Lope
Enter a password:
qwerty
1. A password must have at least ten characters.
Invalid password. Please make sure it meets the criteria.
PS C:\Users\Mark Lopes\Desktop\java> cd "c:\Users\Mark Lope
Enter a password:
mark157898
Password is valid: mark157898
PS C:\Users\Mark Lopes\Desktop\java> cd "c:\Users\Mark Lope
Enter a password:
marklopesqwe
3. A password must contain at least two digits.
Invalid password. Please make sure it meets the criteria.
PS C:\Users\Mark Lopes\Desktop\java>
```

FR. CONCEICAO RODRIGUES COLLEGE OF ENGINEERING
Fr. Agnel Ashram, Bandstand, Bandra (W) Mumbai 400050

Q2 Consecutive numbers checker

```
import java.util.Scanner;

public class ConsecutiveCheck {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Input the first number: ");
        int num1 = scanner.nextInt();
        System.out.print("Input the second number: ");
        int num2 = scanner.nextInt();
        System.out.print("Input the third number: ");
        int num3 = scanner.nextInt();

        boolean areConsecutive = areConsecutiveNumbers(num1, num2,
num3);

        System.out.println(areConsecutive);
    }

    public static boolean areConsecutiveNumbers(int num1, int num2, int
num3) {
        // Check if the difference between adjacent numbers is 1
        return (num2 == num1 + 1 && num3 == num2 + 1) || (num2 == num1
- 1 && num3 == num2 - 1);
    }
}
```

```
PS C:\Users\Mark Lopes\Desktop\java> cd "c:\User
Input the first number: 3
Input the second number: 4
Input the third number: 5
true
PS C:\Users\Mark Lopes\Desktop\java> cd "c:\User
Input the first number: 1
Input the second number: 3
Input the third number: 4
false
PS C:\Users\Mark Lopes\Desktop\java>
```

FR. CONCEICAO RODRIGUES COLLEGE OF ENGINEERING
Fr. Agnel Ashram, Bandstand, Bandra (W) Mumbai 400050

Q3 a) Department package

```java
package com.p1;

public class Department {
    private int dept_id;
    private String dept_name;
    private String dept_hod;

    // constructor with getter and setter
    public Department(int dept_id, String dept_name, String dept_hod) {
        this.dept_id = dept_id;
        this.dept_name = dept_name;
        this.dept_hod = dept_hod;
    }

    // Example method to display department details
    public void displayDepartmentDetails() {
        System.out.println("Department ID: " + dept_id);
        System.out.println("Department Name: " + dept_name);
        System.out.println("Department HOD: " + dept_hod);
    }
}
```

b) College package

```java
package com.p2;
import com.p1.Department;

public class College {
    private int college_id;
    private String college_name;
    private String college_principal;
    private Department college_department;
```

FR. CONCEICAO RODRIGUES COLLEGE OF ENGINEERING
Fr. Agnel Ashram, Bandstand, Bandra (W) Mumbai 400050

```
    // Constructor to receive Department object
    public College(int college_id, String college_name, String
college_principal, Department college_department) {
        this.college_id = college_id;
        this.college_name = college_name;
        this.college_principal = college_principal;
        this.college_department = college_department;
    }

    // Method to display college and department details
    public void displayCollegeAndDepartmentDetails() {
        System.out.println("College ID: " + college_id);
        System.out.println("College Name: " + college_name);
        System.out.println("College Principal: " + college_principal);

        // Display department details using the Department object
        System.out.println("Department Details:");
        college_department.displayDepartmentDetails();
    }
}
```

c) Main method

```
package com.p3;
import com.p1.Department;
import com.p2.College;

public class Main {
    public static void main(String[] args) {
        // Create a Department object
        Department department = new Department(1, "Computer Science",
"Dr. Smith");

        // Create a College object and pass the Department object as a
parameter
        College college = new College(101, "ABC College", "Principal
John", department);

        // Display college and department details
```

FR. CONCEICAO RODRIGUES COLLEGE OF ENGINEERING
Fr. Agnel Ashram, Bandstand, Bandra (W) Mumbai 400050

```
        college.displayCollegeAndDepartmentDetails();
    }
}
```

```
PS C:\Users\Mark Lopes\Desktop\java> cd "c:\Users
College ID: 100
College Name: Frcrce
College Principal: Principal SSR
Department Details:
Department ID: 1
Department Name: Computer Science
Department HOD: Kalpana Miss
PS C:\Users\Mark Lopes\Desktop\java>
```

Q4 Remove duplicate elements from array.

```
import java.util.*;

public class Duplicate
{
    public static void main(String args[])
    {
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter the number of array elements: ");
        int n = sc.nextInt();

        int [] array = new int[n];
        System.out.println("Enter "+n+" array element");

        for(int i = 0; i<n; i++)
        {
            array[i] = sc.nextInt();

        }

        for(int i = 0; i<n; i++)
        {
            int comp = array[i];

            for(int j = i+1;j<n; )
```

FR. CONCEICAO RODRIGUES COLLEGE OF ENGINEERING
Fr. Agnel Ashram, Bandstand, Bandra (W) Mumbai 400050

```
            {
                if(comp == array[j])
                {
                    for(int k = j; k<n-i; k++)
                    {
                        array[k] = array[k +1];

                    }
                    n--;
                }
                else
                {
                    j++;
                }
            }
        }

        System.out.println("After removing duplicate elemnents: ");

        for(int i = 0; i<n; i++)
        {
            System.out.println(array[i]);

        }
    }
}
```

```
PROBLEMS 13  OUTPUT  DEBUG CONSOLE  TERMINAL
PS C:\Users\Mark Lopes\Desktop\java> cd "c:\Users
Enter the number of array elements:
5
Enter 5 array element
1
2
3
4
4
After removing duplicate elemnents:
1
2
3
4
PS C:\Users\Mark Lopes\Desktop\java>
```

FR. CONCEICAO RODRIGUES COLLEGE OF ENGINEERING
Fr. Agnel Ashram, Bandstand, Bandra (W) Mumbai 400050

Q5 Floating point number

```java
import java.util.Scanner;

public class Floating {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter a floating-point number: ");

        double number = scanner.nextDouble();

        if (number == 0) {
            System.out.println("zero");
        } else if (number > 0) {
            System.out.print("positive");
            if (Math.abs(number) < 1) {
                System.out.println(" small");
            } else if (Math.abs(number) > 1_000_000) {
                System.out.println(" large");
            } else {
                System.out.println();
            }
        } else {
            System.out.print("negative");
            if (Math.abs(number) < 1) {
                System.out.println(" small");
            } else if (Math.abs(number) > 1_000_000) {
                System.out.println(" large");
            } else {
                System.out.println();
            }
        }
    }
}
```

FR. CONCEICAO RODRIGUES COLLEGE OF ENGINEERING
Fr. Agnel Ashram, Bandstand, Bandra (W) Mumbai 400050