Reg No: 23MCA1030 **Name:** Vinayak Kumar Singh

Subject: Java Programming Lab (PMCA502P)

1 Logical Operators:

a. Write a Java program that checks whether a given number is both even and divisible by 5. Use logical AND operator.

Code:

```java
import java.util.Scanner;
public class Main {
    public static void main(String args[]) {
        Scanner scan = new Scanner(System.in);
        System.out.println("Reg No : 23MCA1030" );
        System.out.print("Enter an integer: ");
        int value = scan.nextInt();
        if (value % 2 == 0 && value % 5 == 0) {
            System.out.println("True");
        } else {
            System.out.println("False");
        }
        scan.close();
    }
}
```

Main.java

```java
import java.util.Scanner;
public class Main {
    public static void main(String args[]) {
        Scanner scan = new Scanner(System.in);
        System.out.println("Reg No : 23MCA1030" );
        System.out.print("Enter an integer: ");
        int value = scan.nextInt();
        if (value % 2 == 0 && value % 5 == 0) {
            System.out.println("True");
        } else {
            System.out.println("False");
        }
        scan.close();
    }
}
```

```
Reg No : 23MCA1030
Enter an integer: 10
True


...Program finished with exit code 0
Press ENTER to exit console.
```

b. Create a program that determines whether a year is a leap year. A leap year is divisible by 4, but not by 100 unless it is divisible by 400. Use logical AND, OR operators.

Code:

```java
import java.util.Scanner;
public class Main {
   public static void main(String args[]) {
      Scanner scan = new Scanner(System.in);
      System.out.println("Reg No: 23MCA1030");
      System.out.print("Enter Year : ");
      int year = scan.nextInt();
      if ((year % 4 == 0 && year % 100 != 0) || (year % 400 == 0)) {
         System.out.println("True");
      } else {
         System.out.println("False");
      }
      scan.close();
   }
}
```

Main.java

```java
import java.util.Scanner;
public class Main {
    public static void main(String args[]) {
        Scanner scan = new Scanner(System.in);
        System.out.println("Reg No: 23MCA1030");
        System.out.print("Enter Year : ");
        int year = scan.nextInt();
        if ((year % 4 == 0 && year % 100 != 0) || (year % 400 == 0)) {
            System.out.println("True");
        } else {
            System.out.println("False");
        }
        scan.close();
    }
}
```

input

```
Reg No: 23MCA1030
Enter Year : 2000
True


...Program finished with exit code 0
Press ENTER to exit console.
```

c. Write a Java program that checks if a student is eligible for a scholarship. To be eligible, the student must have a GPA greater than 3.5 and must not have any failing grades. Use logical AND and NOT operators.

Code:

```java
import java.util.Scanner;
public class Main {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        System.out.print("Enter student GPA: ");
        double gpa = input.nextDouble();
        System.out.print("Enter the number of failing grades: ");
        int failingGrades = input.nextInt();
        if (gpa > 3.5 && failingGrades == 0) {
            System.out.println("True");
        } else {
            System.out.println("False");
        }
        input.close();
    }
}
```

Main.java

```java
import java.util.Scanner;
public class Main {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        System.out.print("Enter student GPA: ");
        double gpa = input.nextDouble();
        System.out.print("Enter the number of failing grades: ");
        int failingGrades = input.nextInt();
        if (gpa > 3.5 && failingGrades == 0) {
            System.out.println("True");
        } else {
            System.out.println("False");
        }
        input.close();
    }
}
```

input

```
Enter student GPA: 3.8
Enter the number of failing grades: 0
True


...Program finished with exit code 0
Press ENTER to exit console.
```

2. Ternary Operator:

a. Implement a program to find the maximum of two numbers using the ternary operator.

Code:

```java
import java.util.Scanner;
public class Main {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        System.out.println("23MCA1030");
        System.out.print("Enter num1: ");
        int num1 = input.nextInt();
        System.out.print("Enter num2: ");
        int num2 = input.nextInt();
        int result = (num1 > num2) ? num1 : num2;
        System.out.println("Maximum number is: " + result);
        input.close();
    }
}
```

Main.java

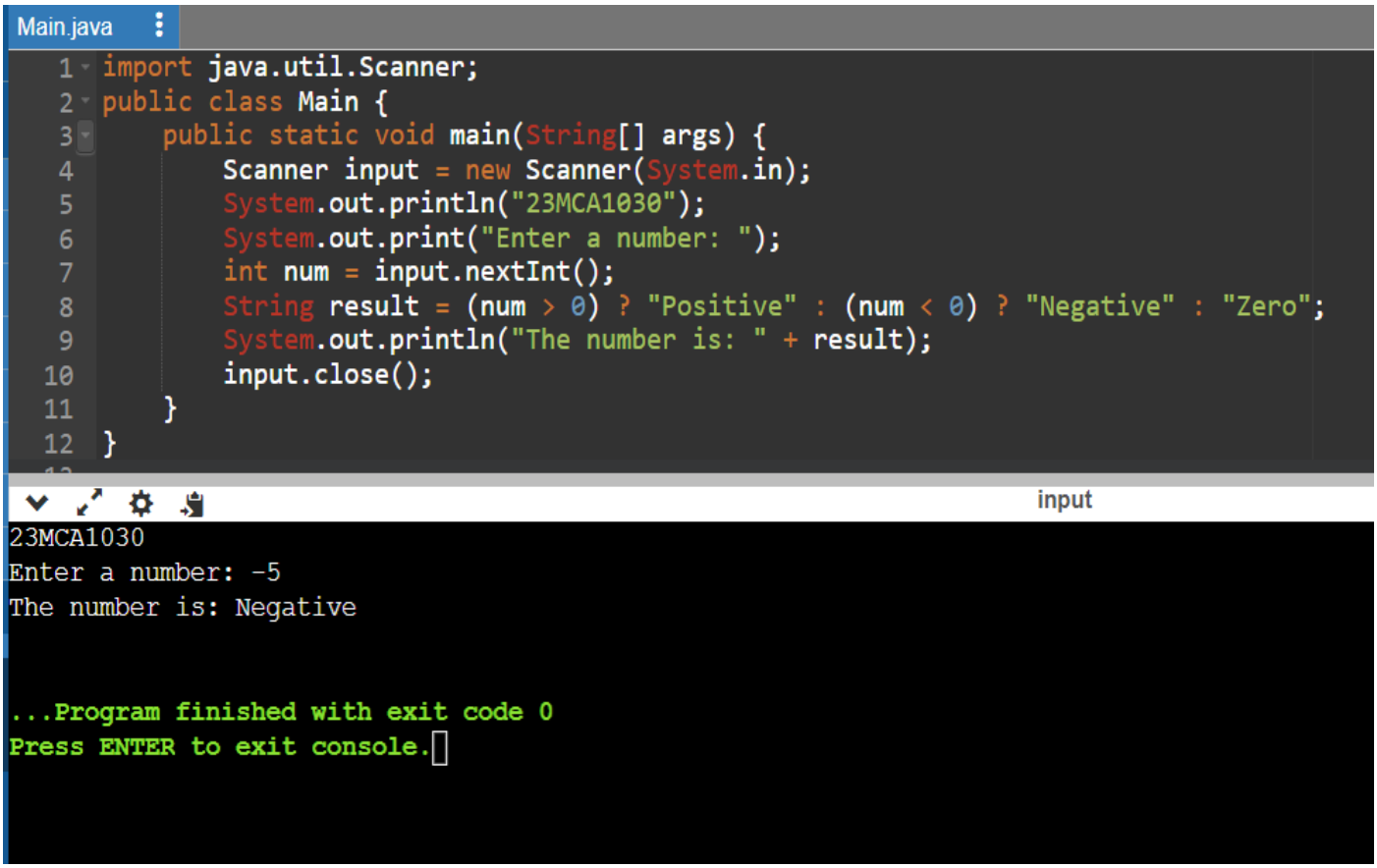
```java
import java.util.Scanner;
public class Main {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        System.out.println("23MCA1030");
        System.out.print("Enter num1: ");
        int num1 = input.nextInt();
        System.out.print("Enter num2: ");
        int num2 = input.nextInt();
        int result = (num1 > num2) ? num1 : num2;
        System.out.println("Maximum number is: " + result);
        input.close();
    }
}
```

```
23MCA1030
Enter num1: 7
Enter num2: 12
Maximum number is: 12


...Program finished with exit code 0
Press ENTER to exit console.
```

b. Write a Java program to determine if a given number is positive, negative, or zero using the ternary operator.

Code:

```java
import java.util.Scanner;
public class Main {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        System.out.println("23MCA1030");
        System.out.print("Enter a number: ");
        int num = input.nextInt();
        String result = (num > 0) ? "Positive" : (num < 0) ? "Negative" : "Zero";
        System.out.println("The number is: " + result);
        input.close();
    }
}
```



c. Create a program that compares three numbers and prints the largest one using the ternary operator.

Code:

```
import java.util.Scanner;
public class Main {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        System.out.println("23MCA1030");
        System.out.print("Enter the first number value of x: ");
        int x = input.nextInt();
        System.out.print("Enter the second number value of y: ");
        int y = input.nextInt();
        System.out.print("Enter the third number value of z: ");
        int z = input.nextInt();
        int largest = (x > y) ? ((x > z) ? x : z) : ((y > z) ? y : z);
        System.out.println("The largest number is: " + largest);
        input.close();
    }
}
```

Main.java

```
1  import java.util.Scanner;
2  public class Main {
3      public static void main(String[] args) {
4          Scanner input = new Scanner(System.in);
5          System.out.println("23MCA1030");
6          System.out.print("Enter the first number value of x: ");
7          int x = input.nextInt();
8          System.out.print("Enter the second number value of y: ");
9          int y = input.nextInt();
10         System.out.print("Enter the third number value of z: ");
11         int z = input.nextInt();
12         int largest = (x > y) ? ((x > z) ? x : z) : ((y > z) ? y : z);
13         System.out.println("The largest number is: " + largest);
14         input.close();
15     }
16 }
```

input

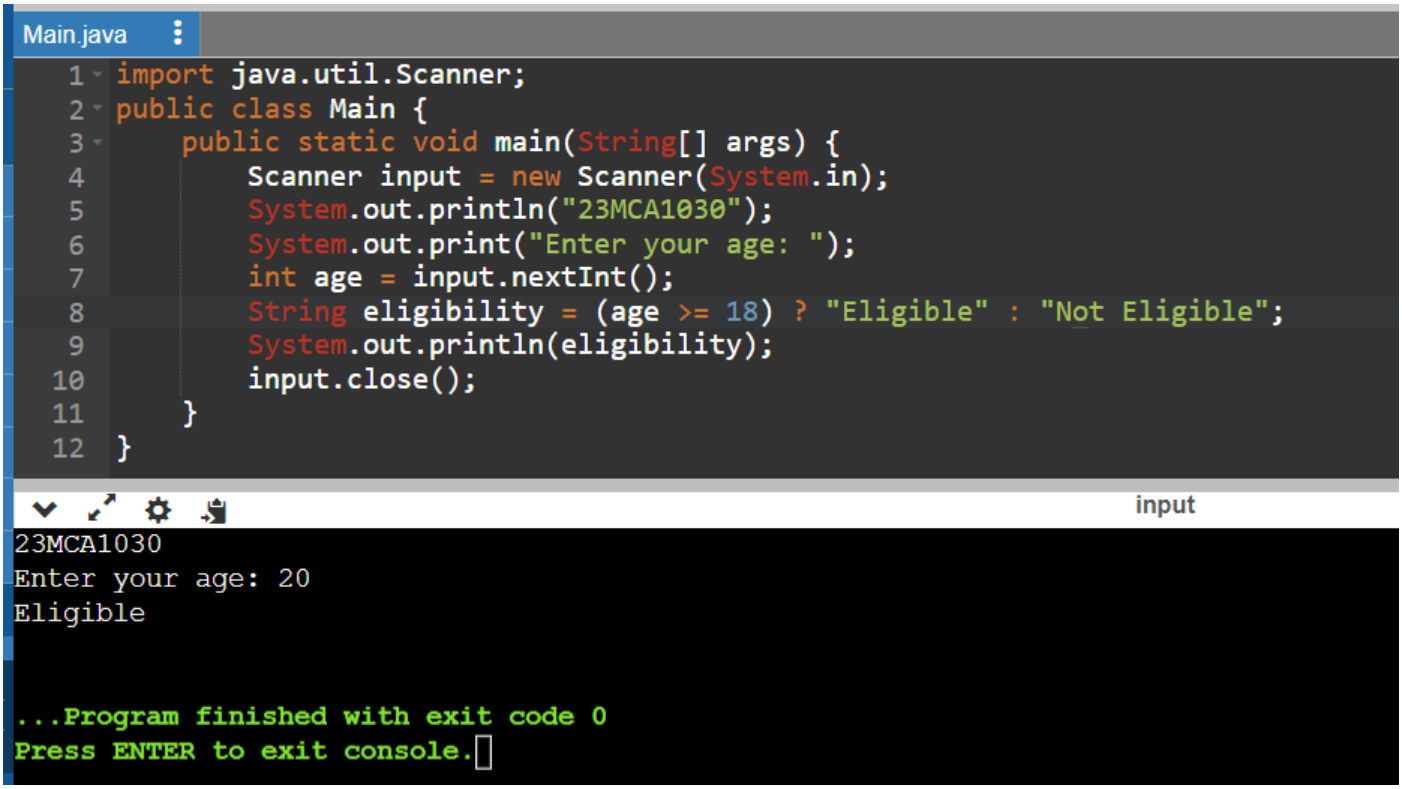
```
23MCA1030
Enter the first number value of x: 25
Enter the second number value of y: 18
Enter the third number value of z: 30
The largest number is: 30


...Program finished with exit code 0
Press ENTER to exit console.
```

3. Combining Logical and Ternary Operators:

a. Develop a program that checks whether a person is eligible to vote. The eligibility age is 18. Use the ternary operator to display "Eligible" or "Not Eligible."

Code:

```java
import java.util.Scanner;
public class Main {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        System.out.println("23MCA1030");
        System.out.print("Enter your age: ");
        int age = input.nextInt();
        String eligibility = (age >= 18) ? "Eligible" : "Not Eligible";
        System.out.println(eligibility);
        input.close();
    }
}
```



b. Write a Java program that determines whether a given character is a vowel or a consonant. Use the ternary operator to print "Vowel" or "Consonant."

Code:

```
import java.util.Scanner;
public class Main {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        System.out.println("23MCA1030");
        System.out.print("Enter character: ");
        char ch = input.next().charAt(0);
        String result = (ch == 'a' || ch == 'e' || ch == 'i' || ch == 'o' || ch == 'u' || ch
== 'A' || ch == 'E' || ch == 'I' || ch == 'O' || ch== 'U')? "Vowel" : "Consonant";
        System.out.println(result);
        input.close();
    }
}
```

Main.java

```
2  public class Main {
3      public static void main(String[] args) {
4          Scanner input = new Scanner(System.in);
5          System.out.println("23MCA1030");
6          System.out.print("Enter a character: ");
7          char ch = input.next().charAt(0);
8          String result = (ch == 'a' || ch == 'e' || ch == 'i' || ch == 'o' || ch == 'u' ||
9                           ch == 'A' || ch == 'E' || ch == 'I' || ch == 'O' || ch == 'U')
10                         ? "Vowel" : "Consonant";
11         System.out.println(result);
12         input.close();
13     }
14 }
15
```

input

```
23MCA1030
Enter a character: A
Vowel


...Program finished with exit code 0
Press ENTER to exit console.
```

c. Create a program that checks if a given year is a leap year and prints the result using the ternary operator.

Code:

```
import java.util.Scanner;
public class Main {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        System.out.println("23MCA1030");
        System.out.print("Enter a year: ");
        int year = input.nextInt();
        String result = (year % 4 == 0 && year % 100 != 0) || (year % 400 == 0)?
"True" : "False";
        System.out.println(result);
        input.close();
    }
}
```