

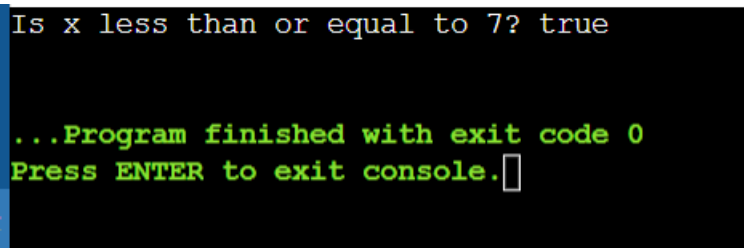
1. Using a ternary operator, write an if/else statement that will return true or false if the variable x is less than or equal to 7.

PROGRAM :

```
public class Main {
    public static void main(String[] args) {
        int x = 5;
        boolean result = (x <= 7) ? true : false;

        System.out.println("Is x less than or equal to 7? " + result);
    }
}
```

OUTPUT :



```
Is x less than or equal to 7? true

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

2. Write a program that prompts the user to enter two floating point (double) numbers and an operator (*, +, /, %, -). Print the results of the given operation. For reading the command line, use the Scanner class. Write the program first using switch logic, then re-write the program using if/else logic.

PROGRAM :

```
import java.util.Scanner;
```

```
public class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter the first number: ");
        double num1 = scanner.nextDouble();

        System.out.print("Enter the second number: ");
        double num2 = scanner.nextDouble();

        System.out.print("Enter the operator (+, -, *, /, %): ");
        char operator = scanner.next().charAt(0);

        double result;

        switch (operator) {
            case '+':
                result = num1 + num2;
                break;
            case '-':
                result = num1 - num2;
                break;
```

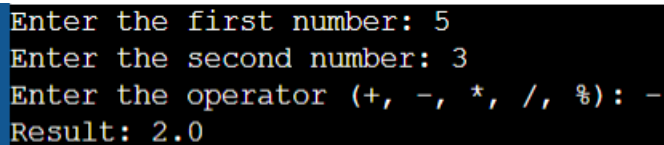
```

        case '*':
            result = num1 * num2;
            break;
        case '/':
            if (num2 != 0) {
                result = num1 / num2;
            } else {
                System.out.println("Error: Division by zero");
                return;
            }
            break;
        case '%':
            if (num2 != 0) {
                result = num1 % num2;
            } else {
                System.out.println("Error: Division by zero");
                return;
            }
            break;
        default:
            System.out.println("Error: Invalid operator");
            return;
    }

    System.out.println("Result: " + result);
}
}

```

OUTPUT :



```

Enter the first number: 5
Enter the second number: 3
Enter the operator (+, -, *, /, %): -
Result: 2.0

```

PROGRAM :

```

import java.util.Scanner;

public class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter the first number: ");
        double num1 = scanner.nextDouble();

        System.out.print("Enter the second number: ");
        double num2 = scanner.nextDouble();

        System.out.print("Enter the operator (+, -, *, /, %): ");
        char operator = scanner.next().charAt(0);
    }
}

```

```

double result;

if (operator == '+') {
    result = num1 + num2;
} else if (operator == '-') {
    result = num1 - num2;
} else if (operator == '*') {
    result = num1 * num2;
} else if (operator == '/') {
    if (num2 != 0) {
        result = num1 / num2;
    } else {
        System.out.println("Error: Division by zero");
        return;
    }
} else if (operator == '%') {
    if (num2 != 0) {
        result = num1 % num2;
    } else {
        System.out.println("Error: Division by zero");
        return;
    }
} else {
    System.out.println("Error: Invalid operator");
    return;
}

System.out.println("Result: " + result);
}
}

```

OUTPUT :

```

Enter the first number: 5
Enter the second number: 3
Enter the operator (+, -, *, /, %): /
Result: 1.6666666666666667

```

3. True or False: IF/ELSE statements can always be replaced with SWITCH statements.

True, but with some nuances.

Explanation:

1. **Basic Replacement:**

- **if/else statements** can indeed be replaced by **switch statements** when dealing with discrete values (like integers or characters) where you have a finite set of possible conditions. For example, if you are evaluating a variable against a set of distinct values, you can often use a switch statement.

2. **Limitations:**

- **switch statements** have limitations compared to if/else statements:
 - **Data Types:** Traditional switch statements work with int, char, byte, short, and enum types. Starting from Java 7, String types are also supported.

However, switch statements cannot handle ranges, floating-point numbers, or complex expressions.

- **Conditions:** switch statements are limited to equality checks against a set of constants. They cannot perform more complex comparisons or handle conditions that are not based on equality (like greater than or less than comparisons).
- **Complex Logic:** For more complex conditional logic or when conditions are based on ranges or non-constant expressions, if/else statements are more flexible

3. Write a Java program to do the following that determines your weight on another planet. The program should ask for the user's weight on Earth, then present a menu of the other planets in our solar system. The user should choose one of the planets from the menu. The program should display the phrase like the following: "Your weight on Mars is 55 lbs." Use the following conversion factors:

Planet	Conversion factor (multiply your Earth weight by this number to determine your weight on this planet)
Mercury	0.38
Venus	0.91
Mars.	0.38
Jupiter	2.36
Saturn	0.92
Uranus	0.89
Neptune	1.13

PROGRAM :

```
import java.util.Scanner;
```

```
public class Main {
```

```
    public static void main(String[] args) {
```

```
        Scanner scanner = new Scanner(System.in);
```

```
        System.out.print("Enter your weight on Earth (in lbs): ");
```

```
        double earthWeight = scanner.nextDouble();
```

```
        System.out.println("Select a planet to determine your weight:");
```

```
        System.out.println("1. Mercury");
```

```
System.out.println("2. Venus");
System.out.println("3. Mars");
System.out.println("4. Jupiter");
System.out.println("5. Saturn");
System.out.println("6. Uranus");
System.out.println("7. Neptune");
```

```
System.out.print("Enter the number corresponding to your choice: ");
int choice = scanner.nextInt();
```

```
double weightOnPlanet = 0.0;
String planetName = "";
```

```
switch (choice) {
    case 1:
        weightOnPlanet = earthWeight * 0.38;
        planetName = "Mercury";
        break;
    case 2:
        weightOnPlanet = earthWeight * 0.91;
        planetName = "Venus";
        break;
    case 3:
        weightOnPlanet = earthWeight * 0.38;
        planetName = "Mars";
        break;
    case 4:
        weightOnPlanet = earthWeight * 2.36;
        planetName = "Jupiter";
        break;
    case 5:
        weightOnPlanet = earthWeight * 0.92;
```

```

        planetName = "Saturn";
        break;
    case 6:
        weightOnPlanet = earthWeight * 0.89;
        planetName = "Uranus";
        break;
    case 7:
        weightOnPlanet = earthWeight * 1.13;
        planetName = "Neptune";
        break;
    default:
        System.out.println("Invalid choice. Please select a number between 1 and 7.");
        return;
}

System.out.printf("Your weight on %s is %.2f lbs.%n", planetName, weightOnPlanet);

scanner.close();
}
}

```

5. Write a Java program that will decide if a student gets into Mountville University. Students must have one of the following criteria:

- been a valedictorian or salutatorian of a school of 1400 or more
- had a gpa of 4.0 or better and a SAT score of 1100 or more
- had a gpa of 3.5 or better and an SAT score of 1300 or more
- had a gpa of 3.0 or better and an SAT score of 1500 or more

PROGRAM :

```
import java.util.Scanner;
```

```
public class Main {
```

```
    public static void main(String[] args) {
```

```
Scanner scanner = new Scanner(System.in);
```

```
System.out.print("Enter the student's GPA: ");
```

```
double gpa = scanner.nextDouble();
```

```
System.out.print("Enter the student's SAT score: ");
```

```
int satScore = scanner.nextInt();
```

```
System.out.print("Enter the student's class size (number of students): ");
```

```
int classSize = scanner.nextInt();
```

```
System.out.print("Is the student a valedictorian or salutatorian? (true/false): ");
```

```
boolean isTopGraduate = scanner.nextBoolean();
```

```
boolean isAccepted = false;
```

```
if (isTopGraduate && classSize >= 1400) {
```

```
    isAccepted = true;
```

```
} else if (gpa >= 4.0 && satScore >= 1100) {
```

```
    isAccepted = true;
```

```
} else if (gpa >= 3.5 && satScore >= 1300) {
```

```
    isAccepted = true;
```

```
} else if (gpa >= 3.0 && satScore >= 1500) {
```

```
    isAccepted = true;
```

```
}
```

```
if (isAccepted) {
```

```
    System.out.println("Congratulations! The student is admitted to Mountville University.");
```

```
} else {
```

```
    System.out.println("Sorry, the student does not meet the criteria for admission to  
Mountville University.");
```

```
}
```

```
        scanner.close();  
    }  
}
```

OUTPUT :

```
Enter the student's GPA: 8.7  
Enter the student's SAT score: 1400  
Enter the student's class size (number of students): 35  
Is the student a valedictorian or salutatorian? (true/false): true  
Congratulations! The student is admitted to Mountville University.  
B
```