Selection 1

Basic Programming Teaching Team 2022

Objectives

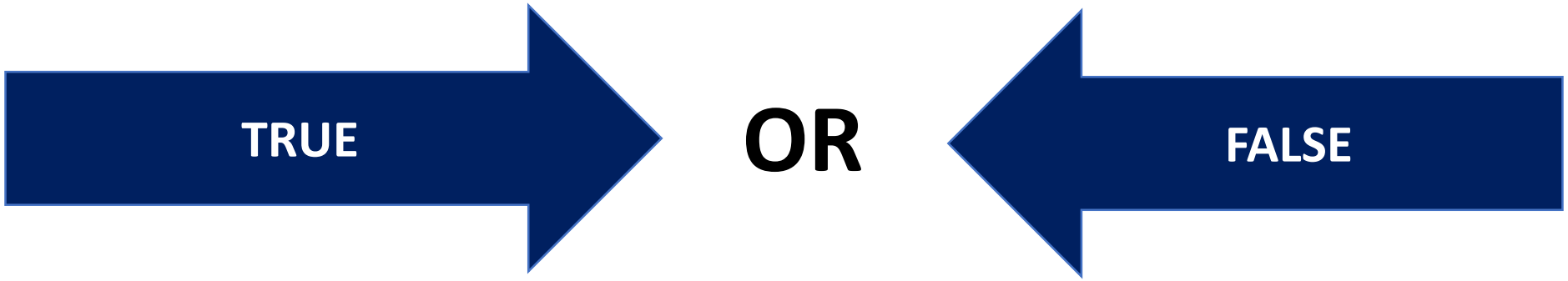
After studying this material, students should be able to:

1. Understand the definition and use of selection syntax 1
2. Understand the basic structure of selection syntax 1
3. Solves the problem by creating a Java program that utilizes the selection syntax 1

Definition

- Selection is an instruction used to select one possibility from several conditions

Condition: a statement or expression (logical statement)



Form of Selection Syntax

1. IF
2. IF…ELSE
3. IF...ELSE IF...ELSE...
4. SWITCH…CASE

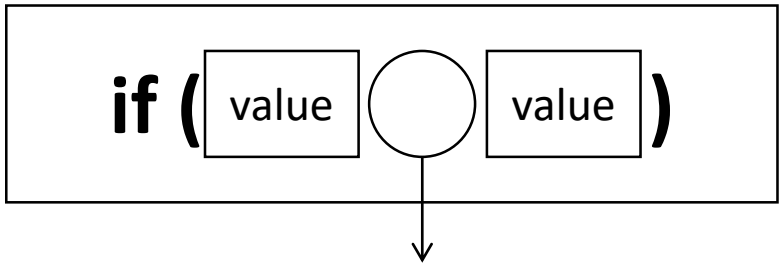
Selection Structure
IF...

Structure IF…

- Statement IF

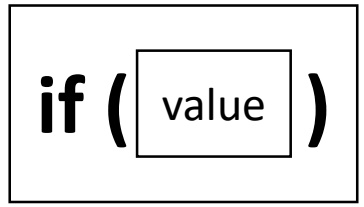
if (condition)

Two-value relationship



Relational Operators

One value



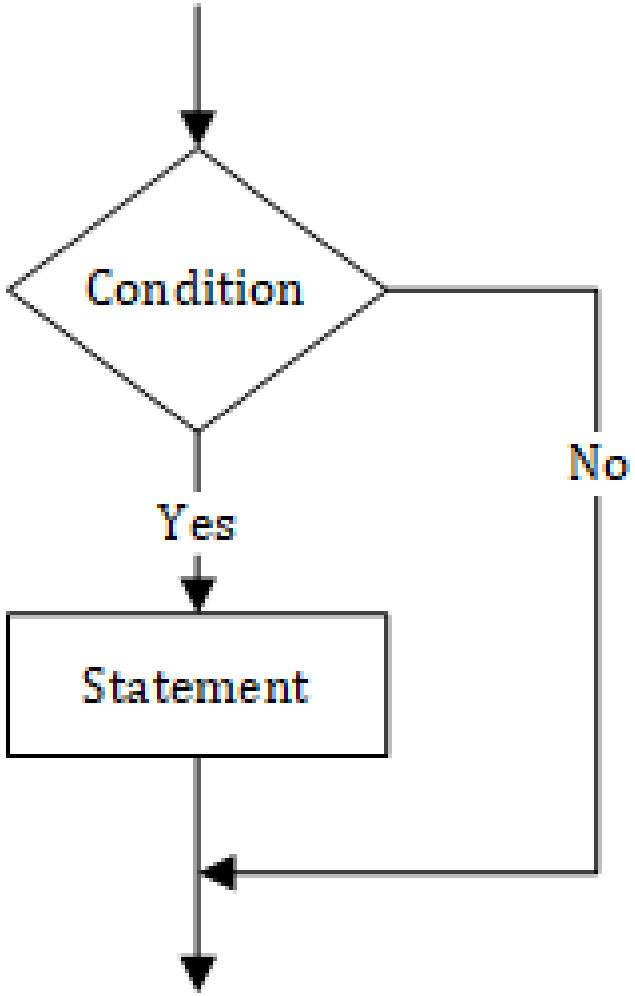
Structure IF…

- General Form:

```
if (Condition)
{
    Statement;
}
```

- ✓ If the ***Condition*** is **true**, the *Statement* will be executed.
- ✓ If the ***Condition*** is **false**, the *Statement* will not be executed.

Flowchart IF...



Example of Program Code

```
import java.util.Scanner;
public class ifCondition {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int temperature;
        System.out.print("Enter the current temperature: ");
        temperature = sc.nextInt();
        if (temperature < 16) {
            System.out.println("Please wear a jacket");
        }
    }
}
```

```
run:
Enter the current temperature: 11
Please wear a jacket
```

Selection Structure
IF...ELSE

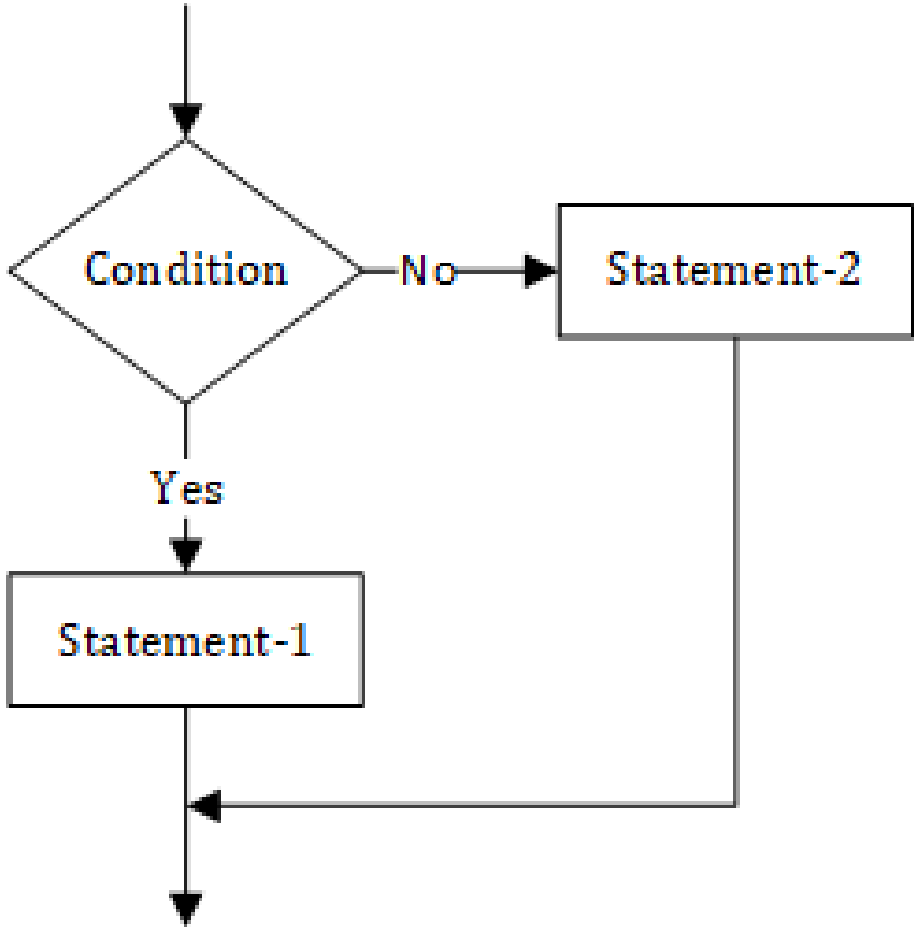
Structure IF…ELSE

- The selection structure IF…ELSE must have at least 2 statements.
- General form:

```
if (Condition)
{
    Statement-1;
}
else
{
    Statement-2;
}
```

- ✓ If the ***Condition*** is **true**, the *Statement-1* will be executed.
- ✓ If the ***Condition*** is **false**, the *Statement-2* will be executed.

Flowchart IF...ELSE



Example of Program Code

```
import java.util.Scanner;

public class ifCondition {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int temperature;
        System.out.print("Enter the current temperature: ");
        temperature = sc.nextInt();
        if (temperature < 16) {
            System.out.println("Please wear a jacket");
        } else {
            System.out.println("Please wear a hat");
        }
    }
}
```

```
run:
Enter the current temperature: 32
Please wear a hat
```

Selection Structure
IF...ELSE IF... ELSE

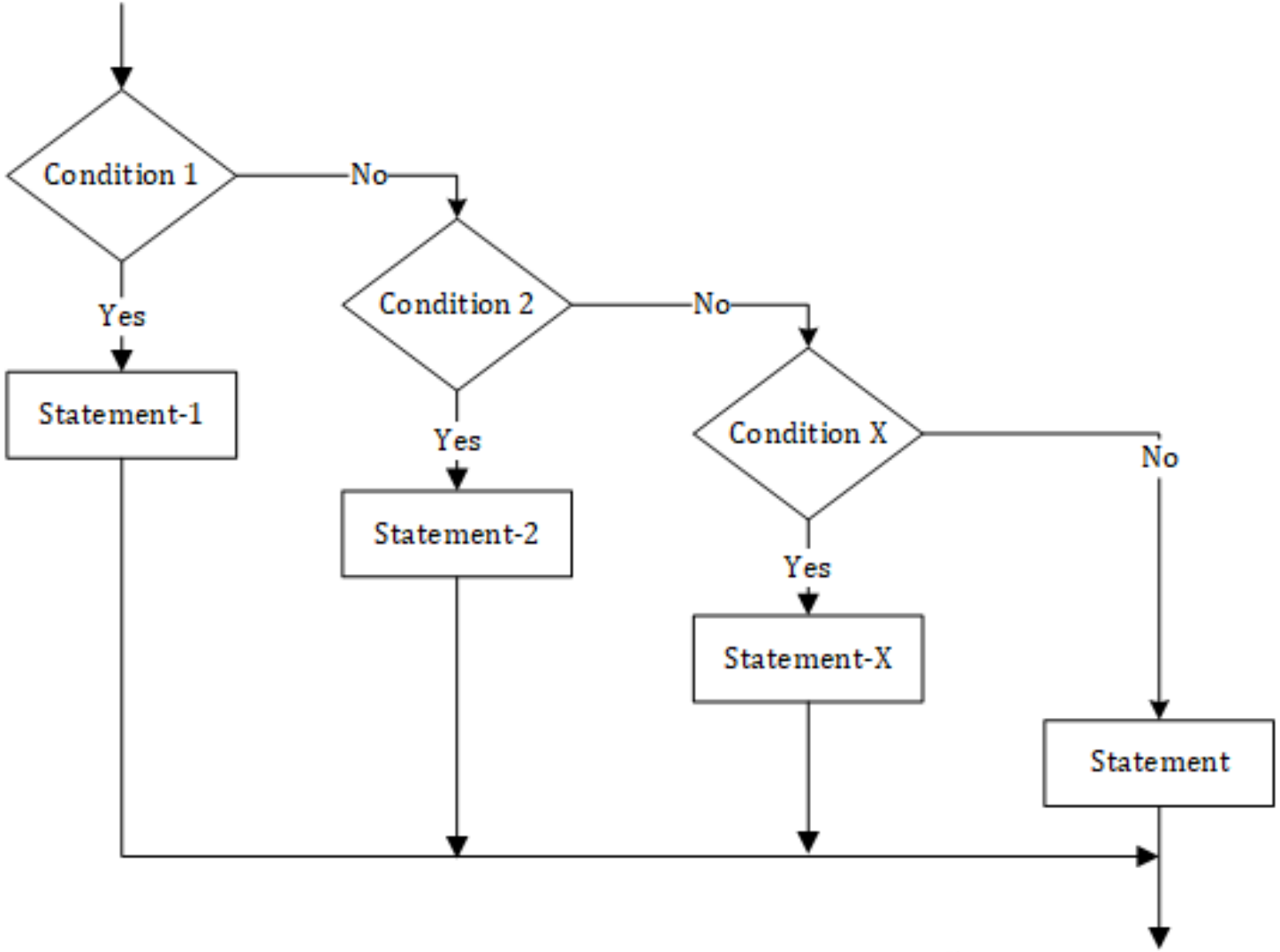
Structure IF...ELSE IF...ELSE

- General form:

```
if (Condition 1)
{
    Statement-1;
}
else if (Condition 2)
{
    Statement-2;
}
……
else if (Condition X)
{
    Statement-X;
}
else
{
    Statement;
}
```

- ✓ If ***Condition 1*** is **true**, *Statement-1* will be executed
- ✓ If ***Condition 1*** is **false**, **Condition 2** will be checked
- ✓ If ***Condition 2*** is **true**, then *Statement-2* will be executed and so on
- ✓ However, if none of the conditions are met, then the *Statement* will be executed

Flowchart IF...ELSE IF...ELSE



Example of Program Code

```java
import java.util.Scanner;

public class elseIfCondition {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int pay;
        System.out.print("Enter the total spend: ");
        pay = sc.nextInt();
        if (pay >= 2000000) {
            System.out.println("Congratulations you get gas stove");
        } else if (pay >= 1000000) {
            System.out.println("Congratulations you get frying pan");
        } else if (pay >= 500000) {
            System.out.println("Congratulations you get plate");
        } else {
            System.out.println("Sorry you did not get a gift, please increase your shopping transaction");
        }
    }
}
```

```
run:
Enter the total spend: 1250000
Congratulations you get frying pan
```

Selection Structure
SWITCH...CASE

Structure SWITCH…CASE

- The SWITCH… CASE selection syntax has the same use as IF… ELSE IF… ELSE, but SWITCH… CASE tends to be used to examine data of type **character** or **integer**.

Structure SWITCH…CASE

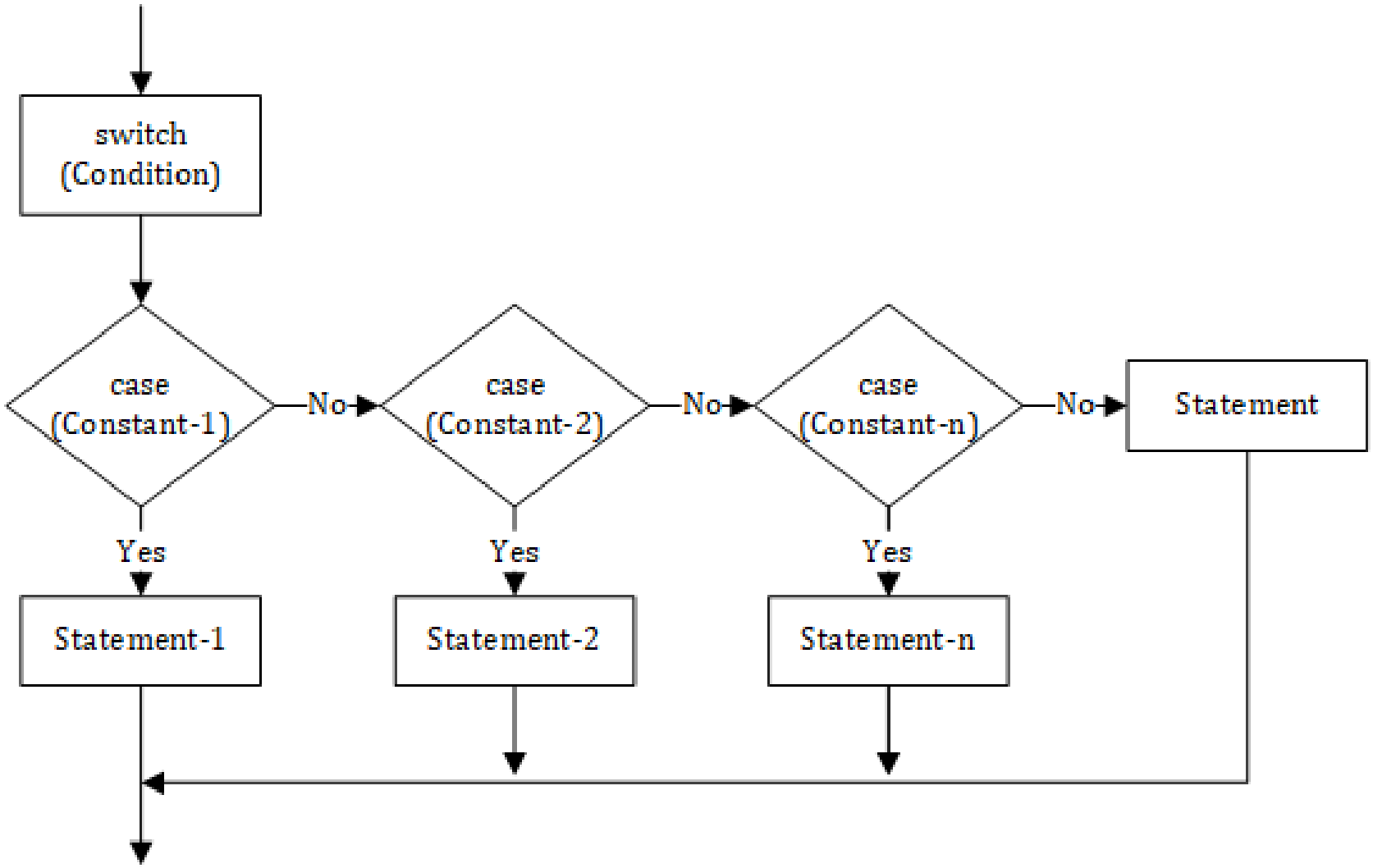
- General form:

```
switch (Condition)
{
    case Constant-1:
    Statement-1;
    break;
    case Constant-2:
    Statement-2;
    break;
    ……
    case Constant-n:
    Statement-n;
    break;
    default:
    Statement;
}
```

Structure SWITCH…CASE

- SWITCH… CASE is used when there are **many possible actions** to be performed under different conditions
- This selection syntax will execute one of several **case** statements according to the condition value contained in **switch**. Furthermore, the process will continue until the **break** statement is found. However, if there is no value in the case that matches the condition value, the process will continue to the statement in the **default**

Flowchart SWITCH…CASE



Example of Program Code

```
public class switchCase {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int number;
        System.out.print("Enter a number: ");
        number = sc.nextInt();
        switch (number) {
            case 1:
                System.out.println("Monday");
                break;
            case 2:
                System.out.println("Tuesday");
                break;
            case 3:
                System.out.println("Wednesday");
                break;
            case 4:
                System.out.println("Thursday");
                break;
            case 5:
                System.out.println("Friday");
                break;
            case 6:
                System.out.println("Saturday");
                break;
            case 7:
                System.out.println("Sunday");
                break;
            default:
                System.out.println("Sorry the number you entered is wrong");
        }
    }
}
```

```
run:
Enter a number: 6
Saturday
```

Ternary Operators

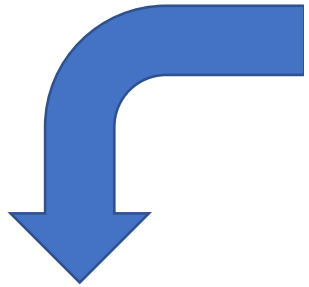
Ternary Operators

- The ternary operator is an operator that involves three operands
- This operator is used in the selection syntax
- General Form:

Condition **?** Statement for **TRUE** : Statement for **FALSE**

Example of Program Code

```
public static void main(String[] args) {
    double number = 5.7;
    String result;
    if (number > 0.0) {
        result = "Positive number";
    } else {
        result = "Negative number";
    }
    System.out.println(number + " is a " + result);
}
```



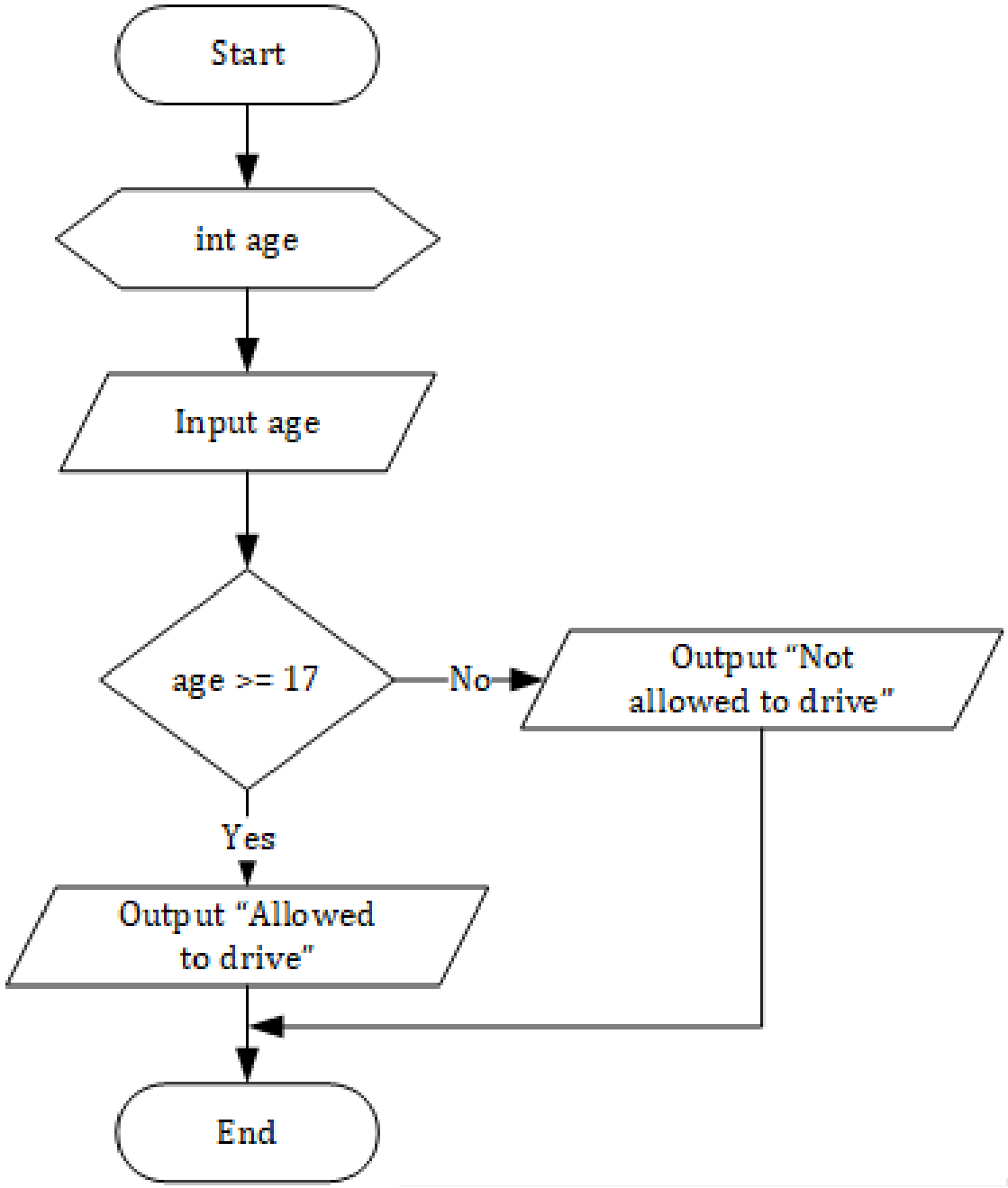
```
public static void main(String[] args) {
    double number = 5.7;
    String result;
    result = (number > 0.0) ? "Positive number" : "Negative number";
    System.out.println(number + " is a " + result);
}
```

Case Study

Example 1

In the rules for driving motorized vehicles, there are rules where people who are allowed to drive a motorized vehicle are people who are at least 17 years old. Make a flowchart to check whether a person's age is allowed to drive a motorized vehicle!

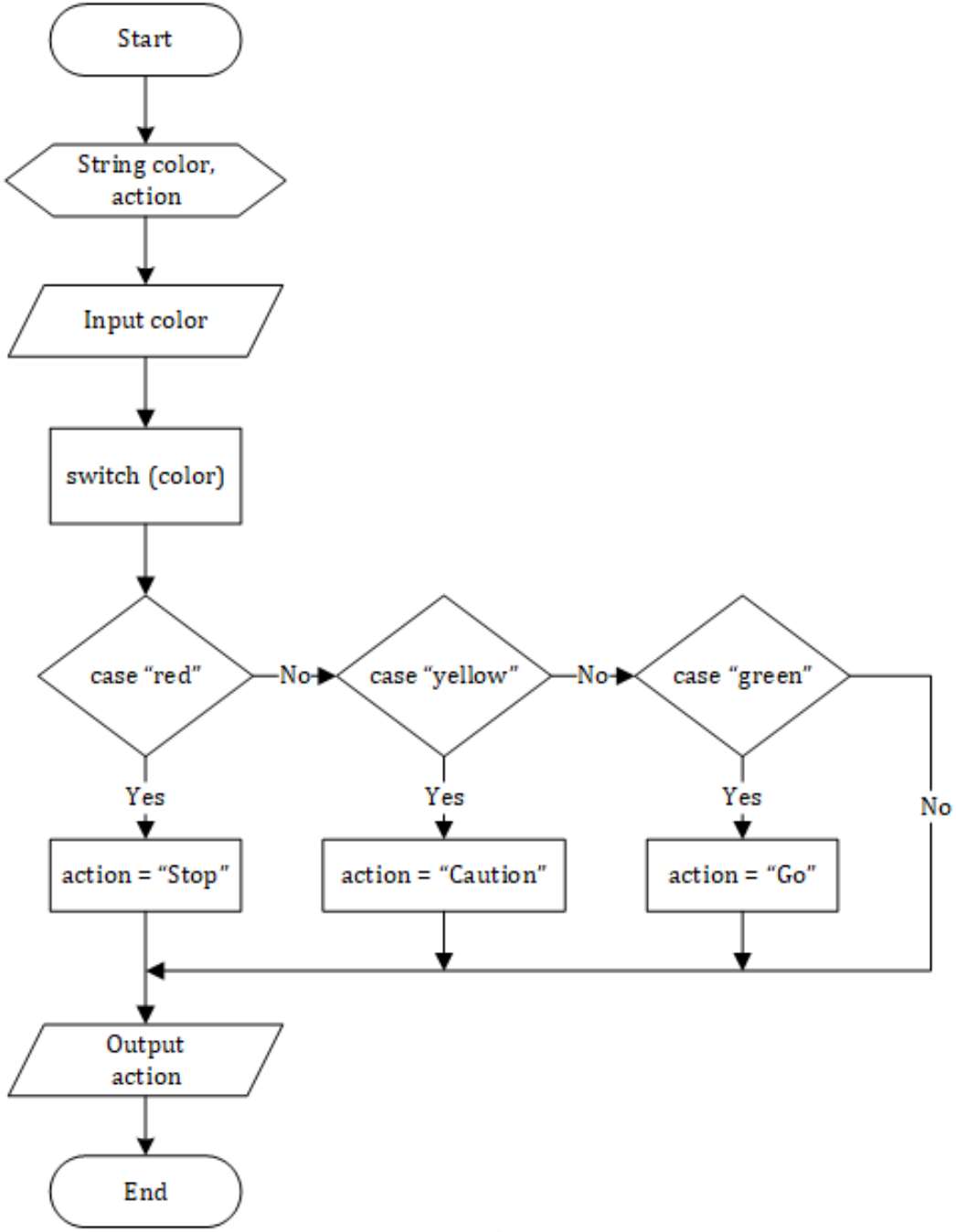
Answer


Start
int age
Input age
age >= 17
No
Output "Not allowed to drive"
Yes
Output "Allowed to drive"
End

Example 2

One reflection of a good citizen's attitude is obeying the rules of traffic signs, one of which is traffic lights. You are a motorbike rider who is crossing the highway and meets a traffic light. Create a flowchart to determine what you should do for each traffic light condition!

Answer


Start
String color, action
Input color
switch (color)
case "red"
No
case "yellow"
No
case "green"
Yes
Yes
Yes
No
action = "Stop"
action = "Caution"
action = "Go"
Output action
End

Assignment

Assignment 1

To avoid fraud committed by photocopied employees when serving customers, a photocopy owner makes a flowchart to calculate the costs to be paid, so that customers can know the calculations clearly and transparently.

If someone makes photocopies with more than 100 copies, then he or she gets a photocopy price of IDR 100 per sheet. Meanwhile, apart from that, he gets a photocopy price of IDR 150 per sheet. Help the photocopy owner to make the flowchart!

Assignment 2

Indonesia Merdeka is one of the shops in Malang which is very crowded with buyers because it is famous for the quality of the products it sells. Every Friday, the shop gives a bonus to customers who buy Indonesian-made electronic goods according to the total purchase.

If the total purchase from this customer is more than or equal to IDR 500.000, the bonus that the customer will get is an iron. If the total purchase is less than IDR 500.000, the bonus the customer gets is an umbrella. Create the flowchart!

Assignment 3

In a calculation program, it is known that the value of P = x + y. The user enters two numbers x and y. After performing the calculations, if P is positive, then the value of Q = x * y. If not, then the value Q = x / y. Create the flowchart!

Assignment 4

One form of love for the environment is throwing garbage in its place. The following is a picture of waste bins that are differentiated based on the type of waste to be disposed of.

Make a flowchart to help someone choose a waste bin when throwing garbage based on the type!