Java Conditions and If Statements

Logical Conditions

Java supports common comparison operators that return a boolean (true or false):

- a < b (less than)
- a <= b (less than or equal to)
- a > b (greater than)
- a >= b (greater than or equal to)
- a == b (equal to)
- a != b (not equal to)

These conditions are often used to make decisions in your code.

Conditional Statements in Java

1. if Statement

This allows you to execute a block of code if a certain condition is true.
Syntax:

```
if (condition) {
   // code to execute if condition is true
}
```

Example:

```
int x = 20;
int y = 18;
if (x > y) {
   System.out.println("x is greater than y");
}
```

2. else Statement

If the condition in the if statement is false, you can execute a different block of code using else.
Syntax:

```
if (condition) {
   // code if condition is true
} else {
   // code if condition is false
}
```

Example:

```
int time = 20;
if (time < 18) {
  System.out.println("Good day.");
} else {
  System.out.println("Good evening.");
}
```

3. else if Statement

Useful when you need to check multiple conditions in sequence. If the first condition is false, the next one is checked.
Syntax:

```
if (condition1) {
  // code if condition1 is true
} else if (condition2) {
  // code if condition1 is false, but condition2 is true
} else {
  // code if both conditions are false
}
```

Example:

```
int time = 22;
if (time < 10) {
  System.out.println("Good morning.");
} else if (time < 18) {
  System.out.println("Good day.");
} else {
  System.out.println("Good evening.");
}
```

4. Ternary Operator

A shorthand for if-else statements. It uses the syntax condition ? expressionTrue : expressionFalse.

Syntax:

```
variable = (condition) ? expressionTrue : expressionFalse;
```

Example:

```
int time = 20;
String result = (time < 18) ? "Good day." : "Good evening.";
System.out.println(result);
```

Real-Life Examples

1. Check Door Code

```
int doorCode = 1337;
if (doorCode == 1337) {
  System.out.println("Correct code. The door is now open.");
} else {
  System.out.println("Wrong code. The door remains closed.");
}
```

2. Check if Number is Positive or Negative

```
int myNum = 10;
if (myNum > 0) {
  System.out.println("The value is a positive number.");
} else if (myNum < 0) {
  System.out.println("The value is a negative number.");
} else {
  System.out.println("The value is 0.");
}
```

3. Check Voting Eligibility

```
int myAge = 25;
int votingAge = 18;
if (myAge >= votingAge) {
  System.out.println("Old enough to vote!");
} else {
  System.out.println("Not old enough to vote.");
}
```

4. Check if a Number is Even or Odd

```
int myNum = 5;
if (myNum % 2 == 0) {
  System.out.println(myNum + " is even");
} else {
  System.out.println(myNum + " is odd");
}
```