

Decision Making (if, if-else, switch, break, continue, jump)

Decision Making in programming is similar to decision-making in real life. In programming also face some situations where we want a certain block of code to be executed when some condition is fulfilled.

A programming language uses control statements to control the flow of execution of a program based on certain conditions. These are used to cause the flow of execution to advance and branch based on changes to the state of a program.

Java's Selection statements:

- if
- if-else
- nested-if
- if-else-if
- switch-case
- jump – (break, continue, return)

1. **If:** if statement is the most simple decisionmaking statement. It is used to decide whether a certain statement or block of statements will be executed or not i.e if a certain condition is true then a block of statements is executed otherwise not.

Syntax:

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

2. **If-else:** The if statement alone tells us that if a condition is true it will execute a block of statements and if the condition is false it won't. But what if we want to do something else if the condition is false? Here comes the else statement. We can use the else statement with the if statement to execute a block of code when the condition is false.

Syntax:

```
if (condition)
{
    // Executes this block if
    // condition is true
}
else
{
    // Executes this block if
    // condition is false
}
```

3.Nested-if: A nested if is an if statement that is the target of another if or else. Nested if statements mean an if statement inside an if statement. Yes, java allows us to nest if statements within if statements. i.e, we can place an if statement inside another if statement.

Syntax:

```
if (condition1)
{
    // Executes when condition1 is true
if (condition2)
{
    // Executes when condition2 is true
}
}
```

4.if-else-if ladder: Here, a user can decide among multiple options. The if statements are executed from the top down. As soon as one of the conditions controlling the if is true, the statement associated with that 'if' is executed, and the rest of the ladder is bypassed. If none of the conditions is true, then the final else statement will be executed. There can be as many as 'else if' blocks associated with one 'if'

block but only one 'else' block is allowed with one 'if' block.

Syntax:

if (condition)

statement; else if

(condition)

statement;

.

.

else

statement;

5.switch-case: The switch statement is a multiway branch statement. It provides an easy way to dispatch execution to different parts of code based on the value of the expression.

Syntax: switch

(expression)

```
{
    case value1:
statement1;
break; case
value2:
statement2;
break;
.
. case valueN:
statementN;
break; default:
statementDefault;
}
```

6. Jump: Java supports three jump statements: break, continue and return. These three statements transfer control to another part of the program.

Break: In Java, a break is majorly used for:

Terminate a sequence in a switch statement (discussed above).

To exit a loop.

Used as a “civilized” form of goto.

- **Continue:** Sometimes it is useful to force an early iteration of a loop. That is, you might want to continue running the loop but stop processing the remainder of the code in its body for this particular iteration. This is, in effect, a goto just past the body of the loop, to the loop’s end. The continue statement performs such an action.
- **The return :** statement is used to Return explicitly return from a method. That is, it causes program control to transfer back to the caller of the method.

1. Which of the following statements is true regarding the switch statement in Java?

- a. The switch statement can only be used with primitive data types.
- b. The switch statement can only be used with objects.
- c. The switch statement can be used with both primitive data types and objects.
- d. The switch statement can only be used with strings.

Answer: c. The switch statement can be used with both primitive data types and objects.

What is the purpose of the if-else statement in Java?

- a. To declare variables.
- b. To loop through a block of code.
- c. To make decisions based on a condition.
- d. To perform mathematical calculations.

Answer: c. To make decisions based on a condition.

Which of the following is NOT a logical operator in Java?

- a. &&
- b. !
- c. ||
- d. #

Answer: d. #

What is the purpose of the ternary operator in Java?

- a. To perform mathematical calculations.
- b. To declare variables.
- c. To make decisions based on a condition.
- d. To loop through a block of code.

Answer: c. To make decisions based on a condition.

What is the purpose of the break statement in Java?

- a. To exit a loop or switch statement.
- b. To continue executing a loop or switch statement.
- c. To define a new block of code.
- d. To declare a new variable.

- Answer: a. To exit a loop or switch statement

Which of the following is not a control structure in Java?

- A. for loop
- B. while loop
- C. do-while loop
- D. switch statement
- E. None of the above

Answer: E. None of the above. All of the listed options are control structures in Java.

Which of the following keywords is used to define a constant in Java?

- A. const
- B. final
- C. static
- D. public
- E. None of the above

Answer: B. final. The final keyword is used to define a constant in Java. Once a variable is declared as final, its value cannot be changed.

Which of the following is the correct syntax for a ternary operator in Java?

- A. condition ? expression1 : expression2
- B. expression1 ? condition : expression2
- C. expression1 : condition ? expression2
- D. expression1 : expression2 ? condition
- E. None of the above

Answer: A. condition ? expression1 : expression2. The ternary operator in Java has the syntax: condition ? expression1 : expression2. If the condition is true, expression1 is evaluated; otherwise, expression2 is evaluated.

Which of the following is not a valid method for converting a string to an integer in Java?

- A. Integer.parseInt()
- B. Integer.valueOf()

- C. Integer.convert()
- D. Integer.decode()
- E. None of the above

Answer: C. Integer.convert(). There is no such method in Java. The correct methods for converting a string to an integer are Integer.parseInt(), Integer.valueOf(), and Integer.decode().

Which of the following is not a component of the if statement in Java?

- A. if keyword
- B. condition
- C. then keyword
- D. code block
- E. else keyword

Answer: C. then keyword. There is no "then" keyword in Java's if statement. The correct syntax is: if (condition) { code block } else { code block } (Note that the "else" keyword is optional.)

What is the correct syntax to create an if statement in Java?

- a) if (condition) {}
- b) if (condition) then {}
- c) if condition {}
- d) if (condition) then

Answer: a) if (condition) {}

What is the difference between a while loop and a do-while loop in Java?

- a) A while loop checks the condition before executing the loop body, while a do-while loop checks the condition after executing the loop body.
- b) A while loop executes the loop body at least once, while a do-while loop may not execute the loop body at all.
- c) A while loop and a do-while loop are the same thing.
- d) A while loop is used for numeric counting, while a do-while loop is used for iterating through collections.

Answer: a) A while loop checks the condition before executing the loop body, while a do-while loop checks the condition after executing the loop body.

What is the correct syntax to create a switch statement in Java?

- a) switch (expression) {}
- b) switch (expression) then {}
- c) case (value) {}
- d) case (value) then {}

Answer: a) switch (expression) {}

What is the purpose of the break statement in a switch statement in Java?

- a) To terminate the entire program.
- b) To break out of the switch statement and continue with the next statement after the switch statement.
- c) To skip to the next case in the switch statement.
- d) To execute the code in the case statement.

Answer: b) To break out of the switch statement and continue with the next statement after the switch statement.

What is the purpose of the continue statement in a loop in Java?

- a) To terminate the entire loop.
- b) To skip to the next iteration of the loop.
- c) To execute the code in the loop.
- d) To break out of the loop.

Answer: b) To skip to the next iteration of the loop.

Which keyword is used to define a switch statement in Java?

- A. case
- B. switch
- C. if
- D. while

Answer: B. switch

What is the purpose of a break statement in a switch statement?

- A. To exit the loop
- B. To execute the default case
- C. To execute the next case
- D. To exit the switch statement

Answer: D. To exit the switch statement

Which statement is used to create an if-else statement in Java?

- A. if
- B. else
- C. switch
- D. for

Answer: B. else

What is the purpose of a ternary operator in Java?

- A. To assign a value to a variable
- B. To compare two values
- C. To perform a mathematical operation
- D. To create a shorthand if-else statement

Answer: D. To create a shorthand if-else statement

Which keyword is used to define a loop that will continue as long as a certain condition is true?

- A. while
- B. for
- C. do
- D. switch

Answer: A. while

What is the purpose of a continue statement in a loop?

- A. To exit the loop
- B. To skip the current iteration of the loop and continue with the next iteration
- C. To execute the loop body one more time
- D. To jump to a specific point in the loop

Answer: B. To skip the current iteration of the loop and continue with the next iteration

Which statement is used to create a for loop in Java?

- A. for
- B. while
- C. do-while D. switch

Answer: A. for

What is the purpose of a do-while loop in Java?

- A. To execute the loop body at least once, regardless of the condition
- B. To repeat a loop a certain number of times
- C. To execute the loop body while a certain condition is true
- D. To jump to a specific point in the loop

Answer: A. To execute the loop body at least once, regardless of the condition

Which keyword is used to exit a loop in Java?

- A. exit
- B. break

C. continue

D. return

Answer: B. break

What is the purpose of a return statement in Java?

A. To exit a loop

B. To skip the current iteration of a loop

C. To exit a method and return a value D. To jump to a specific point in a loop

Answer: C. To exit a method and return a value
What is the syntax for a switch statement in Java?

a. `switch (expression) { case 1: statement1; break; case 2: statement2; break; default: statement3; }`

b. `switch (expression) { case 1: statement1; break; case 2: statement2; break; case 3: statement3; }`

c. `switch (expression) { case 1: statement1; case 2: statement2; default: statement3; }`

d. `switch (expression) { case 1: statement1; case 2: statement2; case 3: statement3; }`

Answer: a

Which of the following is not a valid logical operator in Java?

a. `&&`

b. `||`

c. `!`

d. //

Answer: d

What is the output of the following code snippet?

```
int x = 10;
int y = 20; if
(x > y) {
System.out.println("x is greater than y");
} else {
System.out.println("y is greater than x");
}
```

- a. x is greater than y
- b. y is greater than x
- c. x = y
- d. This code will not compile because of an error

Answer: b

What is the purpose of the break statement in a switch statement in Java?

- a. To exit the switch statement and continue with the next line of code after the switch statement
- b. To exit the entire method and return a value
- c. To skip over the current case and continue with the next case in the switch statement

d. To terminate the program

Answer: a

What is the output of the following code snippet?

```
int x = 5; int  
y = 10; if (x  
> y) {  
System.out.println("x is greater than y");  
} else if (y > x) {  
System.out.println("y is greater than x");  
} else {  
System.out.println("x equals y");  
}
```

- a. x is greater than y
- b. y is greater than x
- c. x equals y
- d. This code will not compile because of an error

Answer: b

Which keyword is used to define a switch statement in Java?

- A. switch
- B. case
- C. default

D. break

Answer: A. switch

Which of the following is NOT a logical operator in Java?

A. &&

B. !

C. ||

D. #

Answer: D. #

Which of the following is used to create an instance of a class in Java?

A. this

B. new

C. super

D. instanceof

Answer: B. new

Which of the following is used to exit a loop in Java?

A. exit()

B. return

C. break

D. continue

Answer: C. break

Which of the following is used to declare a constant in Java?

- A. final
- B. static
- C. const
- D. constant

Answer: A. final

Which of the following is used to handle exceptions in Java?

- A. try-catch
- B. if-else
- C. switch-case
- D. for-loop

Answer: A. try-catch

Which of the following is used to compare two strings in Java?

- A. ==
- B. .equals()
- C. !=
- D. >

Answer: B. .equals()

Which of the following is NOT a primitive data type in Java?

- A. int
- B. double
- C. string
- D. boolean

Answer: C. string

Which statement is used to exit a loop in Java?

- A. break
- B. continue
- C. return
- D. exit

Answer: A. break

What is the purpose of the ternary operator in Java?

- A. To assign a value to a variable based on a condition
- B. To create a new instance of an object
- C. To perform arithmetic operations on two values
- D. To initialize an array

Answer: A. To assign a value to a variable based on a condition

Which of the following is not a Java primitive data type?

- A. int
- B. double
- C. string

D. boolean

Answer: C. string

What is the purpose of the switch statement in Java?

A. To assign a value to a variable based on a condition

B. To create a new instance of an object

C. To perform arithmetic operations on two values

D. To perform different actions based on the value of a variable

Answer: D. To perform different actions based on the value of a variable

Which of the following statements is used to catch exceptions in Java?

A. try

B. catch

C. throw

D. finally

Answer: B. catch

What is the difference between an abstract class and an interface in Java?

A. An abstract class can have non-abstract methods, while an interface cannot

B. An abstract class cannot have any methods, while an interface can have both abstract and non-abstract methods

C. An abstract class can only be extended by one subclass, while an interface can be implemented by multiple classes

D. There is no difference between an abstract class and an interface in Java

Answer: A. An abstract class can have non-abstract methods, while an interface cannot

Which of the following is not a valid access modifier in Java?

- A. private
- B. protected
- C. public
- D. global

Answer: D. global

What is the purpose of the synchronized keyword in Java?

- A. To indicate that a method cannot be overridden
- B. To indicate that a variable cannot be changed
- C. To indicate that a method can only be accessed by one thread at a time
- D. To indicate that a method can be accessed by multiple threads simultaneously

Answer: C. To indicate that a method can only be accessed by one thread at a time

Which of the following statements is true about the "this" keyword in Java?

- A. It refers to the current instance of the class
- B. It refers to the superclass of the current class
- C. It refers to a static variable of the class
- D. It refers to a local variable of the method

Answer: A. It refers to the current instance of the class

What is the output of the following code?

```
int x = 5; if
(x > 10) {
System.out.println("x is greater than 10");
} else if (x > 7) {
System.out.println("x is greater than 7");
} else {
System.out.println("x is less than or equal to 7");
}
```

- A. x is greater than 10
- B. x is greater than 7
- C. x is less than or equal to 7
- D. There is a syntax error in the code

Answer: C. x is less than or equal to 7

Which of the following is NOT a control statement in Java?

- a. if-else
- b. switch-case
- c. for loop
- d. print statement

Answer: d

Which of the following is a valid way to declare a variable in Java?

- a. `int 1x = 10;`
- b. `float x = "3.14";`
- c. `boolean flag = true;`
- d. `String myString;`

Answer: c

What is the purpose of the break statement in a switch statement?

- a. It ends the current iteration of a loop.
- b. It ends the entire switch statement.
- c. It continues to the next case in the switch statement.
- d. It initializes a variable to a certain value.

Answer: b

Which of the following is a ternary operator in Java?

- a. `&&`
- b. `||`
- c. `+`
- d. `?:`

Answer: d

What is the difference between a while loop and a do-while loop in Java?

- a. A while loop executes the loop body at least once, while a do-while loop may not execute the loop body at all.
- b. A while loop and a do-while loop are the same thing.
- c. A while loop always executes the loop body at least once, while a do-while loop may not execute the loop body at all.
- d. A do-while loop executes the loop body at least once, while a while loop may not execute the loop body at all.

Answer: d

What is the result of the following code?

```
int x = 5; int y = 10; int  
z = x + y > 10 ? 5 : 2;  
System.out.println(z);
```

- a. 5
- b. 2
- c. 10
- d. Compile error

Answer: b

What is the output of the following code?

```
int i = 0; while  
(i < 5) {  
System.out.print(i + " "); i++;  
}
```

- a. 0 1 2 3 4
- b. 1 2 3 4 5
- c. 0 1 2 3 4 5
- d. None of the above

Answer: a

Which of the following is a valid way to declare a two-dimensional array in Java?

- a. `int[][] myArray = new int[3];`
- b. `int[][] myArray = new int[][]{{1, 2}, {3, 4}};`
- c. `int[][] myArray = {1, 2, 3, 4};`
- d. `int[][] myArray = new int[2][3];`

Answer: d

What is the difference between a break statement and a continue statement in Java?

- a. A break statement ends the current iteration of a loop, while a continue statement ends the entire loop.
- b. A break statement ends the entire loop, while a continue statement ends the current iteration of the loop.
- c. A break statement and a continue statement are the same thing.
- d. A break statement ends the current iteration of a loop, while a continue statement starts a new iteration of the loop.

Answer: b

What is the output of the following code?

```
int x = 0; do  
{  
System.out.print(x + " "); x++;  
} while (x < 0);
```

- a. 0
- b. Nothing is printed.
- c. An error occurs at runtime.
- d. An infinite loop occurs.

Answer: d

Which of the following statements is true about the ternary operator in Java?

- a) It is a shorthand way of writing an if-else statement.
- b) It is used to compare three values.
- c) It is used to declare three variables.
- d) It can only be used with boolean values.

Answer: a) It is a shorthand way of writing an if-else statement.

What is the difference between a while loop and a do-while loop in Java?

- a) A while loop executes the code inside the loop first, while a do-while loop executes the code inside the loop after checking the condition.
- b) A while loop checks the condition first, while a do-while loop executes the code inside the loop first and then checks the condition.
- c) There is no difference between a while loop and a do-while loop.

d) A while loop can only be used with boolean values, while a do-while loop can be used with any data type.

Answer: b) A while loop checks the condition first, while a do-while loop executes the code inside the loop first and then checks the condition.

What is the purpose of the break statement in Java?

- a) To exit a loop or switch statement.
- b) To continue to the next iteration of a loop.
- c) To create a new object.
- d) To print a message to the console.

Answer: a) To exit a loop or switch statement.

What is the output of the following code?

```
int x = 5; if(x < 10
&& x > 2){
System.out.println("x is between 2 and 10");
}
else{
System.out.println("x is not between 2 and 10");
}
```

- a) x is between 2 and 10
- b) x is not between 2 and 10
- c) There will be a compile error.
- d) The code will not execute.

Answer: a) x is between 2 and 10

What is the purpose of the continue statement in Java?

- a) To exit a loop or switch statement.
- b) To skip to the end of a loop.
- c) To skip to the next iteration of a loop.
- d) To print a message to the console.

Answer: c) To skip to the next iteration of a loop.

What is the purpose of the ternary operator in Java?

- A) To test whether a condition is true or false
- B) To assign a value based on whether a condition is true or false
- C) To perform arithmetic operations
- D) To compare two values

Answer: B

Which of the following is not a control statement in Java?

- A) If-else statement
- B) Switch statement
- C) For loop statement
- D) Print statement

Answer: D

What is the purpose of the break statement in Java?

- A) To terminate a loop
- B) To skip the current iteration of a loop
- C) To continue to the next iteration of a loop
- D) To exit a method or switch statement

Answer: A

Which of the following is a valid comparison operator in Java?

- A) <=>
- B) ><
- C) ==
- D) ><>

Answer: C

What is the purpose of the continue statement in Java?

- A) To terminate a loop
- B) To skip the current iteration of a loop
- C) To continue to the next iteration of a loop
- D) To exit a method or switch statement

Answer: C

Which of the following is not a logical operator in Java?

- A) &&
- B) ||
- C) !
- D) &|

Answer: D

Which of the following is a valid way to handle exceptions in Java?

- A) Using the try-catch statement
- B) Using the throw statement
- C) Using the finally statement
- D) All of the above

Answer: D

Which of the following is not a type of loop in Java?

- A) For loop
- B) While loop
- C) Do-while loop

D) Repeat-until loop

Answer: D

Which of the following is not a valid data type in Java?

A) int

B) double

C) float

D) decimal

Answer: D

Which of the following is true about the switch statement in Java?

A) It can only test for equality

B) It can test for multiple values using case labels

C) It can only be used with integer data types

D) It can only have one default case

Answer: B