

SAT PREP

Assignment : AP Computer Science: Control Structure

Conditional Statement

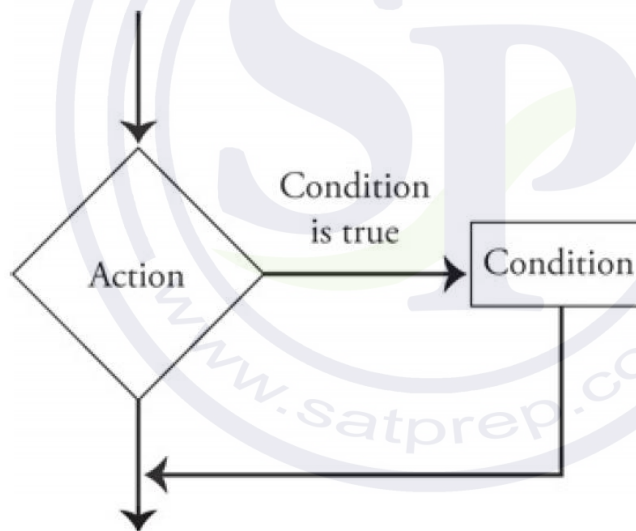
Control structures are the mechanism by which you make the statements of a program run in a nonsequential order. There are two general types: decision making and iteration.

Decision-Making Control Structures

These include the if, if...else, and switch statements. They are all selection control structures that introduce a decision-making ability into a program. Based on the truth value of a boolean expression, the computer will decide which path to follow. The switch statement is not part of the AP Java subset.

The if Statement

The if statement is a conditional statement. In its simplest form, it allows the program to execute a specific set of instructions if some certain condition is met. If the condition is not met, then the program skips over those instructions.

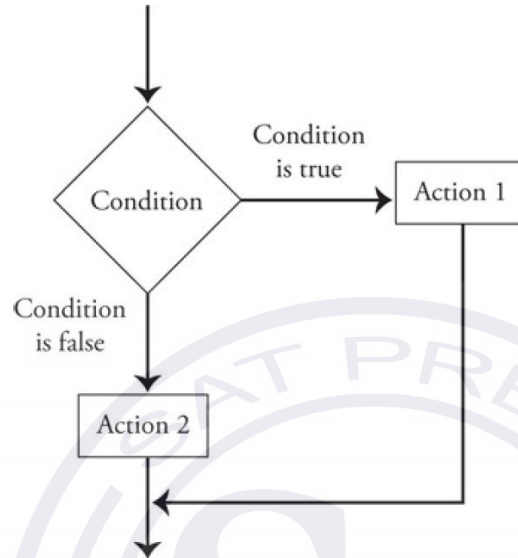


```
if (boolean expression)  
{  
    statements  
}
```

Here the *statements* will be executed only if the *boolean expression* is true. If it is false, control passes immediately to the first statement following the if statement.

The if-else Statement

The if-else statement allows the program to execute a specific set of instructions if some certain condition is met and a different set of instructions if the condition is not met. I will sometimes refer to the code that is executed when the condition is true as the if clause and the code that follows the else as the else clause



```
if (boolean expression)
{
    statements
}
else
{
    statements
}
```

Here, if the *boolean expression* is true, only the *statements* immediately following the test will be executed. If the *boolean expression* is false, only the *statements* following the else will be executed.

Example

```
int n = IO.readInt();           //read user input
if (n > 0)
    if (n % 2 == 0)
        System.out.println(n);
else
    System.out.println(n + " is not positive");
```

user enters 7 and is surprised to see the output

```
7 is not positive
```

NESTED if STATEMENT

If the statement part of an if statement is itself an if statement, the result is a nested if statement.

```
if (boolean expr1)
    if (boolean expr2)
        statement;
```

This is equivalent to

```
if (boolean expr1 && boolean expr2)
    statement;
```

Example

```
String grade = IO.readString(); //read user input
if (grade.equals("A"))
    System.out.println("Excellent!");
else if (grade.equals("B"))
    System.out.println("Good");
else if (grade.equals("C") || grade.equals("D"))
    System.out.println("Poor");
else if (grade.equals("F"))
    System.out.println("Egregious!");
else
    System.out.println("Invalid grade");
```

The switch Statement

Test the value of an expression and, depending on that value, to jump directly to some location within the switch statement. Only expressions of certain types can be used. The value of the expression can be one of the primitive integer types int, short, or byte. It can be the primitive char type. It can be String.

```
switch (expression)
{
    case constant-1:
        statements-1
        break;
    case constant-2:
        statements-2
        break;
    .
    . // (more cases)
    .
    case constant-N:
        statements-N
        break;
    default: // optional default case
        statements-(N+1)
} // end of switch statement
```

Example :

```
public class SwitchCaseExample2 {  
    {  
        public static void main(String args[]){  
            { int i=2;  
              switch(i)  
              {  
                  case 1:  
                    System.out.println("Case1 ");  
                    break;  
                  case 2:  
                    System.out.println("Case2 ");  
                    break;  
                  case 3:  
                    System.out.println("Case3 ");  
                    break;  
                  case 4:  
                    System.out.println("Case4 ");  
                    break;  
                  default:  
                    System.out.println("Default ");  
                }  
            }  
        }  
    }  
}
```

