Java Control: Conditionals

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Relational/Boolean Operators

Relational/Boolean Difference Python to Java

Java	Python
&&	and
||	or
!	not
<,<=,>,>=	<,<=,>,>=

Python may read

```
if ((not sunny and cold ) or raining)
```

Java reads

```
if ((!sunny && cold) || raining)
```

This is c++ inherited syntax (unlike python that uses more human syntax)

Comparing primitives versus objects

Java		Python
x == y, x != y	(compare primitives by data)	No primitives in python
x == y, x!= y	(compares objects by id only)	Same – python __eq__ default (check's id(x) == id(y))
x.equals(y)	(compares objects, id or data)	Same – python __eq__

```
Person x = new Person("Alice");
Person y = new Person("Alice");
z = x;
```

x == x ; is true
x == z ; is true

x == y; is false
x.equals(y); is true as the data is the same *(if equals() is re-defined as comparing Person names to decide equality)*
x.equals(y); is false as different objects *(if equals() has not been re-defined to compare data in each Person)*

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Person x = new Person("Alice")
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x.equals(y);     is true as the dat
x.equals(y);     is false as differe
```

paring Person names to decide equality)
to compare data in each Person)

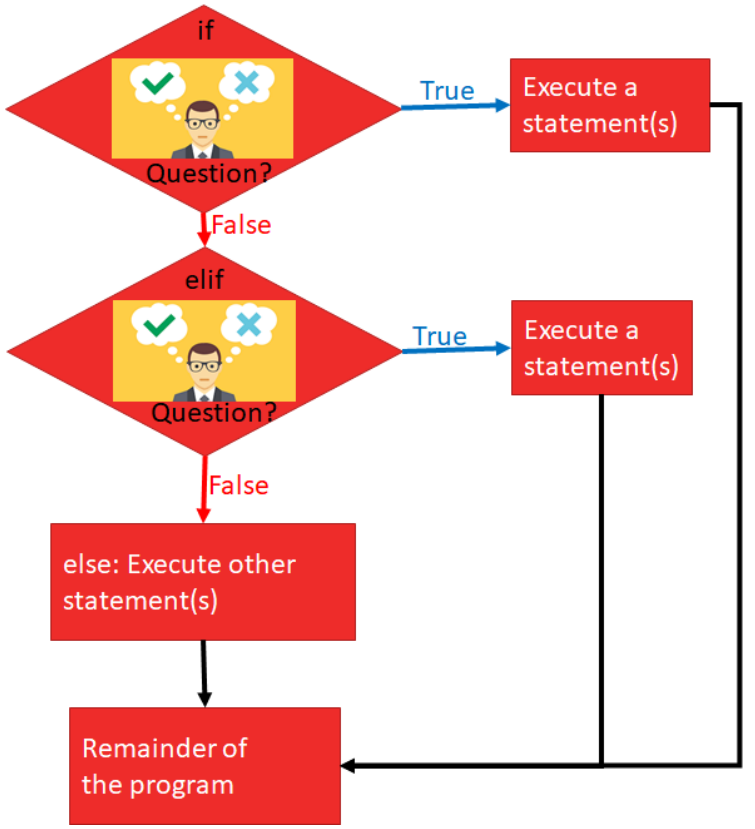
Return To This Later!

Conditionals

Modifications

```
// JAVA
if (expression){
        body of ‘if’
} else if (expression){
        body of ‘elif’
} else {
        body of ‘else’
}
```

```
# PYTHON
if expression:
        body of ‘if’
elif expression:
        body of ‘elif’
else:
        body of ‘else’
```



Modifications

```
// JAVA
if (expression){
        body of 'if'
} else if (expression){
        body of 'elif'
} else {
        body of 'else'
}
```

```
# PYTHON
if expression:
        body of 'if'
elif expression:
        body of 'elif'
else:
        body of 'else'
```

- We are required to use () around the logical expression
- We replace elif by else if
- We don't use : and indentation to indicate inside conditional
  - We use {} instead
- As before
  - 0 or more - **else if**
  - 0 or 1 - **else** at end

Modifications

```
// JAVA
if (expression){
body of ‘if’
} else if (expression){
body of ‘elif’
} else {
body of ‘else’
}
```

- We are required to

Indentation Doesn’t Matter!!!!!

- 0 or more - **else if**
- 0 or 1 - **else** at end

Conditionals - Scope

Scope

Scope is different in Java

{} designate a scope, if we create a variable inside, when it ends, the variable name is deleted

Ex.

- Here printing x,y works inside the if
- After {} ends for the if, only x will print without error

```
public class Test {

    public static void main(String[] args) {
        int x = 1;
        if (true) {
            int y = 2;
            System.out.println(x);
            System.out.println(y);
        }
        System.out.println(x);
        System.out.println(y);
    }

}
```

java: cannot find symbol
symbol: variable y
location: class Test

Conditionals - Switches

Switch-Statements (NEW!)

```
// Annoying chained else-if

if (colour == “red”){

} else if (colour == “green”){

} else if (colour == “blue”){

} else {

}
```

```
// Straight-forward Java Switch
switch (colour) {
        case "red":
                break;
        case "green":
                break;
        case "blue":
                break;
        default:
                break;
}
```

Switch-Statements (NEW!)

```
// Straight-forward Java Switch
switch (colour) {
        case "red":
                break;
        case "green":
                break;
        case "blue":
                break;
        default:
                break;
}
```

- Equality with colour is checked for each case
- Example case “red” is executed if colour==“red”
- Anything we want to do for “red” should be put before the break; for “red” case
- Default acts like our else (otherwise)

Question? What happens if break is omitted?

Switch-Statements (NEW!)

```
// Straight-forward Java Switch
switch (colour) {
        case "red":
                System.out.println(“red”);
        case "green":
                System.out.println(“green”);
        case "blue":
                System.out.println(“blue”);
        default:
                System.out.println(“black”);
                break;
}
```

Question? What happens if break is omitted?

- **We will fall through from above case body into cases below**
- Example “red”==colour will print

- Example “blue”==colour will print

Switch-Statements (NEW!)

```
// Straight-forward Java Switch
switch (colour) {
        case "red":
                System.out.println(“red”);
        case "green":
                System.out.println(“green”);
        case "blue":
                System.out.println(“blue”);
        default:
                System.out.println(“black”);
                break;
}
```

Question? What happens if break is omitted?

- **We will fall through from above case body into cases below**
- Example “red”==colour will print
  - red
  - green
  - blue
  - black
- Example “blue”==colour will print
  - blue
  - black
- Easy mistake to make! One reason python omits switch as often switches are involved in dangerous program bugs/exploits.

Conditionals – In-Line

In-line if statements (Hard to read!)

```
// Regular simple if assignment
if (colour == “red”){
        x = 2;
} else {
        x = 3;
}

//Inline if assignment (not stylistically recommended)
x = colour == "red" ? 2 : 3;
```

In-line if statements (Hard to read!)

```
// Regular simple if assignment
if (colour == "red"){
        x = 2;
} else {
        x = 3;
}

//Inline if assignment (not stylistically recommended)
x = colour == "red" ? 2 : 3;

//read as → set x, IF colour is red  to 2, ELSE to 3
```

Onward to … Loops.

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