

Selection – if statements

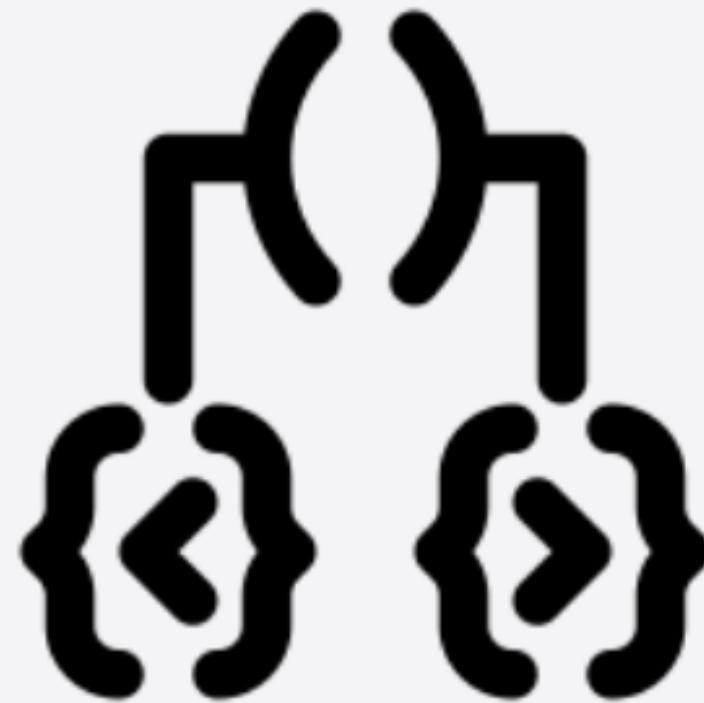


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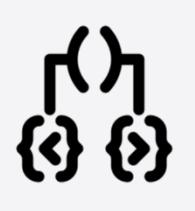
Upcoming

- Conditional statements;
 - Recap
 - Examples

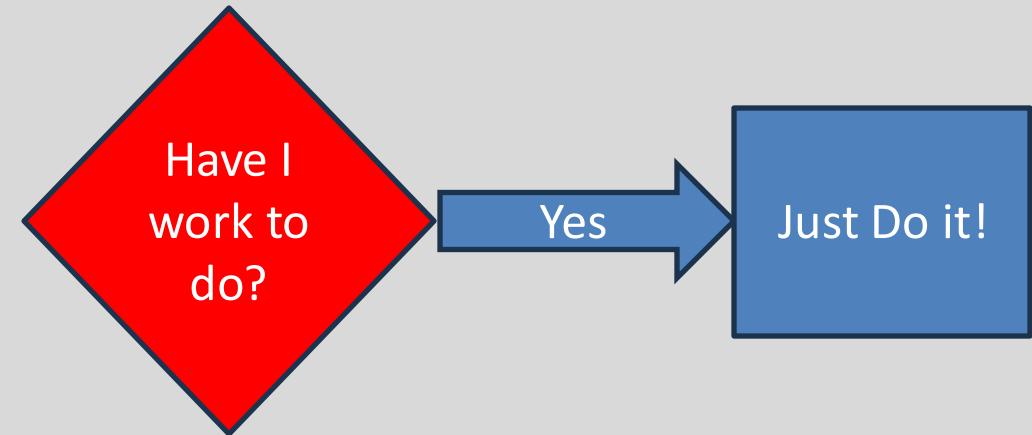
Conditionals – the if statement



Making choices in everyday life

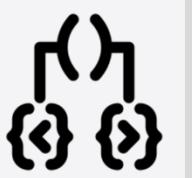


- If I have an assignment to complete, then I shall work on my assignment



Conditional Statement Syntax (1)

```
if(condition1...perform some test)
{
    Do these statements if the test gave a true result
}
```

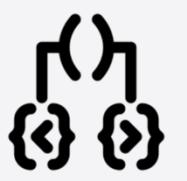


Making a choice in the ticket machine (1)

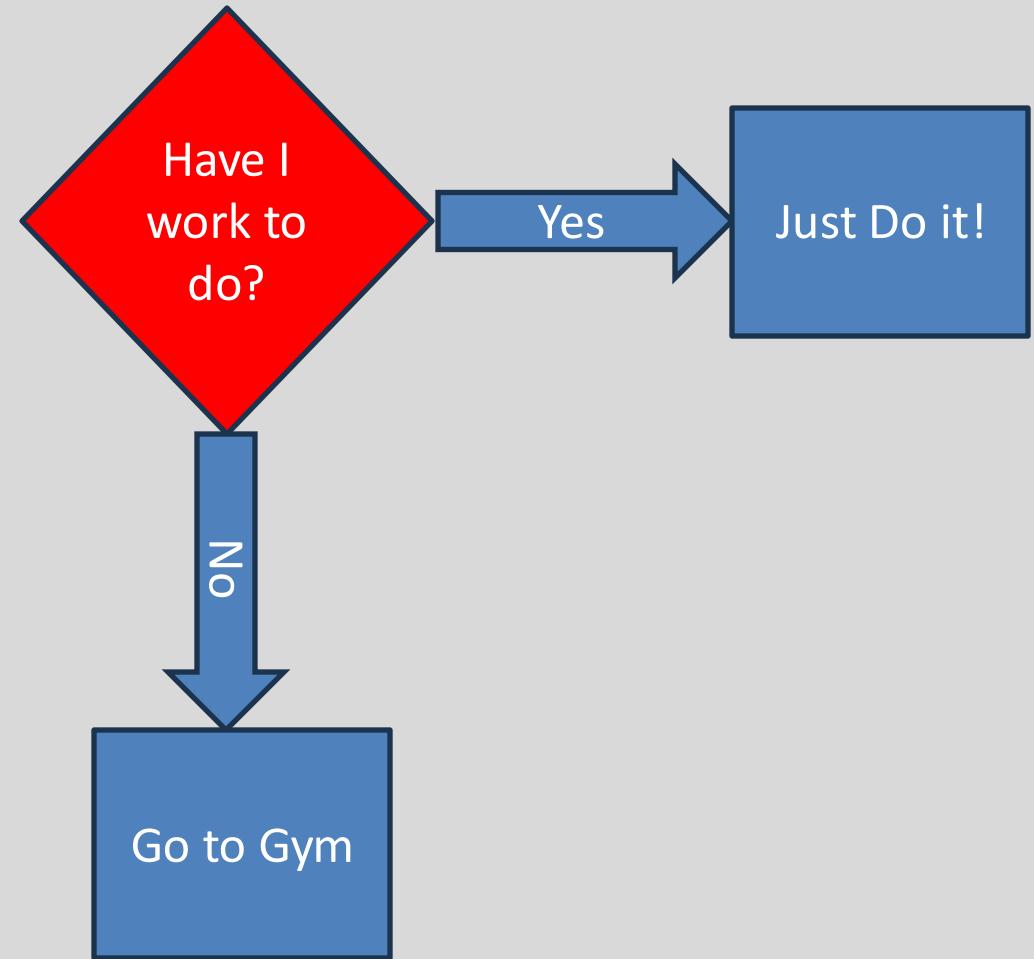
```
public void insertMoney(int amount)
{
    if(amount > 0) {
        balance = balance + amount;
    }
}
```

the conditional statement avoids an inappropriate action

Making choices in everyday life (2)



- If I have an assignment to complete, then I shall work on my assignment
- Otherwise I will go to the Gym

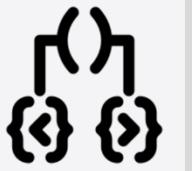


Conditional Statement Syntax (2)

```
if(condition1...perform some test) {  
    Do these statements if the test gave a true result  
}  
else {  
    Do these statements if the test gave a false result  
}
```

Diagram annotations:

- 'if' keyword
- boolean condition to be tested
- actions if condition is true
- 'else' keyword
- actions if condition is false



Making a choice in the ticket machine (2)

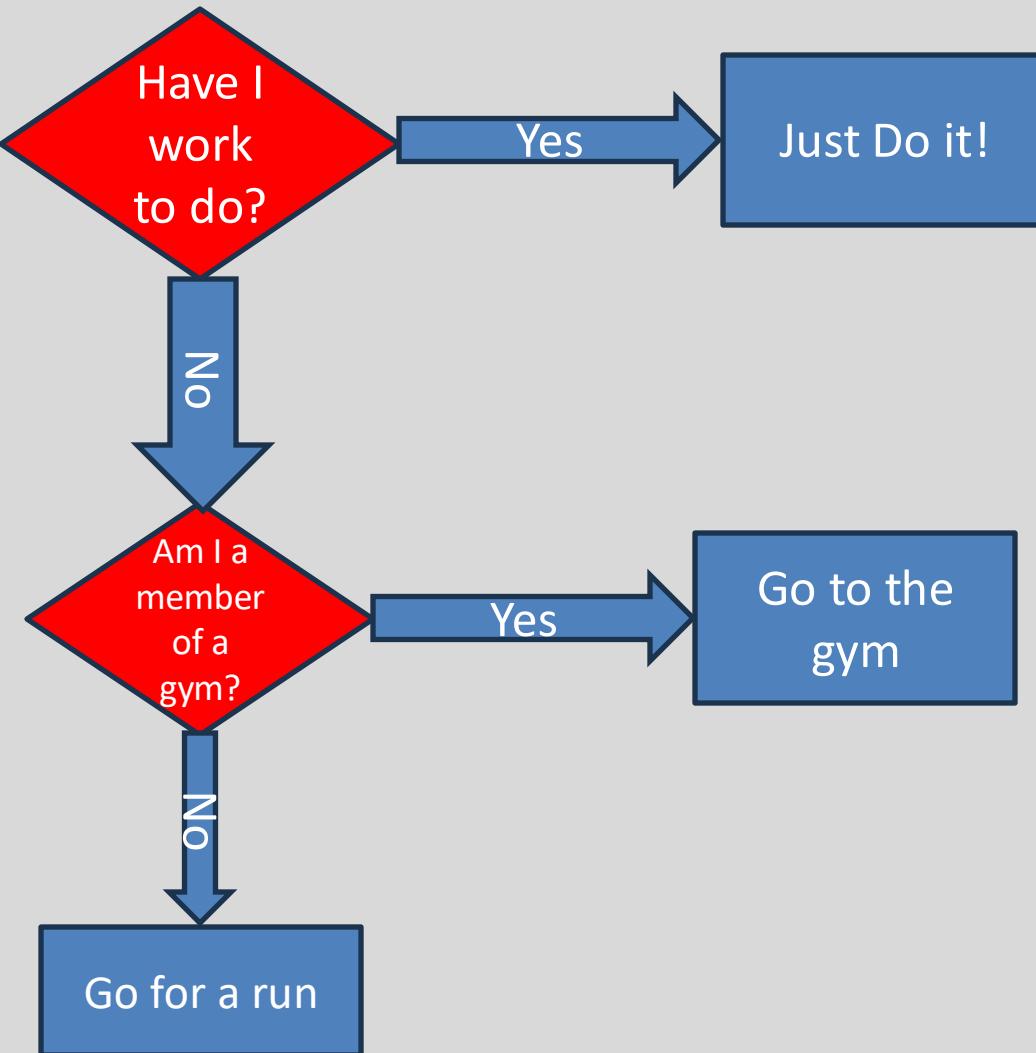
```
public void insertMoney(int amount)
{
    if(amount > 0) {
        balance = balance + amount;
    }
    else {
        System.out.printf(
            "Use a positive amount: %d%n",
            amount);
    }
}
```

the conditional statement avoids an inappropriate action

Making choices in everyday life (3)



- If I have an assignment to complete, then I shall work on my assignment
- Otherwise if I am a member of a gym, go to the gym
- Otherwise I will go for a run



Conditional Statement Syntax (3)

```
if(condition1...perform some test)
{
    Do these statements if condition1 gave a true result
}
else if(condition2...perform some test)
{
    Do these statements if condition1 gave a false
result and condition2 gave a true result
}
else
{
    Do these statements if both condition1 and
condition2 gave a false result
}
```





Making a choice in the ticket machine (3)

```
public void specialOffer(int amount)
{
    if(amount >100) {
        balance = balance + 50;
    }
    else if (amount > 50) {
        balance = balance + 25;
    }
    else amount = amount + 5;
}
```

Note that if any condition is true, the associated statements are executed AND the if statement is finished.

Boolean conditions

- A boolean condition is an expression that evaluates to either **true** or **false** e.g.

price < 50

- An if statement evaluates a **boolean condition** and its result will determine which portion of the if statement is executed.

Boolean conditions

```
// Do these statements before.
```

```
if (boolean condition)
{
    // Perform this clause if the
    // condition is true.
}
```

```
// Do these statements after.
```

Java Relational Operators

Operator	Use	Returns true if...
>	<code>op1 > op2</code>	op1 is greater than op2
>=	<code>op1 >= op2</code>	op1 is greater than or equal to op2
<	<code>op1 < op2</code>	op1 is less than to op2
<=	<code>op1 <= op2</code>	op1 is less than or equal to op2
==	<code>op1 == op2</code>	op1 and op2 are equal
!=	<code>op1 != op2</code>	op1 and op2 are not equal

BEWARE = is an assignment operator.

It doesn't test for equality. Use == to test for equality in primitive types

Some notes on the if statement

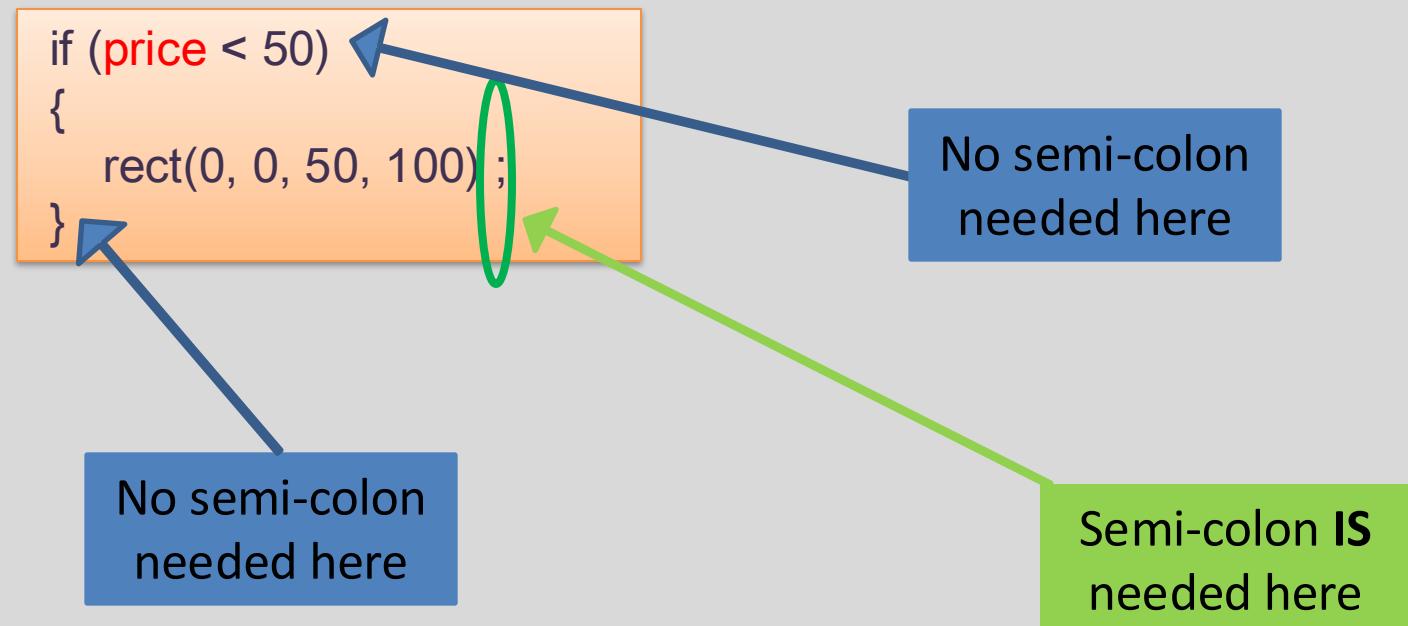
- An if statement **IS** a **statement**; it is only executed once.
- When your if statement only has one statement inside it, you do not need to use the curly braces.
- For example, both of these are the same:

```
if (price < 50)
{
    price = 50;
}
```

```
if (price < 50)
    price = 50;
```

Some notes on the if statement

- The semi-colon (;) is a **statement terminator**.



Conditional Example 1– Child or Adult?

Functionality:

Anyone less than 19 is a child and everyone else is an adult

- age < 19 - child
- Otherwise adult



Conditional Example 1 - code

```
public static void main(String[] args) {  
    int age = 5;  
    if (age < 19) {  
        System.out.println("Child");  
    }  
    else {  
        System.out.println("Adult");  
    }  
}
```



Conditional Example 2 – Introduce more age groups

Functionality:

If the age is

- < 4 Baby
- < 13- Child
- < 19 – Teenager
- Otherwise Adult

Age Range (years)	Age Group
0 - 3	Baby
4 – 12	Child
13 – 19	Teenager
20 and up	Adult

Conditional Example 2 - code

```
public static void main(String[] args) {  
    int age = 5;  
    if (age <= 3) {  
        System.out.println("Baby");  
    }  
    else if (age > 3 && age <= 12) {  
        System.out.println("Child");  
    }  
    else if (age > 12 && age <= 19) {  
        System.out.println("Teenager");  
    }  
    else {  
        System.out.println("Adult");  
    }  
}
```



Conditional Example 2 – different values

```
public static void main(String[] args) {  
    int age = 5;  
    if (age <= 3) {  
        System.out.println("Baby");  
    }  
    else if (age > 3 && age <= 12) {  
        System.out.println("Child");  
    }  
    else if (age > 12 && age <= 19) {  
        System.out.println("Teenager");  
    }  
    else {  
        System.out.println("Adult");  
    }  
}
```

- What happens when the value of age changes to:

- 2
- 5
- 14
- 21

Simple Boolean Conditions

if (age < 19)



else

if (age < 4)



else if (age < 13)



else if (age < 20)



else

Conditional Example 2 - better code

```
public static void main(String[] args) {  
    int age = 5;  
    if (age < 4) {  
        System.out.println("Baby");  
    }  
    else if (age < 13) {  
        System.out.println("Child");  
    }  
    else if (age < 20) {  
        System.out.println("Teenager");  
    }  
    else {  
        System.out.println("Adult");  
    }  
}
```



Remember when
a condition is
true, once the
stmt is executed,
the if stmt is
terminated

Questions?

