

# Selection – if statements



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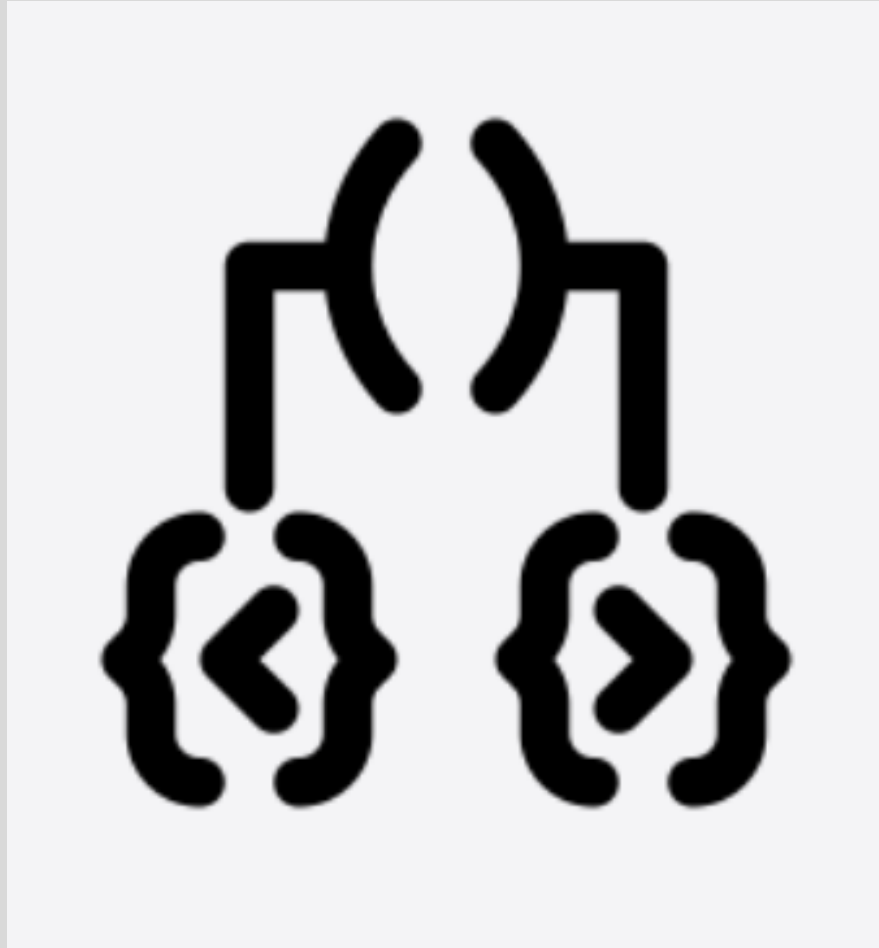
# Upcoming

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- Conditional statements;
  - Recap
  - Examples

# Conditionals – the if statement

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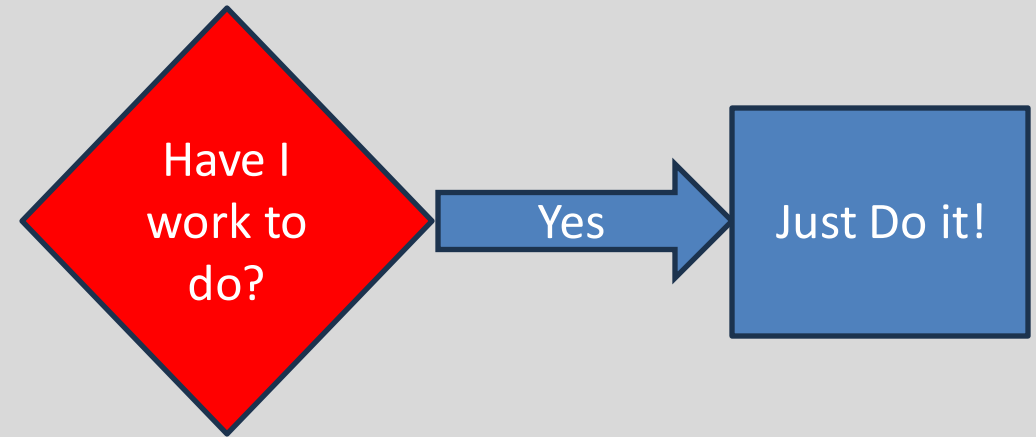


# Making choices in everyday life

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



# Conditional Statement Syntax (1)

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```
if (condition1...perform some test)
```

```
{
```

```
Do these statements if the test gave a true result
```

```
}
```

# Making a choice in the ticket machine (1)



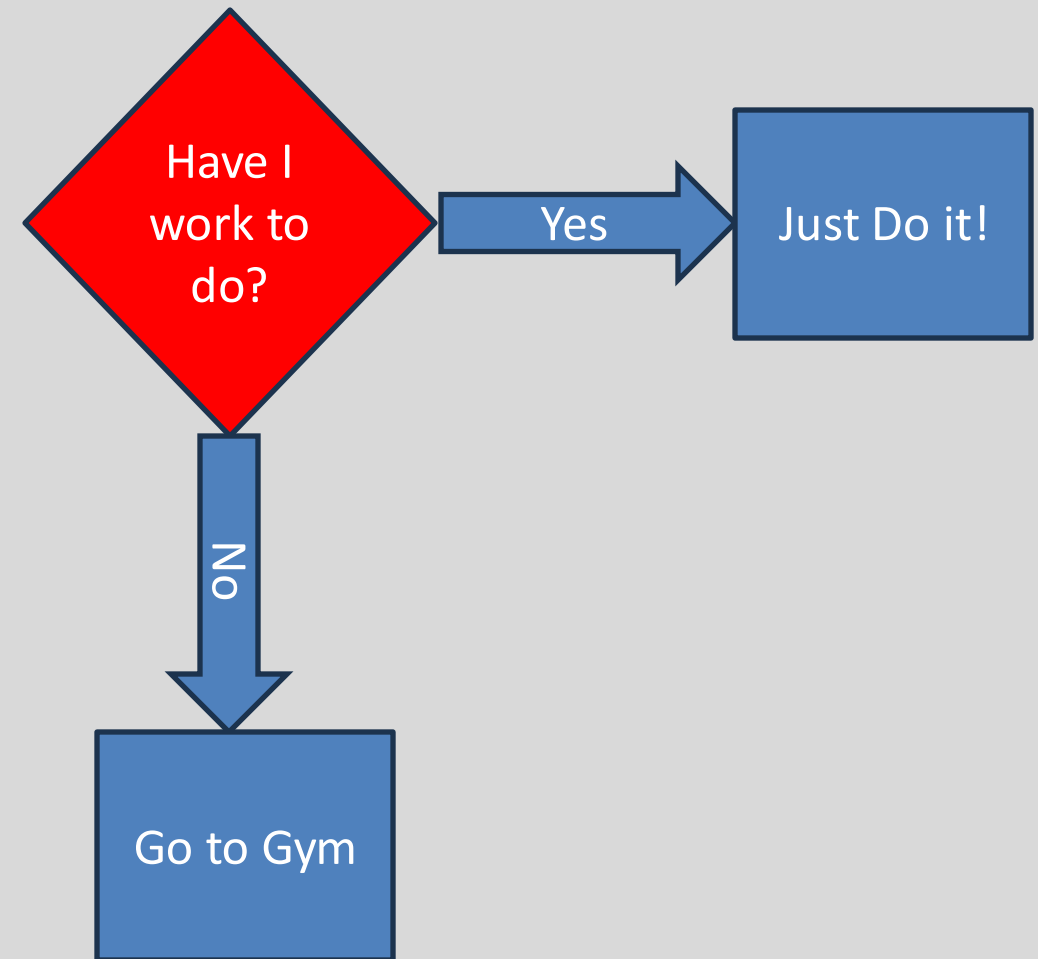
```
public void insertMoney(int amount)
{
    if(amount > 0) {
        balance = balance + amount;
    }
}
```

the conditional statement avoids an inappropriate action

# Making choices in everyday life (2)

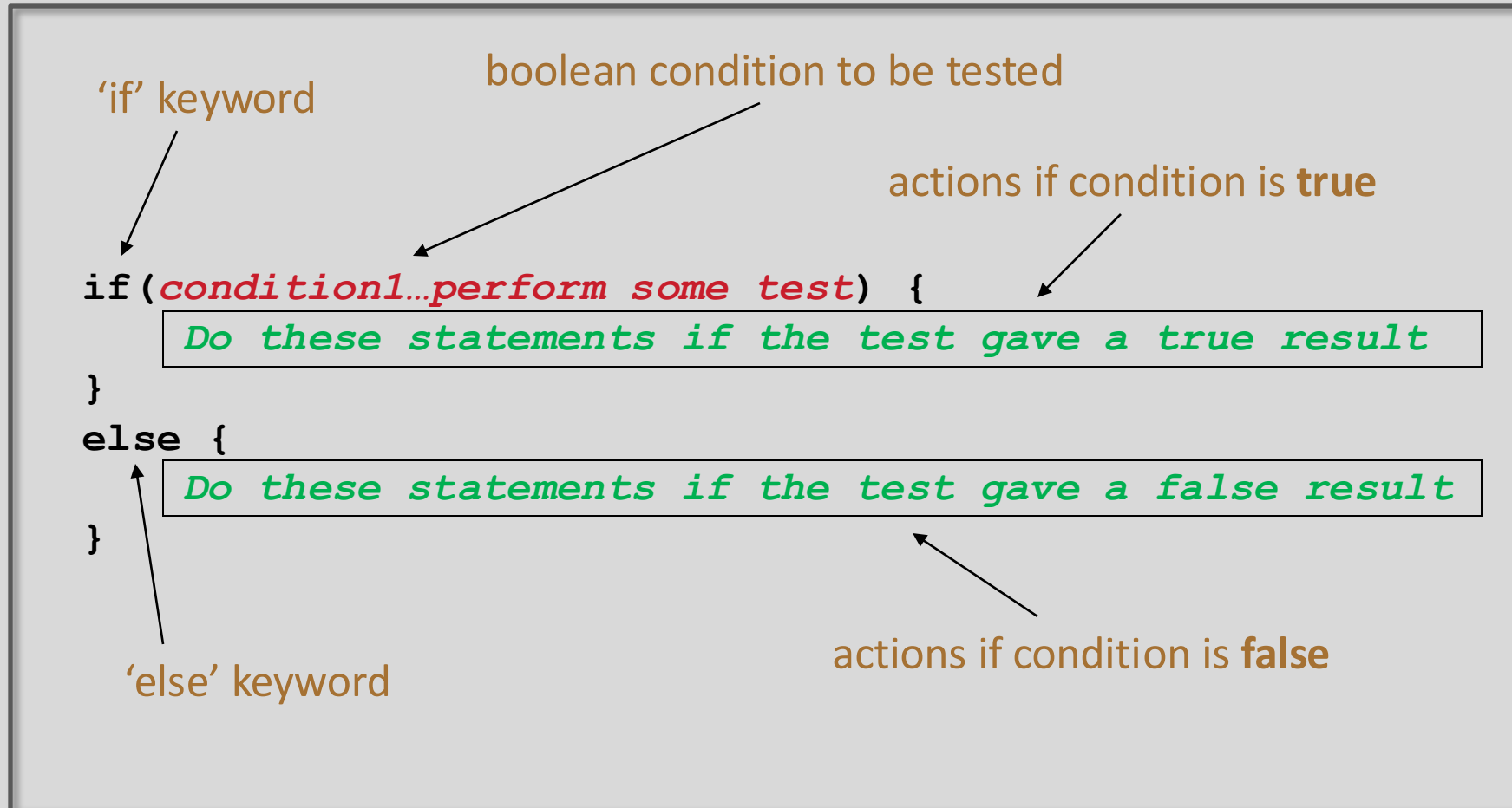


- If I have an assignment to complete, then I shall work on my assignment
- Otherwise I will go to the Gym



# Conditional Statement Syntax (2)

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# Making a choice in the ticket machine (2)



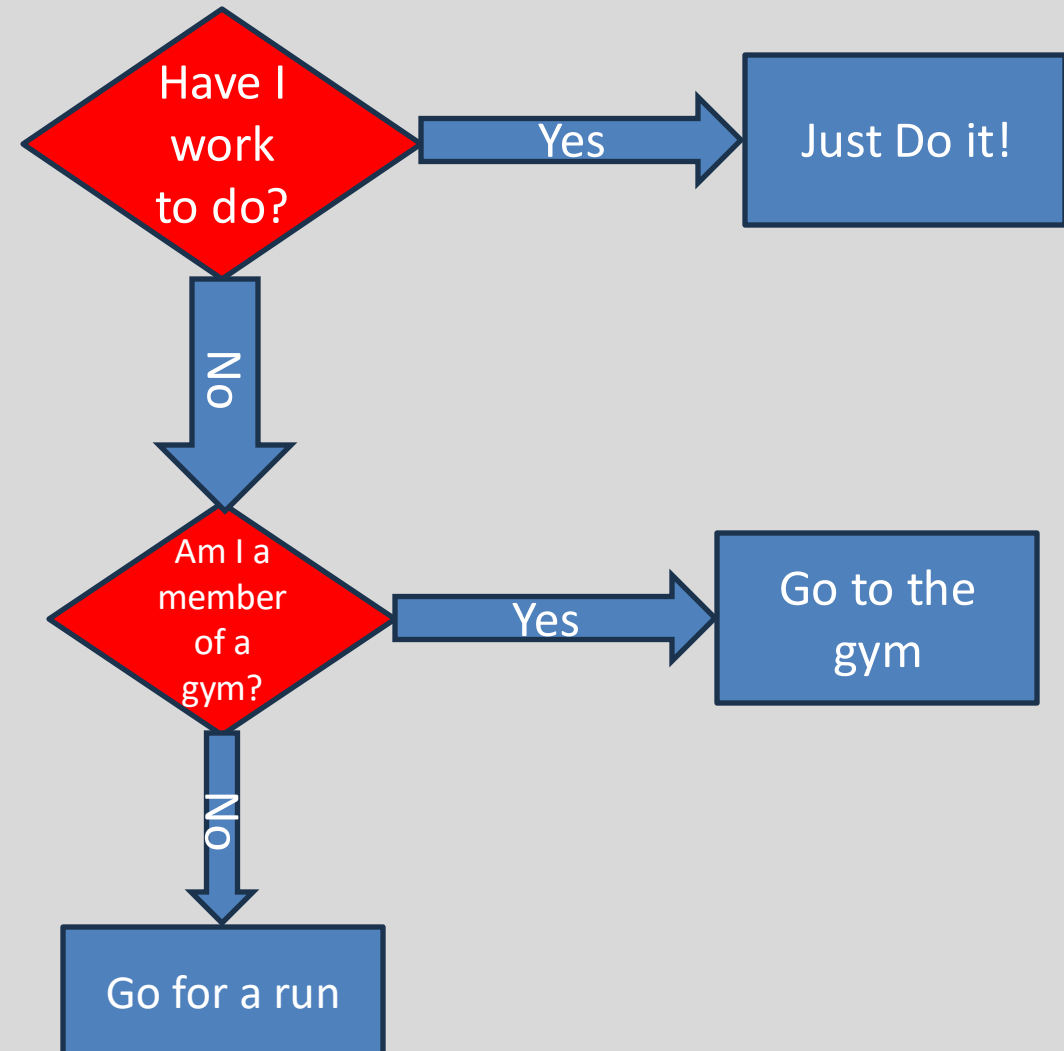
```
public void insertMoney(int amount)
{
    if(amount > 0) {
        balance = balance + amount;
    }
    else {
        System.out.printf(
            "Use a positive amount: %d%n",
            amount);
    }
}
```

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)

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```
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

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- 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

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

```
if (boolean condition)
```

```
{
```

```
    // Perform this clause if the  
    // condition is true.
```

```
}
```

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

# Java Relational Operators

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

BEWARE = is an assignment operator.

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

Source: [http://www.freejavaguide.com/relational\\_operators.htm](http://www.freejavaguide.com/relational_operators.htm)

# Some notes on the if statement

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- 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:

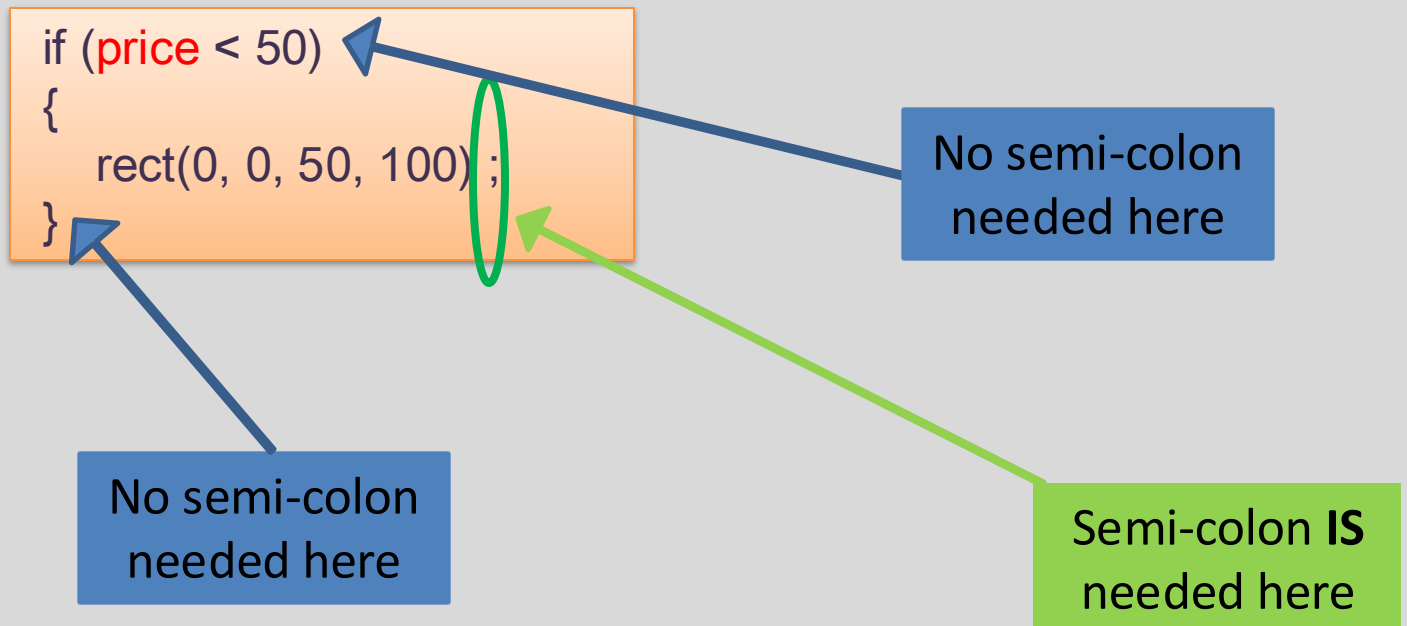
```
if (price < 50)
{
    price = 50;
}
```

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

# Some notes on the if statement

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



# Conditional Example 1– Child or Adult?

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Functionality:

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

- **age < 19 - child**
- **Otherwise adult**



# Conditional Example 1 - code

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```
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

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Functionality:

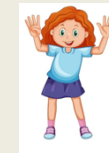
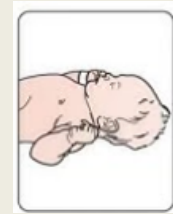
If the **age** is

- **< 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

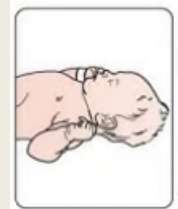


if (age < 4)

else if (age < 13)

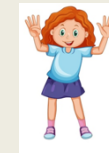
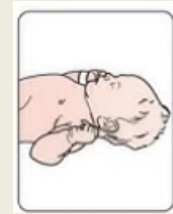
else if (age < 20)

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?

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