Subject 4: Conditionals

***** The condition has to evaluate to true to be executed *****

Simple Conditional Syntax:

```
if ( condition ) {
  System.out.println("The condition was met");
}
```

So what's going on here?

IF the condition is met, then the code inside the condition will be executed.

Multi-Conditional Syntax:

```
if ( condition1 ) {
    System.out.println("Condition 1 was met");
} else if ( condition2 ) {
    System.out.println("Condition2 was met");
}
```

So here, we are just expanding on the scenario with multiple conditions that result in different resulting code being executed.

So IF condition1 is met, then execute code inside condition1

BUT IF condition1 is not met, but condition2 is met, then execute code inside condition2

HOWEVER…

- **IF we were to look at this with our human brains, we might come to the conclusion that both condition1 and condition2 are true.**

- **In this scenario, condition1 would be executed and condition2 would be skipped.**

But what happens if we just want a catch-all for our conditional? This is where we would just use ELSE.

```
if ( condition ) {
    System.out.println("The condition has been met");
} else {
    System.out.println("No conditions were met");
}
```

So in this instance, the condition might not be met and the else case would then be executed.

Practical Example:

So let's consider the following scenario.

If it's cold outside, we need to take a coat to school.

```
boolean isCold = true;

If ( isCold ) {
  System.out.println("We should grab a coat to take to school");
}
```

Let's expand upon this scenario.

If its

- < 45*F = winter coat
- < 65*F = light jacket
- Otherwise we shouldn't need anything

```
int temp = 35;

if ( temp < 65 ) {
    System.out.println("We should grab a light jacket to take to school");
} else if ( temp < 45 ) {
    System.out.println("We should grab a winter coat to take to school");
} else {
    System.out.println("We don't need a jacket or coat today");
}
```

So what would this print out? -

Remember it's going to hit the first conditional it meets, so it would actually tell you to grab a light jacket instead of a winter coat which isn't right considering the scenario.

Instead we should modify the code. There are several different examples of how this could be modified to correctly meet the conditions

Correct Example 1 (Simplest) :

```
int temp = 35;

if ( temp < 45 ) {
    System.out.println("We should grab a winter coat to take to school");
} else if ( temp < 65 ) {
    System.out.println("We should grab a light jacket to take to school");
} else {
    System.out.println("We don't need a jacket or coat today");
}
```

Correct Example 2 (Least Error Prone):

```
int temp = 35;

if ( temp < 45 ) {
    System.out.println("We should grab a winter coat to take to school");
} else if ( (temp >= 45) && (temp < 65) ) {
    System.out.println("We should grab a light jacket to take to school");
} else {
    System.out.println("We don't need a jacket or coat today");
}
```

Often times conditions will be complex in order to get accurate results, but remember the following:

1. **Conditions are executed when the condition evaluates to TRUE**
2. **Ordering of the conditions - First condition met will be executed**
3. **Else statements are optional, but equally important when needed as a catch-all**