And && Or ||

Sometimes you want to test two different things at once

How could you use if statements for the following?

You need to be 17 and have passed drivers ed to be able to drive.

You need to have 3 tickets and be 48 inches tall to ride the ferris wheel

If you win the Rookie All-Star Award or the Chairman's Award, you will advance to the World Championships.

You will get extra credit if you create resources for the class or bring in tissues.

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I only wear sunglasses if it's warm and not raining.

otherwise I don't.

AND - &&

```
public boolean wearSunglasses(boolean isWarm, boolean isRaining){

    if( isRaining == False && isWarm == True){
        return True;
    else {
        return False;
    }

}
```

A person can drive if they are 17+ and have passed drivers ed. Return True if they can drive, False if not.

```
public boolean canDrive(int age, boolean passedDriversEd ){

    if(                                    ){

    } else {

    }

}
```

A person can drive if they are 17+ and have passed drivers ed. Return True if they can drive, False if not.

```
public boolean canDrive(int age, boolean passedDriversEd ){

    if( age >= 17 && passedDriversEd  ){
        return True;
    else {
        return False;
    }

}
```

If I have a free period or a sign in, I don't have to attend class.

otherwise I do.

OR - ||

```
public boolean attendClass(boolean freePeriod, boolean signIn){

    if( freePeriod == True || signIn == True ){
        return False;
    else {
        return True;
    }

}
```

You can get an extra life if you collect 100 coins or if you get a green mushroom.

```
public boolean getExtraLife( int numCoins, boolean greenMush){




}
```

You can get an extra life if you collect 100 coins or if you get a green mushroom.

```
public boolean getExtraLife( int numCoins, boolean greenMush){

    if( numCoins >= 100 || greenMush  ){
        return True;
    else {
        return False;
    }



}
```

Short Circuit Evaluation

Scenario: you have free if you have a free period or a sign in

You have a free period. Do you check the office for a sign in?

Short Circuit Evaluation

```
int freePeriod = True;
boolean signIn = True;

if( freePeriod == True || signIn == True ){
    System.out.println("no class today");
else {
    System.out.println("go to class");
}
```

Do we need to look for a signin if we have a free period?

Scenario: you can ride if you're 48" or taller and have 3 tickets

I'm only 42 inches tall.

Short Circuit Evaluation

```
int height = 42;
int numTickets = 10;

if( height >= 48 && numTickets > 3){
    System.out.println("You can ride");
else {
    System.out.println("You can't ride");
}
```

Does it matter how many tickets I have if I already know we I'm too short to ride?

Short Circuit Evaluation - Divide by Zero

```
int x = 0;
int y = 5;

if( y < 10 || y/x > 100){
    x = 5;
}else {
    x = 3;
}
```

What will x be equal to at the end of this code?

Short Circuit Evaluation - Divide by Zero

```
int x = 0;
int y = 5;

if( y < 10 || y/x > 100){
    x = 5;
} else {
    x = 3;
}
```

5

Short Circuit Evaluation - Divide by Zero

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Short Circuit Evaluation - Divide by Zero

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int x = 0;
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}
```

ArithmeticException

(Divide by Zero)

Truth Tables

A Truth Table is a table used in logic to match input values with the outcome of a function.

AND

```
X && Y
```

What values of X and Y will make this equal to True?

What values of X and Y will make this equal to False?

What are all the possible combinations of X & Y?

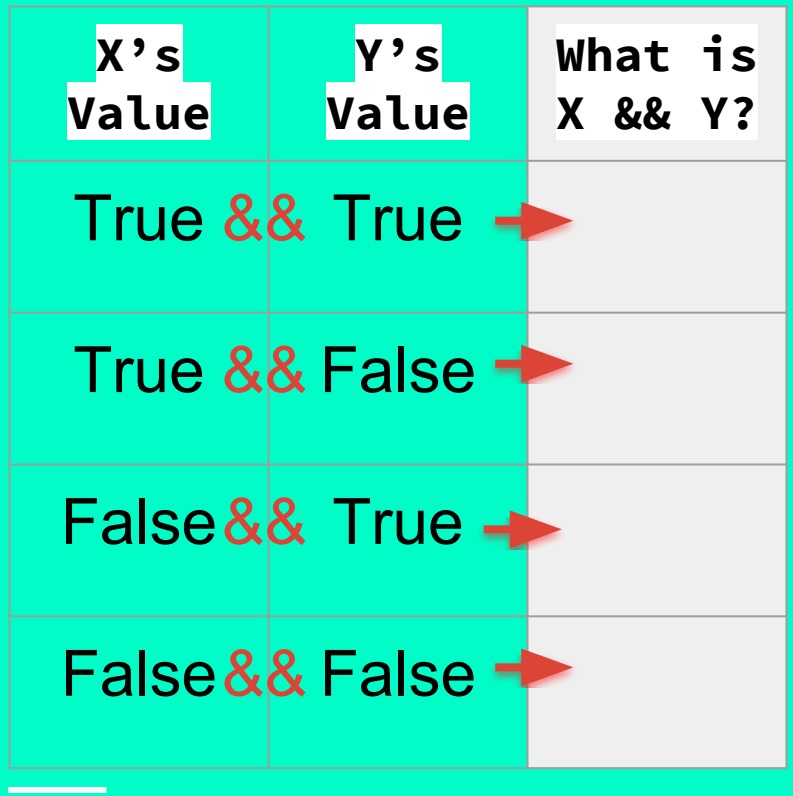
X && Y

X's Value	Y's Value	What is X && Y?

X && Y

X's Value	Y's Value	What is X && Y?
True	True	
True	False	
False	True	
False	False	

X && Y


X's Value
Y's Value
What is X && Y?
True && True
True && False
False && True
False && False

X && Y

X's Value	Y's Value	What is X && Y?
True &&	True →	True
True &&	False →	False
False &&	True →	False
False &&	False →	False

OR

X || Y

X's Value	Y's Value	What is X && Y?

X || Y

X's Value	Y's Value	What is X || Y?
True	True	
True	False	
False	True	
False	False	

X || Y

X's Value		Y's Value		What is X || Y?
True	||	True	→	True
True	||	False	→	True
False	||	True	→	True
False	||	False	→	False

AND

X	Y	X && Y
True	True	True
False	True	False
True	False	False
False	False	False

OR

X	Y	X || Y
True	True	True
False	True	True
True	False	True
False	False	False

Not

!X

X’s Value	What is !X?

!X

X's Value	What is !X?
True	
False	

!X

X's Value	What is !X?
! True	False
!False	True

Homework is on EBackpack.