1. Log in
2. Working in Unit 2
   - Scanner Input & Decimal Formatting
   - If Statements & Relational Operators
   - For and While Loops
   - Recursion

Oct 16-12:21 PM

Types of variables and what they do ...

int	Holds an integer number
double	Holds a decimal number
String	Holds whatever is in quotes
boolean	Holds either true or false

Oct 16-9:28 AM

Basic boolean variable examples ...

boolean theNumber = true;

boolean theLetter = false;

boolean change = !theLetter;

Oct 16-12:34 PM

List of Boolean Operators

&&	AND	Are they both true?
||	OR	Is one of them true?
!	NOT	Changes the "truth" value
==	EQUAL	Are two numbers equal?
!=	NOT =	Are two numbers not equal?
<	Less Than	Is one number less than another?
>	Greater Than	Is one number greater than other?
<=	Less or =	Is number less than or = to other?
>=	Greater or =	Is number greater or = to another?

Oct 16-12:29 PM

Some quick and easy examples ...

```
int a=1, b=2;
if(a==1 && b==2)                // yes
if(a!=3 && b==2)                // yes
boolean tf = (a!=1 || b==2)     // tf = true
boolean tf = (a!=1 || b!=2)     // tf = false
```

Oct 16-12:29 PM

Important Things to Know ...

In order for an && statement to be true...

true && true

Note and discuss the following situations ...

true && false
false && true
false && false
!false && true
!false && !true

Oct 16-12:33 PM

In order for an || statement to be true...

true AND/OR true

Note and discuss the following situations ...

true || false

false || true

false || false

!false || true

!false || !true

false || !true

Oct 16-12:54 PM

What will the output be?

```
System.out.println(true);
System.out.println(!false);
System.out.println(true && false);
System.out.println(!true || false);
System.out.println(!false && !!true);
System.out.println(false || false || true);
System.out.println(true && !false && !true);
```

Oct 16-12:56 PM

Another Example ... SHORT-CIRCUIT EVALUATION

* Once the final truth value can be determined, JAVA immediately stops looking at the code ...

Example

```
int x = 3;
System.out.println(x==3  &&  x<0  &&  x+1==4);
```

JAVA THINKING
It is an AND statement so all things must be true for this statement to be TRUE.

This is true so I must continue on.

This is false ... that's all I need to know STOP HERE!

Never even gets a look even though it is a true statement.

Oct 16-12:57 PM

One more Short-Circuit Evaluation ...

* Once the final truth value can be determined, JAVA immediately stops looking at the code ...

Example

No Error Given!

```
System.out.println(false || true || 13/0==3);
```

JAVA THINKING
It is an OR statement so only one thing has to be true for me to know this is TRUE

This is false so I must continue on.

This is true ... that's all I need to know STOP HERE!

Never even gets a look ... good thing as this is a complete mess!

Oct 16-1:00 PM

Assume the following preconditions ...

int a=1, b=2, c=3, d=4;

What will the output be?

```
System.out.println(a==b);
System.out.println(a<b);
System.out.println((a+d)>=(b+c));
System.out.println((a+b==5) || (a*b==2));
System.out.println(c!=4);
System.out.println((a==1) && (c-2==a));
System.out.println((a+b+c+d)<=10);
```

Oct 16-1:11 PM

One Last Very Important Item ...

In what order are boolean statements "calculated"?

Parenthesis

!

==

!=

&&

||

Note: If a problem has BOTH the && and the ||, the && will always get evaluated first!!!

Oct 16-1:13 PM

How to use the if statement ...

```
if ( is this true? )
{
    if so, do this stuff
}
```

Oct 20-9:40 AM

Example ...

```
int a = 5;
if ( a>0 )
    {
        System.out.println("Hello!");
    }
```

Oct 20-9:40 AM

One step further: The if-else statement ...

```
if ( is this true? )
{
    if so, do this stuff (and skip the rest)
}
else
{
    if not, do this stuff
}
```

Oct 20-9:41 AM

Example ...

```
double myGrade = 47.6;
if ( myGrade > 60)
{
    System.out.println("Yeah, I'm passing!");
}
else
{
    System.out.println("Am I a failure?");
}
```

* Notice: This program will always output something!

Oct 20-9:41 AM

Extending the if-else statement ...

Notice: to conserve space, the first braces are simply shifted up to the if/else line.

```
if ( is this true? ) {
    if so, do this stuff
}
else if (is this true?){
    if so, do this stuff
}
else if (is this true?){
    if so, do this stuff
}
else {
    if none of the above are true, do this
}
```

This is the "catch-all" statement ...

Oct 20-9:42 AM

Here's part of an interesting program ...

```
Scanner yourPercent = new Scanner(System.in);
System.out.println("Enter your current percent: ");
double userPercent = yourPercent.nextDouble();

if(userPercent >= 90)
    System.out.println("You have an A");
else if (userPercent >= 80)
    System.out.println("You have a B");
else if (userPercent >= 70)
    System.out.println("You have a C");
else
    System.out.println("Your grade is too low, please see your teacher!");
```

Notice: Technically, the braces are not needed if your if or if-else statement will only do one thing!

Oct 20-9:42 AM

What is the final output? Analyze carefully ...

```
Scanner readUser = new Scanner(System.in);
System.out.println("Enter an integer: ");
int i = readUser.nextInt( );
if (i==0)
    System.out.println("Why would you enter " + i);
else if (i == 1){
    i+=5;
    System.out.println(i);
}
else if (i <=10){
    i++;
    System.out.println(i);
}
else
    System.out.println(i%2);
```

Oct 20-9:43 AM

How to solve the == issue ...

Comparing Text???

Introducing: .equals( )

variableYouWant.equals("whatYouCheckFor");

Oct 20-9:43 AM

A simple example of .equals( ) ...

```
Scanner getState = new Scanner(System.in);
System.out.println("Enter your favorite state: ");
String favState = getState.nextLine( );
if (favState.equals("Texas"))
    System.out.println("YeeeHaaa, ya'll come back now!");
else if (favState.equals("texas"))
    System.out.println("Good choice, but you should capitalize it!");
else
    System.out.println("Why not Texas? Mr. Henderson lived there!");
```

Oct 20-9:44 AM

Reminder on boolean order ...

In what order are boolean statements "calculated"?

- Parenthesis
- !
- ==
- !=
- &&
- ||

Example:

true || false && false

The "false && false" gets calculated 1st so JAVA is actually using it!!!

Oct 20-9:44 AM

Things to do ...

1. Be wrapping up Decimal Format WS (3 classes)
2. Be wrapping up Scanner Input WS (2 classes)
3. Complet Unit 2 WS 03 - Operators and If-Statements

Oct 16-9:12 AM