Conditionals and Loops

Upon completion of this module, a student will be able to

- create and follow basic flowcharts
- use relational operators to compare values
- use if and else statements to control the flow of code
- use a switch statement to allow for multiple possible outcomes
- use Boolean operators to combine Boolean expressions
- use ternary operators to choose one of two options
- use a while loop to run code until a condition is met
- use a for loop to perform a task a specific number of times

Assignment

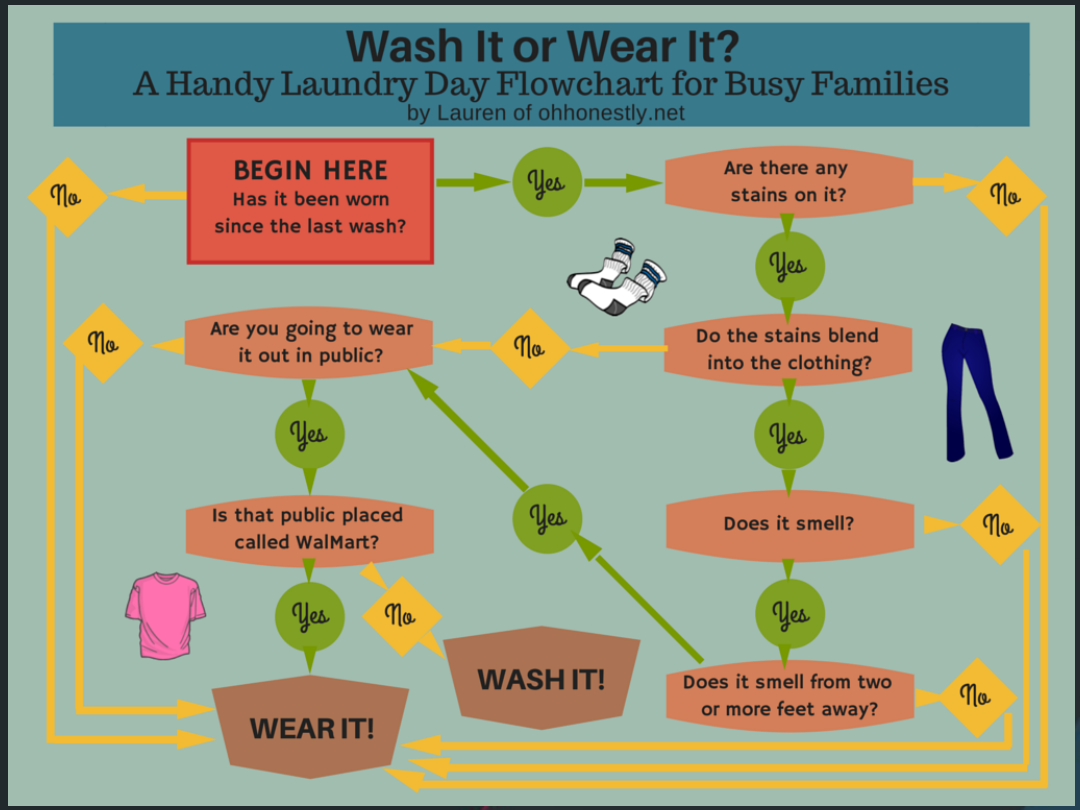
- Task
  - Complete the “Intro to Java” Assignment in repl.it and the worksheet in google forms.
- Repo
  - https://github.com/LambdaSchool/Android_Conditionals_and_Loops
- Submission
  - Submit through repl.it and google forms
- Challenge
  - Practice performing similar tasks in android and writing the output to the UI

A Student Can

create and follow basic flowcharts

Flowcharts

- great tool for planning logic
- different shapes represent different things
- execution follows arrow
- statements represented by rectangles



sample flowchart

A Student Can

use relational operators to compare values

Boolean Expressions

- Expression that returns a Boolean value (true or false)
- Use relational operators to compare two values
- Use Boolean operators to combine relational expressions

Relational Operators

- Compares two values and returns a Boolean result
- == - equivalent to
- != - not equivalent to
- > - greater than
- >= - greater than or equal to
- < - less than
- <= - less than or equal to

Challenge

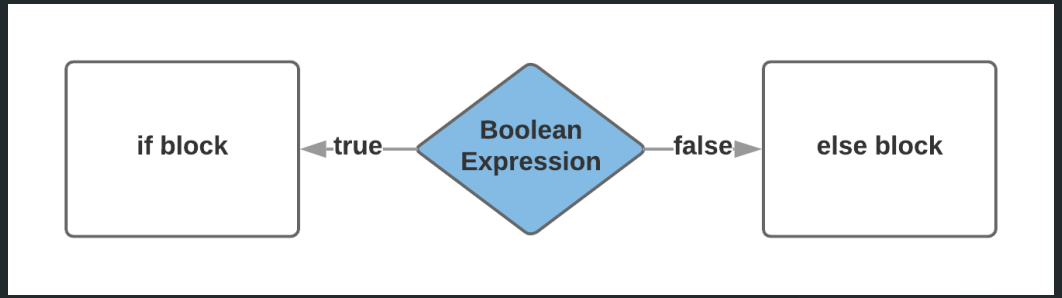
- Create a variable called grade
- Write a line of code that prints True if the grade is high enough to pass the class (you determine what grade that will be).

A Student Can

use if and else statements to control the flow of code

If statement and else statement

- Executes based on result of a Boolean expression
    - if block executes with true Boolean expression
    - else block executes with false Boolean expression
- Executes or skips block of code
- Represented by a diamond shape




```
if( num == 3 ) {
  // if block
} else {
  // else block
}
```

Challenge

- Write code in Android or repl.it to print out which grade a student received.

A Student Can

use a switch statement to allow for multiple possible outcomes

Switch statement

- Multiple branches based on a single value
- Executes a single block of code and then exits the statement
- Default block if no cases match

```
switch(number) {
    case 0:
        // case 0 block
        break;
    case 1:
        // case 1 block
        break;
    default:
        // default block
}
```

A Student Can

use Boolean operators to combine Boolean expressions

Boolean Operators

- Combines two expressions for a single result
- AND (&&)
  - TRUE: both sides true
  - FALSE: if either or both sides are false
- OR (||)
  - TRUE: either side is true
  - FALSE: both sides
- NOT (!)
  - Inverts result of expression

AND (&&)		
A	B	R
T	T	T
T	F	F
F	T	F
F	F	F

OR (||)		
A	B	R
T	T	T
T	F	T
F	T	T
F	F	F

NOT (!)	
A	R
T	F
F	T

A Student Can

use ternary operators to choose one of two options

Ternary Operator

- Combines some if else statements into one line
- Can be used if both blocks return a value to the same place
- Represented the same as an if statement

```
if( value ) {
  System.out.println("true");
} else {
  System.out.println("false");
}

System.out.println(( value ) ? "true" : "false");
```

```
if( value ) {
  number = 1;
} else {
  number = 0;
}

number = ( value ) ? 1 : 0;
```

Challenge

- Write a line of code that prints Passed if the provided grade is high enough to pass the class and Failed if it isn’t.

A Student Can

use a while loop to run code until a condition is met

While Loop

- While Loop
  - Enters loop if expression is true
  - Exits loop when expression becomes false
- Do While Loop
  - Always executes at least once
  - Exits loop when expression becomes false

```
while( value ) {
  // while block
}


do {
  // while block
} while( value )
```

A Student Can

use a for loop to perform a task a specific number of times

For Loop

- Most Common Loop
- Number of loops set upon entry

```
for(int i = 0; i < 5; ++i) {
  // loop body
}
```