Fall 2021 Java Lesson 8.3

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VOCAB:
for loop, boolean expression, variable initialization, increment

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Coding to learn: CodeHS activity

be sure to: Go to your workstation. Log in to codeHS. Carefully read the instructions below, then complete the assignments on CodeHS

Today we'll be working on **while loop** and **for loop** problems on CodeHS

1. Make sure the vocab to the write is copied in your *Java Glossary*.
2. Work on the lessons listed to the right
3. Make sure you also complete the Reflection activity at the end of 4.2.

While loop
Repeats a set of statements until a condition is met.

For loop
Repeats a set of statements a specific number of times.

- **Exercise 4.1.6: Making Taffy**
- **Exercise 4.2.6: Print the Odds**
- **Exercise 4.2.10: Multiplication table**

class: AP CS A **goal:** HDW use for loops to iterate code in Java?

See CodeHS problem guides for full solutions.
Possible questions:
+Why do I need to initialize the temperature variable outside of the while loop (ex. 4.1.6)? Because it's part of the condition for the while loop, so it needs to be initialized before you enter the while loop for the first time.
+How do I only print odd numbers? Think about how you can manipulate the increment in your loop?
+ How do I print out the counter (lesson 4.2)? Remember that the counter is just a variable, so you can concatenate it with strings.

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framing
- **what:** use for loops loops to iterate code in Java
- **why:** Along with the while loop, for loops are basic control structures that are crucial to any programming language. Today we'll explore them in Java.
- **where to:** Basic algorithms that use loops.

class: AP CS A **goal:** HDW use for loops to iterate code in Java?

Vocab

be sure to: Keep your **notebook** open. Copy each definition, including the code sample, in your Java Glossary.

```
for(variable initialization; boolean expression; increment)
{
    //will execute if boolean is true, and until the boolean
expression is false
}

for (int i = 0; i <10; i++){
    System.out.print("I love AP CS A!");
}
System.out.println("second loop:");
for (int i = 0; i <10; i+=2){
    System.out.println("I really love CS A!");
}
```

For loop

Variable initialization gives us the starting value for the counter.

Boolean expression sets the upper bound.

Increment sets how the counter changes with each iteration.

class: AP CS A **goal:** HDW use for loops to iterate code in Java?

a. copy in notes
b. Important thing to notice, increemnt can decrease as well as increase, or change by whatever increment/decrement we want.

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4.1.6: Making taffy:

When you make taffy (a pliable candy), you must heat the candy mixture to 270 degrees Fahrenheit. Write a program that will help a cook make taffy. The cook should be able to enter the temperature reading from their thermometer into the program. The program should continue to let the cook enter temperatures until the temperature is at least 270 degrees.

When the mixture reaches or exceeds 270 degrees, the program should stop asking for the temperature and print **Your taffy is ready for the next step!**.

Here is a sample run of what it should look like:

```
Starting Taffy Timer...
Enter the temperature: 40

The mixture isn't ready yet.
Enter the temperature: 100

The mixture isn't ready yet.
Enter the temperature: 200

The mixture isn't ready yet.
Enter the temperature: 300
Your taffy is ready for the next step!
```

Make sure that your output matches this sample run!

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See pre-planed questions on slide 2. Problem guide for fuly worked out solution

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Coding to learn: CodeHS activity

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4.2.6: Printing the odds: Write a program that prints the odd numbers from 1 to 100.

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See pre-planed questions on slide 2. Problem guide for fuly worked out solution

Coding to learn: CodeHS activity

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4.2.10: Multiplication table:

Create a program using a `for` loop which will print out the 4's times table through 10.

Sample output:

```
4 * 1 = 4
4 * 2 = 8
4 * 3 = 12
4 * 4 = 16
4 * 5 = 20
4 * 6 = 24
4 * 7 = 28
4 * 8 = 32
4 * 9 = 36
4 * 10 = 40
```

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Writing to learn: CodeHS Reflection activity

be sure to: Go to your workstation. Log in to codeHS. Carefully read the instructions below, then complete the assignments on CodeHS

TODO

Answer the reflection questions below:

Reflection questions

1. What is the main point of this week's lessons?
2. Describe two key vocab. items we've learned this week.
3. Pick the exercise from 4.1-4.2 that you struggled with most. **Be sure to** describe:

   a. What was this exercise asking you to do?
   b. How did you try to complete this task?
   c. What did you find most difficult about this exercise?
   d. What's one thing you understand better after completing the exercise?

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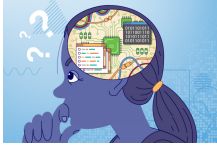answers will vary. Students will share out answers.

Writing to learn: Thinking about thinking

be sure to: Answer each question below with a complete sentence.

a. How are for loops and while loops different?
b. If we have while loops, why do we need for loops?
c. Why do you think the same control structures are used in different programming language, including Python and Java?

class: AP CS A **goal:** HDW use for loops to iterate code in Java?

a. For loops work better when there is a predetermined number of iterations and while loops work better when there is an undetermined number of iterations.
b. They reduce the amount of code that needs to be written in a program, and help decrease the amount of redundant code in a program.