Fall 2021 AP CS A
Lesson 2.2

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VOCAB:
nested loop

Do now

be sure to: Get out your **binder**. Copy **goal** and answer **do now** questions below. Show all work or write a complete sentence for each answer:

```
public static void addOneToEverything(int[] numbers)
{
  for (int j = 0; j < numbers.length; j++)
  {
    numbers[j]++;
  }
}
```

Which of the following code segments, if any, can be used to replace the body of the method so that numbers will contain the same values?

```
I.
  for (int num : numbers)
  {
    num++;
  }
  ..
```

```
II.
  for (int num : numbers)
  {
    num[j]++;
  }
```

```
III.
  for (int num : numbers)
  {
    numbers[num]++;
  }
```

class: AP CS A **goal:** HDW traverse the elements in a 1D array object using an enhanced for loop?

1. 1. only. The num will return an element of the array, not an index, so II and III won't work.
use code tracing table to illustrate how enhanced for loop works.

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framing
- **what:** traverse the elements in a 1D array object using an enhanced for loop
- **why:** This provides us with a simplified structure for traversing a collection of items
- **where to:** Common algorithms using arrays

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Vocab (review)

be sure to: Keep your **notebook** open. These definitions should be in your Glossary. If not Copy each definition, in your Java Glossary.

Enhanced for loop
A simplified, but less flexible way to loop through a collection of items. Often called a a for-each loop.

A regular for loop:

```
int[] scores = {80, 92, 91, 68, 88};
for(int i = 0; i < scores.length; i++)
{
    System.out.println(scores[i]);
}
```

An enhanced for loop:

```
for(int score : scores)
{
    System.out.println(score);
}
```

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Inside the loop, the enhanced for loop variable is assigned a copy from the array without using the array index. Making changes to the enhanced for loop variable does not change the original value in the array.

+What are some reasons it could be useful to use an enhanced for loop? Enhanced for loops offer a simplified structure and are especially good when using nested loops. They tend to be easier to write

+What are some reasons to use a standard for loop? A for loop uses a counter variable which is sometimes needed in your loop. Since enhanced for loops only make a copy with no reference to the index, they are not optimal if you need to update values in the array

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Coding to learn

be sure to: Log in to Workstation. Work on CodeHS exercises below. Make sure to **write out a plan** before you start coding!

A regular for loop:

- Exercise 6.3.6: Print Odds
- Excercise 6.3.7: Largest Value
- Excercise 6.3.8: Classroom Array
- Excercise 6.3.9: Array average

Complete any exercises you don't finish here as homework!

```
int[] scores = {80, 92, 91, 68, 88};
for(int i = 0; i < scores.length; i++)
{
    System.out.println(scores[i]);
}
```

An enhanced for loop:

```
for(int score : scores)
{
    System.out.println(score);
}
```

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SOLUTION CODE (REQUIRES CODEHS):

Exercise 6.3.6: Print Odds
Excercise 6.3.7: Largest Value
Excercise 6.3.8: Classroom Array
Excercise 6.3.9: Array average

Go through student solutions at the end of class.

Reflection: Thinking about thinking

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

1. What are the advantages of using an enhanced loop?
2. When would a standard for loop be a better choice?

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+What are the advantages of using an enhanced loop?
Enhanced for loops offer a simplified structure and are especially good when using nested loops.
+When would a standard for loop be a better choice?
When the counter variable is needed or if you are looking at updating values in your array, you need to use a for loop.