



Fall 2021 AP CS A

Lesson 5.4

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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:

Consider the following code segment, which traverses two integer arrays of equal length. If any element of `arr1` is smaller than the corresponding (i.e., at the same index) element of `minArray`, the code segment should replace the element of `minArray` with the corresponding element of `arr1`. After the code segment executes, `minArray` should hold the smaller of the two elements originally found at the same indices in `arr1` and `minArray` and `arr1` should remain unchanged.

1. Why will this program not work as expected?
2. What could you change to make it work correctly?

```
for (int c = 0; c < arr1.length; c++)
{
    if (arr1[c] < minArray[c])
    {
        arr1[c] = minArray[c];
    }
    else
    {
        minArray[c] = arr1[c];
    }
}
```

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

1. The way the code is written, it actually replaces `arr1` with the larger element.
2. Flip around the 5th line `minArray[c] = arr1[c]`. Remove the else statement.



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

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 for-each loop.

What are some reasons it could be useful to use an enhanced for 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);
}
```

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

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



Practice problem

be sure to: Take notes and answer questions in your **notebook**.

```
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]++;
}
```

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1. only. The num will return an element of the array, not an index, so II and III won't work.



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!

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

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

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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```

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SOLUTION CODE (REQUIRES CODEHS):

[Exercise 6.3.6: Print Odds](#)

[Exercise 6.3.7: Largest Value](#)

[Exercise 6.3.8: Classroom Array](#)

[Exercise 6.3.9: Array average](#)

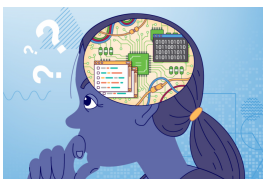
Go through student solutions at the end of class.



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.