

How to generate a series of numeric values using a for loop

University of Mount Union

CSC 120

Lecture 26

So far, we've seen one way to use a loop to generate a sequence of values:

- 1) the control variable of the for loop contains the values to be processed

Example: print the odd numbers between 100 and 200 on separate lines in the Java Console.

```
for (Integer num = 101; num <= 200; num += 2) {  
    System.out.println( num );  
} // end for
```

This works very well if we know the first and last values in the sequence to be processed, and how the values in the sequence change from one to the next.

But it can be difficult to do this if instead of knowing the first and last values in the sequence, we want some specific number of values in a sequence.

Example: print the first 47 multiples of 7 that are ≥ 700 on separate lines in the Java Console.

Print the first 47 multiples of 7 that are ≥ 700 on separate lines in the Java Console:

Here, we know what the starting value is (700), and how the values should change from one to the next ($+= 7$)

But what is the last value in the sequence?

In a situation such as this, we can use a different approach to writing a loop to generate a certain number of values in a series

Generating a certain number of values in a series of values:

- 2) the control variable for the loop counts the number of loop iterations, and a separate variable is used to contain the values in the sequence

Code for the second example: first 47 multiples of 7 that are ≥ 700 :

```
Integer num = 700;
for (Integer count = 1; count <= 47; count++) {
    System.out.println(num);
    num = num + 7;
} // end for
```

Two problem types, two styles of code

If we know the starting and ending values in the sequence we want to generate, it may be hard to calculate how many values are in that sequence

so in this case, the loop control variable contains the data values we wish to process

If we know how many values we want, it may be hard to calculate what the last value is for the sequence we wish to generate

so in this case, the loop control variable counts how many times we go through the loop, and we use extra variables to store the data values we are generating and processing

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