Key components of a for loop

Initialize variable: The variable to be iterated over.

Truth evaluation: The statement to be checked against for repeating the loop.

Incrementation: What value to increment the iterating variable by.

Utilization of a for loop

For loops are used for iterating over knowable quantities at an incremental pace.

Iteration may and often does effect the logic inside the loop.

Ex.

```
for(int i = 0; i < 3; i++){
  for(int j = 0; j <= i; j++ ){
    System.out.print(“*”);
  }
  System.out.println();
}
```

Output:

```
*
**
***
```

The change in i through every iteration of the outer-loop changes the amount of *’s produced.

Algorithm generation

An algorithm, as it applies directly to this class, is the mathematical representation of a phenomena to be reproduced. Once generated, it makes coding a problem more-or-less straightforward.

Heuristics for ASCII art algorithms

Need at least 3 different examples to determine algorithm

Given a variable N changing between the examples:

If there is no change in the pattern it is independent of N.

Linear change implies a multiple of N is used.

Exponential change implies an polynomial N is used.

Ex:

N = 1

****

N = 2

****

N = 3

****

Algorithm: *'s = 4+ 3N //because the *'s changed linearly a multiple of N is used

1.

N = 2

```
||
||
```

N = 3

```
|||
|||
|||
```

2.

N = 2

```
|*|*|
|*|*|
```

N = 3

```
|*|*|*|
|*|*|*|
|*|*|*|
```

3.

N = 2

```
*
**
```

N = 3

```
*
**
***
```

4.

N = 2

```
   *
  **
 ***
****
```

N = 3

```
      *
     **
    ***
      …
*********
```

5.

N = 2

```
 ***
****
```

N = 3

```
  ****
 *****
******
```