

# CSE 121 – Lesson 4

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Music:  [k-pop girlies playlist](#) 



[sli.do #cse121](https://sli.do/#cse121)

# Announcements, Reminders

- Programming Assignment 0 is due tonight
- Creative Project 1 out later today
- R0 open last week, due Thursday (7/06) 11:59 PM
- R1 open Thursday (7/06), due Thursday (7/13) 11:59 PM
- Feedback for C0 was released yesterday
  - Start tracking your grades in our [Minimum Grade Guarantee Calculator](#)
- Quiz 0 [Take-home] Monday (7/10) due 11:59 PM

# Last time: for loops!

For loops are our first *control structure*

A syntactic structure that *controls* the execution of other statements.

```
for ( initialization ; test ; update ) {  
    body (statements to be repeated)  
}
```

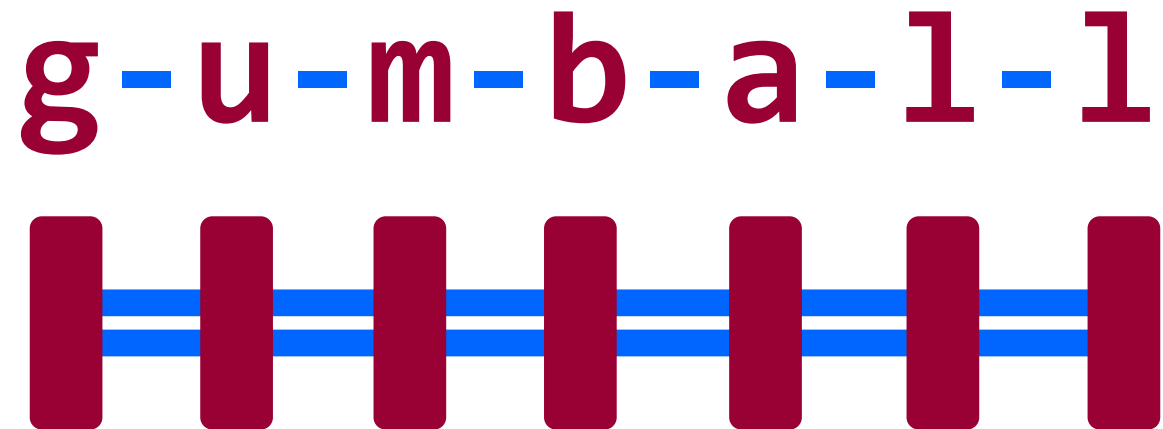
# Fencepost Pattern

Some task where one piece is repeated  $n$  times, and another piece is repeated  $n-1$  times and they alternate

**g-u-m-b-a-1-1**

# Fencepost Pattern

Some task where one piece is repeated  $n$  times, and another piece is repeated  $n-1$  times and they alternate



# (PCM) Nested for loops

```
for (int outerLoop = 1; outerLoop <= 5; outerLoop++) {  
    System.out.println("outer loop iteration #" + outerLoop);  
    for (int innerLoop = 1; innerLoop <= 3; innerLoop++) {  
        System.out.println("    inner loop iteration #" + innerLoop);  
    }  
    // at this point, innerLoop is OUT OF SCOPE!  
    System.out.println(innerLoop);  
}
```

# Poll in with your answer!



What output is produced by the following code?

```
for (int i = 1; i <= 5; i++) {  
    for (int j = 1; j <= i; j++) {  
        System.out.print(i);  
    }  
    System.out.println();  
}
```

A.

1  
12  
123  
1234  
12345

B.

i  
ii  
iii  
iiii  
iiiii

C.

1  
22  
333  
4444  
55555

# Poll in with your answer!



What code produces the following output?

A.

```
for (int i = 1; i <= 5; i++) {  
    for (int j = 1; j <= i; j++) {  
        System.out.print(i);  
    }  
    System.out.println(  
}
```

C.

```
for (int i = 1; i <= 5; i++) {  
    for (int j = 1; i <= j; j++) {  
        System.out.print(j);  
    }  
    System.out.println();  
}
```

B.

```
for (int i = 1; i <= 5; i++) {  
    for (int j = 1; j <= i; j++) {  
        System.out.print(j);  
    }  
    System.out.println();  
}
```

D.

```
for (int i = 1; i <= 5; i++) {  
    for (int j = 1; j <= i; i++) {  
        System.out.print(j);  
    }  
    System.out.println();  
}
```

1  
12  
123  
1234  
12345



# (PCM) Random

A Random object generates *pseudo*-random numbers.

- The Random class is found in the `java.util` package  
`import java.util.*;`

Method	Description
<code>nextInt()</code>	Returns a random integer
<code>nextInt(max)</code>	Returns a random integer in the range $[0, max)$ , or in other words, 0 to $max-1$ inclusive
<code>nextDouble()</code>	Returns a random real number in the range $[0.0, 1.0)$

# Pseudo-Randomness

Computers generate numbers in a predictable way using mathematical formulas.

Input may include current time, mouse position, etc.

True randomness is hard to achieve – we rely on natural processes

- e.g., atmospheric noise, lava lamps