CSE 121 Lesson 7: Methods, Parameters, Returns

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TAs:

Abby	Afifah	Ailsa	Alice	Aliyan	Arohan
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Hanna	Hannah	Heather	Hibbah	Janvi	Jasmine
Judy	Julia	Kelsey	Lucas	Luke	Mahima
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Ruslana	Sahej	Sam	Samrutha	Sushma	Vivian
Yijia	Zachary				

Today's playlist:
121 24au lecture tunes

Announcements, Reminders

- P1 is out, due next Tuesday October 22nd
  - Start early! This one is tough!
  - Doing P1 is *also* studying for the quiz!
- R1 released yesterday, due Thursday October 24
- Post-section work grades now on Canvas (!!)
  - in future: weekly-ish updates (but not instant)
- No PCM for next Wed :)

Quiz 0 (1/2)

- Quiz 0 is Thursday, Oct 24!
  - Big review opportunity: section on Tuesday, October 22nd
  - Practice Quiz is out!
  - stay tuned for potentially more resources
- General notes:
  - taken on your computer, in your quiz section
  - broadly: mostly focused on concepts, reading, and debugging code
  - covers material up to Wednesday's lecture (methods & parameters), but no further (e.g. no returns)

Quiz 0 (2/2)

- Policy notes
  - **Please read the policies & procedures in the practice quiz. You are responsible for following these rules.**
  - (live in lecture, let's go over some of these right now!!)
- Advice
  - do the practice quiz in an environment similar to the quiz: time yourself, only used allowed resources, etc.
  - organize your notes – open book doesn't mean "no notes required"!
  - go to section!!

(Review) Class Constants

A fixed value visible to the whole program (the entire *class*).

- Value can be set only at declaration; **cannot** be reassigned (so the value is constant)

```
public static final type NAME_OF_CONSTANT = expression;
```

(Review) Parameters

Definition: A value passed to a method by its caller

```
public static void myMethod(String musicalAct) {
    System.out.print(musicalAct + " is the best!");
    ...
}
```

Calling a method with a parameter…

```
myMethod("Laufey"); // Laufey is the best!
```

(Review) Scope – in for loops

The part of a program where a variable exists.

- From its declaration to the end of the { } braces
- Ex: a variable declared in a for loop only exists in that loop

innerloop's scope

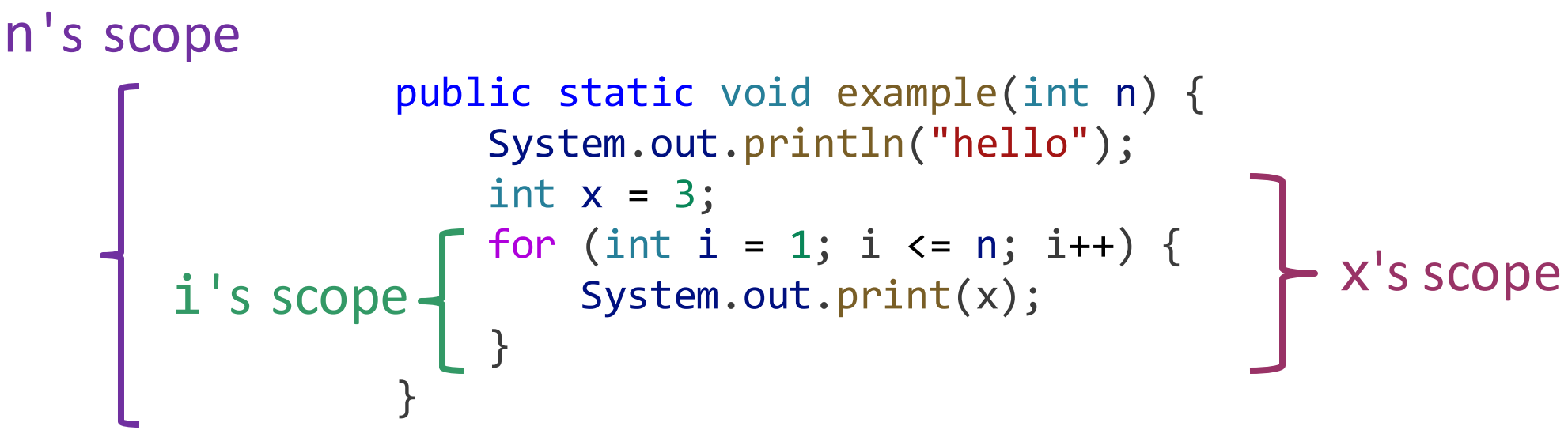
```
for (int outerLoop = 1; outerLoop <= 5; outerLoop++) {
    System.out.println("outer loop iteration #" + outerLoop);
    for (int innerLoop = 1; innerLoop <= 3; innerLoop++) {
        System.out.println("    inner loop iteration #" + innerLoop);
    }
    System.out.println(outerLoop);
}
```

outerloop's scope

(Review) Scope – in methods

The part of a program where a variable exists.

- From its declaration to the end of the { } braces
- Ex: a variable declared in a method exists only in that method



Poll in with your answer!

What will be the **last line of output** from this code?

```
public static final int COUNT = 7;
public static void main(String[] args) {
  int count = 5;
  line(count);
  System.out.println("count is: " + count);
}

public static void line(int count) {
  for (int i = 1; i <= count; i++) {
    System.out.print("*");
  }
  count++;
  System.out.println();
}
```

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A. `count is: 1`

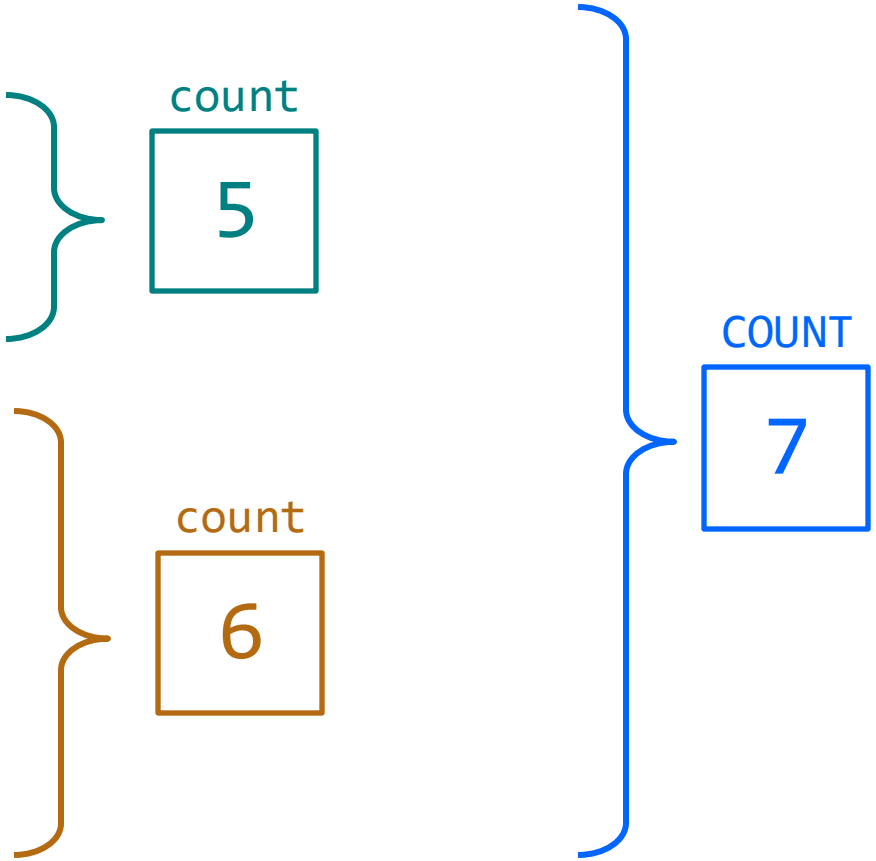
B. `count is: 5`

C. `count is: 6`

D. `count is: 7`

Walkthrough: Counting Counts

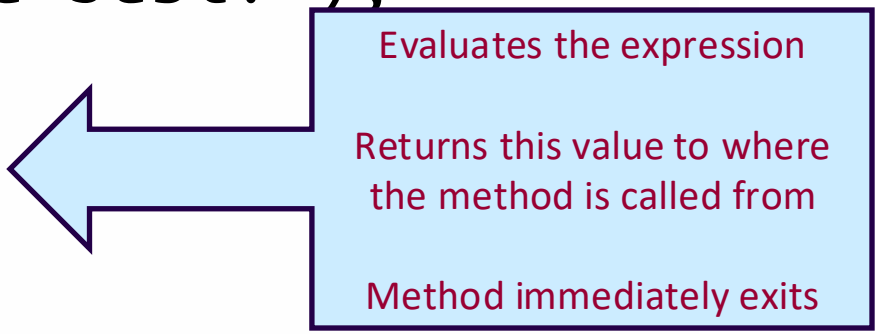
```
public static final int COUNT = 7;
public static void main(String[] args) {
  int count = 5;
  line(count);
  System.out.println("count is: " + count);
}

public static void line(int count) {
  for (int i = 1; i <= count; i++) {
    System.out.print("*");
  }
  count++;
  System.out.println();
}
```



(PCM) Returns

Returns allow us to send values *out of a method*

```
public static <type> myMethod(int num) {
    System.out.print(num + " is the best!");
    ...
    return <value of correct type>
}
```



Calling a method that returns a value…

```
<type> result = myMethod(42);
```

(Recall) String Methods

Usage: `<string variable>.<method>(…)`

Method	Description
`length()`	**Returns** the length of the string.
`charAt(i)`	**Returns** the character at index *i* of the string
`indexOf(s)`	**Returns** the index of the first occurrence of *s* in the string; returns -1 if *s* doesn't appear in the string
`substring(i, j)` or `substring(i)`	**Returns** the characters in this string from *i* (inclusive) to *j* (exclusive); if *j* is omitted, goes until the end of the string
`contains(s)`	**Returns** whether or not the string contains *s*
`equals(s)`	**Returns** whether or not the string is equal to *s* (case-sensitive)
`equalsIgnoreCase(s)`	**Returns** whether or not the string is equal to *s* ignoring case
`toUpperCase()`	**Returns** an uppercase version of the string
`toLowerCase()`	**Returns** a lowercase version of the string

Returns & String Methods

```
String s = "bubblegum";
s = s.substring(7, 8).toUpperCase() + s.substring(8) + "ball";

s =                   "g".toUpperCase() + s.substring(8) + "ball";

s =                                     "G" + s.substring(8) + "ball";

s =                                           "G" + "um" + "ball";
```

Poll in with your answer!

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To go from Celsius to Fahrenheit, you multiply by 1.8 and then add 32. Which of these correctly implements this logic as a method?

A.

```
public static void celsiusToF(double celsius) {
  double fahrenheit = celsius * 1.8 + 32;
  return fahrenheit;
}
```

B.

```
public static void celsiusToF(double celsius) {
  double fahrenheit = celsius * 1.8 + 32;
}
```

C.

```
public static double celsiusToF(double celsius) {
  int fahrenheit = celsius * 1.8 + 32;
  return fahrenheit;
}
```

D.

```
public static double celsiusToF(double celsius) {
  return celsius * 1.8 + 32;
}
```

Poll in with your answer!

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What value is returned from this method?

```
public static int returnExample() {
  for (int i = 0; i < 5; i++) {
    return i;
  }
  return -1;
}
```

A. -1

B. 0

C. 4

D. 5

Method Comments!

- Now that we know how to write methods, we have a new form of documentation (using comments) to write.
- Each method you write (except for main) should be accompanied by a short comment that describes what it does.
- **Be sure to comment on method behavior, and all parameters and returns of a method!**

```
// Randomly generates an addition problem where the
// operands are in the range 1-10 (inclusive), and prints the result
// rounded to two decimal places.
public static void addTwoRandomNumbers() {
    Random randy = new Random();
    int num1 = randy.nextInt(10) + 1;
    int num2 = randy.nextInt(10) + 1;
    int sum = num1 + num2;
    ...
}
```