CSE 121 Lesson 8 : Methods, Parameters, Returns

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TAs:

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Today's playlist:
121 24au lecture tunes

Announcements, Reminders

- Creative Project 2 (C2) releasing later today (due Tuesday, Oct 29th)
- R1 due tomorrow; R2 opens tomorrow (due Thursday, Oct 31st 🎃 👻)
  - R2 eligible assignments: C0, P0, C1, P1
- Friday, Nov 1st: Mid-quarter Formative Feedback in class
- Quiz 0 is tomorrow in your quiz section!
  - Quiz logistics announced on Ed
- Quiz review reminders
  - Priority materials: practice quizzes, starred section problems!
  - Ed Class megathreads (great while reviewing lecture)

(Recall) Methods & Parameters

Definition: A value passed to a method by its caller; sending information into a method

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

Calling a method with a parameter…

```
myMethod("Rush"); // Prints out
                  // "Rush is the best!"
```

(Recall) Returns 1

Returns allow us to send values out of a method

```
public static <type> myMethod(<zero or more params>) {
    ...
    return <value of correct type>
}
```

Evaluates the expression

Returns this value to where the method is called from

Method immediately exits!

Calling a method that returns a value…

```
<type> result = myMethod(...); // catching what is returned!
```

(Recall) Returns 2

Returns allow us to send values out of a method

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

Calling a method with a parameter…

```
String s = myMethod("Rush"); // Prints and returns
                             // "Rush is the best!"
```

(Recall) Returns 3

Returns allow us to send values out of a method

```
public static String myMethod(String musicalAct) {
    ...
    return musicalAct + " is the best!”
}
```

Calling a method with a parameter…

```
String s = myMethod("Rush"); // Returns
                             // "Rush is the best!"
```

(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

String example

```
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";
```

Example of returns: Math class

Methods	Returns
`Math.abs(`*value*`)`	Absolute value of *value*
`Math.ceil(`*value*`)`	*value* rounded up
`Math.floor(`*value*`)`	*value* rounded down
`Math.max(`*value1*`, `*value2*`)`	Larger of the two given values
`Math.min(`*value1*`, `*value2*`)`	Smaller of the two given values
`Math.round(`*value*`)`	*value* rounded to the nearest whole number
`Math.sqrt(`*value*`)`	Square root of *value*
`Math.pow(`*base*`, `*exp*`)`	*base* to the *exp* power

Math example

```
double value = 823.577564893;
double roundedValue = (double) Math.round(value * 100) / 100;
                    = (double) Math.round( 82357.7564893 ) / 100;
                              = (double) 82358.0 / 100;
                              = 823.58
```

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.

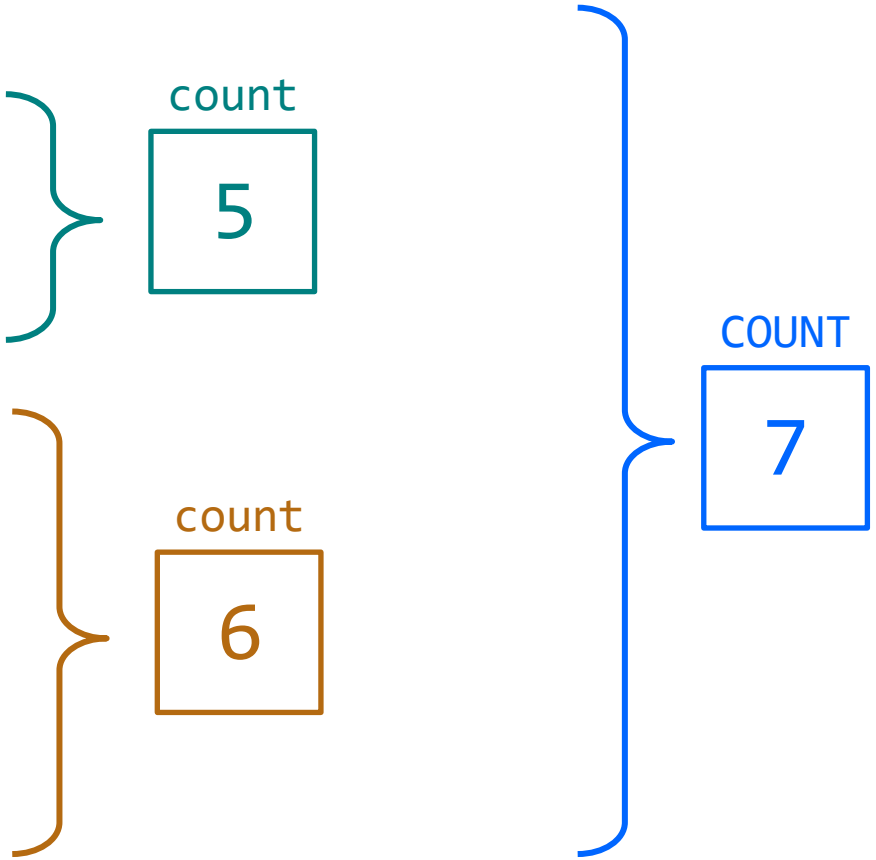
```
public static double celsiusToF(double celsius) {
  int fahrenheit = celsius * 1.8 + 32;
  return fahrenheit;
}
```

D.

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

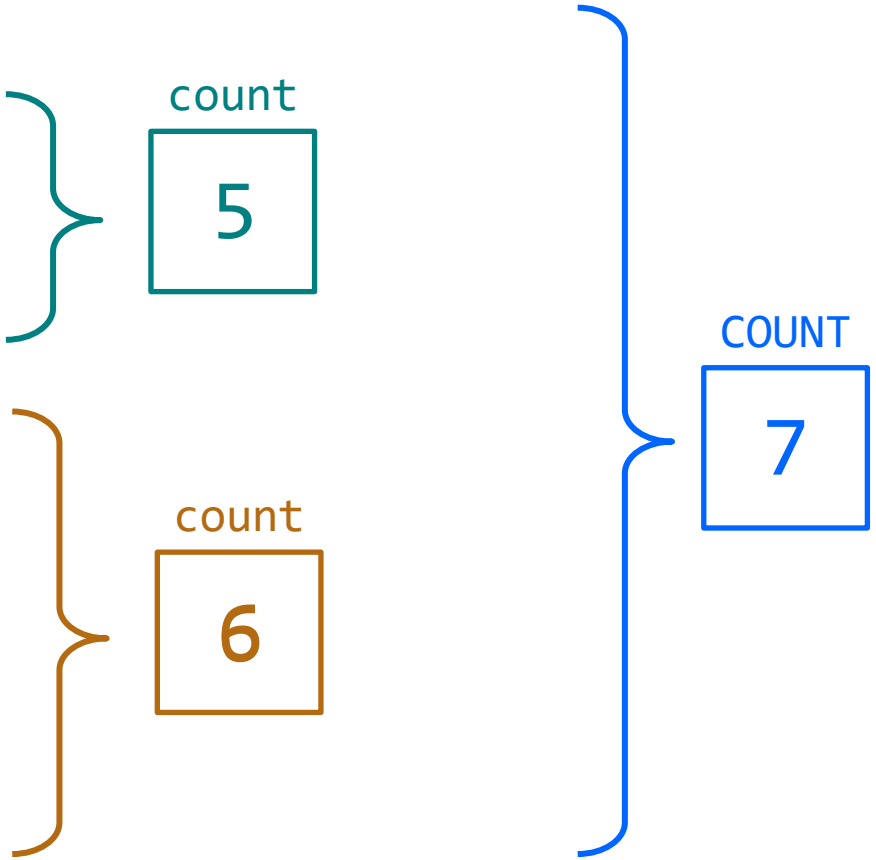
(Recall) Tricky Poll: Last line printed?

```
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();
}
```



Tricky Poll: Returnable

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

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



Poll in with your answer!

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What value is returned from this method?

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

A. `-1`

B. `0`

C. `max-1`

D. `max`

Common Problem-Solving Strategies

- **Analogy** – Is this similar to another problem you've seen?
- **Brainstorming** – Consider steps to solve problem before jumping into code
  - Try to do an example "by hand" → outline steps
- **Solve sub-problems** – Is there a smaller part of the problem to solve?
- **Debugging** – Does your solution behave correctly?
  - What is it doing?
  - What do you expect it to do?
  - What area of your code controls that part of the output?
- **Iterative Development** – Can we start by solving a different problem that is easier?