Static Variables

Do now

What if you want to keep track of something across an entire class?

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If a variable or method belongs to the **class** and not the **instance**, it is considered a class variable or class method.

These can also be called **static variables** or **static methods.**

Class Variables or Static Variables

A variable or attribute of a class that is common to all instances of a class

Class Methods or Static Methods

A method of a class that is common to all instances of a class, and is not called on an object instance.

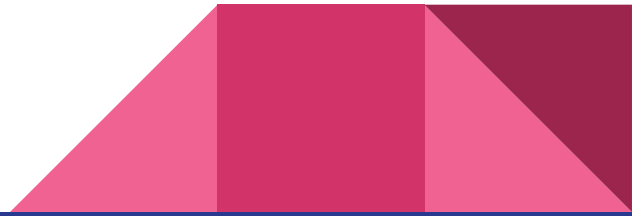
Static and Non-static methods

A **static method** is a method that belongs to a class, but it does not belong to an instance of that class and this method can be called without the instance or object of that class. They may not use non-static methods. Example: static methods in class “Math.abs()”, “Math.pow()”, “Math.PI”

```
public static void printMsg(){
  System.out.println("Hi! Rectangle class");
}
```

Non-static belongs to each object that is generated from the class. Methods can access any **static** method and **static** variable.

```
public int calcArea(){
  return width * height;
}
```



Static variable example

```
public class Rectangle{

    // This variable is the same for all instances.
    // It tracks how many total rectangle objects have been created.

    private static int totalRectangles = 0;

    public Rectangle(int myWidth, int myHeight){

        width = myWidth;

        height = myHeight;

        // every time we make a new rectangle, it will increment by 1

        totalRectangles++;

    }

}
```

Static Method Example

```
class Rectangle{
        // other code here ……
        public static int getTotalRectangles(){
                return totalRectangles;
        }
}
```

What is printed?

```
public class SomeClass{
     private int x = 0;
     private static int y = 0;
     public SomeClass(int pX){
          x = pX;
          y++;
     }
     public void incrementY(){
          y++; }
     public void incrementY(int inc){
          y += inc; }
     public int getY(){
          return y; }
}
```

The following code segment appears in a class other than SomeClass.

```
SomeClass first = new SomeClass(10);
SomeClass second = new SomeClass(20);
SomeClass third = new SomeClass(30);
first.incrementY();
second.incrementY(10);
System.out.println(third.getY());
```

A. 0 B. 1 C. 11 D. 14 E. 30

Exercise

Create a class Employee (Employee.java)

Define instance variables

Define at least 3 construtor (1 of them default constructor)

Declare static and non-static methods

Create multiple objects from your Driver.java and test the constructors and methods.

Save here:
.../APCSA1/apcsa-assignments-fall-YourUsername/classwork/10_14_classes/