Fall 2021 AP CS A
Lesson 15.2

Dr. O'Brien
Herbert H. Lehman High School
4 January 2022

Do now

be sure to: Get out your **binder**. Copy **goal** and answer **do now** questions below. Answer the questions below and write a sentence justifying your answer.

Consider the following `Bugs` class, which is intended to simulate variations in a population of bugs. The population is stored in the method's `int` attribute. The `getPopulation` method is intended to allow methods in other classes to access a `Bugs` object's population value; however, it does not work as intended.

```
public class Bugs
{
  private int population;

  public Bugs(int p)
  {
    population = p;
  }

  public int getPopulation()
  {
    return p;
  }
}
```

A. The getPopulation method should be declared as private .
B. The return type of the getPopulation method should be void.
C. The getPopulation method should have at least one parameter.
D. The variable population is not declared inside the getPopulation method.
E. The instance variable population should be returned instead of p, which is local to the constructor.

class: AP CS A **goal:** HDW define the behavior of an object using mutator methods?

framing

- **what:** define the behavior of an object using mutator methods
- **why:** We want to develop facility with writing mutator methods, so we can efficiently write more complex classes.
- **where to:** How to change formal parameters in methods

class: AP CS A **goal:** HDW define the behavior of an object using mutator methods?

Vocab (review)

be sure to: Keep your **notebook** open. Copy the definitions in your notebook, if they are not there already.

getter method
Allows us to access specific instance variables in an object.
Aka accessor methods.

setter method
Allows us to change specific instance variables in an object.
Aka mutator methods

class: AP CS A **goal:** HDW define the behavior of an object using mutator methods?

Coding to learn: Independent work

be sure to:

1. Go to your workstation.
2. Watch the video 5.5.1: Mutator Methods
3. Work on following problems in CodeHS:
    a. 5.5.5: Student Setters
    b. 5.5.6: Full Fraction Class
    c. 5.5.7: Weekly routine
    d. 5.4.8 A Chef's best Meal
4. We'll go over the exercises at tehe end of class!

class: AP CS A **goal:** HDW define the behavior of an object using mutator methods?

Practice problem 5.5.5

be sure to: Review your work. Be prepared to share out!

- `getHeight`
- `setHeight`
- `getWidth`
- `setWidth`
- `getArea`
- `getPerimeter`
- `toString` - The output of a rectangle with width 10 and height 4 method sho

```
Rectangle width: 10, Rectangle height: 4
```

class: AP CS A **goal:** HDW define the behavior of an object using mutator methods?

Practice problem 5.5.6

be sure to: Review your work. Be prepared to share out!

In this exercise, you must take your Fraction class from exercise 2.8.9 and extend it by adding a few handy methods.

YOUR JOB:

Implement the following methods in the Fraction class:

```
public void add(Fraction other)
public void subtract(Fraction other)
public void multiply(Fraction other)
public int getNumerator()
public int getDenominator()
public void setNumerator(int x)
public void setDenominator(int x)
public String toString()
```

Use the FractionTester file to test as you go along.

class: AP CS A **goal:** HDW define the behavior of an object using mutator methods?

Practice problem 5.5.7

be sure to: Review your work. Be prepared to share out!

In this exercise, you will write a class that represents how you spend your time.

The class should have four double instance variables

- `school`
- `sleep`
- `friends`
- `hobbies`

These variables will track the number of hours you spend doing each of these activiites in a **single day**.

The class should have mutators and accessors for each instance variable.

It should also have a method called `printTotal` that should print the total number of hours **per week** you spend doing each of these activities.

Note you will have to calculate the weekly hours by using the daily hours stored in the instance variables. It should also print the total number of hours in the week that you are busy.

Here is an example of the output of `printTotal` if sleep = 8, school = 8, friends = 2.5, and hobbies = 2.

```
How You Spend Your Week
At School: 56.0
Sleeping: 56.0
With Friends: 17.5
Doing fun stuff: 14.0
You're busy 143.5 hours a week!
```

class: AP CS A **goal:** HDW define the behavior of an object using mutator methods?

Exit ticket

be sure to: Get out a sheet of loose leaf paper. Write your **name** and the **date** on the top. Answer each question below with a complete sentence. Be prepared to turn in!

Consider the code below:

1. write a setter method for `name`.

2. write a possible setter method for `classRoom`.

```
public class Grade
{
    private String name;
    private Class classRoom;

    public Student(String studentName, Class studentClass)
          {
                    name = studentName;
                    classRoom = new Class(studentClass.getGrade(), studentClass.getTeacher());
           }
}
```

class: AP CS A **goal:** HDW define the behavior of an object using mutator methods?