**ITCS 209 Object Oriented Programming**

Assignment Week 2 (Due 28 January 2019)

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Instructions:

* Assignment must be uploaded to the My Courses system <https://mycourses.ict.mahidol.ac.th> by due date
* For questions that need to write a program, you also need to zip all the code files, rename the zip file to your student id, and upload it to the My Courses system.

**Exercise 1**: Explain the difference between an object and a class. And give an example of objects and classes.

**Answer**

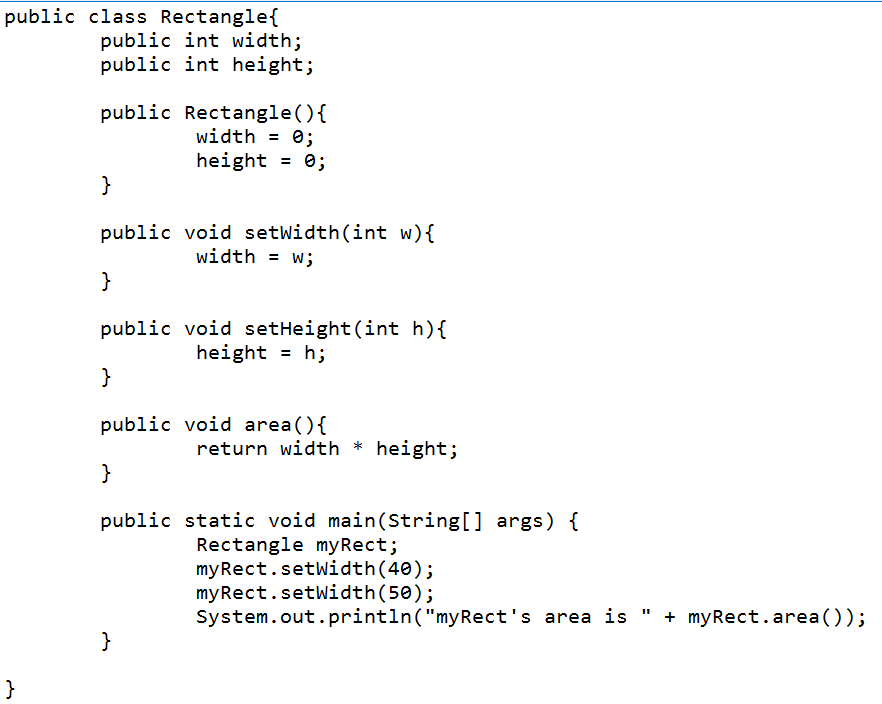
A class is a main idea that need to have an attributes, constructor and methods to build up an object. An object is a result of the process in each class that still keep the original information that requires from the constructors.

ex. Blueprint of an animal

* + Species
  + Colour
  + Size
  + Gender

For this example shown that Blueprint of an animal is prepared for class and have 4 attributes are species, colour, size, gender. If object need only some of an attribute, so we can choose only one that we need to. In one class we can make more than 1 constructor.

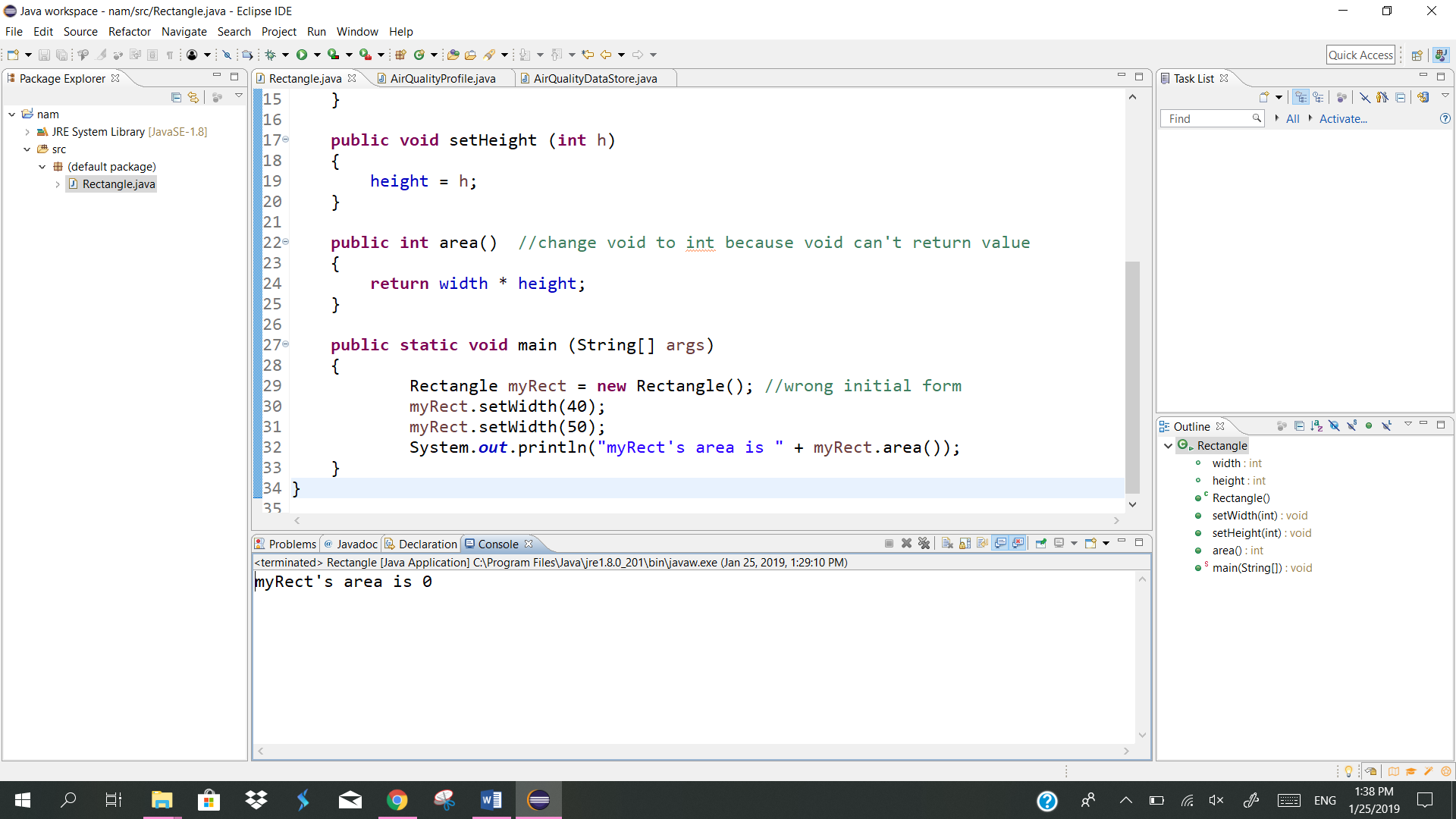
**Exercise 2:** What’s wrong with the following program?



**Answer.** *(Hint there are two problems in this code)*

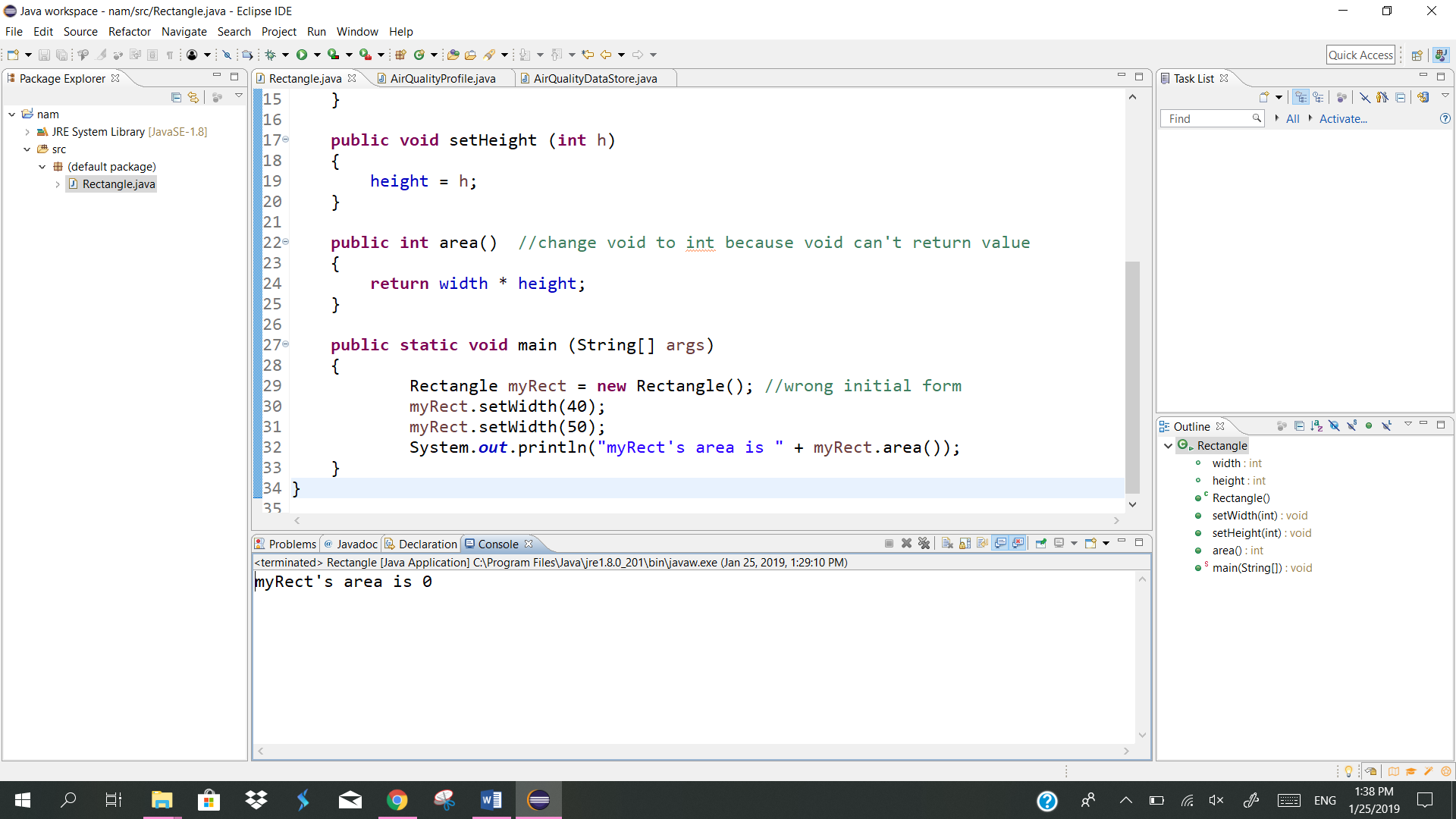
First problem : void can’t return value back

Second problem : wrong code in parts of object

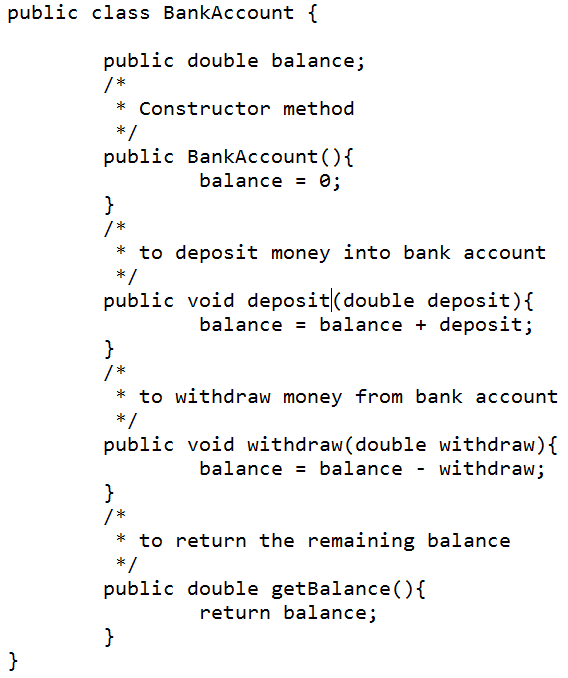


**Exercise 3:** Fix the Rectangle program shown in Exercise 2, and show the output of this program.

**Answer** (please show your output here)



**Exercise 4.** BankAccount Class is provided below.



Write a BankAccountTester class whose main method constructs a bank account, deposits $1,000, withdraws $500, withdraws another $400, and then prints the remaining balance. Submit your source code and show the output of your program here.

**Exercise 5.** **(Optional, this is a challenge question… just for fun ^\_^)**

Implement class Car with the following properties. A car has a certain fuel efficiency (measured in km/litters) and a certain amount of fuel in the gas tank. The efficiency is specified in the constructor, and the initial fuel level is 0. Supply a method drive that simulates driving the car for a certain distance, reducing the amount of gasoline in the fuel tank. Also supply method getGasInTank, returning the current amount of gasoline in the fuel tank, and addGas, to add gasoline to the fuel tank. Sample usage:

Car myCar = new Car(20); // 20 kilometers per litter

myCar.addGas(40); // Add gasoline 40 litters

myCar.drive(100); // Drive 100 kilometers

double gasLeft = myCar.getGasInTank();

// get gas remaining in tank

You may assume that the drive method is never called with a distance that consumes more than the available gas. And write a CarTester class that tests all methods.

***Hint:***

Example of constructor and three methods:

public Car (double efficiency)

public void drive(double distance)

public double getGasInTank()

public void addGas(double litter)