Day 5: It is Friday! Time to celebrate!

We have learned:

Data types:

Java supplied: String, int, double

Programmer created: Day, Rectangle, Car

OOP: Object Oriented Programming:

 Instantiate objects: (example) Car mazda = new Car(25);

 Methods: use the dot operator on an object to call a method

 Signature: Public (sometimes private), return type, name, parameter in parenthesis:

 public void drive(double distance)

Accessors: int currentYear=day1.getYear();

 Mutators: rectangle1.translate(5,10); (Note: the return type is void)

 Constructors: No return type & requires new operator, see example above

Variables:

 Parameters: Passed into methods and are in the parentheses. See example above, 25 is parameter

 Instance variable: private, at the top of a class

 Local variables: used in a method to make a calculation. Declare once by stating type

Pseudocode helps to create algorithms: calculation, repetition, decision

Designing classes:

Documentation helps to read others’ classes

Create a plan for the methods, their signatures (1st lines) and the instance variables

Test the classes directly through BlueJ or write a TesterClass with a main method



Exercise 1: You are working for American Express. They need to develop credit card processing software. You need to write a CreditCard class so that it passes their tester. // Create a class CreditCard that represents a credit card account.

You need to construct a new credit card with a 0.0 balance.

The constructor will have this header: public CreditCard()

CreditCard will have these methods:

public void purchase(double amount)

public void payment(double amount)

public double getBalance()

Download CreditCard.zip

Exercise 2: You are a designer and need to create a logo for a company. They want

Write a class that describes a flower. A flower has a location, a constructor and a draw method.

The constructor takes the (x, y) coordinate of the upper left-hand corner of the flower. (So you need two private instance variables). The arrow points to the x,y coordinates of the flower.

There are four pink petals and a yellow center. Each petal and the center is a circle with a diameter of 20. A circle is an ellipse in which the width and height are both equal to the diameter of the circle. The pink circles touch the yellow one.

The stem is green and is on the center line of the flower. Its length is 3 times the diameter.

When implementing the draw method, I recommend that you start with the top petal, figure out its coordinates, instantiate a circle at that point with a diameter of 20, and call its draw method.

Then test. You can create a flower object in BlueJ and invoke its draw method. Pick another of the circles; calculate its coordinates; instantiate a circle at that location; and. Call its draw method. Now test again. I believe you will find it much less intimidating to draw one little thing, get it right, and go to the next. You may want to use pencil and paper to do this. I did.

Note: When drawing an Ellipse, you specify the x, y coordinates and the width and height of the rectangle that would surround the ellipse. Here is how you would draw a circle of diameter 20 when the surrounding rectangle has a x, y coordiantes or 30, 50

Ellipse circle = new Ellipse(30, 50, 20,20);

circle.draw();

Exercise 3: Optional: You are a biologists and creating a model for animal behavior. Write a class, InchWorm, that models an inch worm moving along a horizontal line. The inch worm moves either to the right or left. Initially, the inch worm moves to the right, but it can turn to change its direction. In each move, its position changes by one unit in the current direction.