COMP 1020
Lab 8

MATERIAL COVERED

- **Graphics with StdDraw**
- **Object Hierarchies**
- **ArrayLists**

Notes:

- You should definitely do at least the Bronze and Silver exercises. You can do these
  - before the lab, on your own, using any Java programming environment you like, or
  - during the lab, with assistance from the lab TA, or
  - after the lab, on your own.
- For credit, you must demonstrate at least one working exercise (Bronze), in the lab.
- Make sure your TA has recorded your mark before leaving.
- The three questions are sequential – each builds on the previous one.
- Always try to complete as many exercises as you can on every lab.

For this assignment, you will be adapting the graphics example we did in class. Have a look at the provided code as you will need to utilize it / use it as a reference.

Bronze:

Complete the **`House`** class constructor so that it draws the provided output when the **`testHouse`** methods are called in **`TestClass`**. See the **`Car`** example for reference. The **`House`** should utilize the **`Rectangle`** and **`Triangle`** classes and be able to generate different sized houses depending on the parameters provided to the **`House`** constructor.

Tips:

*Since you are extending **`ManyShapes`**, you should be able to use its **`draw()`** method (among others). See the **`Car`** example for details.*

Make sure your origin point is in the middle & bottom of the house. Think of everything as positioned relative to that origin point.

Silver:

a) Replace the array in **ManyShapes** with an **ArrayList**. Update all the **ManyShapes** methods to use the **ArrayList** instead.

b) Update your **House** to include color (see the colored reference example). You should also provide an alternate **House** constructor that includes parameter values to set the colors at runtime.

> *Tip: See **StdDraw** for filled versions of the **Rectangle** and **Triangle** methods. You can access **StdDraw** colors with the call to the **static** color variables such as **StdDraw.RED**. See **StdDraw** for the full list of **Color** values available (they are defined as variables near the top). Alternatively, you could input color as RGB values.*

Gold

Create your own custom **Class** that draws a unique picture but works similarly to **House** and **Car**. Bonus if you color fill and animate it. Be creative! Try some advanced animation tricks like having the trajectory "bounce" off the edge of the **GUI** window frame size (detect the position and calculate a new velocity for it).