CS 201
Advanced Object-Oriented Programming
Lab 4 Preparation

This lab preparation will be collected at the beginning of lab and count as 10 points towards the lab grade. Since it will be collected, you should be sure to have a copy that you can work with during lab.

In next week’s lab, you will complete the Asteroids program that you started this week. In writing this program you will gain experience creating a superclass and extending it. In particular, you will be creating an Asteroid class, which shares many features with the Ship class you wrote last week. An Asteroid is a polygon that can be rotated and move across the screen in any direction. There are some differences, however. An Asteroid is a more complex shape than just a triangle. While it can be oriented in any direction, it does not change its orientation after creation. Also, it travels in a straight line at a constant speed.

Here are two snapshots from this program:

<table>
<thead>
<tr>
<th>Image 1</th>
<th>Image 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Image 1" /></td>
<td><img src="image2.png" alt="Image 2" /></td>
</tr>
</tbody>
</table>

The ship is in the center and pointing up. The asteroids start in random locations and move in straight lines, but in random directions. If an asteroid hits the ship, the ship will disappear.

The user can shoot with the space bar. Bullets will go in the direction that the space ship is pointing. If a bullet hits an asteroid, the asteroid will disappear.
You should closely examine your Ship class. List here the instance variables and constants that you have in Ship that are also meaningful for Asteroid. These will be moved to a new superclass, called AsteroidGameShape, when you complete the lab.

List here the instance variables and constants in your Ship class that are not meaningful for an asteroid. These will continue to be in your Ship class.

Next, look at your constructor. The main job of a constructor is to initialize instance variables. What should the constructor in the new superclass look like?
What should the constructor in the Ship class look like after you have introduced the new superclass constructor?

Which of your methods should stay in Ship?

Which of your methods should be moved to AsteroidGameShape?

Are there methods that you will declare in AsteroidGameShape, but need to override in Ship? If so, explain in English what overriding will be used for.