# Software documentation

During this milestone I am aiming to make my code more efficient and focus on evolving my current code to include patterns such as factories, singleton and observer.

The singleton can be included with the factory pattern which will be used to create the creatures within the aquarium, while the singleton will ensure that the factory is created by itself.

The observer pattern will be used to check for a change in state for mouse input.

During development I wanted to create a behaviour manager class which would be a singleton.

During my time trying to implement collision detection between the java fish and the piranha I found that due to java fish and piranha not being the enclosing class I couldn’t link the classes together.

Implementation of the flyweight pattern was taking too much time as I didn’t understand how to use the HashMap within Java.

I feel my main problem became linking the creatures together i.e getting a piranha to eat a javafish. This is also clear as to why bubbles aren’t emitted from a fish and are purely random positions. However, I have learnt a great deal through using patterns and overall how to design my code. I have tried to use the SOLID principle to ensure my code is good code. While also trying to use Unit testing since the previous milestone, the other test strategy I used mainly based on using the terminal to print text messages to verify if a method was being read by the aquarium manager correctly or not. In terms of design patterns, I feel I spend too long trying to implement a lot of design patterns instead of focusing on the task at hand. In hindsight I would have focused my attention on Factory, Observer and Singleton, two of these are implemented as I have used both singleton and factory to create the creatures, bubbles and food within my aquarium. I would of used the Observer pattern to ensure I had mouse input within the aquarium which is why there is a example of a observer pattern sitting within the package. Using packages is a great way to link with other packages once I figured out how to import the package from one to the other.