**A.P. Computer Science**

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MBCS- Part I Assignment

1. a) Create a new project called **MBCSp1.** Copy **aquafish.h**, **aquafish.cpp**, and **aquamain.cpp** into the folder that was created. **Using Project…Add to Project…Files** go to your folder and add these three files to your project.

1. Run the program, entering various values for tank size and steps per simulation.

2. a) Modify **aquamain.cpp** to be able to view graphically the position of the fish in each simulation.

i.e.- ~~~~~\*~~~~~ where ~ represents water and the \* represents the fish

You can do this two ways:

1. Modify **aquafish.h**, **aquafish.cpp**, and **aquamain.cpp** to pass the variable **pos** by reference and then use **pos** and a loop to graphically display the simulation.
2. Use the private data member that has already been created and then use **it** and a loop to graphically display the simulation.
3. Run the new program several times. Where does the fish always start? Why?

3. a) Modify **aquafish.cpp** and **aquafish.h** by adding a new member function that does the same as #2.

b) Run the new program several times. What was easier parameter passing and writing code in the main or creating a new member function and using the data members that have already been created?

4. a) Modify **aquafish.cpp** to be able to randomly generate the starting position of the fish in the first simulation. Hint: Use the body of the constructor and an instance of RandGen to assign your initial position.

1. Run the new program several times. Where does the fish start? Is it working?

5. a) Incorporate up and down movements along with the right and left movements by asking for the tank’s height and width. Modify **aquamain.cpp** to be able to view graphically the position of your fish in a two-dimensional tank.

b) Modify aquafish.cpp and aquafish.h by adding a new member function that does the same as above.

**Optional:**

6. a) Incorporate multiple fish (more than 2) by using a two-dimensional array to store the fish and its position thru each simulation. Use this array to graphically display the movement of the multiple fish thru each simulation.

b) Modify **aquafish.cpp** and **aquafish.h** by adding a new member function and using apmatrix that does the same as above.

1. Run the new program several times. What was easier parameter passing and writing code in the main or creating a new member function and using the data members that have already been created?