**Marine Biology Case Study**

**Free Response Assignment #1**

You will need to review the .h files for environ.h and fish.h in order to complete this question.

A.      Write the function distanceBetween that calculates the distance between the fish with the two id's that are passed to the function. (Assume math.h has been included and you can use the sqrt() function.)

double environment::distanceBetween(int id1, int id2)

//Pre: The environment has been initialized and there are fish in it.

//Post: returns the distance between the two fish with the above id's

B.       Write the function distanceAll that calculates the distance from one fish to all the fish in the environment. The function should create a vector that stores the distances based upon the id's of the fish. You may assume that distance between works as specified.

apvector<double> environment::distanceAll(int id)

//Pre: The environment has been initialized and there are fish in it.

//Post: returns a vector with with the distance from one fish to all other fishes in the environment.

C.       Write the function aveDist that calculates the average distance between one fish and all other fish in the lake. Be sure not to include the distance from the fish to itself. You may assume that distanceBetween and distanceAll work as specified.

double environment::aveDist(int idno)

//Pre: The environment has been initialized and there are fish in it.

//Post: returns the average distance from one fish to all other fishes in the environment.