

A fish tank simulation

Write a program that simulates life in a fish tank. Different types of fish (you can be creative) have different characteristics (e.g. size, appetite, etc.) and behavior (e.g. aggressive, lazy, etc.). Fish move according to attitude, hunger, proximity of other fish or food, etc. At least 3 different types of fish must be present in the tank at all times, and at least two different sources of fish food. Don't forget to feed them, as they may run out of food!!!!

Level 1 – F: Fail

Includes **screen output** and **keyboard input** and **basic classes**. There are java source files for at least three major classes in the program. Good source comments and code indentation is expected for all implemented parts of the code

Example: The program reads and prints the details and status of the fish in the simulation

Level 2 – E: Borderline Fail Includes **methods** and **variables** for at least three major classes, and all constructions above. At least 3 major methods fully implemented and working for each class

Example: As above, but also fish can display some simple movement inside the tank.

Level 3 – D: Bare Pass At least three major program classes will be implemented, with **methods working and well designed**, and all constructions above Use of **inheritance** with at least one superclass and three subclasses Class, method and variable naming will be clear and consistent

Example: As above, but also there is a basic simulation, though movement of fish may be basic.

Level 4 – C: Pass Polymorphism should be used in at least three subclasses, and all constructions above **Exception handling** is used to catch and handle at least three different types of exceptions At least four major program classes will be implemented, with methods working and well designed, Comments are clear and applied to class and method level consistently

Example: As above, but simulation is more natural, and fish movements are affected in at least one way (e.g. change direction) by an external factor (e.g. food proximity/hunger).

Level 5 – B: Satisfactory Use of **Vectors** in all parts of the program, and all constructions above. Exception handling is carried out appropriately in all parts of the program Inheritance is correctly applied to all parts of the program.

Example: As above, but basic fish interaction scenarios will be included (you can be creative). A basic GUI will also be included showing fish details, status, etc.

Level 6 – A: Merit Includes **file input and/or output**, and all constructions above The simulation (including fish movement) will be displayed on the GUI Polymorphism will be fully implemented in all parts of the program

Example: As above, but with full interaction implemented (between fish, between fish/food, etc.). Shortage of food in tank should be detected. Fish details should be read from a file.

Level 7 – A+: Distinction Includes everything required for an A grade but also **something special** (using other more advanced constructs or algorithms, or something you just read up on yourself). Make it a program someone would really want to use!

Example: Use a fancy GUI for the simulation, add a smart algorithm to determine the movement of fish depending on proximity of other fish/food/attitude. Or ...