Test Plan

Throughout the course of this project, I will use the following methods of testing:

* Component testing
* Integrative testing
* Functionality testing
* Usability testing
* Acceptance Testing
* End-user beta testing
* (possible) regression testing

**Component/Integrative testing**

I plan to design this program in a modular way, and so will test each module or component individually, as they are implemented (contrary to my initial gantt chart, but reflected in my revised gantt chart). This is done to ensure each component works before I move on to develop the next component.

However, after each component is implemented, I will need to make sure it works in tandem with all the other implemented components. This will involve integrative testing, making sure that each component correctly works with the other components and passes the right data.

The following are the components which will be individually tested:

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| * Neural Net |
| * Main Menu |
| * Slow Generation |
| * Fast Generation |
| * Average Survival Time Graph |
| * Creature Cannibalism |
| * Creature Names Generation |

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| **Component** | **Test Method/Inputs** | **Expected Output** | **Actual Output** | **P/F** |
| Frame and Panel | Driver code telling canvas to display a circle: Macintosh HD:Local:Users:AHCS:Desktop:Screen Shot 2018-11-22 at 14.10.56.png | A black background with a red sphere in the centre. | Macintosh HD:Local:Users:AHCS:Desktop:Screen Shot 2018-11-22 at 14.12.23.png | **P** |
| Neural Net | Driver code to test the SigmoidInputNode class and the sigmoid transfer functionMacintosh HD:Local:Users:AHCS:Desktop:Screen Shot 2018-11-26 at 09.03.54.png | Outputs very close to zero for low inputs (-ve), increasing output as input value increases, outputs very close to 1 for high input values (+ve) | Macintosh HD:Local:Users:AHCS:Desktop:Screen Shot 2018-11-26 at 09.05.50.png | **P** |
| Neural Net | Driver code to test the SigmoidNode class and how it gets data from a SigmoidInputNode with value 0.5Macintosh HD:Local:Users:AHCS:Desktop:Screen Shot 2018-11-29 at 14.21.50.png | h1 output equal to:  sigmoid(sigmoid(0.5) \* h1\_weight + h1\_bias) | Macintosh HD:Local:Users:AHCS:Desktop:Screen Shot 2018-11-29 at 14.21.58.png | **P** |
| Neural Net | Driver code to test the HardlimNode class and how it gets data from a SigmoidNode, which in turn gets data from a SigmoidInputNode:  Macintosh HD:Local:Users:AHCS:Desktop:Screen Shot 2018-11-29 at 15.18.38.png | u1 output equal to:  hardlim(h1\_output \* weight + bias) | Macintosh HD:Local:Users:AHCS:Desktop:Screen Shot 2018-11-29 at 15.18.47.png | **P** |
| Neural Net | Driver code to set up a full neural net and test the frequency of getting 1s and 0s as the outputs  Macintosh HD:Local:Users:AHCS:Desktop:Screen Shot 2018-12-13 at 14.21.08.png  Macintosh HD:Local:Users:AHCS:Desktop:Screen Shot 2018-12-13 at 14.21.33.png | Ratio of 1s:0s is about 1:1 | Macintosh HD:Local:Users:AHCS:Desktop:Screen Shot 2018-12-13 at 14.25.03.png  ratio of about 3:7 | **F1** |
| Neural Net | As above, but with the fix mentioned in F1 | As above | Macintosh HD:Local:Users:AHCS:Desktop:Screen Shot 2018-12-13 at 14.44.40.png | **P** |
| Main Menu |  |  |  |  |
| Slow Generation |  |  |  |  |
| Integration |  |  |  |  |
| Fast Generation |  |  |  |  |
| Integration |  |  |  |  |
| Average Food Graph |  |  |  |  |
| Integration |  |  |  |  |
| Creature Cannibalism |  |  |  |  |
| Integration |  |  |  |  |
| Creature Name Generation |  |  |  |  |
| Integration |  |  |  |  |

F1 – The failure of this test was due to the fact that he hardlim function returned 1 when x was >0.5, rather than when x>0. This was fixed and retested

**Functionality, Usability, Acceptance, and Beta testing**

These will all be done only once the project has reached a stable releasable state.

Functionality testing will simply be carried out by myself, to check if all functional requirements have been met.

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| **Requirement** | **P?** |
| Initialise a frame and panel |  |
| Create Neural Nets with random weight values |  |
| Create children of Neural Nets with random mutations |  |
| Store and read in neural net weights |  |
| Run a quick generation which makes a new set of neural nets |  |
| Run a slow generation which allows the user to see the ‘creatures’ in slowed down time as they compete |  |
| Record and display average survival time values |  |
| Creatures able to eat other creatures as well as pellets |  |
| Draw names for creatures from CSV file |  |

Usability and Acceptance (Beta) testing will be carried out by giving the release to end-users (such as peers in my class) to use the program, without any instruction or guidance from me. The end-users will then fill out a survey asking about how intuitive they felt the design was, and how well it met the user requirements, using direct questions.

**Regression Testing**

Regression testing will only be necessary in the following circumstances:

* If the other types of testing show errors in the code, or that requirements are not met, and changes are made to existing components. If that is the case, the component and integrative testing for the changed components will be redone.
* If additional time is left at the end of development, and the additional features are implemented. In this case, more component, integrative, and beta testing will be done for these components.