Ishmail Qasim 180021745	**Progress Update** (What has been done/Which goals have been met?)	**Next Plan** (Objective for the next week)
04/10/2020 - 10/10/2020	- Established connections and meeting schedule with personal tutor. - Discussed project plans ideas and mapped out potential deliverables of the project. - Discussed implementation methods and what tools may be useful for implementation and established the use of either Box2D to focus on logic and potentially moving the development to Java, utilizing JBullet's physics engine.	- As some of the logic behind the evolutionary creatures project involves learning about the evolutionary algorithms covered in the Computational Intelligence. Logic was to be left on hold until those topics were covered in lectures. - Install Box2D and learn how to use the software/language and provide simple demos. - Consider more concretely what the deliverables and originality this project will produce.
11/10/2020 - 17/10/2020	- The early stage deliverables were concretely defined with an ideal outcome. Deciding to creating a creature that will iteratively be developed to be able to travel and carry out extremely simple tasks. - During the scheduled meeting, support was provided by the supervisor on initial programming logic for the local random search algorithm. - Project Definition Form and Poster submitted.	- Produce diary with all that has happened so far. - Work on the Computational Intelligence module. - Install Box2D and begin learning how to use software/language. - Develop a Trello task breakdown to give an idea of what needs to be done for the project. - Work on developing a Gantt chart with objectives and deadlines.
18/10/2020 - 24/10/2020	- Research into physics engines for graphical implementation carried out. - Peter Lewis' suggestion for utilizing Box2D for simple graphical functionality while logic is focused on was accepted. - As Box2D's native implementation was in C++, it would be more efficient to find an engine that uses a more familiar language. After research, it was found that a Java implementation was available and was steadily imported into the Eclipse work space. - The JBox2D physics engines came with dependency issues that currently has no clear fix.	- Work through fixing the dependency issue found through importing JBox2D as it should take less time than adapting to the familiarised engine rather than the engine of an unfamiliar language. - Supposedly, .JAR files are missing that won't allow for the correct dependencies to be linked. This will be worked through and documented for future troubleshooting.

25/10/2020 - 31/10/2020	- Dependency issue fixed, reinstallation of Eclipse updated the maven archive in order to attach the m2e connectors required to utilize JBox2D. - Briefly had a chance to look into the engine and learn how to use it but will require more training on the system.	- Continue to learn how to use JBox2D and creating simple animations with a thorough understanding of the software in order to begin working on evolutionary creature logic.
01/11/2020 - 07/11/2020	- Focused on Computational Intelligence Implementation and Logic for my understanding about how to tackle the problem.	- Complete sign off tasks for the Computational Intelligence coursework.
08/11/2020 - 14/11/2020	- Continued to focus on Computational Intelligence Implementation and Logic for my understanding about how to tackle the problem. Working on the sign-off code.	- Begin the Term 1 report. - Enhance my understanding of past approaches with research. - Begin to further learn how Box2D works but creating a few small animations or objects manipulating the physics.
15/11/2020 - 21/11/2020	- Begun Term 1 report. - Produce Gantt chart in order to begin monitoring my progress by concretely illustrating this.	- Finish producing Gantt chart with feedback from Peter Lewis. - Develop evolutionary algorithm to understand and begin incorporating into FYP.
22/11/2020 – 28/11/2020	- Completed Gantt chart with review from supervisor, Peter Lewis. - Basis of evolutionary algorithm formed with tweaks to be made to create a functional algorithm.	- Complete evolutionary algorithm for testing with crossover implementation. Potentially incorporate mutation. - Begin on researching background into Evolving Virtual Creature development in 2D.
29/11/2020 - 05/12/2020	- Completed evolutionary algorithm. - Brought Term 1 report near to completion - Began background research	- Begin toying with JBox2D and implementing task 1 in 2D.
06/12/2020 – 12/12/2020	- Submitted Term 1 report.	- Begin implementing task 1. - Analyse background reading for final report.
13/12/2021 – 06/02/2021	- No progress made	- Begin implementing task 1. - Analyse background reading for final report.

07/02/2021 – 13/02/2021	- Began Dissecting JBox2D - Re-evaluated the scope of the project to come to the decision that re-implementation in 3D would be infeasible within the time frame. - The above was discussed and agreed with by the supervisor. - Began working on sample animation in order to familiarise myself with the tools of JBox2D	- Complete sample animation built entirely from scratch. - Begin implementing task 1. - Add notes for the Final Report - Analyse background reading for final report.
14/02/2021 – 03/07/2021	- No progress made - Mentor switched from Dr Peter Lewis, to Dr Megan Robertson - Discussed next steps after no progress for months - Began working again	- Finish learning how Box2D works (i.e. why are there wheel/joint limits, fully understand the mechanisms of wheel joints) - Build work space for program to execute - Complete sample animation
04/07/2021 – 10/07/2021	- Began cleaning up library code for project use - Discuss shrinking project scope from evolving bipedal creature to evolving car	- Understand more of how wheel joints work and get started on the limited wheel issue - Modify existing test code
11/07/2021 – 17/07/2021	- Modifications have been made but incomplete - Continued working out why there is a limitation of wheel joints.	- Try to overcome wheel limit limitation or proceed with 2 wheels only. - Start by focusing the variables for the car into a genetic list and begin trialling evolution - Create a method of logging results, via framerate taken to complete task. - Possibly add bhp to list and calculate the required stoppage distance from the car to the destination and contributing this to findings. (it would be pointless to not have to stop as more torque/speed means better results by default. The balancing act is where the algorithm can shine)
18/07/2021 – 24/07/2021	- Completed setting up cost measurement using Apache stopwatch. - Deliberated code/class design structure moving forward (Evolver and Recorder classes).	- Begin rewriting existing code from Computational Intelligence and integrating them. - Decide on the variability of each individual gene as there will be different restrictions to each gene. - Produce an animation that triggers a set amount of

		iterations until complete.
25/07/2021 – 31/07/2021	- Consolidated Evolver class (gene variance needs completing).	- Find out how to regenerate animation functionally - Integrate new genetic system for evolution into CarTest. - Install restraints in genes into evolver and sample evolution cycles.
01/08/2021 – 07/08/2021	- Regenerations have been created. - Contact node exists in order to facilitate regenerations - Evolution visualization implemented	- Implement stat recorder - Complete software - Finalize report
08/08/2021 – 13/08/2021	- Completed Software - Complete Report	Project Complete