Your project title: Which can be longer when it is displayed on the front page of the document

Report Name	Project Outline
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1.   Project description

- The project's main aim is to create a collection of games teaching bioinformatics concepts. Each game will be based on a classic game and will build on concepts that have been learnt in the previous game. The games will be written in Python, I intend on using PyGame [1] to develop the game, and then hosting them on my Aber domain. To do this I will need to package the games in a way that can be played online. To do this I will either use PyBag [2] or PygBag [3].

- The first game will be based on Snake and will be an introduction to DNA sequences. Players will control a snake that collects nucleotides, represented by colours or patterns. Collected nucleotides correspond to gene fragments that will be displayed to the user. Collisions could represent challenges in DNA sequencing such as mutations. The second game will be based on Minesweeper. I intend on having similar mechanics; however, the mines will represent the DNA sequences formed in the Snake game instead. Players could "sweep" for regions and the numbers could represent similarity of genes instead of number of mines, a Manhattan distance perhaps. The third game will be based on the tile merging game 2048. The player will merge tiles that correspond to overlapping sequences, with the intention of building a complete genome. These genomes will contribute to a population in the next game. The fourth and final game will be based on Paperboy, however instead of having a single character, there will be several populations of character, that have the genes that have been assembled in the previous games. The objective of the game will be to show how various genes can be expressed and affect populations.

- For this project to be worthwhile I need to ensure that the games created are educational and not overly complicated or misleading. To do this, I need to do research on other educational games, this will allow me to understand features and methods I should use in my own project.

- There are several end goals to this project. Firstly, I would like to create a collection of games that are educational. The games need to be enjoyable and high quality and the players need to be educated, perhaps a gamified test could be implemented to check this.

2.   Proposed tasks

- Research the games that I will be basing the project on: Snake [4], Minesweeper [5], 2048 [6], Paperboy [7]. This will involve reading the documentation and further information on the games. This is an important step to create a high-quality product that stays true to the original games.

- Recreate the base for each game in Python, this will be a large step that may take a significant amount of time, once this task has been completed however, the games can be adapted to add in the bioinformatics elements.

- Research bioinformatics topics to teach: [8] Lecture notes. This needs to be done so that the topics taught in the game are factual and informative. All the information that I need is in the lecture slides.

- Research how to teach using games: This step will help with the creation of my games and bring a more rounded and finished aspect to the educational side of them, hopefully making them more enjoyable and effective.

- Refine each game: This step involves tweaking the games to have the bio-informatics side to them and they should be considered finished by this point, minus testing and feedback.

- Present at science week: If the project is coming along in good time, the games could be presented at the university's science week. This will give me the option for lots of people to playtest my game and give feedback.

3.   Project deliverables

- Final Games: The four games that I have proposed to create should each be high quality and meet the requirements I have proposed.

- Webpage to host them: The games should be able to be run on the web, which means a small website will be needed to host them, I intend on using my Aber domain for this.

- Documentation: This will consist of sprint backlogs, testing results, reports and boards representing the work that I have done.

- Research / testing results: This also comes under documentation but is worth separating as the testing phase is important to ensure the quality of the games.

4.   Initial annotated bibliography

[1]   [1] PyGame: The primary library that will be used for the development of the game.
[2]   [2] PyBag: A tool for running Python in browsers.
[3]   [3] PygBag: A tool for running Python games in browsers.
[4]   [4] A snake project created in JavaScript.
[5]   [5] A minesweeper project that I can use for inspiration.
[6]   [6] The Wikipedia page for 2048.
[7]   [7] The Paperboy operators manual.
[8]   [8] Lecture notes *(contains all topics I need to refer to)*