# CS39440: DNA Games Project Outline

## 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 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.

## Proposed Tasks:

* Research retro games
* Recreate the snake project in unity
* Research bioinformatics topics to teach
* Research how to teach using games
* Create other games
* Present at science week?

## Project Deliverables:

* Final Games
* Webpage to host them
* Documentation
* Research / testing results

## Initial Annotated Biography: