**SWEN30006 Software Modeling and Design**

**Project 1 – Submission 1**

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**Topic:** Biological Inheritance – Mendel's laws

**Game Outline**

The game consists of creatures that swim around in a 2-dimensional world, each of which has the ability to move and shoot. Creatures are controlled either by the player or an AI.

The focus of the game will be to teach year 10 students about the principles of genetic inheritance. It will focus on Mendel's laws, including:

1. **Law of segregation:** Every individual possesses a pair of alleles for a trait, one from each parent chosen at random.
2. **Law of Independent Assortment:** Traits are inherited independently of one another.

The game will also illustrate how dominant and recessive genes are involved in determining the traits of a creature. This will be achieved by having the player's creature be able to steal the DNA of any enemy that it kills. This DNA is then combined with it's own genetic material, producing an offspring that has genes based on the combination of the two DNA sequences.

The game will have various traits that can be inherited. These will be illustrated mostly through the game graphics, such as by changing the way the creature looks. These traits include (but are not limited to):

* **Movement based traits** – affect the movement of the creature, for example:
  + Acceleration
  + Top Speed
* **Attack based traits** – affect the way the creature attacks other creatures, for example:
  + Attack Damage
  + Attack Speed
* **Life based traits** – affect how long a creature will live for, such as:
  + Lifespan
  + Max Health

After the player kills an enemy, they will have a choice of whether of not to acquire their DNA. If the player does, a new creature will spawn. Its characteristics will be calculated based on the DNA of the two parent creatures, with the genes picked at random, and the final traits calculated based on whether the selected genes are recessive or dominant.

The player will be shown the results of the merging of DNA, and then gain control of the newly spawned creature.

The player will score points based on how long they survive. As the game progresses, enemy creatures will become stronger, faster, and more numerous.