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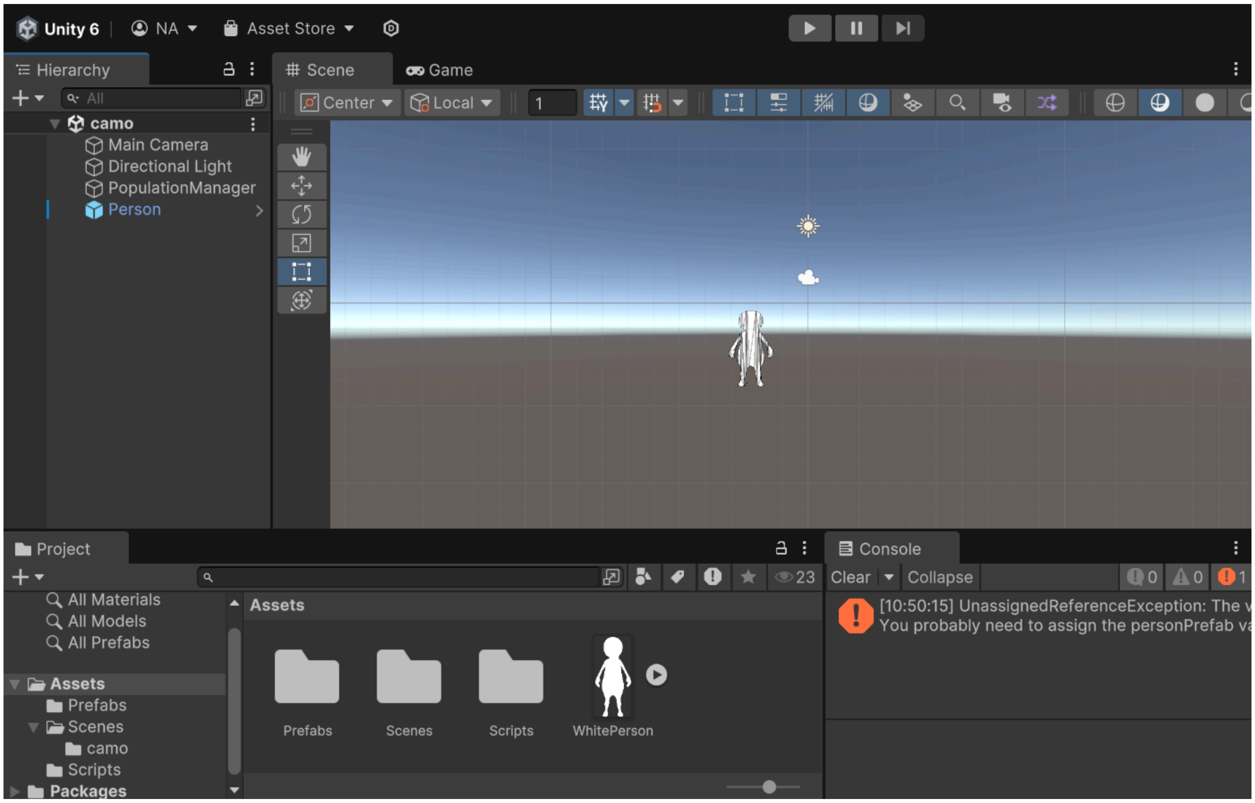
Hafta II

Genetic Programming I

Github link:

We start off by creating a new project and naming it accordingly. Then we proceed to download the provided assets and import the package. We replace the default scene and add in the provided scene (camo).



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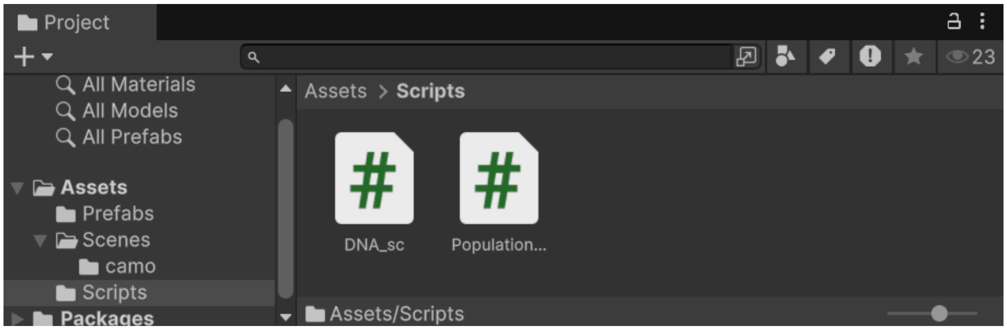
[10:50:15] UnassignedReferenceException: The v
You probably need to assign the personPrefab va
```

We create separate folders for Prefab and Scripts. In the scripts folder we add two scripts namely ‘DNA_sc” and “PopulationManager_sc”. For our project, the “PopulationManager_sc” will instantiate copies of the "person" prefab at random positions to form a population. Each "person" will carry the properties and behavior specified in the “DNA_sc” script. So we create an empty Game Object and attach “PopulationManager_sc” to it and attach the “DNA_script” to the person prefab.



We want to design a simulation where the healthy genes are passed down, we represent this with different colors. The “DNA_sc” contains the genetic algorithm simulation:

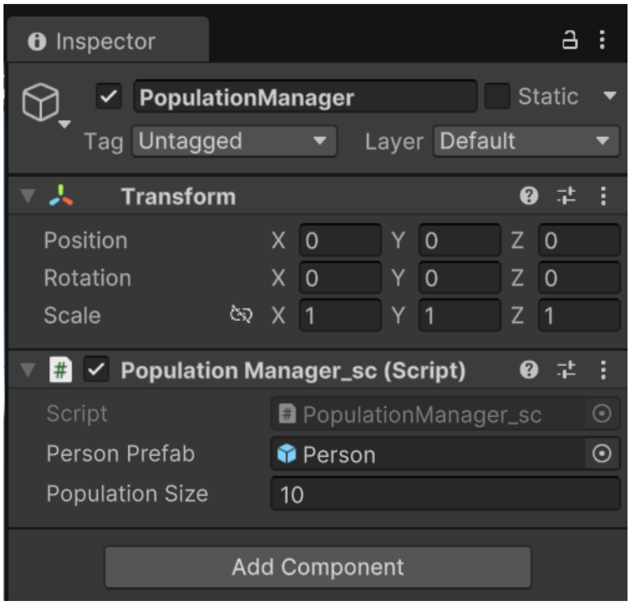
- Sets each object’s color based on its DNA.

- Allows each object to be "killed" when clicked, recording its death time.

- When considered dead, the object is “disabled”.

Clicking on an object (which in this simulation is equivalent to "dying") removes it from the population and renders it invisible and unclickable. The PopulationManager_sc can use the timeToDie variable to calculate "fitness" in genetic algorithms by knowing when each object died. It's possible that longer-lived items are more "fit" and are therefore chosen to pass on their color genes to future generations.

After attaching “PopulationManager_sc” to the empty GameObject,we assign the "person" prefab to the personPrefab field in “PopulationManager_sc” from the Inspector. This setup allows PopulationManager to instantiate multiple copies of the "person" prefab at runtime.



☑ PopulationManager □ Static

Tag Untagged Layer Default

	X	Y	Z
Position	0	0	0
Rotation	0	0	0
Scale	1	1	1

☑ Population Manager_sc (Script)

Script	PopulationManager_sc
Person Prefab	Person
Population Size	10

For the “PopulationManager_sc”, we start by declaring the variables and components, we use Methods like Start, Update, BreedNewPopulation and Breed to accomplish different tasks like death, generations and the time. The overall evolution is managed by “PopulationManager_sc” in the following parts:

- Initial Population: population of random colors is created using "DNA"

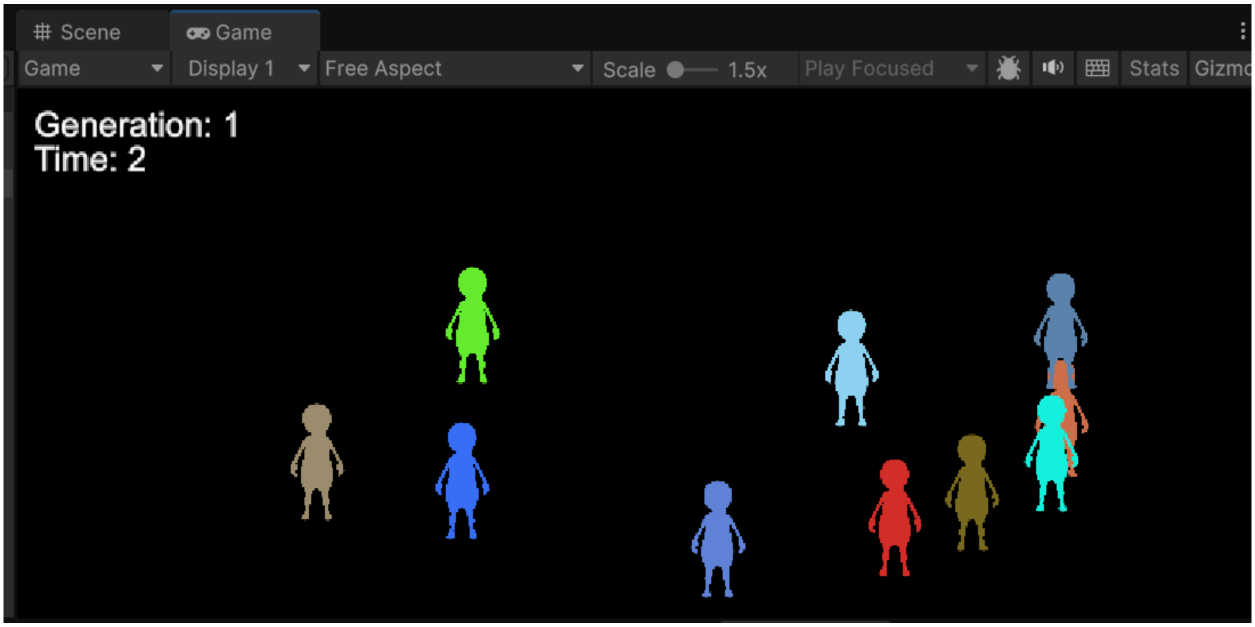
- Time-Based Evaluation: TrialTime seconds are the lifeblood of every generation.

- Breeding and Selection: The individuals with the longest lifespans are selected at the end of each generation to pass on their qualities to their offspring.

- GUI: Shows the time and current generation to illustrate the evolutionary process.

The screenshots of game play:

OVER 6 GENERATIONS:



Generation: 1
Time: 2

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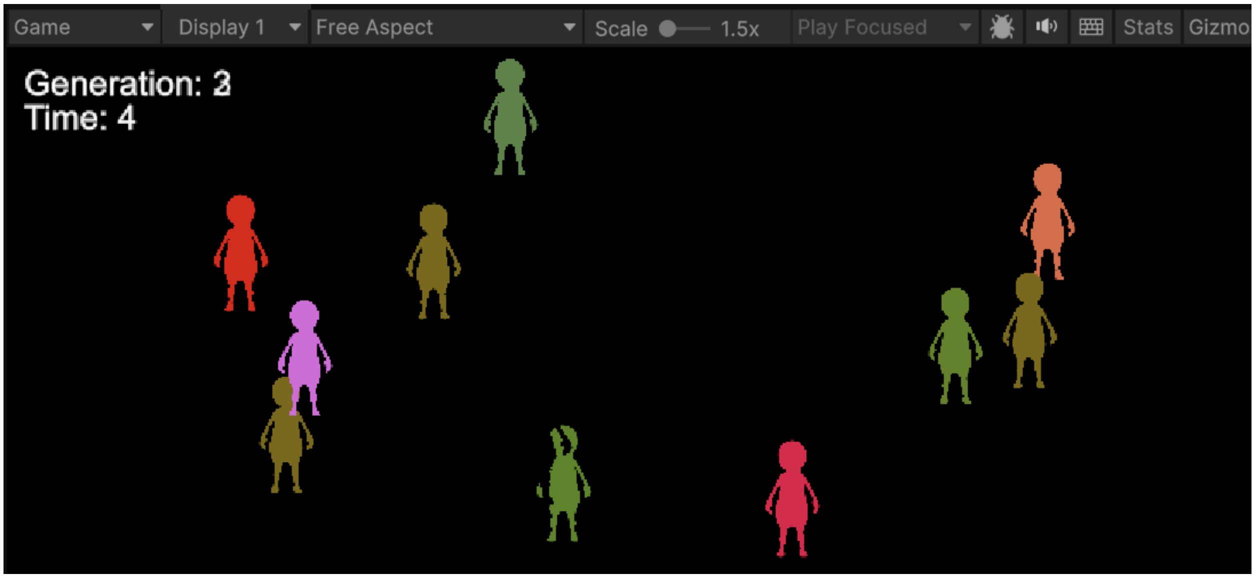

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Generation: 3
Time: 4
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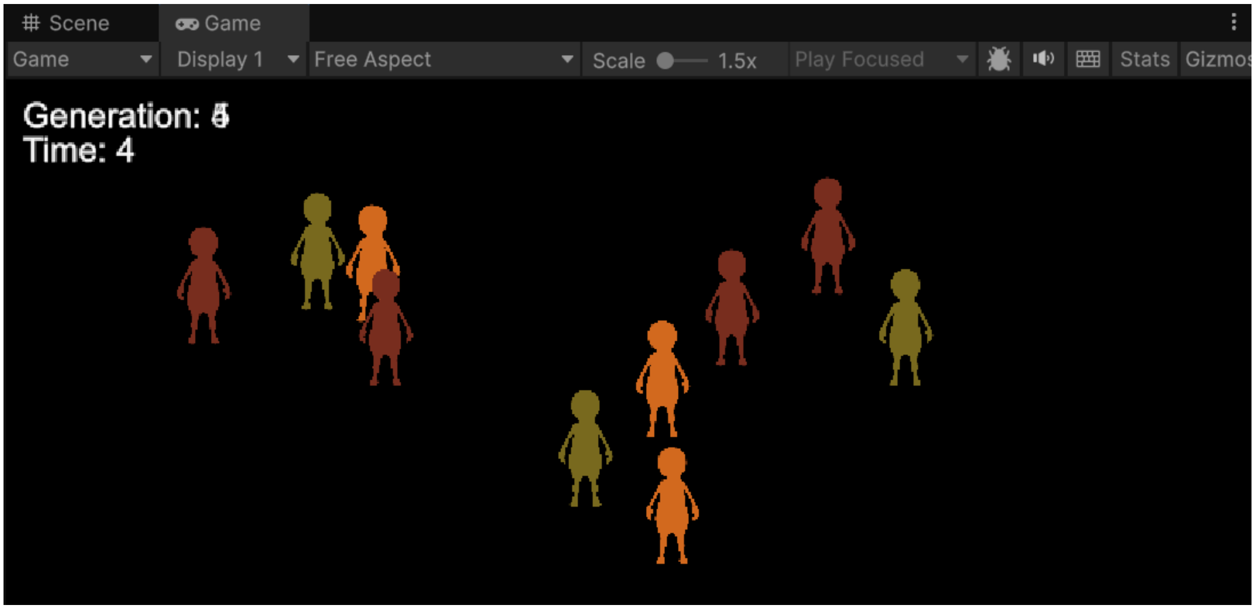

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Generation: 5
Time: 4
```

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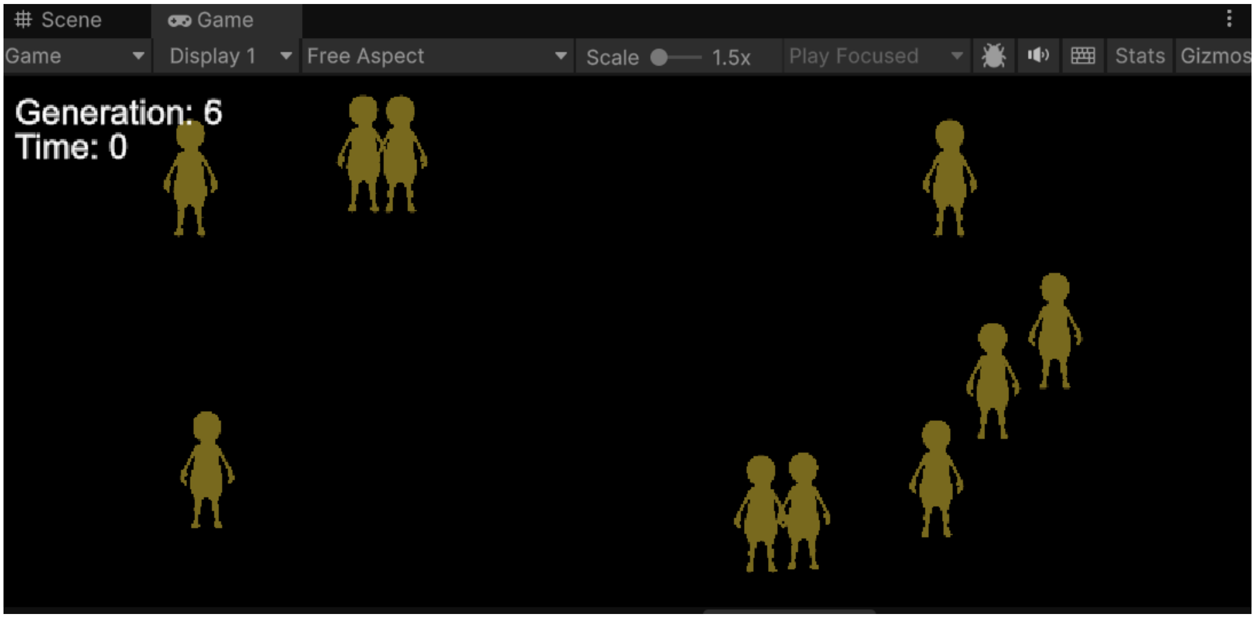

Generation: 6
Time: 0