**AI DRIVEN SNAKE GAME USING DEEP Q - LEARNING**



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**INTRODUCTION:** This project is based on Reinforcement Learning, which educates the snake to eat food found in its surroundings.

An example gif is provided below to give you an idea of what we intend to construct.

A picture containing graphical user interface

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After we've built the basic snake game, we'll look at how to add Reinforcement Learning to it.

**GOALS AND OBJECTIVES:**

**THE PREREQUISITE FOR THIS PROJECT ARE:**

* Reinforcement Learning
* Deep Learning (Dense Neural Network)
* Pygame

For this project, we must construct three modules:

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The Environment (the game that we build)

The Model (Reinforcement model for move prediction)

The Agent (Intermediary between Environment and Model)

We've randomly put snakes and food on the board.

* Calculate the snake's state using the 11 values, and if any of the requirements is met, set that value to zero; otherwise, set one.

The 11 state variables indicated above will be calculated based on the current Head position.

* After obtaining these states, the agent would transmit them to the model, which would then conduct the following action.
* Calculate the reward after performing the next state. The following are the rewards:

+10 for eating food

-10 for game over

Else: 0

* Update the Q value (to be mentioned later) and Form the Model.
* After understanding the method, we must now develop a concept for how to proceed with coding this program.

The model was created with Pytorch, however you may also use TensorFlow if you choose.

We're utilizing a Dense neural network with an 11-layer input, one dense layer with 256 neurons, and three neurons as output. You may fine-tune these hyper settings to achieve the best results.

Diagram

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REFERENCE:

<https://www.geeksforgeeks.org/ai-driven-snake-game-using-deep-q-learning/>

<https://github.com/vedantgoswami/SnakeGameAI>