**Tetris bot**

AI is being used more and more frequently in various sectors. Working with it can be challenging and difficult, so the team decided to create a project which will demonstrate the use of AI in a game of Tetris. The idea behind it is to make sure that the AI grows and evolves as the game progresses. Keeping this goal in mind, the team decided to use the Genetic Algorithm as the base for the AI.

To begin with the analysis, the creation of a Use Case Diagram seemed to be a good starting point. Here the general demonstration of the program is shown without diving deep in the backend.**Diagram

Description automatically generated**

The following diagram demonstrates the General Sequence of the game. This diagram demonstrates when various components of the game are being activated and under which circumstances can the game be terminated.

A picture containing calendar

Description automatically generated

Diagram

Description automatically generatedIn General Activity Diagram, the general working pattern of the game is shown in a comprehensive way. In the AI column, the condition under which the AI evolves and grows are shown (The game is played until the game is over (general rule of Tetris) or until the AI has finished its 500 moves which results into AI evolving and moving to next generation).

Class Diagram demonstrates the various classes and methods that might be needed to code the game. This doesn’t include the UI (User Interface) or UX (User Experience) changes. The team decided to create three classes (AI, User and Tetris). AI class contains the methods and parameters needed for the AI. Tetris contains the general methods and parameters for the game including the functions of AI. User Class contains the methods and parameters so that the user can play the game himself/herself.

Diagram

Description automatically generated

A more in-depth view of the AI’s Genetic Algorithm:

50 genes are generated per generation. Each gene gets the chance to play the game. The moves made by each gene gets rated. Once the genes are done with their moves, they get sorted in ascending order on basis of their rating. The ones with the best ratings are selected to create children for the next generation. There is also the possibility of the children getting mutated. Each child is then given the chance to make the move and those are rated as well. This way the AI learns and evolves.

Diagram

Description automatically generated