Artificial intelligence -Spring 2024

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Project 2

Please read the description to understand story of the project. And we'll ask you to do your task in this project.

Description

In Taiwan, the term '*Mountain Road Speed Daemon*' epitomizes the young motorcyclists' quest for speed and glory on serpentine mountain paths.

Among them is Lin, a seasoned rider known among his peers for his unmatched speed and daring maneuvers. Lin is not just another speed daemon; he rides for a cause, to honor the memory of a fallen friend who once ruled these mountains. With every race, Lin carries the legacy of his friend, weaving through the roads like a ghostly apparition, swift and untouchable.

On a night graced by a full moon, Lin meets "*The Phantom*," a veiled challenger. Their duel is not merely of speed, but of souls. As they climb, rivalry fades into respect, and Lin realizes that The Phantom is not just an adversary, but a kindred spirit, seeking redemption on the mountain's winding paths.

The thrill of the race, once the heartbeat of his existence, fades into the background as the true value of life comes into sharp focus. With newfound wisdom, Lin turns his back on the mountain roads that once defined him.

This revelation shifts Lin's perspective on life, leading him to forsake the perilous races for the strategic realm of board games. There, his tactical prowess crowns him a legend anew.

*This picture depicts the splendid view of **provincial road 7B** in Taiwan, sourced from Wikipedia.*

Your Job

Now, as a smart student in NYCU, you are asked to defeat Lin by using some methods of artificial intelligence to win the next upcoming competition about the fascinated game "**Strands**".

What you **must** do is to implement the **two** different game search algorithms.

(a) A* Search / Minimax algorithm (choose one of them)
(b) MCTS [Monte Carlo Tree Search]

(Either A* or Minimax only consider as one type. So, you must implement one of them along with MCTS)

Also, we will use the code of your algorithm to compete with your classmates to determine everyone's ranking. This ranking will constitute a portion of your project's score!

**Hint: the way to evaluate your utility function is important!! Go check the slide of Game Search and you'll know why I say it important.*

Please Note

1. We'll provide the framework of project 2 for you later, so just think about how to design your AI algorithm first.
2. If your idea is **correct** and the code is **workable**, you'll get full credit of the source code part. However, if your idea is just a nonsense, the score will be deducted.
   (For example, if you just use random function to decide where to put next, we'll consider it a nonsense and deduce your score.)
3. I firmly believe that it is impossible to find out the solution on the internet. But still, you're **not allowed to plagiarize**!!! Also, believe me, the code generated by AI (Chatgpt, Copilot, Chemini) may be not that useful, so just do the project by yourself!