

CECS 451
Assignment 3
Total: 60 Points

General Instruction

- Submit uncompressed file(s) in the Dropbox folder via BeachBoard (Not email).
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1. Implement 5-queens problem solvers with Python 3 by using the **hill-climbing algorithm** and the **genetic algorithm**.
 - (a) (30 points) Implement a program that performs the **Hill-Climbing algorithm** to find a solution.
 - (b) (30 points) Implement a program that performs the **Genetic algorithm** with 8 states including the three operations, i.e., **selection**, **crossover**, **mutation** to find a solution.

Program specification.

- i. Find the `board.py`. You can modify the `Board` class.
- ii. The function `fitness` in the `board.py` returns **the number of attacking pairs**.
- iii. Sometimes the algorithms can stuck in local minima. Please implement the random restart procedure when they stuck.
- iv. Please measure the running time and the number of restart.
- v. An expected output.

```
Running time: 200ms
# of restart: 1
1 - - - -
- - - 1 -
- 1 - - -
- - - - 1
- - 1 - -
```

- vi. Submit `hill.ipynb`, `genetic.ipynb`, and `board.py`.