

Northeastern University**CS 5100 Introduction to Artificial Intelligence****Project#3 Assigned: 11/10/19 Due: 11/30/19** [200 points]

Please - clearly write your **full name** on the first page. Submit a single zip file with all .Py files and a text/pdf file for the answer. Please include a readme file giving instructions on how to run your program.

Your work will be graded based on the following criteria:

1. How well your program satisfies the requirements
2. Error handling - Catch all exceptions and print useful error messages (No print stack trace)
3. Readme - Include clear instructions on how to run your code
4. Code structure, organization and documentation

This is a Python implementation project. Please refer to (page 238 Norvig & Russell) Hunt the Wumpus problem

Study this implementation from github or similar as you find helpful:

https://github.com/wmayner/wumpus/blob/master/wumpus_world.py

<https://github.com/greeder59/Wumpus>

First implement a basic Hunt the Wumpus game in Python, see references above (borrow the code, and run it) . Explain the results in the context of Agents (Ch. 7).

Now, modify the game's implementation as below:

Agent must use a classification algorithm in every cell before it decides to kill the wumpus - Agent can kill Wumpus ONLY if the decision = "Play" from the Weather data set.

Use the Weather data set (Witten 14 instances basis data) in all cells, but change the data values randomly (so each cell's weather is different).

Use Dec Trees, ANN and SVM for this classification, and build an ensemble on their resul - take a vote among the 3 results.

Report: explain the problem, design of your solution following the above Github tutorial, a summary of the results.

Problem:

For this project, we must implement weather to each room in the wumpus and then using given data, generate 3 predictive models which vote to determine the ability of the agent to shoot the wumpus from each given room.

The Wumpus game implementation is taken directly from:

<https://github.com/greeder59/Wumpus>

Solution:

Decision Tree, ANN and SVM models are all generated upon initialization of a predictive object and stored within the object for use throughout the game. At each room, the weather components (Outlook, Temperature, Humidity, Windy) are all accessed and passed to the predictive object which runs the data through all 3 models which then vote to determine whether an arrow can or cannot be fired from that room. The rest of the game will function the same.

In order to run the game, wumpus.py can be run using the console command:

```
python3 wumpus.py
```

pandas, numpy, sklearn, and keras are required dependencies.