

Programming Project #11

Assignment Overview

This project focuses on gathering some data from players playing a game. It is worth 60 points (6% of your overall grade). It is due Monday, December 1st before midnight.

The Problem

There is an interesting game/problem called the “Traveler’s Dilemma” formulated in 1994 by Kaushik Basu. The following is a description of the game by Wikipedia (http://en.wikipedia.org/wiki/Traveler's_dilemma)

An airline loses two suitcases belonging to two different travelers. Both suitcases happen to be identical and contain identical antiques. An airline manager tasked to settle the claims of both travelers explains that the airline is liable for a maximum of \$100 per suitcase, and in order to determine an honest appraised value of the antiques the manager separates both travelers so they can't confer, and asks them to write down the amount of their value at no less than \$2 and no larger than \$100. He also tells them that if both write down the same number, he will treat that number as the true dollar value of both suitcases and reimburse both travelers that amount. However, if one writes down a smaller number than the other, this smaller number will be taken as the true dollar value, and both travelers will receive that amount along with a bonus/malus: \$2 extra will be paid to the traveler who wrote down the lower value and a \$2 deduction will be taken from the person who wrote down the higher amount. The challenge is: what strategy should both travelers follow to decide the value they should write down?

What is the “best” solution. There is a solution predicted by game theorists (the so called Nash equilibrium) but it is rarely discerned by most players.

Task

Write a program that plays the Traveler’s dilemma. Then have 10 different pairs of people play that game and gather statistics on their play (more people if you like, but minimally 10). The game records the statistics in a file that is then turned in along with the program. Finally, you will write a brief “analysis” of how people played the game based on the statistics you gathered.

Requirements

Your program must use one class and one exception

Program Specifications

Your program will do the following:

1. When the program begins, open the existing statistics file for **appending** information.
2. Gather some stats on each player (Name, age, education level, etc.)
3. Record the info in the file. Start the game
4. For each round of the game, have one player make a guess, blank the screen and have the other make their guess
5. After both guesses, show what the two guess were, then give the player’s their scores.

6. Have the pair repeat the game until someone selects the “perfect” answer or 5 games, whichever comes first. Keep a cumulative score.
7. When the game ends, announce the winner and record the guesses in the statistics file. Close the file.

Deliverables

Unlike typically, there are **3 things to hand in** for this project.

- **proj11.py** -- your source code solution (remember to include your section, the date, project number and comments).
 - **stats.txt** – the statistics file collected by the game during all the plays.
 - **report.doc** – your writeup (**with graphs**) on your results. Approximately 1 to 2 pages in length.
1. Please be sure to use the specified file name, i.e. “proj11.py”
 2. Save a copy of your file in your CSE account disk space (H drive on CSE computers).
 3. Submit the files using the "handin" program: <http://www.cse.msu.edu/handin/webclient>

Assignment Notes:

Look at the example stats.txt file provided. The stats.txt file should have the following format:

- An integer on a line by itself, indicating how many games were played
- 4 lines for each game:
 - how many rounds for these two players. Single integer on a line by itself
 - player1 info as a comma separated list
 - player2 info as a comma separated list
 - list of tuples. List contains all rounds played. Each tuple is one round. First element of the tuple is player 1 guess, second element is the player 2 guess

What “info” should you collect on each player? Up to you. Be creative. Age, weight, height, level of education, kin relation, whatever.

In your report, give some information on your results. Again, up to you. Be creative. For example, how many got the perfect answer, average first guess (across all games), average second guess, average difference between first and second guess. Most importantly, it **must include one graph**. Topic of your choice. Lab 13 will discuss how to do graphs using python. Again, for example, age vs first guess, average guesses each round, etc.

Discussion

Consider this a science experiment you are conducting for someone. You are writing a program to gather data and analyze that data. As this is your last project you have some leeway on what to collect. Use your skills and see what you can do!

Things to watch for:

- test your program thoroughly before inflicting it on users. In particular, make sure that opening, appending and closing the stats file doesn’t lose any data. Back up often
- The program is not difficult. Get it done early so you have time to gather data

- To “clear” a screen in Idle, you are going to have to write a function that just writes a bunch of empty lines. If you run python from a console, import `os` and
 - Windows: `os.system('cls')`
 - OS X/Linux: `os.system('clear')`