Hashimate University
Department of Computer Engineering
Data System and Science

Assignment 1

March 16, 2023

(**Part 1**)
Modify the script of *Fig04_02.py* (Intro to Python for Computer Science and Data Science Textbook, page 128) to play 1,000,000 games of craps. Use a **wins** dictionary to keep track of the number of games won for a particular number of rolls. Similarly, use a **losses** dictionary to keep track of the number of games lost for a particular number of rolls. As the simulation proceeds, keep updating the dictionaries.

Example: A typical key–value pair in the wins dictionary might be 4: 50217. indicating that 50217 games were won on the 4th roll. Display a summary of the results including (See Figure 1 on the next page):

1. the percentage of the total games played that were won.
2. the percentage of the total games played that were lost.
3. the percentages of the total games played that were won or lost on a given roll (column 2 of the sample output).
4. the cumulative percentage of the total games played that were won or lost up to and including a given number of rolls (column 3 of the sample output).

(**Part 2**)
Convert the **wins** and **losses** dictionaries in Part 1, to Panda Dataframes, then using *matplotlib* and *seaborn*, plot two figures (for each dictionary) which visualize the collected results!

Note: Deadline is Mar, 25

```
Percentage of wins: 50.2%
Percentage of losses: 49.8%
Percentage of wins/losses based on total number of rolls

          % Resolved        Cumulative %
Rolls   on this roll   of games resolved
    1         30.10%              30.10%
    2         20.80%              50.90%
    3         14.10%              65.00%
    4          9.90%              74.90%
    5          7.40%              82.30%
    6          4.60%              86.90%
    7          3.70%              90.60%
    8          2.40%              93.00%
    9          1.90%              94.90%
   10          1.10%              96.00%
   11          0.90%              96.90%
   12          0.80%              97.70%
   13          0.80%              98.50%
   14          0.30%              98.80%
   15          0.30%              99.10%
   16          0.30%              99.40%
   17          0.50%              99.90%
   25          0.10%             100.00%
```

Figure 1: Sample Output