ASSIGNMENT 1

In this assignment, you will use a random number generator to simulate a game of craps and implement some simple machine learning strategies to automate your wager.

You can read more about the game of craps at http://www.math.uah.edu/stat/games/Craps.html. You will only be implementing the pass bet. Remember the following for the pass bet:
1. If on the first roll of dice, the sum is 7 or 11, you win. If the sum is 2, 3 or 12, you lose.
2. After the first roll of dice, if the value of the first roll repeats before the number 7, you win. If the number 7 appears before the repetition of the first roll, you lose.

If you win, the winning amount is equal to the wager amount. For example, if you wager $100, you win $100.

You start off with a balance of $1000 and play 10 games or until you run out of money. The wagering strategies will be as follows:

1. Even wager: On every roll, you wager $100, irrespective of previous win or loss.

2. Martingale System: You can read about it https://en.wikipedia.org/wiki/Craps#Martingale_system. Basic idea is that if you win, in the next bet you wager $100. If you lose, you double previous wager.

Note: If you don't have enough balance to double previous wager, then you should play with whatever is remaining. That is, if you have to wager $800, but you only have $600 available, then bet $600.

Example:

Game #	Starting Balance	Wager	Outcome
1	1000	100	Loss
2	900	200	Loss
3	700	400	Win
4	1100	100	Win
5	1200	100	Loss
6	1100	200	Win
..	..	…	..

3. Reverse Martingale System: In this case, you double your wager in case of win and keep constant in case of loss.

Note: If you don't have enough balance to double previous wager, then you should play with whatever is remaining. That is, if you have to wager $800, but you only have $600 available, then bet $600.

Game #	Starting Balance	Wager	Outcome
1	1000	100	Loss
2	900	100	Loss
3	800	100	Win
4	900	200	Win
5	1100	400	Win
6	1500	800	Loss
7	700	100	Loss

You have to implement these three simple algorithms and play 5 rounds with maximum 10 games each using the three strategies. To clarify, in round 1, you will play up to 10 games using strategy 1, 2, and 3 respectively.

Output the result to a text file in following format (no need for fancy tables, even tab or comma separated output is fine) :

Round 1:

Strategy	Number of games	Ending Balance
1	10	$1500
2	10	$2400
3	4	$0

Round 2:

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You can use R, Java, or Python for this. Include source code, output file, and a README file for compiling your code. In the README file, also include a short sentence explaining which strategy you think worked the best for you.