Assessment Instructions – Bottle Cap Prize

Instructions: Write a program that uses the Monte Carlo sampling method to estimate the average number of bottles of ***e***-Boost someone would have to drink to win a prize. There is a 1 in 5 chance that a bottle cap will have a prize.

1. Create a new project called Monte Carlo Method in the Unit05 Assessments folder.
2. Create a class called BottleCapPrize in the newly created project folder.
3. Determine how many bottle caps each person has to open in order to find a winning cap. (This represents one trial.) Print this value to a text file. Review Dr. Lin's suggestion about performing this simulation with dice.
4. Prompt the user for the number of trials. Conduct at least 1000 trials.
5. Read back the data for all of the trials from the output file.
6. Calculate the average number of caps opened in order to win a prize.
7. Print the result to the screen.

Suggestion: Write this program in stages. You may need to spread this assessment out over time in order for all the pieces to fall into place.

- Play with some dice to visualize the Monte Carlo Method.
- Plan your algorithm. Write pseudocode or at least an outline.
- Work on the code that conducts trials and temporarily print the results to the screen; however, during testing only use about 20 trials.
- Print the results of each trial (the number of caps opened to get a prize) to a file.
- Use Notepad to verify the file data matches the screen output.
- Read the trial data back in and calculate the average.
- Print the results.

Expected Output: When your program runs your output should simply print a message indicating the average number of bottles of ***e***-Boost you would need to drink to win a prize.