ISE 5123: Software Tools-Dec Support
Assignment #1
Due February 11, 9:00 am

There are 4 problems in this assignment. Please submit a single Python file including the full working code of all problems with the logical order.

Problem 1

The German mathematician Gottfried Leibniz developed the following method to approximate the value of π:

$$\pi/4 = 1 - 1/3 + 1/5 - 1/7 + \cdots$$

Write a program that allows the user to specify the number of iterations used in this approximation and that displays the resulting value of π.

Problem 2

Write a program that receives a series of numbers from the user and allows the user to press the Enter key to indicate that he or she is finished providing inputs. After the user presses the Enter key, the program should print the sum of the numbers and their average.

Problem 3

Teachers in most school districts are paid on a schedule that provides a salary based on their number of years of teaching experience. For example, a beginning teacher in the Lexington School District might be paid $30,000 the first year. For each year of experience after this first year, up to 10 years, the teacher receives a 2% increase over the preceding value. Write a program that displays a salary schedule, in tabular format, for teachers in a school district. The inputs are the starting salary, the percentage increase, and the number of years in the schedule. Each row in the schedule should contain the year number and the salary for that year.

Problem 4

In the game of Lucky Sevens, the player rolls a pair of dice. If the dots add up to 7, the player wins $4; otherwise, the player loses $1. Suppose that, to entice the gullible, a casino tells players that there are lots of ways to win: (1,6), (2,5), and so on. A little mathematical analysis reveals that there are not enough ways to win to make the game worthwhile; however, because many people's eyes glaze over at the first mention of mathematics, your challenge is to write a program that demonstrates the futility of playing the game. Your program should take as input the amount of money that the player wants to put into the pot and play the game until the pot is empty. At that point, the program should print the number of rolls it took to break the player, as well as maximum amount of money in the pot.