Bronx Community College
Department of Mathematics and Computer Science
CSI31 Fall 2018
Programming Assignment 6: worth 35 points
Assigned on November 26, 2018
Due on December 5, 2018

Assignment 6:

Write a program that simulates the game of craps and uses the simulation to estimate the probability of winning.

Craps is a gambling game in which the bettors place bets on the outcome of rolls of two regular six-sided dice. The full game with all the betting possibilities is quite complicated, so in this version we make simplifying assumptions and ignore the betting.

One player, called the shooter, rolls the dice. On the first roll, if he rolls 2, 3, or 12, he loses, and if he rolls 7 or 11, he wins.   Any other roll establishes a number called the point, and the shooter rolls again. If he rolls the point number again, he wins. If he rolls a 7, he loses. If he rolls any other number, he rolls again. So after establishing the point, the shooter continues to roll until either he rolls a 7 and loses or rolls the point again and wins.

Your program should simulate any number of games of craps. The number of games to simulate will be the only input to the program. Use the results of the simulations to estimate the probability that the shooter wins on the first roll, the probability the shooter loses on the first role, the probability the shooter wins after the first roll and the probability the shooter loses after the first roll. The output of the program should be some text giving the estimated probabilities of these outcomes. Since the outcomes listed are all the possible outcomes, the sum of those probabilities should be 1. In class we will compute the probabilities for the outcomes of the first roll so you will be able to check your estimates.

First, write a top-level design. You can use the high-level design for the racquetball simulation as a model. Use functions to make your program modular. Some of these functions will be simple to write.

Submit what you have written for the top-level design by the end of class.

Submit a file with the program and a file showing at least three runs of your program by midnight December 5, 2018 by email to prof.persinger@gmail.com