Chapter 5 Programming Project

Complete this programming project using your notes, the text book, and any online or in-class sources that you like. You and your programming partner should work on each question together. You may ask a friend to look over your work or discuss procedural decomposition, but you and your partner must write all code on your own.

**To get full credit on this assignment, you must include a structure diagram and/or pseudocode explaining your strategy for each question.**

Exercise 1

*Write a game that plays many rounds of Rock Paper Scissors. The user and computer will each choose between three items: rock (defeats scissors, but loses to paper), paper (defeats rock, but loses to scissors), and scissors (defeats paper, but loses to rock). If the player and computer choose the same item, the game is a tie.*

* *A good program will prompt for user input, compare input to a computer counter-move, then output a verdict (user loses, wins, or ties), prompt for another round or exit.*
* *An excellent program will do all that a good program does, but will use different algorithmic strategies for choosing the best item.*

*Before you begin, take a moment to decide how your computer will pick rock, paper, or scissors. Should the computer pick randomly? Should it pick the same item always? Should it repeat the same item for a time, then switch strategies? Read through the New York Times article on Rock Paper Scissors, and any other online sources you choose to help you draft a plan for your program.*

Exercise 2

*You and your partner should test out the game by playing it at least 3 times each. Keep record of how many moves it took before you won or lost the game.*

**Game 1 Outcome: Game 1 # of Moves:**

**Game 2 Outcome: Game 2 # of Moves:**

**Game 3 Outcome: Game 3 # of Moves:**

**Game 4 Outcome: Game 4 # of Moves:**

**Game 5 Outcome: Game 5 # of Moves:**

Exercise 3

*Write a program that compares 2 players. Your program should prompt for each player:*

1. *the number of times they played the game,*
2. *the number of times they won the game,*
3. *the number of moves for each game.*

*Have the program report which player performs better on the basis of their reported statistics.*

*Test your program by inputting your and your partner’s results from Exercise 2.*

Exercise 4

*Write a program that plays the dice game Pig. Pig is a 2-player game where the players take turns repeatedly rolling a single 6-sided die.*

*A player repeatedly rolls the die until one of the two events occurs:*

*(1) either the player chooses to stop rolling, in which case the sum of that player’s rolls are added to his/her total points, or*

*(2) if the player rolls a 1 at any time, all points from that turn are lots and the turn ends immediately.*

*The first player to reach a score of at least 100 points wins.*