Programming Projects:

Birthday Program

In this program we wanted to see the probability of two people in each group size having the same birthday. I set the group size to be 50. From that I looped the project 100 times to see the probability of the amount of same birthdays over the amount of loops. From the calculations I saw having a group size of 50 gives you roughly around 90 percent. Before creating the project, I would have thought the probability would be lower than it came out to be.

In the program there are four classes. The class BirthdayProbability is the main program that runs the project. There is a run method to loop the run, then calls a method to calculate the probability and finally calls a method to print the probability. The BirthdayProbabilityTester is the main method and all it does is call the BirthdayProbability class to run the program. The class GroupCreator is a factory design pattern that creates a group of people and stores them into a Person array. The Person class creates the Person object by randomly generating the month and day of the person’s birthday. I do not take into account that some months have less days in the month. Every month in the program has 31 days.

Door Game Program

In this program we wanted to see have would happen when a person picks one of three doors to win a prize. We run four possibilities where: (1) choosing door two and you do not switch doors halfway through, (2) choosing door two and you do switch doors halfway through, (3) randomly choosing a door and you do not switch doors, and (4) randomly choosing a door and you do switch doors. When you do switch doors you have a higher probability of winning the prize compared to not switching doors.

In this project there are two classes. First one is the Problem220Tester where it is the main method and its job is you call the Problem220 program to run the project. The second one is the Problem220 program where it runs the whole game. The program is nicely organized into having a method for every job.

Probability and Statistics Program

In this project we are creating a Probability and Statistics library. It contains Binomial Distribution, Geometric Distribution, Combination, Permutation, Factorial, Mean, Median, Mode, Standard Deviation, Union, Intersection, and Complement.

There is a Run program that is the template design pattern to call all of the classes in the library. Each equation in the library has its own class except for mean, median, mode and union, intersection, and complement. Both of those are combined into two classes. The ProbandStatTester is the main method and it calls the Run program to run the entire library.