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**Project II**

**Stats Library – Distributions**

The Stats Library Program has been updated with a new option to access the Distribution Calculator. This calculator outputs the expected mean, variance, and probabilities for each distribution. The distributions calculated are Binomial, Geometric, Hypergeometric, and Poisson. The calculator also calculates the cumulative probabilities as well. Each Distribution states the purpose of the variables being inputted and allows for user input of those variables. Almost every distribution utilizes the getCombo() method to reduce the repetition of code when a factorial or combination needs to be calculated in the formula. Each distribution contains the methods: EqualTo(), LessThan(), LessThanEqual(), GreaterThan(), and GreaterThanEqual(). For some distributions it was easier to use the formula 1-P(X) to determine the probability then to loop through and keep a running sum of every probability. The program heavily relies on the Math utility to do calculations such as: to the power of a variable, the use of *e* in the Poisson distribution, etc. The program was fairly simple as the main goal is to perform calculations using the given formulas with the user inputted variables.

**Distributions**

**Binomial**

1. The experiment has n trials
2. There are two possible outcomes: success or failure
3. The trials are independent but identical
4. The probability of successes is the same between trials where 1-p is the probability of a failure

**Geometric**

1. The experiment has independent trials
2. There are two possible outcomes: success or failure
3. The probability of success is defined as p
4. The random variable is the trial where the first success occurs
5. There could be 1 to ∞ number of trials

**Hypergeometric**

1. Contains a sample size of n, the sample is randomly selected without replacement from the population of N.
2. The random variable is the number of successes
3. Not independent trials
4. The probability of success changes with each trial

**Poisson**

1. The experiment is based on the occurrence of an event during a specific interval
2. The probability that the event occurs is the same
3. The events of the experiment are independent

**Function Plotter, Salter, and Smoother**

The function

**Poker Hand Tester**