For my StatsLibrary for Project 2, I implemented uniform distributions for single continuous variables, as well as discrete multivariate distributions.

Uniform distributions were implemented by treating both the range bounds and the value itself as doubles, allowing for the determination of probabilities of the value falling within a certain subrange by comparing the sizes of the range and subrange.

Discrete multivariate distributions were implemented by treating the probability function as a two-dimensional array. Joint distribution values were found by adding up all the values up to a certain row and column number. Marginal probabilities for y1 and y2 were found by adding up all the probabilities in a given row and column respectively, while conditional probabilities were found by dividing the joint probability by the marginal probability. Independence of the two variables was determined by finding the product of the relevant marginal probabilities for each point and comparing them to the joint probability at that point.

I also used a custom exception type for error handling, with several different cases to check for depending on the exact method being called.

Implementing these distributions in Java was a rewarding experience which taught me not only about the probability theory concepts themselves, but also about developing software in a professional environment, as I had to consider how to handle errors and how to document my code for the benefit of others building on my programs.