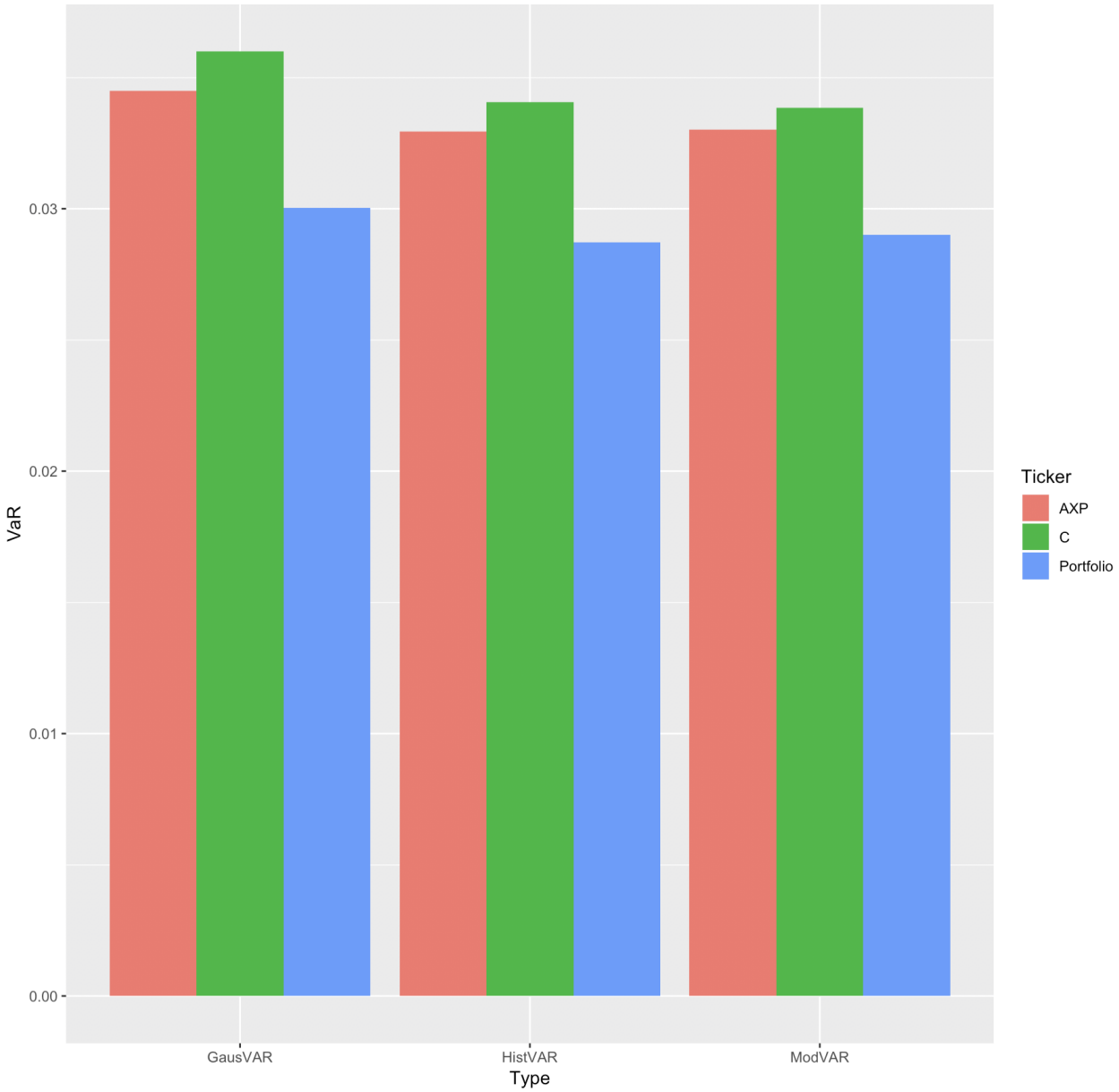
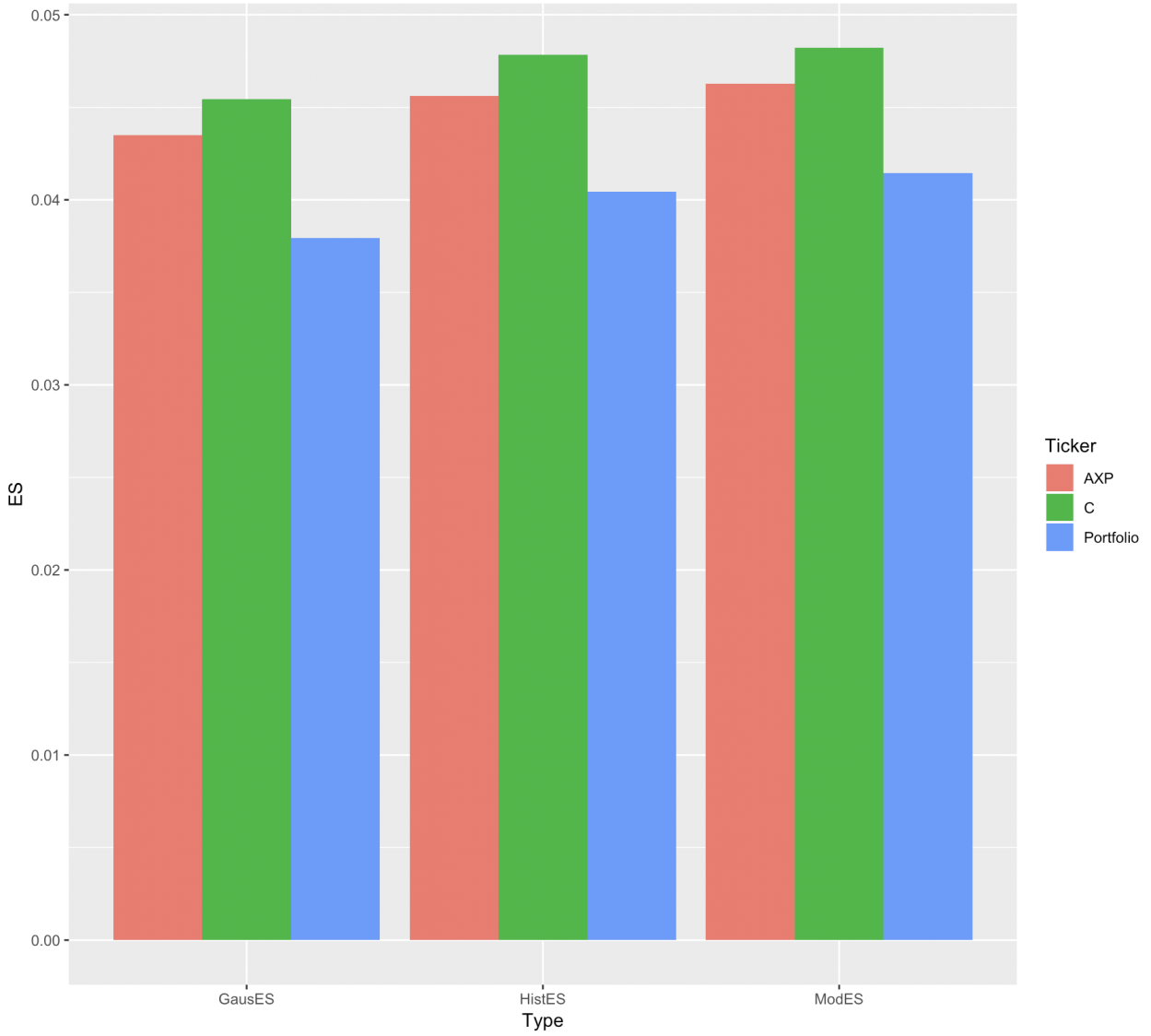
Risk Management Analysis Report
Name: Rajat Dua

In this folder, I have incorporated my Risk Management project. I have developed this project using R statistical tool as a part of PRMIA Risk Management competition, as follows:

1. ES&VaR Model.R: In this problem, I performed some computation using R statistical tool in order to estimate the Value at Risk (VaR) and Expected shortfall (ES or Cumulative VaR) of individual assets and the overall portfolio. In order to execute that I first found the optimal portfolio weights by using portfolio optimizer function in R and rebalancing weights every month by taking the lookback period to be 10 months. The rebalancing of weights is such that the latest months of portfolio return in the interval are given more weightage than historical months portfolio return. The constraints in the optimizer were such that we could have long short portfolio weights to achieve maximum return for given time frame. We used the final rebalancing weight in our VaR and ES model to compute VaR and ES of individual stocks and overall portfolio using historical, gaussian, and modified method using 95% confidence interval. The graph generated for VaR model is as follows:



The graph generated for Expected Shortfall (ES) method is as follows:



From these bar charts it is clearly shown that using the optimal weights of the stocks in the portfolio I could achieve a Value at Risk (VaR) and Expected Shortfall (ES) of the portfolio less than individual stocks in the portfolio at 95% confidence level using any of the three methods of determination, that is, historical, gaussian, or modified. I am therefore successfully able to mitigate risk in the portfolio using optimal portfolio weights and also able to achieve maximum returns with my strategy.