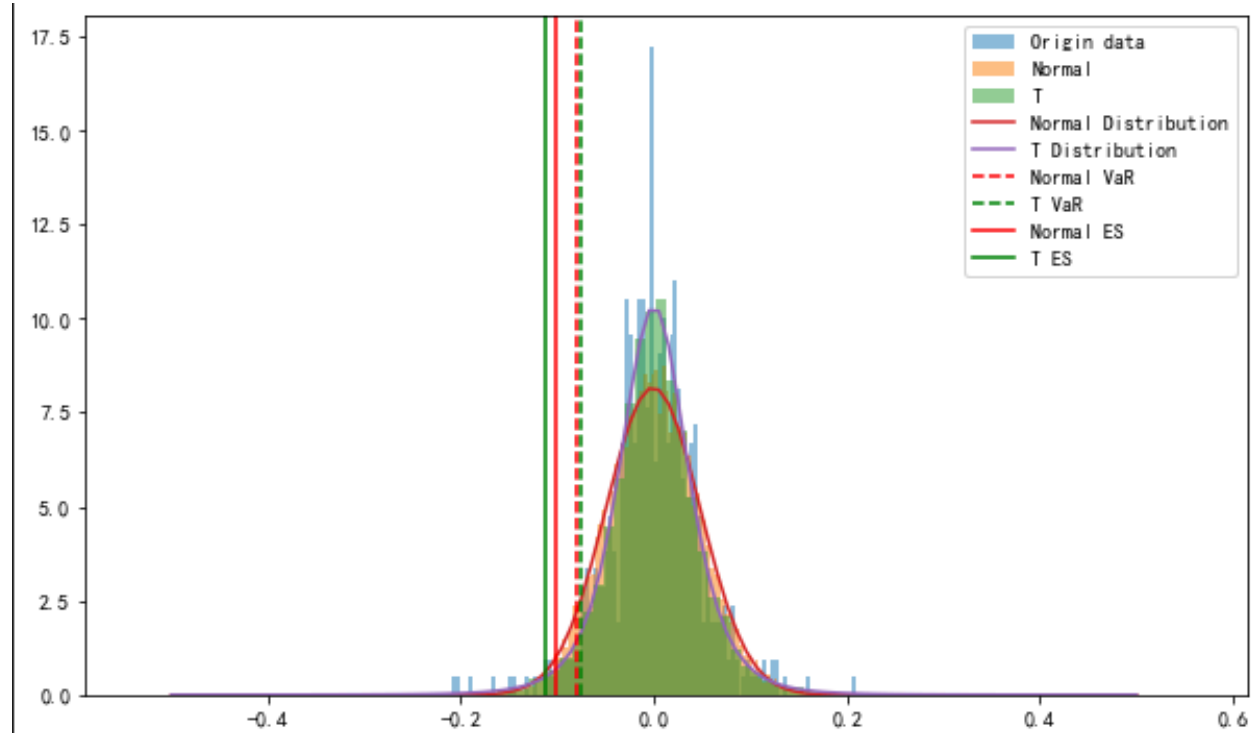


Problem 1



From the graph, we can see that T distribution is a better measure than normal distribution in this problem because it plots the original data better. Also, the Expected Shortfall of T distribution is much smaller than ES of normal distribution. On the other hand, the VaR of T distribution is a little larger than VaR of normal distribution. Both distribution did not successfully measure the fat tail.

Problem 2

All functions perform as expected.

Problem3

portfolio A

VaR: 8095.196338093723

ES: 10488.25119291017

portfolio B

VaR: 6669.440977851744

ES: 8828.535166718351

portfolio C

VaR: 5733.587370468653

ES: 7550.886235631004

portfolio Total

VaR: 19886.127163797966

ES: 26518.88282006731

Comparing to Week 4's result, we can see the VaR and ES under the assumption of T distribution is higher because T distribution measures the distribution better.