Week 5 Assignment Report

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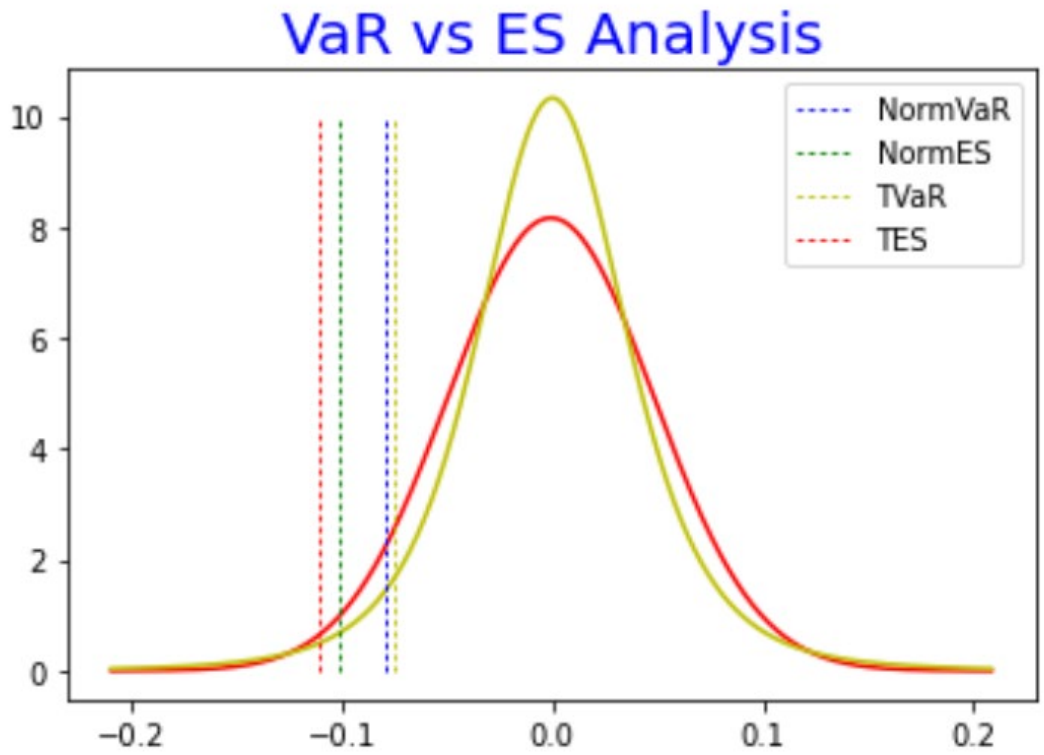
Question 1:

For this question, I first write the VaR_ES function. Then, I do the simulationwith normal fit and T fit. After that, I calculated the VaR and ES for both fit and compare the difference.

Here is the plot:



In the plot, I find the Normal fit VaR larger than the T fit VaR; however, the Normal fit ES smaller than T fit ES. The VaR for both fit smaller than ES.

Question 2:

I create a Library.ipynb and run it. I run some test to test my Library function work

Question 3:

First, I do the T fit simulation by do copula Simulation. After I get the simulation, I calculate the VaR and ES for each portfolio.

Here is the result:

```
PortfolioA VaR: 1721.644530201138
PortfolioA ES: 2702.0557226768246
PortfolioB VaR: 1301.3487403741074
PortfolioB ES: 1867.5890310419659
PortfolioC VaR: 2010.760765388066
PortfolioC ES: 2560.617974539322
PortfolioTotal VaR: 741.20783106771 34
PortfolioTotal ES: 1440.1317872155025
```

Here is the result last week:

Portfolio	PV	Delta VaR	MC VaR	MC VaR KDE	Historical	His VaR KDE
A	364,532.9604	6003.221298	6031.353035	6133.180296	5298.490899	6607.530596
B	326,770.1488	4886.596042	4713.121717	4877.027258	5576.130248	5948.630563
C	326,727.670717	3679.556069	3678.559149	3809.341859	3307.758233	3987.124178
All	1,018,030.78	14100.55012	14159.42006	14209.99006	12460.87375	15411.86675

I believe, there are some problem in my code when I do the simulation. My VaR and ES are very small than I expected. I will try to find why.