Problem 1

Value at Risk (VaR) is the negative of the predicted distribution quantile at the selected probability level.

Expected Shortfall (ES) is the negative of the expected value of the tail beyond the VaR

Under situation when the distribution of a certain portfolio is skewed or has multiple peaks, even though VaR is the same, ES could indicate the potential risk of the portfolio better by showing potential loss/gain than Value at Risk

Problem 2

https://github.com/zw219/FinTech590-RiskManagement.git

Problem 3

- Calculation from #2

```
ES_A: 0.036085481937280055
ES_B: 0.033226349452243197
ES_C: 0.03399938028566378
ES_total: 0.02638795537598822

VaR_A: 1.013918537073878
VaR_B: 1.0144714479417678
VaR_C: 1.0110980676399755
VaR_Total: 1.0053690699731563
```

- Calculation from Week04-P3

varA
1.013918537073878

varB
1.0144714479417678

varC
1.0110980676399755

varT
1.0053690699731563