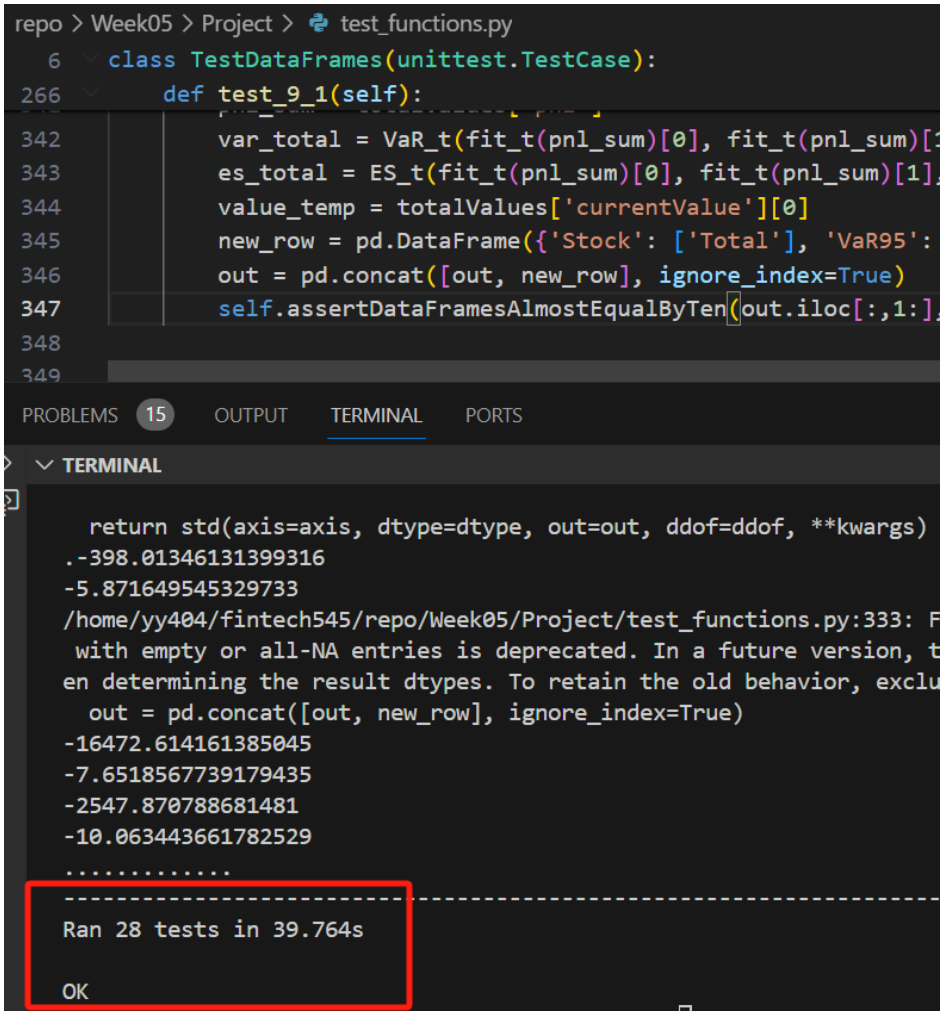
Project Week05 – Yue Yu(yy404)

Problem1

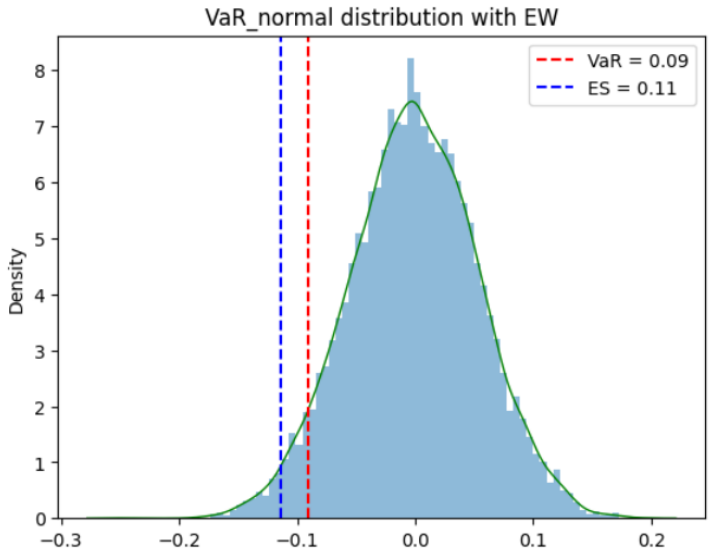
Pass all the tests.

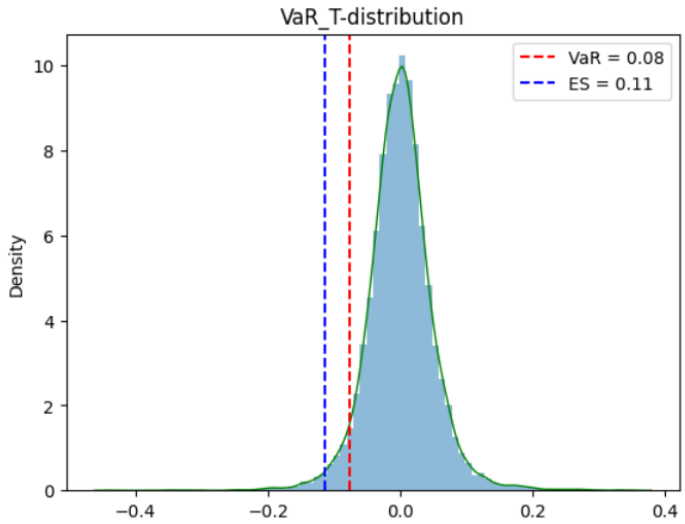


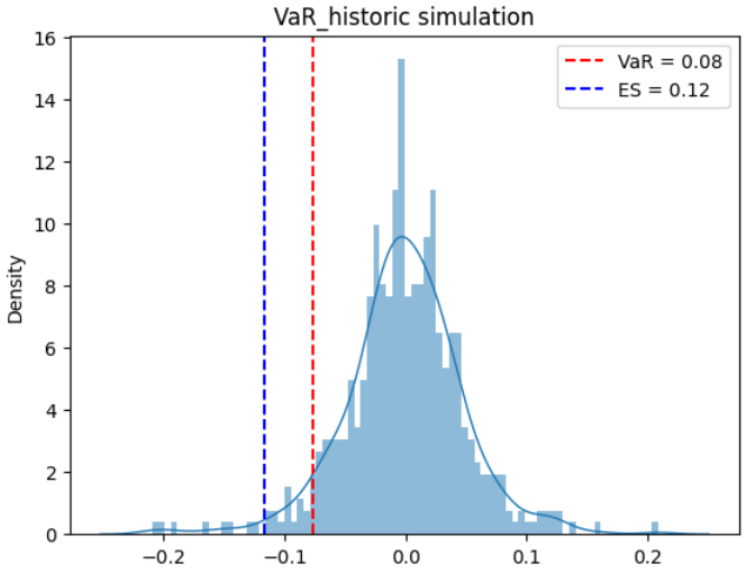
Problem2

Using the data in problem1.csv, the VaR and ES are calculated by 3 fitting methods as following:

	VaR	ES
Normal distribution with EW	0.0911693	0.1141065
MLE + t distribution	0.0764756	0.1132179
Historic Simulation	0.0759807	0.1167766







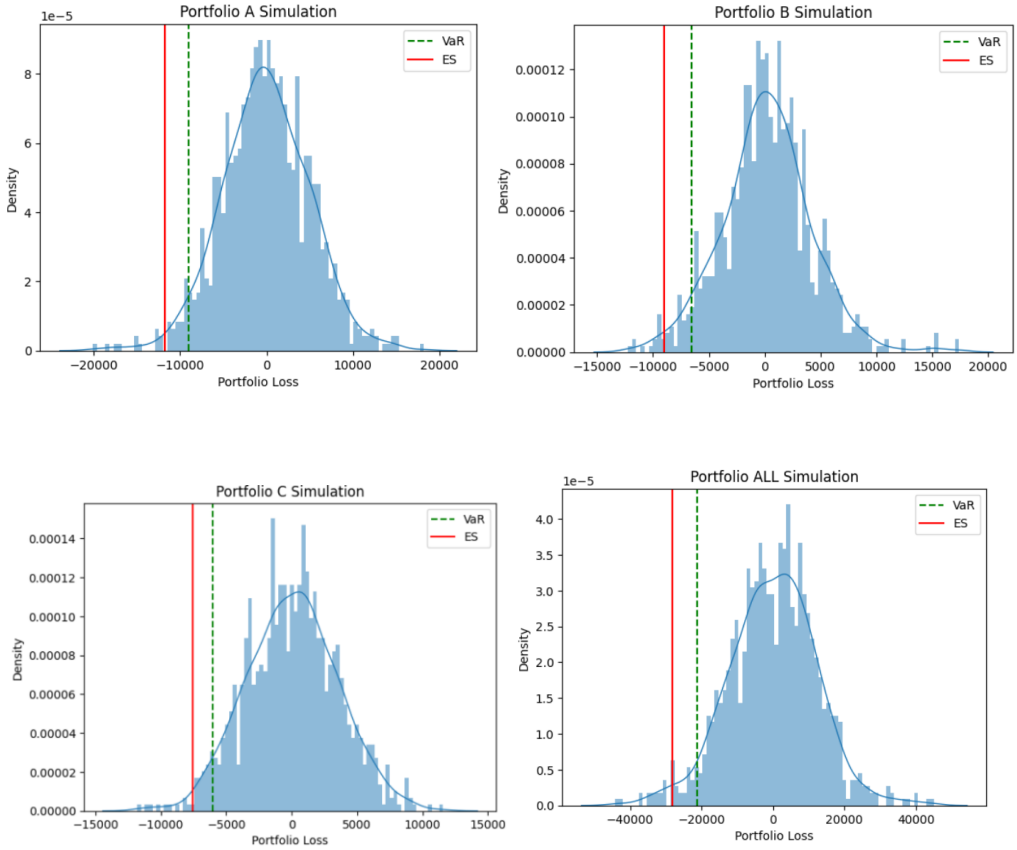
We can see that the VaR under the Normal Distribution with EW is noticeably the largest,

while the VaR under MLE-fitted t distribution and Historical Simulation are approximately similar. However, the ES estimates for these three fitting methods are very close. I believe this is because the Normal Distribution is more concentrated in the center, whereas the t Distribution has thicker tails. Moreover, from the graphical perspective, the t Distribution aligns better with Historical Simulation, and one could argue it is closer to real-world conditions.

Problem3

By fitting Generalized T model to portfolio A and B, and Normal distribution to portfolio ES, the VaR and ES as following:

Portfolio	VaR	ES
A	9022.89	11752.09
B	6886.91	8962.14
C	6217.31	7568.13
Total	21333.03	28153.62



By comparing the VaR from Copula with the methods last week, we can see the VaR is

completely different, which due to the different portfolios and returns.

Portfolio	Copula	Delta Normal	Monte Carlo	Historic
A	9022.89	15426.97	14014.13	17933.41
B	6886.91	8082.57	7474.11	10983.46
C	6217.31	18163.29	16285.41	21409.75
Total	21333.03	38941.38	35642.05	49544.19