Assignment 4

FINA 5250 Empirical Methods in Finance

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Question 1

1.1

The covariance matrix Σ_{t+1} is as follows:

```
##          [,1]    [,2]     [,3]
## [1,] 0.00010 0.00030 0.000240
## [2,] 0.00030 0.00090 0.000720
## [3,] 0.00024 0.00072 0.000576
```

1.2

Assume $R_{P,t+1}$ is standard normal, then the 1% VaR for the one-day ahead return of B is:

```
## [1] 0.06979044
```

1.3

Assume $R_{P,t+1}$ is standard normal, then the 1% VaR for the one-day ahead return of the portfolio is:

```
## [1] 0.04303744
```

The beta of the portfolio is:

```
## [1] 0.925
```

Question 2

The 1-day, 1% VaR of of the portfolio is:

```
## [1] 0.01199291
```

The 1-day, 1% VaR of of DJIA is:

```
## [1] 0.02483741
```

The VaR of the portfolio is lower than that of DJIA, because part of the unsystematic risk is diversified.