N0.1 a)

```
Resulting MAP estimates = [2.5411      0.2595]

Resulting number of iterations = 7
```

b)

```
Resulting MAP estimates = [2.541     0.25952]

Resulting number of iterations = 5
```

N0.2

```
CM = 2×2
    0.4036         0
         0    0.0042

CD = 5×5
10^-8 ×
    0.6665         0         0         0         0
         0    0.0806         0         0         0
         0         0    0.3490         0         0
         0         0         0    0.0976         0
         0         0         0         0    0.1778

MAP = 2×1
    2.5411
    0.2595
iter =
     6

Resulting MAP estimates = [2.5411      0.2595]

Resulting number of iterations = 6

covariance_matrix = 2×2
10^-9 ×
    0.2389   -0.0130
   -0.0130    0.0008
```

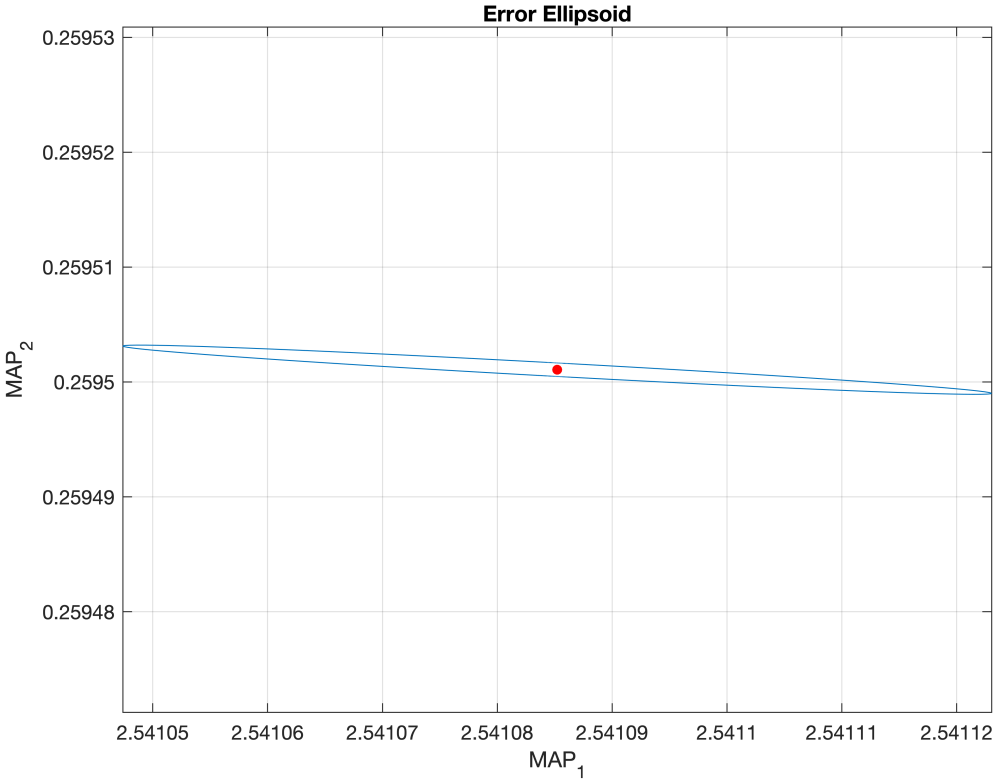
Because $(\sigma_{LM})_1(\sigma_{LM})_2 \neq 0$, then the computed confidence interval doesn't capture the relationship between MAP_1 and MAP_2

```
Resulting cofidence_interval for the first estimate =  [2.541054921983898       2.54111550902723]

Resulting cofidence_interval for the first estimate =  [0.2594993499022446     0.2595027800518799]
```

The estimates lie with in the confidence interval.

```
Correlation_matrix = 2×2
    1.0000   -0.9616
   -0.9616    1.0000
```



The values of the estimates lie at the center of the ellipsoid, which implies that the estimates lie with in the confidence region.