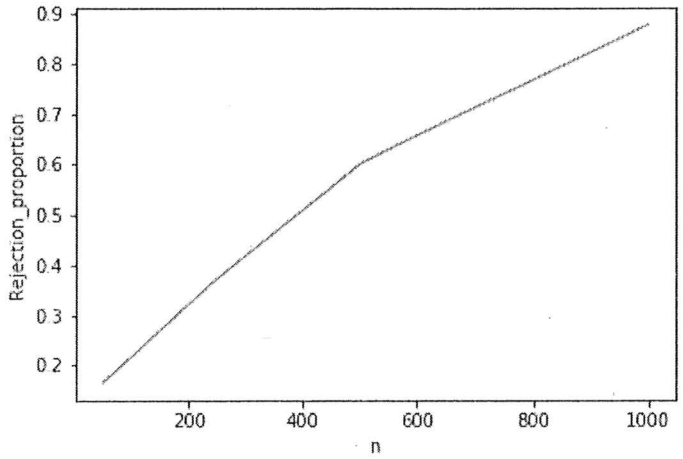
(85) + 1 day late

LAB 3,ACS2, PANKAJ CHOUHAN

Problem 1, Part 2



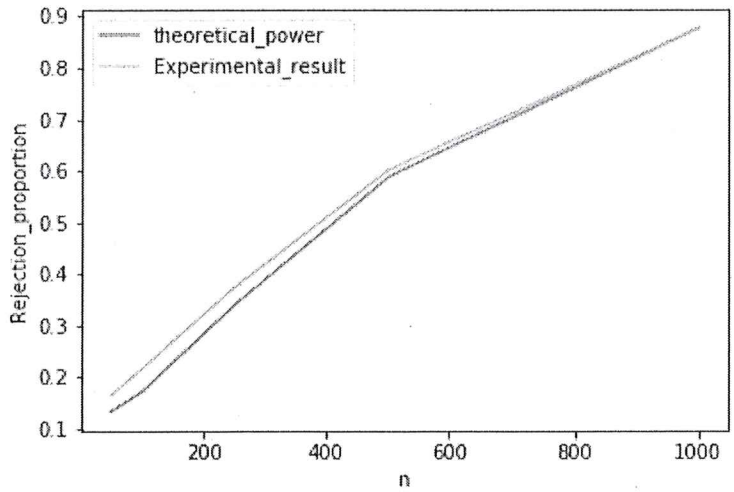
✓ (1) + 12.5/12.5

(2) + 12.5/12.5

As the sample size increase we can see that Rejection Proportion approaches to 1.

Problem 1, Part 3

Please refer to Notebook for theoretical explanation as it's written in LATEX.



(3) + 12.5/12.5

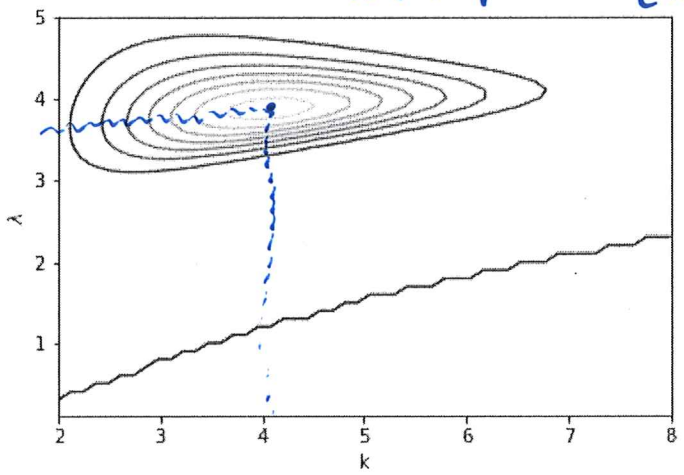
(4) + 12.5/12.5

Theoretical Power is almost the same as what I have observed in experiment.

Problem 2, Part 1

Please refer to Notebook for expression as it's written in LATEX and I can't copy them to WORD.

Problem 2,Part 2



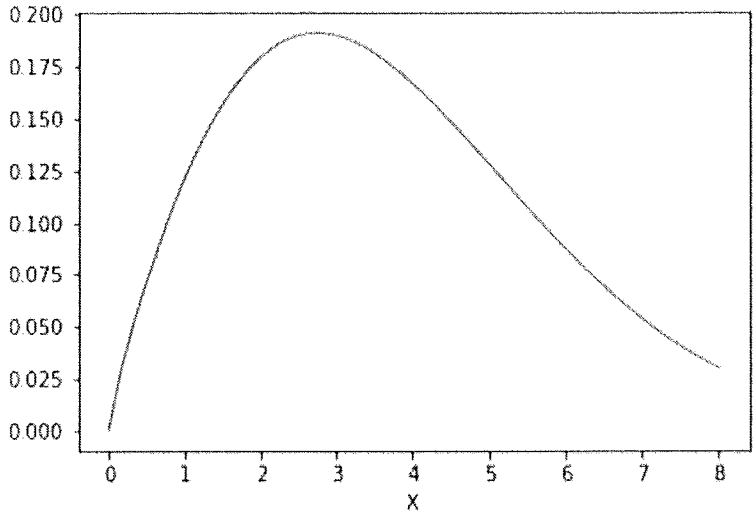
Note : - I am not aware of the reason for the line in plot. I tried to figure it out but can't seem to figure out a reason for this behavior.

Problem 2, Part 3 and Part 4

For X in range (3,6)

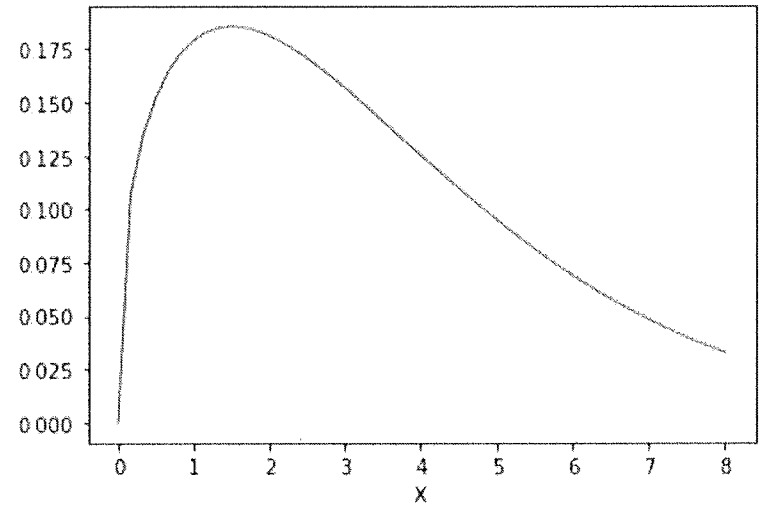
Results and Warning of the solver

```
Warning: Desired error not necessarily achieved due to precision loss.
         Current function value: -3.147914
         Iterations: 3
         Function evaluations: 98
         Gradient evaluations: 86
k,lamb =  1.8247438778440916 4.242582359693068
```



For X in range (3,4)

Results and Warning of the solver

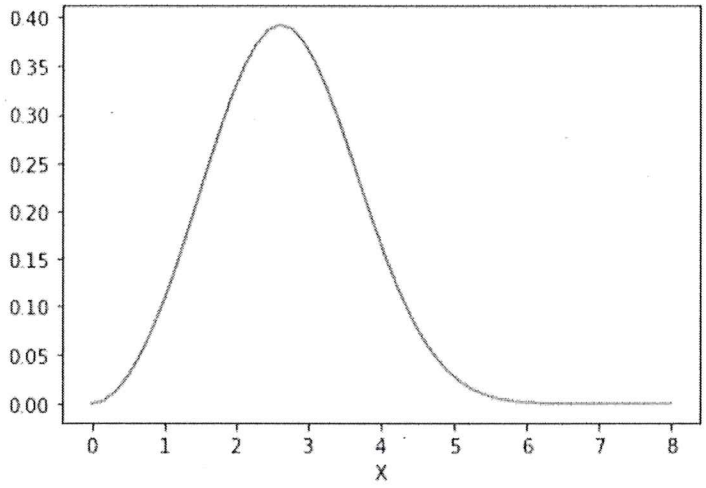



```
Warning: Desired error not necessarily achieved due to precision loss.
         Current function value: -3.383666
         Iterations: 3
         Function evaluations: 100
         Gradient evaluations: 88
k,lamb =  1.3616844114019195 3.9583389843755326
```

For X in range (3,3.1)

Results and Warning of the solver

```
Warning: Desired error not necessarily achieved due to precision loss.
         Current function value: -2.000202
         Iterations: 0
         Function evaluations: 106
         Gradient evaluations: 94
k,lamb =  3.0 3.0
```



I have used most of the solver available in scipy.optimize.minimize and none of them seems to able to minimize the problem. 'BFGS' solver come close to actual result, so therefore i am reporting the result from that solver.

(4) Maybe it's because you aren't incorporating $\nabla_z \hat{L}$ correctly. You are also plotting $p(x|z)$, not the likelihood. $+\frac{10}{20}$