**Task A**

1.a.



Denominator

Numerator

1.b.

Test=

{'+'} {'-'} {'+'} {'+'} {'+'} {'+'} {'+'} {'-'} {'-'} {'-'}

post\_pres\_test =

0.0010 0.0194 0.0000 0.3477 0.9864 0.9998 1.0000 1.0000 0.0000 0.0000 0.0000

post\_abs\_test =

0.9990 0.7219 1.0000 0.0949 0.0048 0.0002 0.0000 0.0000 1.0000 1.0000 1.0000

**Task B**

1&2.





3.





4.a.

|  |  |  |  |
| --- | --- | --- | --- |
|  | n=10 | n=1000 | n=100000 |
| Likelihood | 9.7656e-04 | 9.3326e-302 | 0 |

For large values of n, we have likelihood=0.

4.b.

|  |  |  |  |
| --- | --- | --- | --- |
|  | n=10 | n=1000 | n=100000 |
| Log-Likelihood | -6.9315 | -693.1472 | -6.9315e+04 |

Log-likelihood avoids overfit and underfit.

4.c.

|  |  |  |  |
| --- | --- | --- | --- |
|  | n=10 | n=1000 | n=100000 |
| Likelihood | 9.7656e-04 | 9.3326e-302 | 0 |

4.d.







4.e. As the number of observation increases, the likelihood function becomes more non-biased.

5.i&ii.

 

 

 

The present figures are the rescaled form of the previous ones and the result is that the previous measured likelihood multiplied by uniform prior distribution.

5.iii.

Col 1, Fig 6.4: a=b=250





Col 2, Fig 6.4: a=18.25,b=6.75

 

Col 3, Fig 6.4: a=b=1

 