HW4

May 23, 2023

STAT 207 HW4

Due June 2nd

Your Name

All homeworks should be completed independently; make your answers and codes as concise as possible; avoid excessive outputs; submit BOTH your source code and output file to Canvas.

Please refer to the textbook for full statements of the problems.

1. NAS Problem 13.10.9

In a genetic linkage experiment, …

2. NAS Problem 13.10.13

Consider an i.i.d. sample drawn from a bivariate normal distribution …

Write out the EM algorithm and the functions for implementation, with the following true parameters

```
[5]: import numpy as np

mu = np.array([2,10])
sigma = np.array([[4, 1], [1, 6]])

p=20
q=30
r=40
```

(100, 3)

3. NAS Problem 14.11.1

Consider the map …

4. NAS Problem 14.11.2 and 14.11.3

Problem 14 of Chapter 5 can be adapted to extract the m-th root of a positive semidefinite matrix A. …

5. NAS Problem 14.11.12

In robust regression ...

6. NAS AIDS Model

Model the AIDS data in Table 14.2 with the Poisson distribution $\mu_i(\theta) = \exp(\theta_1 + i\theta_2)$.

    a) Implement the Fisher scoring method

    b) Implement one of the quasi-Newton methods (rank-one or rank-two DFP or BFGS)

[ ]: