Week 3 Project

Problem 2

Here are the results:

图表, 折线图

描述已自动生成

图表, 折线图

描述已自动生成

As N increases, the Frobenius Norm of Higham’s method stays almost the same. But the Frobenius Norm of near\_psd increases significantly. This indicates that Higham’s method generates more accurate results. As N increases, the run time of Higham’s method increases significantly. But the run time of near\_psd doesn’t increase much.

So, we can conclude that the pros of Higham’s method is that the implementation is more robust and it works well for large matrices. The cons of Higham’s method is that it takes more time to run when working with large matrices. The pros of near\_psd is that it works well for small matrices and the run time remains short when working with large matrices. The cons of near\_psd is that as the matrices get larger, the error increases sharply.

I would choose to use near\_psd when I need to make a quick correction to a small non-PSD matrix. I would choose to use higham() when run time is not important. I can then get a more accurate result, especially when the matrices are large.