# Homework 12 Mini Report

The time it took the CuPy parallelized matrix population and operations to complete was 4.401585 seconds. For a similar operation, Numpy took 58.65332 seconds to finish. Using CuPy for a $30000^2$ matrix resulted in a 13.32549979x speedup as compared to Numpy. This is likely because of the ability for CuPy to rapidly populate the K matrix and f vector with it comparatively vast number of workers. Additionally, populating the matrix and vector was a menial task, not requiring much power. There may also have been parallelism-based time saves with CuPy's linalg.solve() function that Numpy may not have been able to exploit due to a more limited number of workers.