Runtime (seconds)

25
20
15
10
5
0

program0
program1

5000   10000   15000   20000   25000   30000

Input (size)

Based on the graph, as we increase the input size ,the run time difference between program0 and program1 increases. We can see that program0 runs faster than program1 as the size grows. Program0 and program1 are similar programs the only difference is how they iterate through matrix vectors. Program0 iterates through matrix vector through adjacent elements, so it iterates through the matrix row by row, while program1 jumps from element to element, because it iterates through the matrix column by column. Both programs have the same complexity but program0 will run faster as the elements is it iterating through are next to each and the program doesn't have jump back and forth like program1 does. As the input becomes larger and larger the difference can be seen more clearly and program1 gradually become slower and slower than program0.