**PA4 Report by Siyuan Yang**

Data Requests:

*n = 15k*



*Table 1.* *Runtime with different numbers of worker threads*

*Diagram 1. Runtime vs. w*

Discussion:

For runtime with different numbers of worker threads, as the number of worker threads increases, the running time decreases proportionately. The change of runtime is linearly proportional to the change of number of worker threads, but when the number of worker threads surpasses 500, the change of runtime would be smaller and even remain unchanged.

*n = 15k*



*Table 2. Runtime with different sizes of request buffer*

*Diagram 2. Runtime vs. b*

Discussion:

For runtime with different sizes of request buffer, the change of size of does not necessarily affect the performance of the program. As b is the size of request buffer, it is no longer the bottleneck of the program since the context switch of the worker thread contribute more when the size gets larger. There is not an obvious trend in the relationship between buffer size and runtime.



*Table 3. Runtime with different numbers of requests per patient*

*Diagram 3. Runtime vs. n*

Discussion:

For runtime with different numbers of requests per patient, as the number of requests per patient increases, the running time increases. The change is linear for certain range, as the number of requests would allow the program to process the data longer.

File Request:



*Table 4. Runtime with different numbers of worker threads*

*Diagram 4. Runtime vs. w*

Discussion:

For runtime with different numbers of worker threads, as the number of requests per patient increases, the running time decreases then increases. There is no linear scaling overall, but it has some linear feature within certain range.



*Table 5. Runtime with different sizes of buffer capacity*

*Diagram 5. Runtime vs. m*

Discussion:

For runtime with different buffer capacity, as the number of buffer capacity increases, the running time decreases. The change of runtime is linearly proportional to the change of buffer capacity, as the buffer capacity increases, the program can process the data more efficiently.