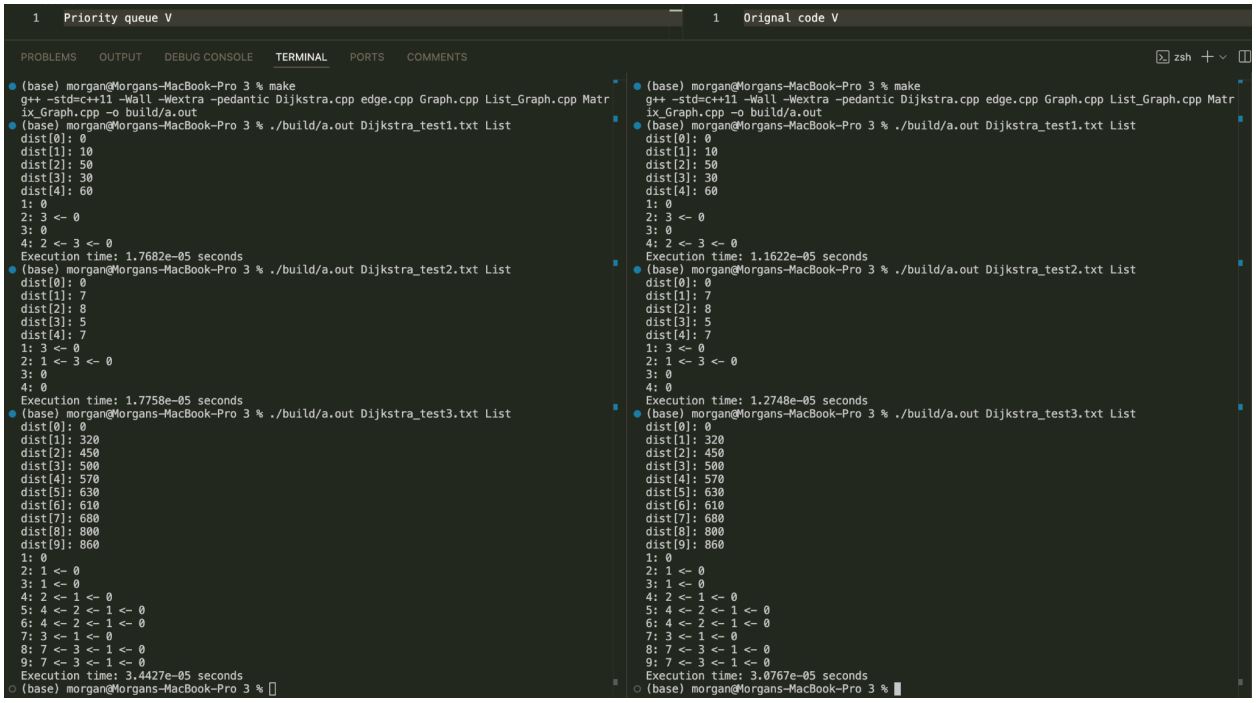
From the results we may observe that there is a slight improvement in the code where a priority queue is used. I personally believe that the data used is not significant enough to come to a conclusion. Even on my Larger_test1.txt file that is significantly larger than given test files it is difficult to come to a conclusion. There are too many confounding variables(startup times, cpu scheduler) to display the theoretical improvement of the priority queue. If we were to test this code on a larger data set we would see the efficiency of the priority queue to be O(log V) as compared to the original O(V^2). Both of these algorithms both have the same accuracy and will return the same results.

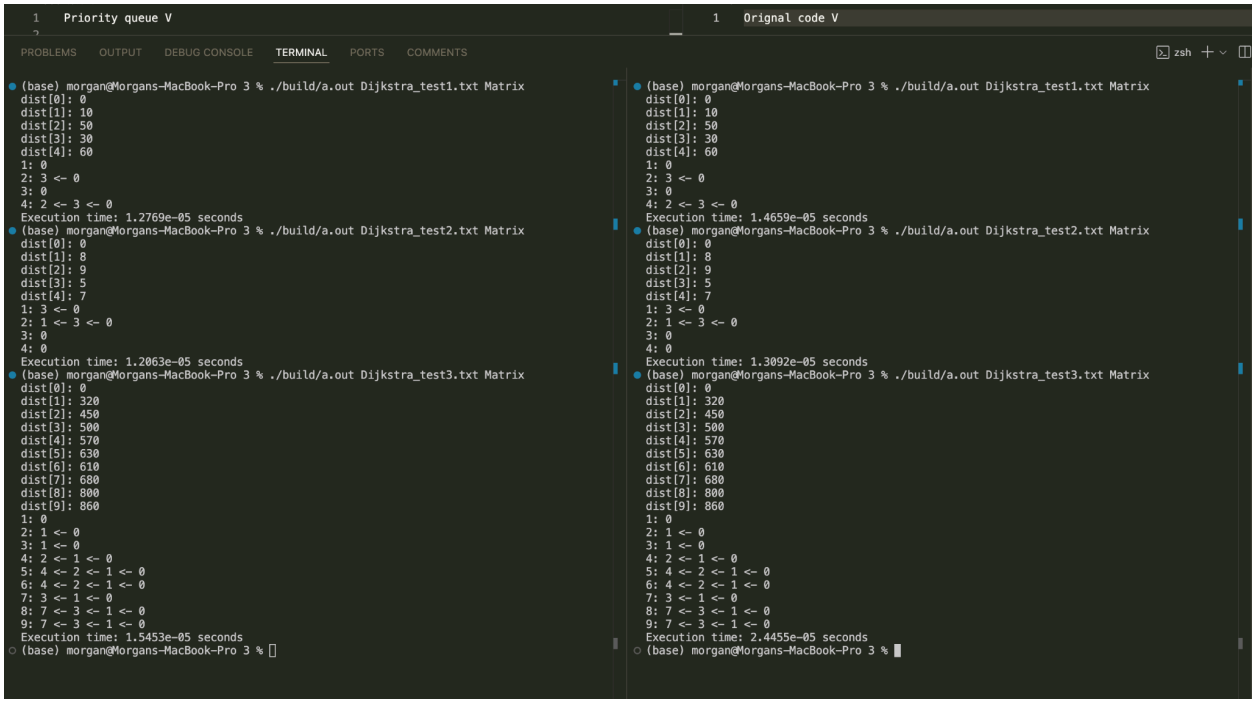
Tested on the original test files

Test/File & Type	Original Code (s)	Priority Queue (s)
Dijkstra_test1 (List)	1.1622e-05	1.7682e-05
Dijkstra_test2 (List)	1.2748e-05	1.7758e-05
Dijkstra_test3 (List)	3.0767e-05	3.4427e-05
Dijkstra_test1 (Matrix)	1.4659e-05	1.2769e-05
Dijkstra_test2 (Matrix)	1.3092e-05	1.2063e-05
Dijkstra_test3 (Matrix)	2.4455e-05	1.5453e-05

Tested on the Larger_test1.txt file

Implementation (List)	Execution Time (s)
Priority Queue Implementation	0.000845937
Original Dijkstra	0.00100736


1 Priority queue V
1 Orignal code V
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS COMMENTS
zsh
(base) morgan@Morgans-MacBook-Pro 3 % make
g++ -std=c++11 -Wall -Wextra -pedantic Dijkstra.cpp edge.cpp Graph.cpp List_Graph.cpp Matrix_Graph.cpp -o build/a.out
(base) morgan@Morgans-MacBook-Pro 3 % ./build/a.out Dijkstra_test1.txt List
dist[0]: 0
dist[1]: 10
dist[2]: 50
dist[3]: 30
dist[4]: 60
1: 0
2: 3 <- 0
3: 0
4: 2 <- 3 <- 0
Execution time: 1.7682e-05 seconds
(base) morgan@Morgans-MacBook-Pro 3 % ./build/a.out Dijkstra_test2.txt List
dist[0]: 0
dist[1]: 7
dist[2]: 8
dist[3]: 5
dist[4]: 7
1: 3 <- 0
2: 1 <- 3 <- 0
3: 0
4: 0
Execution time: 1.7758e-05 seconds
(base) morgan@Morgans-MacBook-Pro 3 % ./build/a.out Dijkstra_test3.txt List
dist[0]: 0
dist[1]: 320
dist[2]: 450
dist[3]: 500
dist[4]: 570
dist[5]: 630
dist[6]: 610
dist[7]: 680
dist[8]: 800
dist[9]: 860
1: 0
2: 1 <- 0
3: 1 <- 0
4: 2 <- 1 <- 0
5: 4 <- 2 <- 1 <- 0
6: 4 <- 2 <- 1 <- 0
7: 3 <- 1 <- 0
8: 7 <- 3 <- 1 <- 0
9: 7 <- 3 <- 1 <- 0
Execution time: 3.4427e-05 seconds
(base) morgan@Morgans-MacBook-Pro 3 %
(base) morgan@Morgans-MacBook-Pro 3 % make
g++ -std=c++11 -Wall -Wextra -pedantic Dijkstra.cpp edge.cpp Graph.cpp List_Graph.cpp Matrix_Graph.cpp -o build/a.out
(base) morgan@Morgans-MacBook-Pro 3 % ./build/a.out Dijkstra_test1.txt List
dist[0]: 0
dist[1]: 10
dist[2]: 50
dist[3]: 30
dist[4]: 60
1: 0
2: 3 <- 0
3: 0
4: 2 <- 3 <- 0
Execution time: 1.1622e-05 seconds
(base) morgan@Morgans-MacBook-Pro 3 % ./build/a.out Dijkstra_test2.txt List
dist[0]: 0
dist[1]: 7
dist[2]: 8
dist[3]: 5
dist[4]: 7
1: 3 <- 0
2: 1 <- 3 <- 0
3: 0
4: 0
Execution time: 1.2748e-05 seconds
(base) morgan@Morgans-MacBook-Pro 3 % ./build/a.out Dijkstra_test3.txt List
dist[0]: 0
dist[1]: 320
dist[2]: 450
dist[3]: 500
dist[4]: 570
dist[5]: 630
dist[6]: 610
dist[7]: 680
dist[8]: 800
dist[9]: 860
1: 0
2: 1 <- 0
3: 1 <- 0
4: 2 <- 1 <- 0
5: 4 <- 2 <- 1 <- 0
6: 4 <- 2 <- 1 <- 0
7: 3 <- 1 <- 0
8: 7 <- 3 <- 1 <- 0
9: 7 <- 3 <- 1 <- 0
Execution time: 3.0767e-05 seconds
(base) morgan@Morgans-MacBook-Pro 3 %


1 Priority queue V
1 Orignal code V
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS COMMENTS
zsh
(base) morgan@Morgans-MacBook-Pro 3 % ./build/a.out Dijkstra_test1.txt Matrix
dist[0]: 0
dist[1]: 10
dist[2]: 50
dist[3]: 30
dist[4]: 60
1: 0
2: 3 <- 0
3: 0
4: 2 <- 3 <- 0
Execution time: 1.2769e-05 seconds
(base) morgan@Morgans-MacBook-Pro 3 % ./build/a.out Dijkstra_test2.txt Matrix
dist[0]: 0
dist[1]: 8
dist[2]: 9
dist[3]: 5
dist[4]: 7
1: 3 <- 0
2: 1 <- 3 <- 0
3: 0
4: 0
Execution time: 1.2063e-05 seconds
(base) morgan@Morgans-MacBook-Pro 3 % ./build/a.out Dijkstra_test3.txt Matrix
dist[0]: 0
dist[1]: 320
dist[2]: 450
dist[3]: 500
dist[4]: 570
dist[5]: 630
dist[6]: 610
dist[7]: 680
dist[8]: 800
dist[9]: 860
1: 0
2: 1 <- 0
3: 1 <- 0
4: 2 <- 1 <- 0
5: 4 <- 2 <- 1 <- 0
6: 4 <- 2 <- 1 <- 0
7: 3 <- 1 <- 0
8: 7 <- 3 <- 1 <- 0
9: 7 <- 3 <- 1 <- 0
Execution time: 1.5453e-05 seconds
(base) morgan@Morgans-MacBook-Pro 3 %
(base) morgan@Morgans-MacBook-Pro 3 % ./build/a.out Dijkstra_test1.txt Matrix
dist[0]: 0
dist[1]: 10
dist[2]: 50
dist[3]: 30
dist[4]: 60
1: 0
2: 3 <- 0
3: 0
4: 2 <- 3 <- 0
Execution time: 1.4659e-05 seconds
(base) morgan@Morgans-MacBook-Pro 3 % ./build/a.out Dijkstra_test2.txt Matrix
dist[0]: 0
dist[1]: 8
dist[2]: 9
dist[3]: 5
dist[4]: 7
1: 3 <- 0
2: 1 <- 3 <- 0
3: 0
4: 0
Execution time: 1.3092e-05 seconds
(base) morgan@Morgans-MacBook-Pro 3 % ./build/a.out Dijkstra_test3.txt Matrix
dist[0]: 0
dist[1]: 320
dist[2]: 450
dist[3]: 500
dist[4]: 570
dist[5]: 630
dist[6]: 610
dist[7]: 680
dist[8]: 800
dist[9]: 860
1: 0
2: 1 <- 0
3: 1 <- 0
4: 2 <- 1 <- 0
5: 4 <- 2 <- 1 <- 0
6: 4 <- 2 <- 1 <- 0
7: 3 <- 1 <- 0
8: 7 <- 3 <- 1 <- 0
9: 7 <- 3 <- 1 <- 0
Execution time: 2.4455e-05 seconds
(base) morgan@Morgans-MacBook-Pro 3 %