Floyd’s Algorithm

File 1 Shortest Path Output

10

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 5 | 8 | 7 | 9 | 6 | 7 | 8 | 6 | 2 |
| 5 | 0 | 8 | 2 | 4 | 7 | 5 | 4 | 9 | 3 |
| 8 | 8 | 0 | 6 | 8 | 4 | 3 | 7 | 2 | 8 |
| 7 | 2 | 6 | 0 | 2 | 9 | 3 | 6 | 7 | 5 |
| 9 | 4 | 8 | 2 | 0 | 10 | 5 | 8 | 9 | 7 |
| 6 | 7 | 4 | 9 | 10 | 0 | 7 | 10 | 6 | 4 |
| 7 | 5 | 3 | 3 | 5 | 7 | 0 | 9 | 4 | 8 |
| 8 | 4 | 7 | 6 | 8 | 10 | 9 | 0 | 9 | 6 |
| 6 | 9 | 2 | 7 | 9 | 6 | 4 | 9 | 0 | 8 |
| 2 | 3 | 8 | 5 | 7 | 4 | 8 | 6 | 8 | 0 |

File 2 Shortest Path Output

20

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 9 | 3 | 9 | 1 | 7 | 5 | 4 | 7 | 12 | 10 | 7 | 8 | 4 | 5 | 8 | 3 | 2 | 4 | 5 |
| 9 | 0 | 10 | 4 | 10 | 7 | 11 | 9 | 11 | 13 | 13 | 13 | 7 | 11 | 4 | 8 | 11 | 7 | 10 | 10 |
| 3 | 10 | 0 | 6 | 2 | 4 | 3 | 3 | 4 | 13 | 7 | 4 | 7 | 1 | 7 | 5 | 6 | 5 | 1 | 4 |
| 9 | 4 | 6 | 0 | 8 | 9 | 9 | 9 | 10 | 12 | 13 | 10 | 6 | 7 | 8 | 8 | 12 | 7 | 7 | 9 |
| 1 | 10 | 2 | 8 | 0 | 6 | 5 | 5 | 6 | 13 | 9 | 6 | 7 | 3 | 6 | 7 | 4 | 3 | 3 | 4 |
| 7 | 7 | 4 | 9 | 6 | 0 | 5 | 7 | 8 | 9 | 11 | 8 | 3 | 5 | 3 | 1 | 10 | 6 | 5 | 6 |
| 5 | 11 | 3 | 9 | 5 | 5 | 0 | 6 | 5 | 10 | 6 | 7 | 4 | 2 | 8 | 6 | 8 | 7 | 4 | 1 |
| 4 | 9 | 3 | 9 | 5 | 7 | 6 | 0 | 7 | 16 | 10 | 7 | 10 | 4 | 5 | 8 | 7 | 2 | 4 | 7 |
| 7 | 11 | 4 | 10 | 6 | 8 | 5 | 7 | 0 | 12 | 9 | 6 | 6 | 3 | 11 | 8 | 6 | 9 | 3 | 6 |
| 12 | 13 | 13 | 12 | 13 | 9 | 10 | 16 | 12 | 0 | 16 | 15 | 6 | 12 | 12 | 8 | 15 | 14 | 14 | 9 |
| 10 | 13 | 7 | 13 | 9 | 11 | 6 | 10 | 9 | 16 | 0 | 10 | 10 | 6 | 9 | 12 | 13 | 12 | 8 | 7 |
| 7 | 13 | 4 | 10 | 6 | 8 | 7 | 7 | 6 | 15 | 10 | 0 | 9 | 5 | 11 | 9 | 10 | 9 | 3 | 6 |
| 8 | 7 | 7 | 6 | 7 | 3 | 4 | 10 | 6 | 6 | 10 | 9 | 0 | 6 | 6 | 2 | 11 | 9 | 8 | 3 |
| 4 | 11 | 1 | 7 | 3 | 5 | 2 | 4 | 3 | 12 | 6 | 5 | 6 | 0 | 8 | 6 | 7 | 6 | 2 | 3 |
| 5 | 4 | 7 | 8 | 6 | 3 | 8 | 5 | 11 | 12 | 9 | 11 | 6 | 8 | 0 | 4 | 7 | 3 | 8 | 9 |
| 8 | 8 | 5 | 8 | 7 | 1 | 6 | 8 | 8 | 8 | 12 | 9 | 2 | 6 | 4 | 0 | 11 | 7 | 6 | 5 |
| 3 | 11 | 6 | 12 | 4 | 10 | 8 | 7 | 6 | 15 | 13 | 10 | 11 | 7 | 7 | 11 | 0 | 5 | 7 | 8 |
| 2 | 7 | 5 | 7 | 3 | 6 | 7 | 2 | 9 | 14 | 12 | 9 | 9 | 6 | 3 | 7 | 5 | 0 | 6 | 7 |
| 4 | 10 | 1 | 7 | 3 | 5 | 4 | 4 | 3 | 14 | 8 | 3 | 8 | 2 | 8 | 6 | 7 | 6 | 0 | 5 |
| 5 | 10 | 4 | 9 | 4 | 6 | 1 | 7 | 6 | 9 | 7 | 6 | 3 | 3 | 9 | 5 | 8 | 7 | 5 | 0 |

Average runtimes of Floyd’s algorithm on different sized random matrices

Size Average Time(milliseconds)

100 2.10

200 12.40

500 182.20

1000 2207.20

Dijkstra’s Algorithm

File 3 Shortest Path Output

[2] 3->1

[21] 3->9->2

[0] 3

[11] 3->8->4

[17] 3->8->5

[21] 3->8->10->6

[15] 3->8->7

[6] 3->8

[10] 3->9

[13] 3->8->10

File 4 Shortest Path Output

[8] 9->17->7->1

[5] 9->2

[11] 9->17->3

[9] 9->4

[9] 9->2->12->5

[9] 9->17->7->1->6

[6] 9->17->7

[8] 9->2->8

[0] 9

[10] 9->17->15->10

[9] 9->2->11

[8] 9->2->12

[12] 9->2->13

[20] 9->17->7->1->6->14

[4] 9->17->15

[12] 9->4->16

[3] 9->17

[9] 9->17->15->18

[18] 9->2->11->19

[6] 9->20

Average runtimes of Dijkstra’s algorithm on different sized random matrices and random source vertices

Size Average Time(milliseconds)

100 0.30

200 0.30

500 5.6

1000 10.7

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 100 | 200 | 500 | 1000 |
| Run 1 | 0.00 | 0.00 | 22.00 | 0.00 |
| Run 2 | 1.00 | 2.00 | 0.00 | 15.00 |
| Run 3 | 1.00 | 0.00 | 0.00 | 0.00 |
| Run 4 | 1.00 | 0.00 | 0.00 | 15.00 |
| Run 5 | 0.00 | 1.00 | 2.00 | 15.00 |
| Run 6 | 0.00 | 0.00 | 16.00 | 0.00 |
| Run 7 | 0.00 | 0.00 | 0.00 | 15.00 |
| Run 8 | 0.00 | 0.00 | 0.00 | 16.00 |
| Run 9 | 0.00 | 0.00 | 0.00 | 15.00 |
| Run 10 | 0.00 | 0.00 | 16.00 | 16.00 |