```
/Library/Java/JavaVirtualMachines/jdk-13.0.1.jdk/Contents/Home/bin/java "-javaagent:/Applications/IntelliJ IDEA.app/Contents/lib/idea_rt.jar=60379:/Applications/IntelliJ IDEA.app/Contents/bin" -Dfile.encoding=UTF-8 -classpath "/Users/lanshunfang/Documents/NEU-Classes-Courses/Program Structure - Algorithms/alg-hw/out/production/alg-hw" org.neu.alg.hw.hw10.GraphTest
Java version used for this program is 13.0.1
GraphTest.java starts
You can see dot file at /Users/lanshunfang/Downloads/graph-output/7.dot
------------------- 7.txt -------------------

0       2       3       1       6       4       5
F       F       F       F       F       F       F
0.0     L       L       L       L       L       L
0       2       3       1       6       4       5


Work on vertex: 0

0       2       3       1       6       4       5
T       F       F       F       F       F       F
0.0     5.0     3.0     14.0    L       L       L
0       0       0       0       6       4       5

Work on vertex: 3

0       2       3       1       6       4       5
T       F       T       F       F       F       F
0.0     5.0     3.0     9.0     L       10.0    L
0       0       0       3       6       3       5

Work on vertex: 2

0       2       3       1       6       4       5
T       T       T       F       F       F       F
0.0     5.0     3.0     9.0     L       8.0     7.0
0       0       0       3       6       2       2

Work on vertex: 5

0       2       3       1       6       4       5
```

```
T       T       T       F       F       F       T
0.0     5.0     3.0     9.0     14.0    8.0     7.0
0       0       0       3       5       2       2

Work on vertex: 4

0       2       3       1       6       4       5
T       T       T       F       F       T       T
0.0     5.0     3.0     9.0     13.0    8.0     7.0
0       0       0       3       4       2       2

Work on vertex: 1

0       2       3       1       6       4       5
T       T       T       T       F       T       T
0.0     5.0     3.0     9.0     13.0    8.0     7.0
0       0       0       3       4       2       2

Work on vertex: 6

0       2       3       1       6       4       5
T       T       T       T       T       T       T
0.0     5.0     3.0     9.0     13.0    8.0     7.0
0       0       0       3       4       2       2

The best way to go from 0 to city 2 is follows
0 -> 2  Cost = 5.0 = 5.0
The best way to go from 0 to city 3 is follows
0 -> 3  Cost = 3.0 = 3.0
The best way to go from 0 to city 1 is follows
0 -> 3 -> 1  Cost = 3.0 + 6.0 = 9.0
The best way to go from 0 to city 6 is follows
0 -> 2 -> 4 -> 6  Cost = 5.0 + 3.0 + 5.0 = 13.0
The best way to go from 0 to city 4 is follows
0 -> 2 -> 4  Cost = 5.0 + 3.0 = 8.0
The best way to go from 0 to city 5 is follows
0 -> 2 -> 5  Cost = 5.0 + 2.0 = 7.0
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Graph Type    = WEIGHTED_DIRECTED GRAPH
Num Vertices  = 7
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Num Edges     = 12
Work done     = 12
numOfNodeAddedToHeap     = 16
Shortest path from city 0 to city 6   =  13.0
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You can see dot file at /Users/lanshunfang/Downloads/graph-output/17.dot
------------------- 17.txt -------------------

C       D       E       B       G       F       A
F       F       F       F       F       F       F
L       L       L       L       L       L       0.0
C       D       E       B       G       F       A


Work on vertex: A

C       D       E       B       G       F       A
F       F       F       F       F       F       T
3.0     L       L       1.0     L       10.0    0.0
A       D       E       A       G       A       A

Work on vertex: B

C       D       E       B       G       F       A
F       F       F       T       F       F       T
2.0     8.0     6.0     1.0     3.0     10.0    0.0
B       B       B       A       B       A       A

Work on vertex: C

C       D       E       B       G       F       A
T       F       F       T       F       F       T
2.0     8.0     5.0     1.0     3.0     10.0    0.0
B       B       C       A       B       A       A

Work on vertex: G

C       D       E       B       G       F       A
T       F       F       T       T       F       T
2.0     8.0     5.0     1.0     3.0     10.0    0.0
B       B       C       A       B       A       A
```

```
Work on vertex: E

C       D       E       B       G       F       A
T       F       T       T       T       F       T
2.0     7.0     5.0     1.0     3.0     7.0     0.0
B       E       C       A       B       E       A

Work on vertex: D

C       D       E       B       G       F       A
T       T       T       T       T       F       T
2.0     7.0     5.0     1.0     3.0     7.0     0.0
B       E       C       A       B       E       A

Work on vertex: F

C       D       E       B       G       F       A
T       T       T       T       T       T       T
2.0     7.0     5.0     1.0     3.0     7.0     0.0
B       E       C       A       B       E       A

The best way to go from A to city C is follows
A -> B -> C  Cost = 1.0 + 1.0 = 2.0
The best way to go from A to city D is follows
A -> B -> C -> E -> D  Cost = 1.0 + 1.0 + 3.0 + 2.0 = 7.0
The best way to go from A to city E is follows
A -> B -> C -> E  Cost = 1.0 + 1.0 + 3.0 = 5.0
The best way to go from A to city B is follows
A -> B  Cost = 1.0 = 1.0
The best way to go from A to city G is follows
A -> B -> G  Cost = 1.0 + 2.0 = 3.0
The best way to go from A to city F is follows
A -> B -> C -> E -> F  Cost = 1.0 + 1.0 + 3.0 + 2.0 = 7.0
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Graph Type    = WEIGHTED_UNDIRECTED GRAPH
Num Vertices  = 7
Num Edges     = 26
Work done     = 26
numOfNodeAddedToHeap     = 17
```

```
Shortest path from city A to city F   =  7.0
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GraphTest.java Ends
goggle: grapviz online

Process finished with exit code 0
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