Report for CS3205 Lab 5: OSPF

The following topologies were attempted, described in the format prescribed by the problem statement.

Topology 1: Static graph

```
8 20
0 1 4 4
0 2 1 1
0 3 7 7
0 6 3 3
1 2 6 6
1 3 1 1
1 4 9 9
1 7 8 8
2 3 2 2
2 4 7 7
2 7 5 5
2 6 3 3
3 4 8 8
3 5 6 6
3 6 3 3
4 5 5 5
4 7 2 2
5 6 9 9
5 7 7 7
6 7 6 6
```

All the links have fixed costs, as each link's minimum weight equals its maximum weight. Hence, routing tables do not change with time. The routing tables of all 8 routers follow.

```
Routing table for Node No. 0 at Time 20
Destination      Path         Cost
1                0-1          4
2                0-2          1
3                0-2-3        3
4                0-2-4        8
5                0-2-3-5      9
6                0-6          3
7                0-2-7        6
```

```
Routing table for Node No. 1 at Time 20
Destination      Path         Cost
0                1-0          4
2                1-3-2        3
3                1-3          1
4                1-4          9
5                1-3-5        7
6                1-3-6        4
7                1-7          8
```

```
Routing table for Node No. 2 at Time 20
Destination      Path        Cost
0                2-0         1
1                2-3-1       3
3                2-3         2
4                2-4         7
5                2-3-5       8
6                2-6         3
7                2-7         5
```

```
Routing table for Node No. 3 at Time 20
Destination      Path         Cost
0                3-2-0        3
1                3-1          1
2                3-2          2
4                3-4          8
5                3-5          6
6                3-6          3
7                3-2-7        7
```

```
Routing table for Node No. 4 at Time 20
Destination      Path        Cost
0                4-2-0       8
1                4-1         9
2                4-2         7
3                4-3         8
5                4-5         5
6                4-7-6       8
7                4-7         2
```

```
Routing table for Node No. 5 at Time 20
Destination      Path          Cost
0                5-3-2-0       9
1                5-3-1         7
2                5-3-2         8
3                5-3           6
4                5-4           5
6                5-6           9
7                5-7           7
```

```
Routing table for Node No. 6 at Time 20
Destination      Path        Cost
0                6-0         3
1                6-3-1       4
2                6-2         3
3                6-3         3
4                6-7-4       8
5                6-5         9
7                6-7         6
```

```
Routing table for Node No. 7 at Time 20
Destination      Path         Cost
0                7-2-0        6
1                7-1          8
2                7-2          5
3                7-2-3        7
4                7-4          2
5                7-5          7
6                7-6          6
```

Topology 2: Links with noisy weights

Links are now given different minimum and maximum possible weights so that their weights would no longer be fixed. The topology for this case is as follows.

```
10 25
0 1 4 6
0 3 2 3
0 4 5 7
1 4 2 6
2 3 1 3
2 5 4 5
2 6 4 6
2 7 1 3
2 8 5 8
3 4 5 6
3 8 9 10
3 9 3 5
4 6 4 6
4 8 1 2
4 9 3 6
5 7 1 3
5 9 2 6
6 7 3 4
6 8 5 6
6 9 6 9
7 8 4 5
8 9 1 4
4 5 3 6
1 8 4 7
0 9 5 8
```

The routing tables for each of the ten routers are as follows. Three instances of each routing table are provided to show variation with time.

```
Routing table for Node No. 0 at Time 20        Routing table for Node No. 1 at Time 20
Destination      Path        Cost                Destination      Path        Cost
1                0-1         5                   0                1-0         5
2                0-3-2       6                   2                1-8-2       9
3                0-3         3                   3                1-0-3       8
4                0-4         5                   4                1-4         5
5                0-4-5       10                  5                1-8-9-5     8
6                0-4-6       10                  6                1-8-6       9
7                0-3-2-7     7                   7                1-8-7       9
8                0-4-8       7                   8                1-8         4
9                0-3-9       7                   9                1-8-9       5

Routing table for Node No. 0 at Time 40        Routing table for Node No. 1 at Time 40
Destination      Path        Cost                Destination      Path        Cost
1                0-1         4                   0                1-0         4
2                0-3-2       5                   2                1-4-8-2     9
3                0-3         2                   3                1-0-3       6
4                0-4         7                   4                1-4         3
5                0-3-2-7-5   8                   5                1-4-5       9
6                0-3-2-6     9                   6                1-4-6       8
7                0-3-2-7     7                   7                1-4-8-7     9
8                0-4-8       8                   8                1-4-8       4
9                0-9         5                   9                1-4-9       8

Routing table for Node No. 0 at Time 60        Routing table for Node No. 1 at Time 60
Destination      Path        Cost                Destination      Path        Cost
1                0-1         5                   0                1-0         5
2                0-3-2       6                   2                1-8-2       10
3                0-3         3                   3                1-0-3       8
4                0-4         6                   4                1-4         6
5                0-3-2-5     10                  5                1-4-5       10
6                0-3-2-6     10                  6                1-8-6       11
7                0-3-2-7     9                   7                1-8-7       9
8                0-4-8       8                   8                1-8         5
9                0-3-9       7                   9                1-8-9       6
```

```
Routing table for Node No. 2 at Time 20        Routing table for Node No. 3 at Time 20
Destination     Path        Cost                Destination     Path        Cost
0               2-3-0       6                   0               3-0         3
1               2-8-1       9                   1               3-0-1       9
3               2-3         3                   2               3-2         3
4               2-8-4       7                   4               3-4         5
5               2-5         4                   5               3-2-7-5     7
6               2-7-6       5                   6               3-2-7-6     8
7               2-7         1                   7               3-2-7       4
8               2-8         5                   8               3-9-8       5
9               2-8-9       6                   9               3-9         4


Routing table for Node No. 2 at Time 40        Routing table for Node No. 3 at Time 40
Destination     Path        Cost                Destination     Path        Cost
0               2-3-0       5                   0               3-0         2
1               2-3-0-1     9                   1               3-0-1       7
3               2-3         3                   2               3-2         3
4               2-8-4       6                   4               3-4         6
5               2-7-5       3                   5               3-2-7-5     5
6               2-6         4                   6               3-2-7-6     7
7               2-7         2                   7               3-2-7       4
8               2-8         5                   8               3-4-8       7
9               2-3-9       8                   9               3-9         5


Routing table for Node No. 2 at Time 60        Routing table for Node No. 3 at Time 60
Destination     Path        Cost                Destination     Path        Cost
0               2-3-0       6                   0               3-0         3
1               2-8-1       10                  1               3-0-1       7
3               2-3         3                   2               3-2         3
4               2-8-4       7                   4               3-4         5
5               2-5         4                   5               3-2-5       7
6               2-6         4                   6               3-2-6       7
7               2-7         3                   7               3-2-7       6
8               2-8         5                   8               3-9-8       5
9               2-8-9       6                   9               3-9         4
```

```
Routing table for Node No. 4 at Time 20
Destination    Path      Cost
0              4-0       5
1              4-1       3
2              4-8-2     7
3              4-3       5
5              4-5       5
6              4-6       5
7              4-8-7     7
8              4-8       2
9              4-9       3

Routing table for Node No. 4 at Time 40
Destination    Path      Cost
0              4-0       7
1              4-1       3
2              4-8-2     6
3              4-3       6
5              4-5       6
6              4-6       4
7              4-8-7     6
8              4-8       1
9              4-9       5

Routing table for Node No. 4 at Time 60
Destination    Path      Cost
0              4-0       6
1              4-1       6
2              4-8-2     7
3              4-3       5
5              4-5       4
6              4-6       6
7              4-5-7     5
8              4-8       2
9              4-8-9     3
```

```
Routing table for Node No. 5 at Time 20
Destination    Path        Cost
0              5-9-0       9
1              5-9-8-1     8
2              5-2         4
3              5-9-3       7
4              5-4         5
6              5-7-6       7
7              5-7         3
8              5-9-8       4
9              5-9         3

Routing table for Node No. 5 at Time 40
Destination    Path        Cost
0              5-7-2-3-0   7
1              5-4-1       10
2              5-7-2       2
3              5-7-2-3     5
4              5-4         6
6              5-7-6       4
7              5-7         1
8              5-7-8       6
9              5-9         6

Routing table for Node No. 5 at Time 60
Destination    Path        Cost
0              5-2-3-0     10
1              5-4-1       9
2              5-2         4
3              5-2-3       7
4              5-4         4
6              5-7-6       4
7              5-7         1
8              5-7-8       5
9              5-9         4
```

```
Routing table for Node No. 6 at Time 20
Destination      Path         Cost
0                6-4-0        10
1                6-8-1        9
2                6-7-2        4
3                6-7-2-3      7
4                6-4          5
5                6-7-5        6
7                6-7          3
8                6-8          5
9                6-9          6

Routing table for Node No. 6 at Time 40
Destination      Path         Cost
0                6-2-3-0      9
1                6-4-1        9
2                6-2          4
3                6-2-3        7
4                6-4          6
5                6-7-5        4
7                6-7          3
8                6-8          6
9                6-9          8

Routing table for Node No. 6 at Time 60
Destination      Path         Cost
0                6-2-3-0      10
1                6-4-1        9
2                6-2          4
3                6-2-3        7
4                6-4          5
5                6-7-5        4
7                6-7          3
8                6-8          6
9                6-9          7
```

```
Routing table for Node No. 7 at Time 20
Destination      Path         Cost
0                7-2-3-0      7
1                7-8-1        9
2                7-2          1
3                7-2-3        4
4                7-8-4        7
5                7-5          3
6                7-6          3
8                7-8          5
9                7-5-9        6

Routing table for Node No. 7 at Time 40
Destination      Path         Cost
0                7-2-3-0      7
1                7-8-4-1      9
2                7-2          2
3                7-2-3        5
4                7-8-4        6
5                7-5          1
6                7-6          3
8                7-8          5
9                7-5-9        7

Routing table for Node No. 7 at Time 60
Destination      Path         Cost
0                7-2-3-0      9
1                7-8-1        9
2                7-2          3
3                7-2-3        6
4                7-5-4        5
5                7-5          1
6                7-6          3
8                7-8          4
9                7-5-9        5
```

```
Routing table for Node No. 8 at Time 20        Routing table for Node No. 9 at Time 20
Destination     Path        Cost                Destination     Path        Cost
0               8-9-0       7                    0               9-3-0       7
1               8-1         4                    1               9-8-1       5
2               8-2         5                    2               9-8-2       6
3               8-9-3       5                    3               9-3         4
4               8-4         2                    4               9-4         3
5               8-9-5       6                    5               9-5         3
6               8-6         5                    6               9-6         6
7               8-7         5                    7               9-8-7       6
9               8-9         1                    8               9-8         1

Routing table for Node No. 8 at Time 40        Routing table for Node No. 9 at Time 40
Destination     Path        Cost                Destination     Path        Cost
0               8-4-0       8                    0               9-0         5
1               8-1         5                    1               9-8-1       9
2               8-2         5                    2               9-3-2       8
3               8-2-3       6                    3               9-3         5
4               8-4         1                    4               9-4         5
5               8-4-5       5                    5               9-5         6
6               8-6         6                    6               9-6         8
7               8-7         5                    7               9-5-7       7
9               8-9         4                    8               9-8         4

Routing table for Node No. 8 at Time 60        Routing table for Node No. 9 at Time 60
Destination     Path        Cost                Destination     Path        Cost
0               8-9-0       6                    0               9-3-0       7
1               8-1         5                    1               9-8-4-1     5
2               8-2         5                    2               9-8-2       6
3               8-9-3       5                    3               9-3         4
4               8-4         2                    4               9-8-4       3
5               8-4-5       5                    5               9-5         4
6               8-6         6                    6               9-6         7
7               8-7         4                    7               9-8-7       5
9               8-9         1                    8               9-8         1
```