

Assignment 4

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Step 1:

Small Network: the process of a router reaches the final state

The initial cost of edges is:

	1	2	3
1	0	4	1
2	4	0	50
3	1	50	0

The cost of edges after converging is:

	1	2	3
1	0	4	1
2	4	0	5
3	1	5	0

```
was-MacBook-Pro:code zhangxiaoyu$ python start_router.py config/small-1
Router # 1 State # 0 2018-11-19 10:38:44
Received new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
2        2          4
3        3          1

Router # 1 State # 1 2018-11-19 10:38:46
Received neighbor's new distance vector and forwarding table hasn't changed.

Router # 1 State # 2 2018-11-19 10:38:46
Received neighbor's new distance vector and forwarding table hasn't changed.

Router # 1 State # 3 2018-11-19 10:38:47
Received neighbor's new distance vector and forwarding table hasn't changed.

Router # 1 State # 4 2018-11-19 10:38:47
Received neighbor's new distance vector and forwarding table hasn't changed.
```

```
was-MacBook-Pro:code zhangxiaoyu$ python start_router.py config/small-2
Router # 2 State # 0 2018-11-19 10:38:46
Received new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
1        1        4
3        3        50

Router # 2 State # 1 2018-11-19 10:38:46
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
1        1        4
3        1        5

Router # 2 State # 2 2018-11-19 10:38:47
Received neighbor's new distance vector and forwarding table hasn't changed.

Router # 2 State # 3 2018-11-19 10:38:47
Received neighbor's new distance vector and forwarding table hasn't changed.
```

```
was-MacBook-Pro:code zhangxiaoyu$ python start_router.py config/small-3
Router # 3 State # 0 2018-11-19 10:38:47
Received new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
1        1        1
2        2        50

Router # 3 State # 1 2018-11-19 10:38:47
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
1        1        1
2        1        5

Router # 3 State # 2 2018-11-19 10:38:47
Received neighbor's new distance vector and forwarding table hasn't changed.
```

Step 2:

Small Network: the “Count-to-Infinity” problem

Part1: “Bad news travels slow”

After all the routers hit the stable state in Step 1, I changed the link cost of (1,2) from 4 to 60 in config/small-1, and also changed the link cost of (2,1) from 4 to 60 in config/small-2 correspondingly, and the routers started to change state again.

And Router#1 took another 25 steps to hit the stable state, Router#2 just took 1 step to hit the stable state, and Router#2 took another 22 steps to hit the stable state. The output state clearly shows that “Count-to-Infinity” problem happened at Router#1 and Router#3.

The updated cost state :

	1	2	3
1	0	51	1
2	51	0	50
3	1	50	0

(1) Router#1

```
Router # 1 State # 1 2018-11-19 10:38:46
Received neighbor's new distance vector and forwarding table hasn't changed.

Router # 1 State # 2 2018-11-19 10:38:46
Received neighbor's new distance vector and forwarding table hasn't changed.

Router # 1 State # 3 2018-11-19 10:38:47
Received neighbor's new distance vector and forwarding table hasn't changed.

Router # 1 State # 4 2018-11-19 10:38:47
Received neighbor's new distance vector and forwarding table hasn't changed.

Router # 1 State # 5 2018-11-19 10:42:29
Received new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
2       3        6
3       3        1
```

```
Router # 1 State # 6 2018-11-19 10:42:44
Received neighbor's new distance vector and forwarding table hasn't changed.
```

```
Router # 1 State # 7 2018-11-19 10:42:58
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
2        3          8
3        3          1
```

```
Router # 1 State # 8 2018-11-19 10:43:24
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
2        3          10
3        3          1
```

```
Router # 1 State # 9 2018-11-19 10:43:53
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
2        3          12
3        3          1
```

```
Router # 1 State # 10 2018-11-19 10:44:21
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
2        3          14
3        3          1
```

.....Omit intermediate steps.....

```
Router # 1 State # 26 2018-11-19 10:51:43
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
2        3        46
3        3        1

Router # 1 State # 27 2018-11-19 10:52:11
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
2        3        48
3        3        1

Router # 1 State # 28 2018-11-19 10:52:40
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
2        3        50
3        3        1

Router # 1 State # 29 2018-11-19 10:53:09
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
2        3        51
3        3        1
```

(2) Router#2

```
[was-MacBook-Pro:code zhangxiaoyu$ python start_router.py config/small-2
Router # 2 State # 0 2018-11-19 10:38:46
Received new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
1        1        4
3        3        50

Router # 2 State # 1 2018-11-19 10:38:46
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
1        1        4
3        1        5

Router # 2 State # 2 2018-11-19 10:38:47
Received neighbor's new distance vector and forwarding table hasn't changed.

Router # 2 State # 3 2018-11-19 10:38:47
Received neighbor's new distance vector and forwarding table hasn't changed.

Router # 2 State # 4 2018-11-19 10:42:31
Received new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
1        3        51
3        3        50

Router # 2 State # 5 2018-11-19 10:42:43
Received neighbor's new distance vector and forwarding table hasn't changed.
```

(3) Router#3

```
was-MacBook-Pro:code zhangxiaoyu$ python start_router.py config/small-3
Router # 3 State # 0 2018-11-19 10:38:47
Received new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
1        1          1
2        2          50
```

```
Router # 3 State # 1 2018-11-19 10:38:47
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
1        1          1
2        1          5
```

```
Router # 3 State # 2 2018-11-19 10:38:47
Received neighbor's new distance vector and forwarding table hasn't changed.
```

```
Router # 3 State # 3 2018-11-19 10:42:43
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
1        1          1
2        1          7
```

```
Router # 3 State # 4 2018-11-19 10:42:44
Received neighbor's new distance vector and forwarding table hasn't changed.
```

```
Router # 3 State # 5 2018-11-19 10:43:10
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
1        1          1
2        1          9
```

```
Router # 3 State # 6 2018-11-19 10:43:38
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
1        1          1
2        1          11

Router # 3 State # 7 2018-11-19 10:44:08
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
1        1          1
2        1          13

Router # 3 State # 8 2018-11-19 10:44:33
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
1        1          1
2        1          15

Router # 3 State # 9 2018-11-19 10:45:01
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
1        1          1
2        1          17

Router # 3 State # 10 2018-11-19 10:45:30
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
1        1          1
2        1          19
```

.....Omit intermediate steps.....

```
Router # 3 State # 23 2018-11-19 10:51:30
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
1        1          1
2        1          45
```

```
Router # 3 State # 24 2018-11-19 10:51:57
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
1        1          1
2        1          47
```

```
Router # 3 State # 25 2018-11-19 10:52:26
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
1        1          1
2        1          49
```

```
Router # 3 State # 26 2018-11-19 10:52:55
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
1        1          1
2        2          50
```

```
Router # 3 State # 27 2018-11-19 10:53:22
Received neighbor's new distance vector and forwarding table hasn't changed.
```

Part2: “Good news travels fast”

After updating the cost from Router#1 to Router#2 from 4 to 60, it takes about 10 minutes for the three routers to hit the new stable state. Then I change the cost back from 60 to 4. It took 1 step for the three routers to get to the new stable state (the state after step1).

```
Router # 1 State # 29 2018-11-19 10:53:09
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
2        3        51
3        3        1
```

```
Router # 1 State # 30 2018-11-19 11:12:26
Received new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
2        2        4
3        3        1
```

```
Router # 1 State # 31 2018-11-19 11:12:46
Received neighbor's new distance vector and forwarding table hasn't changed.
```

```
Router # 1 State # 32 2018-11-19 11:12:56
Received neighbor's new distance vector and forwarding table hasn't changed.
```

(1) Router#2

```
Router # 2 State # 51 2018-11-19 10:53:22
Received neighbor's new distance vector and forwarding table hasn't changed.

Router # 2 State # 52 2018-11-19 11:12:33
Received new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
1        1        4
3        1        5
```

```
Router # 2 State # 53 2018-11-19 11:12:40
Received neighbor's new distance vector and forwarding table hasn't changed.
```

```
Router # 2 State # 54 2018-11-19 11:12:56
Received neighbor's new distance vector and forwarding table hasn't changed.
```

(2) Router#3

```
Router # 3 State # 27 2018-11-19 10:53:22
Received neighbor's new distance vector and forwarding table hasn't changed.

Router # 3 State # 28 2018-11-19 11:12:40
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
1        1        1
2        1        5

Router # 3 State # 29 2018-11-19 11:12:46
Received neighbor's new distance vector and forwarding table hasn't changed.
```

Step 3:

Large Network: the process of a router reaches the final state
(1) Router#1

```
was-MacBook-Pro:code zhangxiaoyu$ python start_router.py config/large-1
Router # 1 State # 0 2018-11-19 12:48:05
```

```
Received new distance vector and forwarding table has changed.
```

```
Sent updated forwarding table to neighbors:
```

ID	NextHop	Cost
----	---------	------

6	6	12
---	---	----

10	10	17
----	----	----

3	3	8
---	---	---

```
Router # 1 State # 1 2018-11-19 12:48:09
```

```
Received neighbor's new distance vector and forwarding table has changed.
```

```
Sent updated forwarding table to neighbors:
```

ID	NextHop	Cost
----	---------	------

6	6	12
---	---	----

10	10	17
----	----	----

3	3	8
---	---	---

8	3	24
---	---	----

```
Router # 1 State # 2 2018-11-19 12:48:09
```

```
Received neighbor's new distance vector and forwarding table hasn't changed.
```

```
Router # 1 State # 3 2018-11-19 12:48:15
```

```
Received neighbor's new distance vector and forwarding table has changed.
```

```
Sent updated forwarding table to neighbors:
```

ID	NextHop	Cost
----	---------	------

6	6	12
---	---	----

10	10	17
----	----	----

3	3	8
---	---	---

8	3	24
---	---	----

5	6	19
---	---	----

2	6	31
---	---	----

.....Omit intermediate steps.....

```
Router # 1 State # 10 2018-11-19 12:48:26
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
6       6        12
10      10       17
3       3        8
8       3        24
5       6        19
2       6        25
7       6        30
4       3        33
9       6        30
```

```
Router # 1 State # 11 2018-11-19 12:48:26
Received neighbor's new distance vector and forwarding table hasn't changed.
```

(2) Router#2

```
was-MacBook-Pro:code zhangxiaoyu$ python start_router.py config/large-2
Router # 2 State # 0 2018-11-19 12:48:07
```

```
Received new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
```

ID	NextHop	Cost
5	5	6
6	6	19
7	7	5
4	4	13

```
Router # 2 State # 1 2018-11-19 12:48:11
```

```
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
```

ID	NextHop	Cost
5	5	6
6	6	19
7	7	5
4	4	13
9	4	20
8	4	22

```
Router # 2 State # 2 2018-11-19 12:48:11
```

```
Received neighbor's new distance vector and forwarding table hasn't changed.
```

```
Router # 2 State # 3 2018-11-19 12:48:13
```

```
Received neighbor's new distance vector and forwarding table has changed.
```

```
Sent updated forwarding table to neighbors:
```

ID	NextHop	Cost
5	5	6
6	5	13
7	7	5
4	4	13
9	5	17
8	4	22

.....Omit intermediate steps.....

```
Router # 2 State # 20 2018-11-19 12:49:08
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
5       5        6
6       5        13
7       7        5
4       4        13
9       5        17
8       4        22
1       5        25
10      7        19
3       7        32
```

```
Router # 2 State # 21 2018-11-19 12:49:37
Received neighbor's new distance vector and forwarding table hasn't changed.
```

(3) Router#3

```
was-MacBook-Pro:code zhangxiaoyu$ python start_router.py config/large-3
Router # 3 State # 0 2018-11-19 12:48:09
Received new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
1       1       8
10      10      13
8       8       16

Router # 3 State # 1 2018-11-19 12:48:09
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
1       1       8
10      10      13
8       8       16
6       1       20

Router # 3 State # 2 2018-11-19 12:48:15
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
1       1       8
10      10      13
8       8       16
6       1       20
5       1       27
2       1       39
```

.....Omit intermediate steps.....

```
Router # 3 State # 9 2018-11-19 12:48:28
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
1       1          8
10      10         13
8       8          16
6       1          20
5       1          27
2       10         32
7       10         27
4       8          25
9       8          32
```

```
Router # 3 State # 10 2018-11-19 12:48:28
Received neighbor's new distance vector and forwarding table hasn't changed.
```

(4) Router#4

```
was-MacBook-Pro:code zhangxiaoyu$ python start_router.py config/large-4
Router # 4 State # 0 2018-11-19 12:48:11
Received new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
9       9        7
2       2        13
8       8        9

Router # 4 State # 1 2018-11-19 12:48:11
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
9       9        7
2       2        13
8       8        9
5       2        19
6       2        32
7       2        18

Router # 4 State # 2 2018-11-19 12:48:13
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
9       9        7
2       2        13
8       8        9
5       2        19
6       2        26
7       2        18
```

.....Omit intermediate steps.....

```
Router # 4 State # 9 2018-11-19 12:48:23
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
9       9        7
2       2        13
8       8        9
5       9        18
6       9        25
7       2        18
1       8        33
10      8        21
3       8        25
```

```
Router # 4 State # 10 2018-11-19 12:48:23
Received neighbor's new distance vector and forwarding table hasn't changed.
```

(5) Router#5

```
was-MacBook-Pro:code zhangxiaoyu$ python start_router.py config/large-5
Router # 5 State # 0 2018-11-19 12:48:13
Received new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
6        6        7
2        2        6
9        9        11
```

```
Router # 5 State # 1 2018-11-19 12:48:13
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
6        6        7
2        2        6
9        9        11
7        2        11
4        2        19
8        2        28
```

```
Router # 5 State # 2 2018-11-19 12:48:13
Received neighbor's new distance vector and forwarding table hasn't changed.
```

```
Router # 5 State # 3 2018-11-19 12:48:15
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
6        6        7
2        2        6
9        9        11
7        2        11
4        2        19
8        2        28
1        6        19
```

.....Omit intermediate steps.....

```
Router # 5 State # 12 2018-11-19 12:49:10
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
6       6        7
2       2        6
9       9        11
7       2        11
4       9        18
8       9        27
1       6        19
10      2        25
3       6        27
```

```
Router # 5 State # 13 2018-11-19 12:50:00
Received neighbor's new distance vector and forwarding table hasn't changed.
```

(6) Router#6

```
was-MacBook-Pro:code zhangxiaoyu$ python start_router.py config/large-6
Router # 6 State # 0 2018-11-19 12:48:15
Received new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
5        5        7
1        1        12
2        2        19

Router # 6 State # 1 2018-11-19 12:48:15
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
5        5        7
1        1        12
2        2        19
10      1        29
3        1        20
8        1        36

Router # 6 State # 2 2018-11-19 12:48:15
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
5        5        7
1        1        12
2        2        19
10      1        29
3        1        20
8        1        36
7        2        24
4        2        32
9        2        36
```

.....Omit intermediate steps.....

```
Router # 6 State # 12 2018-11-19 12:48:58
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
5       5        7
1       1        12
2       5        13
10      1        29
3       1        20
8       5        34
7       5        18
4       5        25
9       5        18
```

```
Router # 6 State # 13 2018-11-19 12:49:13
Received neighbor's new distance vector and forwarding table hasn't changed.
```

(7) Router#7

```
was-MacBook-Pro:code zhangxiaoyu$ python start_router.py config/large-7
Router # 7 State # 0 2018-11-19 12:48:18
Received new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
10      10      14
2       2       5

Router # 7 State # 1 2018-11-19 12:48:18
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
10      10      14
2       2       5
5       2       11
6       2       18
4       2       18
9       2       22
8       2       27
1       2       30
3       2       38

Router # 7 State # 2 2018-11-19 12:48:23
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
10      10      14
2       2       5
5       2       11
6       2       18
4       2       18
9       2       22
8       10      26
1       2       30
3       10      27
```

.....Omit intermediate steps.....

```
Router # 7 State # 2 2018-11-19 12:48:23
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
10      10      14
2       2       5
5       2       11
6       2       18
4       2       18
9       2       22
8       10      26
1       2       30
3       10      27
```

```
Router # 7 State # 3 2018-11-19 12:48:23
Received neighbor's new distance vector and forwarding table hasn't changed.
```

(8) Router#8

```
[was-MacBook-Pro:code zhangxiaoyu$ python start_router.py config/large-8
Router # 8 State # 0 2018-11-19 12:48:19
Received new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
3       3        16
10      10       12
4       4        9

Router # 8 State # 1 2018-11-19 12:48:19
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
3       3        16
10      10       12
4       4        9
1       3        24
6       3        36
5       3        43
2       3        49
7       3        54
9       3        54

Router # 8 State # 2 2018-11-19 12:48:19
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
3       3        16
10      10       12
4       4        9
1       3        24
6       4        35
5       4        28
2       4        22
7       4        27
9       4        16
```

.....Omit intermediate steps.....

```
Router # 8 State # 9 2018-11-19 12:48:28
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
3       3        16
10      10       12
4       4        9
1       3        24
6       4        34
5       4        27
2       4        22
7       10       26
9       4        16
```

```
Router # 8 State # 10 2018-11-19 12:48:28
Received neighbor's new distance vector and forwarding table hasn't changed.
```

(9) Router#9

```
[was-MacBook-Pro:code zhangxiaoyu$ python start_router.py config/large-9
Router # 9 State # 0 2018-11-19 12:48:21
Received new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
5        5        11
4        4        7

Router # 9 State # 1 2018-11-19 12:48:21
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
5        5        11
4        4        7
6        5        18
2        5        17
7        5        22
8        5        39
1        5        30
10       5        47
3        5        38

Router # 9 State # 2 2018-11-19 12:48:21
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
5        5        11
4        4        7
6        5        18
2        5        17
7        5        22
8        4        16
1        5        30
10       4        28
3        4        32
```

.....Omit intermediate steps.....

```
Router # 9 State # 2 2018-11-19 12:48:21
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
5       5        11
4       4        7
6       5        18
2       5        17
7       5        22
8       4        16
1       5        30
10      4        28
3       4        32
```

```
Router # 9 State # 3 2018-11-19 12:48:23
Received neighbor's new distance vector and forwarding table hasn't changed.
```

(10) Router#10

```
[was-MacBook-Pro:code zhangxiaoyu$ python start_router.py config/large-10
Router # 10 State # 0 2018-11-19 12:48:23
Received new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
1       1       17
3       3       13
8       8       12
7       7       14

Router # 10 State # 1 2018-11-19 12:48:23
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
1       1       17
3       3       13
8       8       12
7       7       14
2       7       19
5       7       25
6       7       32
4       7       32
9       7       36

Router # 10 State # 2 2018-11-19 12:48:23
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
ID      NextHop Cost
1       1       17
3       3       13
8       8       12
7       7       14
2       7       19
5       7       25
6       7       32
4       8       21
9       8       28
```

.....Omit intermediate steps.....

```
Router # 10 State # 4 2018-11-19 12:48:23
Received neighbor's new distance vector and forwarding table has changed.
Sent updated forwarding table to neighbors:
```

ID	NextHop	Cost
1	1	17
3	3	13
8	8	12
7	7	14
2	7	19
5	7	25
6	1	29
4	8	21
9	8	28

```
Router # 10 State # 5 2018-11-19 12:48:23
Received neighbor's new distance vector and forwarding table hasn't changed.
```