Report of Assignment 1

A. IMPLEMENTATION:

1. Ownership_Strength:

We use a Dictionary to maintain the Ownership between publisher and some topic (zipcode):
Below is the output of event_server: when a new publisher came in, server will register this one and update ownership table. (e.g. 10.0.0.3: (10000, 10051) means the zipcodes from 10000 to 10051 belongs to publisher 10.0.0.3

```
registered 10.0.0.2
Current ownership
{'10.0.0.2': (10000, 10102)}

registered 10.0.0.3
Current ownership
{'10.0.0.3': (10000, 10051),
 '10.0.0.2': (10051, 10102)}

registered 10.0.0.4
Current ownership
{'10.0.0.4': (10000, 10034),
 '10.0.0.3': (10034, 10068),
 '10.0.0.2': (10068, 10102)}

registered 10.0.0.5
Current ownership
{'10.0.0.5': (10000, 10026),
 '10.0.0.4': (10026, 10052),
 '10.0.0.3': (10052, 10078),
 '10.0.0.2': (10078, 10104)}
```

2. Update Ownership when some publisher die.

When the event_server detect some publisher is not working (not receiving any new message from this publisher for some time), server will unregister this publisher and update the ownership table.
Below is an example of server unregister publisher 10.0.0.2 and update the ownership table.

```
Un registered 10.0.0.2
Current ownership
{'10.0.0.5': (10000, 10034),
 '10.0.0.4': (10034, 10068),
'10.0.0.3': (10068, 10102)}
```

Below is part of the output of one subscriber who subscribe with topic 10079, notice that the publisher changed from 10.0.0.2 to 10.0.0.3

```
10079 -53 39 10.0.0.2
10079 -75 43 10.0.0.2
10079 -11 10 10.0.0.3
10079 -4 16 10.0.0.3
10079 -71 38 10.0.0.3
10079 113 53 10.0.0.3
```

3. History

Event server use a dictionary to record and keep updating each topic's last N events. When a new subscriber send a request to server some history, server will find those information and send it back to subscriber.

Below is an example of new subscriber asking for last 5 sample of some topic (zipcode)

```
The time is : Thu Feb  9 21:56:59 2017
Reciving last # 5  history samples of zipcode 10041  from weather server...
70  13 10.0.0.4
-12 15 10.0.0.4
126 55 10.0.0.4
-12 40 10.0.0.4
14  47 10.0.0.4
```

B. RESULT ANALYSIS:

# Switches (Ranks)	# Publishers	# Subscribers	Average End to End Time (seconds)
1	2	5	0.000857
1	6	40	0.002235
1	10	200	0.007673
3	2	5	0.001052
3	6	40	0.002205

Based on the given data, we can conclude that: when the number of publishers and subscribers increased, the publishing from publisher to subscriber will take longer time. It means when the network become larger , it is harder for the event service to manage the communications between more hosts.