MP1 Report - Group 57 - Jiazheng Li (jl46) & Yabo Li (yaboli2)

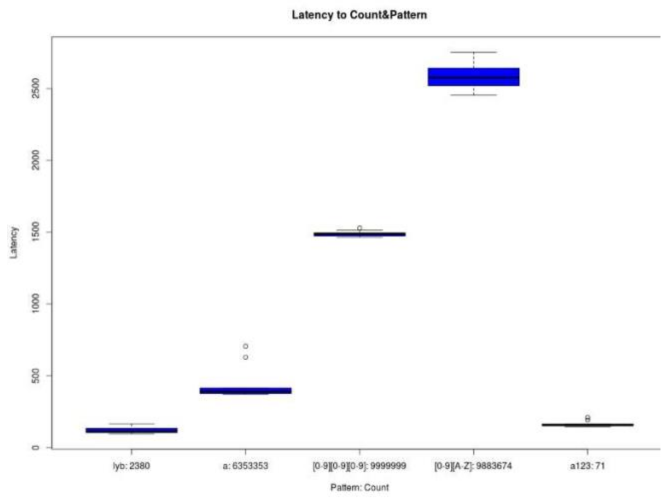
System Design:

For each VM, we copy the same client and server go files. The server on each VM keeps listening until it crashes. We use RPCs to achieve communication between a client and a server. The port of the query API is set to 12345. When querying, the client send its asynchronous requests using go modifier to 10 servers. The 10 servers start querying locally concurrently. To make sure every query is finished before stopping executing the program, we use “sync” module to set a WaitGroup where we increase its size before we send a request to the server, and mark it as done when we finish the execution of one request function. The latency we use is the time difference between we send the first request, and receive the last response. When doing the query, we accumulate the sum of all queried counts, to get a total count. For those failed VMs, we set their count to default-0.

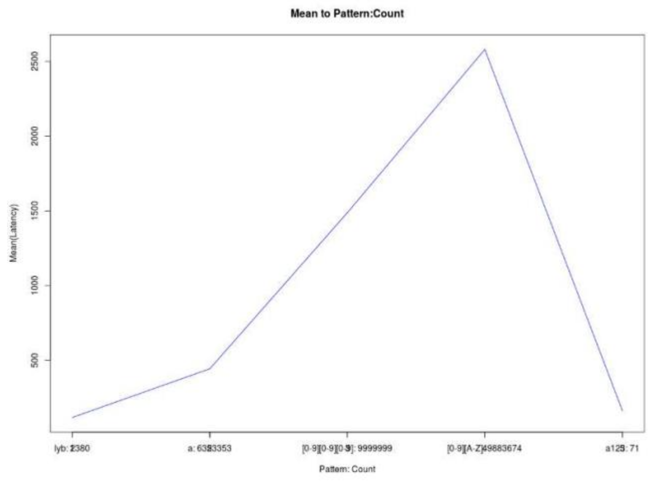
Unit tests:

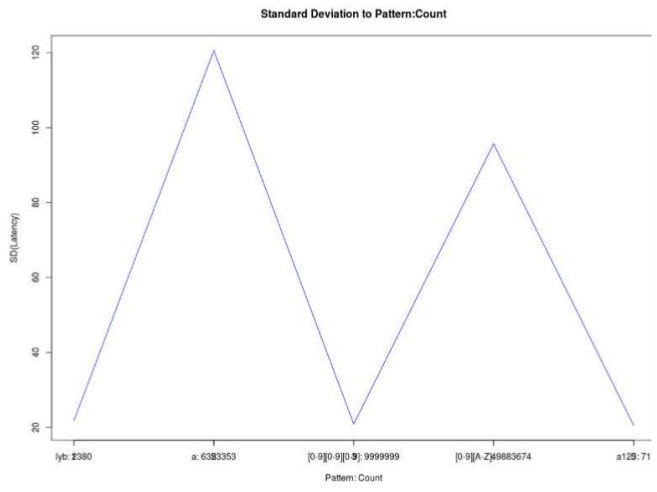
We mainly test the function in clients that calculate the total count of a pattern, sending requests to all 10 servers. When the calculated total count matches the test record, we say the test is passed. In our tests, we use a very frequent pattern (“a”) with a total count of 6353353, a somewhat frequent pattern (“ab”) with a total count of 152281 and an infrequent pattern (“abc”) with a total count of 1861. The three situations should be able to represent more of the cases.

Visualization:



From the graph, we know there is a trend that when a pattern is more frequent, the latency tends to be larger. However, the patter itself also matters - the combination of numbers and letters normally have larger latency. Combination of pure numbers tend to have a lower standard deviation in terms of latency. It is also interesting combination of 4 English letters (like “abcd”) never occurs. We can find certain similarity in all the logs (mort patterns have similar frequencies).


Mean to Pattern:Count
Mean(Latency)
Pattern: Count
lyb: 2380
a: 6353353
[0-9][0-9][0-9]: 9999999
[0-9][A-Z]: 9883674
a123: 71


Standard Deviation to Pattern:Count
SD(Latency)
Pattern: Count
lyb: 2380
a: 6353353
[0-9][0-9][0-9]: 9999999
[0-9][A-Z]: 9883674
a123: 71