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CS421 Computer Networks - Spring 2021
Programming Assignment #1

Q: How the GET requests and corresponding responses operate?

A: The given server code is written such that it imitates HTTP protocol. GET requests are sent to the port 8000 by the client code and received by the server from the same port. Response is put back to the port 8000 where it is received by the client. When a GET request is sent, the server basically parses it and takes action accordingly.

Q: Why did the first attempt resulted with an error code? Why do we use authorization?

A: The first attempt resulted with an error code because it did not have Basic Authorization header with correct data in it. In other words, the client did not authenticate itself to get the requested response. Authorization is used to ensure that client requests access data securely.

Q: Why do we use an encoding when sending the authorization request?

A: Whilst encoding the password and user name with the Base64 algorithm usually makes them unreadable to the naked eye, decoding them is as easy as encoding them. Security is not the intended outcome of the encoding step. The intended outcome is encoding the non-HTTP-compatible characters that may be extant in the user name or the password into characters that are HTTP-compatible.

Q: Explain what the received headers do and compare the two.

A: Accept-Ranges response is a marker used by the server to indicate whether or not it supports partial requests. The value of this field indicates the unit that can be used to define a range. Content-Length indicates the size of entity-body in bytes. For the big.txt, partial requests are accepted in bytes. For index.html, partial requests are not accepted.

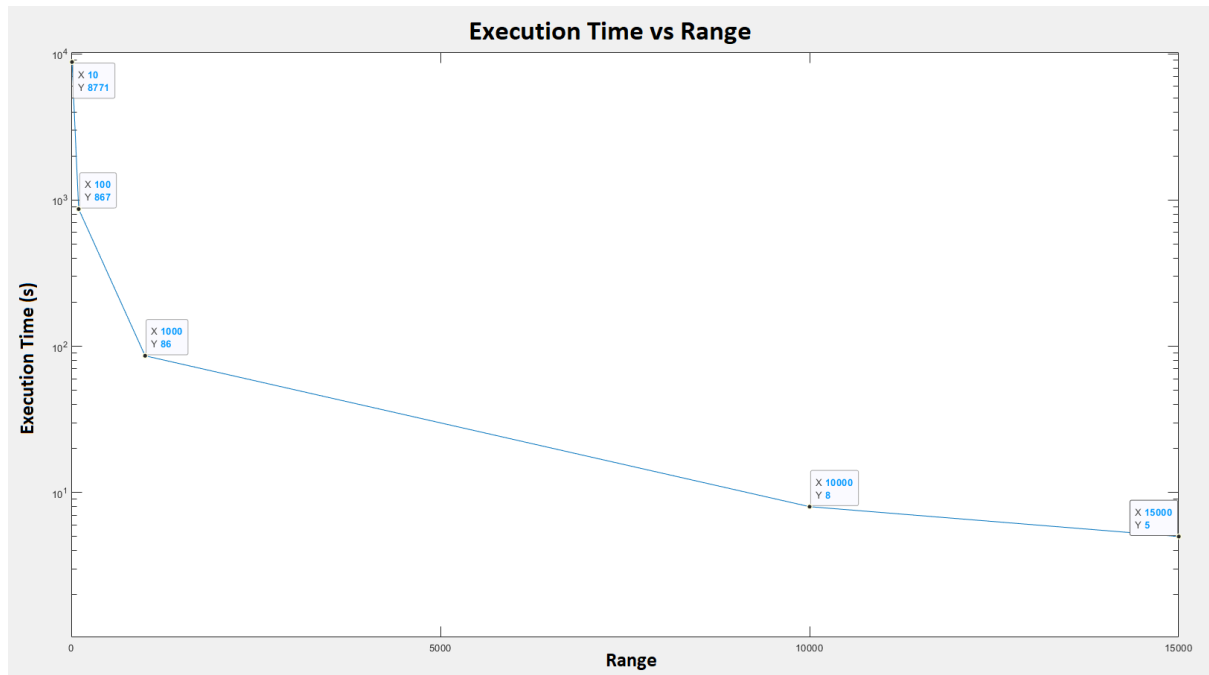


Figure 1: Execution Time vs Range

Q: Comment on the reason why the graph has the shape that you obtained.

The reason why execution time is much more for small ranges is because when the range is small, too many requests are sent and too many responses are received. The overhead time becomes much more significant with small ranges. As the range increases, the overhead time becomes less and less significant.

Q: Discuss on what would happen if you try to download the text file with a single GET request (not using range requests).

A: The server would send an error message indicating that the page can only be downloaded using range requests. This makes sense because the text file is too large to be sent in a single response.

Q: Give a brief description of the challenges you have faced during the implementation process.

A: I realized that my code was not downloading all of the big.txt because I was not checking whether the end of the range was exceeding the file length. I fixed this issue by making the last range request end with the file length. I did not face any other challenge.