BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI
IS F462 Network Programming
II Semester 2016-17
Assignment-2
Weight: 11% (66M) **Due Date of Submission:** 23-April-2017

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Important to Note:

1. Group of maximum 3 students.
2. There are **three** programming problems.
3. For any clarifications please contact me (khari@pilani.bits-pilani.ac.in).

Plagiarism will be thoroughly penalized.

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P1. [Server Performance]

You are required to implement and compare the performances of the following server designs on a cloud. The details for the same is given here (section 3).

- Multi-Process
- Multi-Threaded
- Single Process Event-Driven
- Asynchronous Multi-Process Even Driven

a. Implement each of the above server designs for serving static files using HTTP/1.1 protocol.
b. Run each of the servers on Azure cloud.
c. Generate HTTP traffic for each of the webserver using httpperf tool, requesting a file of size at least 10 MB.
d. Plot the following graphs for each of them (X-axis will have server types).
    a. connection rate
    b. connection time
    c. reply rate
    d. reply time
    e. throughput
    f. Server side request processing time

Deliverables:

- Brief Design Document (.pdf)
- Code in folder named Code
- Plots in plots folder

[40 M]

P2.

Consider the design of traceroute program discussed in the class. The program operates by sending UDP datagrams at increasing TTL and receiving the ICMP replies to determine the router's address at respective TTL.

a. Now let us modify the program by introducing threads into the process to quicken the finding of route. There is one thread per one TTL i.e. one thread for TTL=1, another thread for TTL=2, another thread for TTL=3 etc. There are group of threads (at least 3) which read ICMP replies. Design this multithreaded program including how the coordination will happen among all the threads. Implement this.

Run your program with only one thread for sending and receiving replies and measure time taken. Run your program with the above implementation and measure time taken. Plot this for different destinations.

b. Consider the 13 DNS root server IP addresses. Goal is to find maximum overlapping path between all 13 root servers. Write a program that identifies paths to all 13 root servers and prints the maximum overlapping path. Does this change when you run your program at different times? Does this change when you run your program from different continents?

   Plot the length of maximum overlapped path from different contents namely West coast America, East coast, Europe, South India.

[26M]

Deliverables:

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- Plots in plots folder

How to upload?

- Create group.txt file and put idno, name of members into this file.
- Make a directory for each problem like P1, P2 etc and copy deliverables into these directories.
- Tar all of them including group.txt into idno1_idno2_assignment1.tar
- Upload on http:/nalanda.

===End of assignment===