List of Projects.

1. Implement GFS with additional features such as replication of the master.
2. Verifying the MST: The input is a weighted graph G and a tree T with the claim that T is an MST of G. Read the MST verification algorithms for distributed computing and implement such an algorithm using MPI.
3. Chord: Implement the P2P network Chord and support operations such as Insert/Delete/ Search operations.
4. Projects 4—6: Enumerative algorithms on graphs -- counting number of triangles, counting number of 4-cycles, using MPI (Project 4), using Giraph (Project 5), using GoFFish (Project 6)
5. Erlang is yet another language that supports writing distributed programs. In thse projects, the goal is to use Erlang and study how algorithms can be implemented in Erlang. Project 7 -- graph BFS, Project 8 -- Graph Connectivity, Project 9 -- Graph coloring, Project 10 -- Matrix multiplication.
6. Project 11, 14: Simulate message delivery guarantees such as Causal/FIFO/Arbitrary and their impact on some distributed algorithm such as termination detection/mutual exclusion. Pick one of Causal and FIFO, along with Arbitrary and pick any of the distributed algorithms.
7. Project 15: Experiment with various deadlock detection algorithms under various message delivery guarantees and study the number of messages required to detect the dealock(s),.
8. Projects 16 to 19: (up to 4) using Blockchain/distributed storage/distributed verification.

9. Projects 20—: Propose your own project by preparing a one-page writeup including the problem description and the deliverables. Once your project proposal is approved by the instructor, (me), you can go ahead.

Mechanism

1. Use the google sheet supplied below to mark up to three of your preferences in order. The TAs will let you know of the project allotment subsequently.
   URL:
   https://docs.google.com/forms/d/e/1FAIpQLSfAy2l_6SEb29jSFSuYemD-MQw5ADhYY90gnknERR_cCVWEuA/viewform?usp=sf_link
2. You can meet me or the TAs during office hours or by appointment if you need any clarifications.
3. In about two weeks, you should submit a small report of 1-2 pages describing the scope of your project, current status, and promised deliverables. This report WILL be evaluated for about 10% of the overall project grade.
4. Projects are done usually in a team of two students. So, only one team member need to fill the Google sheet with preferences.
5. Projects are due close to the final grades due date. Exact dates and schedule will be communicated shortly. It is required for both the team members to be available during project evaluation.

6. You are encouraged to explore around the allotted project and try any ideas you may have on your own. For this reason, the exact project description is kept to the bare minimum just so as to give you a starting point.
7. You will be able to use the accounts on Abacus created for Homework 2. More details on this will be provided soon.
8. For the final submission, it is important to illustrate a good understanding of the project along with reasonable results. Plots and other aids are especially welcome.

Important Dates:

Last date to fill in project preferences: Monday, March 17, 2019, 8 PM
Projects allotment: Tuesday, March 18, 2019
Preliminary Report Due: April 2, 2019, 8 PM
Projects Due: TBA.