Homework 2

Pick two problems, one from each list and solve in the appropriately mentioned setting.

Set 1: These are to be solved using gRPC. For the solution, you have to provide both the server and the client.

1. Provide a service that lists the files of a given remote directory.
2. Provide a service that reports the number of users on the remote server, their last login times, and other such information. Read about the Linux command ``who" for details.
3. Provide a service that converts quantities from one metric to another: say cm to inches, lb to gms etc. Provide as many as you can.
4. Provide a service that evaluates expressions. The input form the client is an infix expression and the output is the result of the expression.

Set 2:

1. Read and implement the algorithm of Boruvka to find a minimum spanning tree of a weighted graph G. The graph is distributed across the processors in a vertex-partitioning model where all the neighbors of a vertex v are located in the same processor. Nevertheless, each processor has the same number of vertices.
2. Repeat question 1 in an edge partitioning model where the edges of the graph are distributed across the processors. Nevertheless, each processor has the same number of edges.
3. Study how one can implement BFS using MPI. The graph is distributed across the processors in a vertex-partitioning model where all the neighbors of a vertex v are located in the same processor. Nevertheless, each processor has the same number of vertices.
4. Repeat question 3 in an edge partitioning model where the edges of the graph are distributed across the processors. Nevertheless, each processor has the same number of edges.

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