Map Reduce Phase 4

CIS-687 OBJECT ORIENTED DESIGN

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6/13/2022

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Map Reduce Phase 4:

1. Link to repository: https://github.com/ColtonWilson/MapReduce_Project_Phase-4

2. "How-To" document and code reviews are in the repository.

3. I was responsible for designing and implementing the heartbeat threads from the map and reduce processes to the controller process. My partner, Colton Wilson, was responsible for designing the controller, stub1, and stub2 processes and implementing the initial commands from controller to stub process.

   The controller process creates the stub1 and stub2 processes. It then sends the message "2 0" to the stub1 process on port 54000. The stub1 process creates a MapReduce process and forwards the message from the controller. The second number of the message is a boolean value (0 or 1). If it is a 0, the MapReduce process will create map processes. The first number will tell it how many to create. Therefore, "2 0" informs the MapReduce process to create 2 map processes.
   Each map/reduce process has a heartbeat thread sending messages back to the controller process on port 8002/8003. The controller will receive messages from the map process shown below.

   Mapping in progress
   Mapping in progress
   Mapping in progress
   Mapping in progress
   Mapping complete

   When the "Mapping complete" message has been received from both mapping processes, the controller will send "2 1" to the Stub2 process. The message is forwarded to a MapReduce process, which will create 2 reducer processes. When the controller receives "Reducing complete" from both reducer processes, the program is complete.

   NOTE: The user must provide the input, intermediate, and output file paths in the MapReduce project's Executive.cpp file. Also, the controller's Main.cpp file requires the absolute file paths to the Stub1.exe file and the Stub2.exe file. The Main.cpp files in the Stub1 and Stub2 projects require the absolute file path of the MapReduce.exe file. Additionally, the absolute file paths to the MapLibrary.dll and ReduceLibrary.dll must be provided in the MapProcess.cpp and ReduceProcess.cpp files.

4. The project was a success. Given that phase 3 contained multiprocessing and multithreading, we decided to alter phase 3 slightly and use it in our phase 4 project. Also, it was interesting and exciting to implement socket programming.

   My partner, Colton Wilson, was great. He is always responsive and helpful.