Check-in

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August 27, 2018

1 Updates on previous goals

- Discuss details of testing for all the class we have right now and separate the workload for Josh and me.

- Integrate the new material class with the restart

- Start the research purpose development.

2 Progress up to now

2.1 Success and failure of MPI Testing

Success of MPI since last meeting. A PR has been reviewed by Josh and merged for that. In short, we could do MPI testing by giving a TearDown function to finalize the MPI.

I thought it was a whole success and so I continued adding testings with MPIs and things compile fine. But when running, it failed. More than a week was spent on finding where the error came from.

It was finally realized that the MPI failed for multiple tests because the file test_main.cc written by Josh by separating testing part of previous main.cc was ignored in the compilation process (for instance, including any random header file never existed would not cause an compilation error). By default gtest_main.cc was used. Unfortunately, the default main function from gtest does not have proper mechanism creating and destroying parallel environment, causing the errors we have now.

I was trying to resolving this and later involved Josh in.

2.2 Research purpose development

We started scheduling hours long meeting on coding with BART, specifically about the finite element parts in EquationBase. Fortunately, Josh understood the logics quickly with taking detailed notes. What I feel is Doxygen would not be super useful in starting-period. In-person explanation is much

easier for new developer to understand the whole thing. So we planned to meet in the coming week for both answering his existing questions and talking more about other parts we haven't touched.

The goodness is Josh loves to learn what's going on under the hood, not just learn the data structures/logics of BART, but the logical relationship between BART and deal.II to improve his understandability. So while he goes back and digest on what we talked, I suggested two basic yet useful tutorials on deal.II as he requested useful tutorial steps.

2.3 New material class integration

This part is in progress and in a ongoing PR by Josh. I will just assist Josh on this if there's any issue resolving the Travis failure.

3 Goals/Things will be going on

- Fix the MPI test failure with Josh and continue testing
- Be a consultant for Josh to accelerate BART implementations