Project 4

- **Take the decomposed set of blocks and connectivity file for the 10x10 and 5x4 block decompositions that you created under project-2, and write a code that will map them onto P processors.**
  - Use what information you know about the grid to maximize data-locality and minimize communication costs
  - You can write your own code or use existing libraries such as Metis
    - I want you to write your own code, however.
  - In your new connectivity file(s), somehow mark the neighbor information to keep track of neighbor processor numbers and a way to map local (virtual) block numbers to global block numbers

Project 4

- Write out either a single new connectivity file or P connectivity files, multi-block grid, and multi-block initial temperature files with names corresponding to rank number (eg conn.dat.p0, xyz.dat.p0, temp.dat.p0) so that each processor can “read-and-go” in project 5.
  - I have put an example how to write sequential files in “Additional Material” on smartsite
- You can combine this code with your project-2 spatial decomposition code if you wish.
  - That way, you can decompose and map in one step.
- Or you can create a new code just for the parallel/processor mapping.

- **The goal is for each processor in the project 5 code to read only it’s information and start iterating! <u>No processor should contain the global information</u> (except possibly upon convergence to agglomerate the blocks back to the global domain for plotting purposes)**

Project 4

- **Due Wednesday, November 20th**
  - Brief description of your project
  - How you decomposed the domain in project 2
  - Methods used to map the decomposed grid onto P processors
  - Listing of parallel/processor decomposition code
  - Demonstration that your code works for 4 and 6 processors on the 10x10 and 5x4 set of blocks
    - Write out a sample of the connectivity file(s) for the 4 and 6 processor parallel/processor decompositions on both set of blocks
    - Give a measure of the load balance of each processor taking into account the weight of the block given by the number of cells and the weight of the communication given by the number of face nodes