One of the projects will be assigned

• Project A - 2D Poisson equation in a rectangle – Choose and compare 2 linear solvers among Gauss elimination, Gauss-Seidel, and Successive Over Relaxation (SOR).

• Project B - 2D Diffusion equation in a rectangle – Choose and compare 2 time integration methods among explicit, implicit, Crank-Nicolson, ADI and Runge-Kutta (RK). • Contact one of the instructors to receive a detailed description of your project.

**Requirements**

• The whole project must be done individually.

• Report \*

• Written in either MATLAB, C, C++ or Fortran \*

• Employs checkpoint/restart capability \*

• Uses source control \*

• Uses visualization \*

• Performance/efficiency measurement

• Code verification/validation

**Grading of projects**

• Report

– Discretization of mathematical problem (10%)

– Description of algorithm (10%)

– Verification (15%)

– Presentation of results

• Grid independence (5%)

• Graphs and tables (10%)

• Code

– Working (30%)

– Optimization (10%)

– Readability (comments) and modularity (5%)

– Check pointing and version control (5%)

**Project submission (Due - 5/4/2019)**

• Submit the git repository via blackboard

– project

– project/doc/ {for Final Report} – 50%

– project/src/ {for all working code} – 50%

– project/bin/ {for executable(s)}

– project/tests/ {for test cases (if any)