Ideas for projects:

Here are some ideas for projects; you are also encouraged to suggest your own project topic (Note that 10% of the project mark is allocated for innovation).

Please ensure that you have chosen a project topic by the first week back after the mid-semester break, or I will assign you one of the projects that other people have not chosen.

Project ideas include:

1. Program a new numerical zero finding procedure not covered in lectures – Ridder's method, Dekker's method, Brent's method. Analyse the convergence.
2. Program one of the minimum-finding procedures not covered in Labs.
3. Implement and analyse Newton's method for complex variables
4. Implement and analyse Newton's method in 3D
5. Research and implement bracketing in 2D (and higher dimensions)
6. Program a conjugate gradient method in nD
7. Write python code to solve the Black-Scholes equation
8. Write python code to solve and visualise the heat equation
9. Investigate and program a higher-order Newton's method
10. Implement Romberg integration
11. Program your own Simplex method. Give it an extra action that improves the search in some way.
12. Write code to solve the surface flux integrals from Vector Calculus
13. Write your own Brent's method for minimisation.
14. Write code that minimises integrals. Demonstrate this using a physical example.