

Class Projects Goals

1. Practice designing and implementing an object oriented program.
2. Do something interesting and potentially useful to others.
3. Look at what other people did by refereeing other projects.

Desirable Properties

1. Efficient
2. User friendly
3. Extendable (Easy to change and adapt)
4. Elegant
5. Well Documented with examples

Ideas for Possible Projects

1. Math

- (a) Minimization
- (b) Integration
- (c) Differential Equations
- (d) Contour Integrals
- (e) Infinite Series
- (f) Special Functions
- (g) Splines
- (h) Fast Fourier Transforms
- (i) Statistical Analysis (e.g. curve fitting)
- (j) Mathematica Type operations (like algebraic manipulation)
- (k) Matrix Library

2. Physics

- (a) Solve introductory physics problems
- (b) Algebra of quantum mechanical operators
- (c) Monte Carlo simulation

- (d) Molecular Dynamics simulation
- (e) Dimensional Analysis

3. **Graphics**

- (a) Draw real surfaces
- (b) Draw molecules
- (c) Atomic orbitals
- (d) 1D and 2D plots

4. **Others**

- (a) Traveling Salesman (see Numerical Recipes)
- (b) Compiler for your own language
- (c) Chess program
- (d) Encryption (see Numerical Recipes)
- (e) Periodic Table (way to look up data about elements)