



# Matching Research Requirements to Software

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# Write your own OR Use existing?

- Writing your own software
  - Don't reinvent the wheel!
    - Do a survey on what's available
    - Use existing libraries (LAPACK, etc.) and solvers
    - Modify / improve / reuse existing codes / routines
  - Use best practices
    - Version control (git)
    - Document, document, document!
    - Leave room for improvements / change of methods (reviewer requests for example)



- Writing your own software ...
  - Testing
    - Unit testing (testing individual units)
    - Regression testing (testing overall functionality)
  - Verification
    - Compare numerical results with analytical solutions
    - Compare with other published results
    - Run benchmark tests



# Use Community Software

- Find commonly used in your research area
  - Publications / other researchers / friends
- Well documented
  - Manuals
  - Peer reviewed publications
- Evaluate usability
  - Does it fit the needs
  - Special hardware or software (libraries/compiler) needs
- Check accuracy



- Use Community Software ...
  - Benchmarks (some packages provide benchmarks ready to run)
    - Tests for performance and scalability in a cluster environment
  - Currently being developed and supported
    - Stable versions, no alpha, beta releases!
    - “User friendly” developer or not