

# CSC 2700: Scientific Computing

## Class Projects

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## Come up with something yourself!

- Time  $\gtrsim$  #persons  $\times$  20h
- 2-3 persons per team
- Ideally something “scientific”
- Has to have at least some scientific “component”
- Has to run on Linux (e.g. supermike)
- Talk to us before you choose!



# Project Requirements

- Name, team name
- Source available from public repository
- Open Source Licence
- Executable on Linux
- Public webpage
  - Description of project
  - Installation instructions
  - Usage instructions
  - Contact for public (email, ...)
- Webpage describing project development
  - Timeline (Plan including dates)
  - Project log (who did what when and for how long, meeting times and topics)



# Project Examples: plot ocean data

- <http://www.ndbc.noaa.gov/>
- Data from boyes around the world
- Automate getting most recent data from all boyes in the Gulf of Mexico (e.g. wind speed and direction)
- Plot data (interpolate between boyes), 2D + arrows
- Use historical data to create animation
- Publish animation on youtube, adding link to project page



# Project Examples: Parallelize unit tests

- Create tens of mock tests, each with individual runtime
- Write program to minimize overall runtime of tests
- Account for changes in runtime
- Input:
  - unit test names
  - nr processors available
  - nr of processors needed for specific test
- Use 'make' for parallelism
- Collect output from unit tests
- Provide feedback of saved time



# Project Examples: simple missile game

- Show (even ASCII) map, origin and target
- Show x-y (2D + height display)
- Enter power, direction (numbers or graphical)
- Show trajectory of missile (1D along trajectory)
- Determine hit / no hit
- Use physics model
  - gravity
  - air resistance
  - wind
- Figure out how a second missile (from another point) has to fire to hit first missile before impact

