Project Requirements

* Must be finished by the end of the semester
* Object oriented programming preferred
* Must document all 5 phases for all iterations and increments (requirements, analysis, design, implementation, and testing) using GitHub
* Include time for integration of parts, formalizing/compiling documentation, reports, and presentations
* Create testing plans before implementation/development
* UML diagram in Astah, Gantt chart in Microsoft project (or other), and State diagrams?

Integrated software system for a “car”

* must be able to drive - turn on/off, accelerate (gas), slow down (brake)
  + must be on to accel or slow down
  + car only starts with nonempty fuel and valid digital key)
    - must have personalized digital keys (and a validation system)
      * digital keys are username + password???
    - must recognize fuel level (empty or not empty)
      * consumption rate??
  + cannot continue to drive if fuel is empty (or car = off if fuel = 0)
  + driver controls on/off, accel/decel, “set” speed
  + ONLY STRAIGHT LINES (turning not included)
* must have radio - on/off, am/fm band, volume up/down, stations from a list
  + some stations location dependent
* must have phone - list of # or manual entry, volume up/down, mic up/down
* must have a simple interface displaying the following features:
  + Drive
    - On/off - display status + one button to toggle
    - Key - somewhere to enter the key to start the car (on/off can be toggled once valid key entered)
    - Accel/Decel - one button each? => need to clarify if rate can be adjusted
    - Set speed - one button to maintain current
    - See speed - display current
    - Fuel level - display current
    - See trip time - display current
  + Radio
    - Adjust volume (up/down) - one button each + display current
    - Adjust station (up/down) - one button each + display current
    - Adjust band (AM/FM) - one button to adjust + display current
  + Phone
    - Adjust volume - one button for up and one for down + current vol
    - Adjust mic level - one button ea. + current
    - See call duration - display current
    - List of phone numbers to select (dial when selected)
    - Manual # entry - keypad + call/end toggle button + display of numbers entered

Map

* current location - display
* stopped/not stopped - display
* must log information from each driving session, including:
  + driver name
  + speed and acceleration during trip
  + fuel supply/consumption
  + car, radio, and phone operation (include station, volume, call # and duration)
  + date and trip duration
  + avg and max speeds
* must log information from all sessions, including:
  + complete list of drivers
  + avg and max speeds (for each driver and overall?)
  + list of phone calls made

User Inputs: Digital Key, Car on/off, Accel, Decel, Set speed, radio volume up/down, station selection, station up/down, am/fm toggle, phone list (if selected automatically toggles dial), keypad, toggle dial/end, mic vol up/down, phone vol up/down

Outputs: On/off status, accel/decel rate, current speed, fuel level, trip time, current radio volume, current station, current band (am/fm), phone number entered, phone status (dialing/ended), call duration, current mic volume, current phone volume, map current loc + moving status, data file with tracked info

Coakley wrote what is below, but I separated them into bullet points and added the remaining requirements that I could find and think of. Not sure how to represent requirements best.

* A helpful user interface that has buttons that operate separate functions for acceleration, braking,start,shut off, radio on/off, am and fm, two buttons for channel seeking, 2 buttons for the volume, call/end call, 2 buttons for microphone volume, 2 buttons for speaker volume.
* this user interface should also include visual representations of what these buttons are doing, along with a fuel gauge, phone interface, radio display, speed display.
* there needs to be some function so that car and accelerate and store this information for each trip, another function to decelerate the car, a type of authentication to only allow some digital keys access and create a list of the people who used the car, a function to calculate fuel consumption, timers that record how long each driving session has occurred, a list of phone numbers, two lists of radio stations (am/fm), functions to display average and maximum speeds for current driving session and other driving sessions.