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Senior Design I

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**Work Package**

Work to be completed by me before the end of the semester:

* Raspberry pi gps location sent to firebase spreadsheet
  + Currently the pi can read its own location based on latitude and longitude, but we need to send that data after each specified time interval to the firebase spreadsheet.
  + Steps to completion:
    - The pi can send updates to the spreadsheet
    - The pi sends updates automatically to the spreadsheet
    - The pi sends updated on a specific time interval to the spreadsheet
    - The pi will only send updates when required
      * This will be based on bus’s consistent movement, a ‘on’ time frame, or other (undecided)
  + Research:
    - How to send data to firebase
    - How to modify specific cells of a spreadsheet
* Database reads in gps location from spreadsheet
  + Once the spreadsheet has been updated, the database should be updated automatically so that the users can retrieve the most recent data.
  + Steps to completion:
    - The database can read in values from spreadsheet
    - The database will automatically read in values from the spreadsheet after a time interval
    - The database will update other information once the spreadsheet value has been read in
  + Research:
    - Updating a database from a spreadsheet
    - Automatic Database updating
* Application receives current gps location from the database.
  + I am only in charge of back end, there is someone else in charge of what to do once the data has been received, but the application needs to be able to receive the gps information from the database.
  + Steps to completion:
    - Application can read in location from database
    - Application will automatically request updates from the database after every time interval
  + Research:
    - Automatic SQL or similar commands to retrieve information
* NEXT SEMESTER PLANS
  + Research possible switch to phone-based gps tracking
    - Need to find information on cost, ease of transmission, and possible legal issues of the driver having a phone on and nearby.
  + Build a login system with different privileges
    - Research possible security issues and countermeasures to SQL injection attacks
    - Apply privileges on a case-by-case basis
  + Modify database to hold information on expected arrival times and a warning system when a bus gets too far behind