# ECE 411 Industry Design Processes: Assignment #5

Due on Thursday, November 14, 2019

Team: T09

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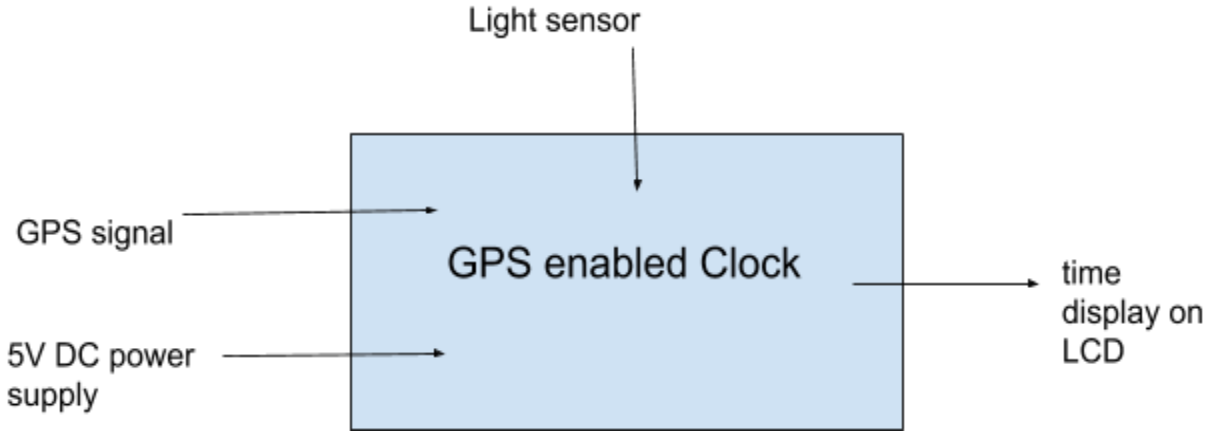
**Draw a high-level block diagram of your practicum project showing all inputs and outputs.**

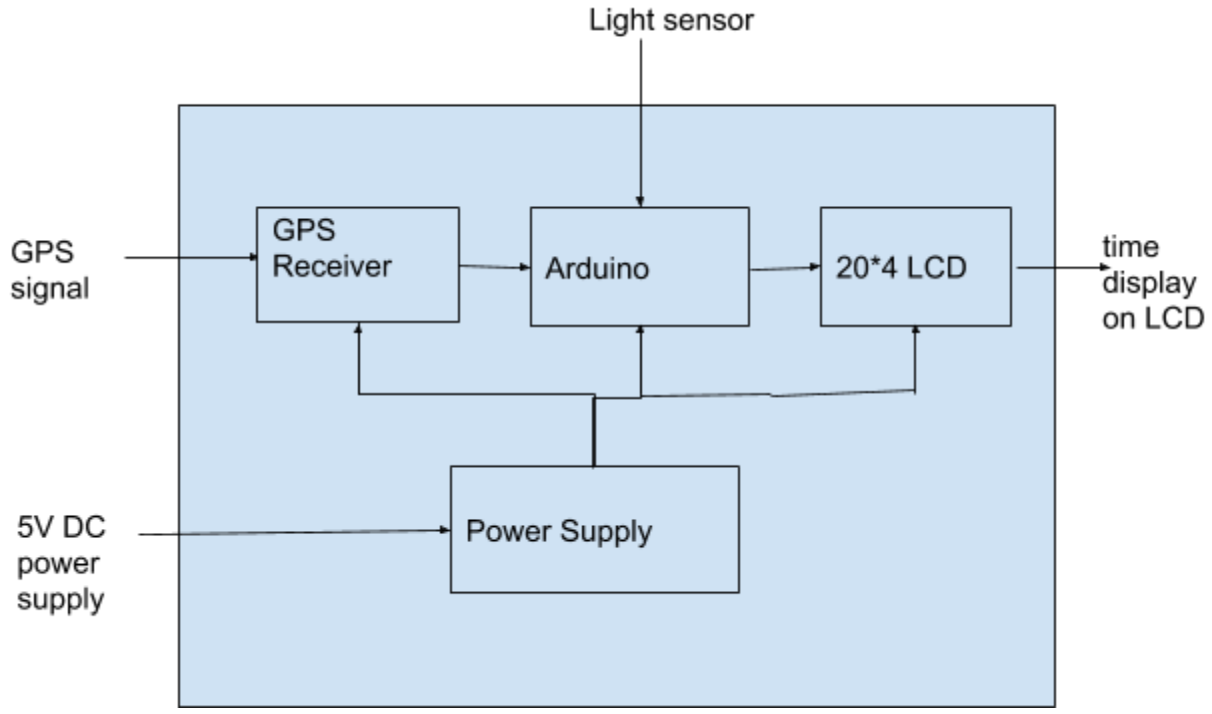
# GPS enabled clock: Level 0

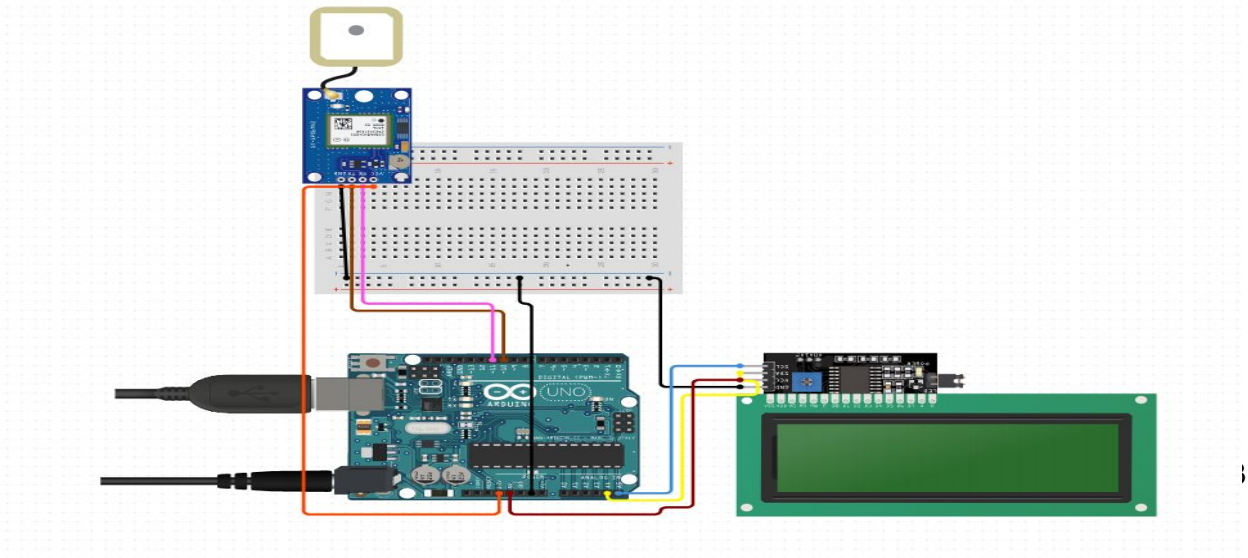



| | |
|---|---|
| Module | GPS enabled clock |
| Inputs | Light sensor, GPS receiver, DC power supply |
| Outputs | 20x4 RGB LCD |
| Functionality | Uses a GPS receiver that receives location information and sends it to the Adruino. Then, Adruino will set the time automatically on LCD. |

**Draw a next-level block diagram showing the principal components or modules of your project along with the interconnections between them.**

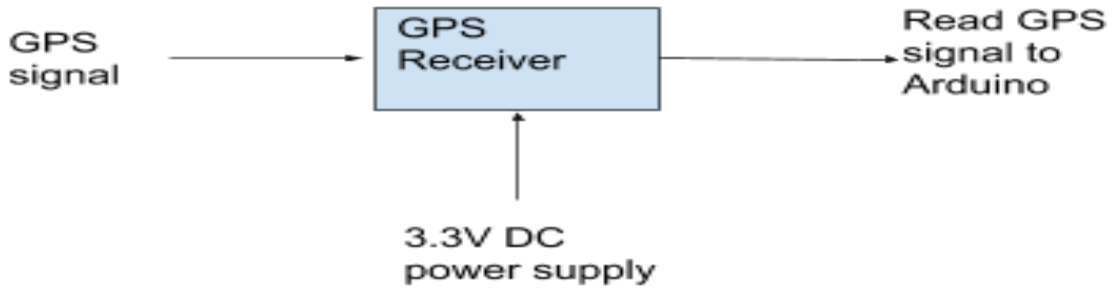
# GPS enabled clock: Level 1



**Draw a next-level block diagram showing the principal components or modules of your project along with the interconnections between them.**

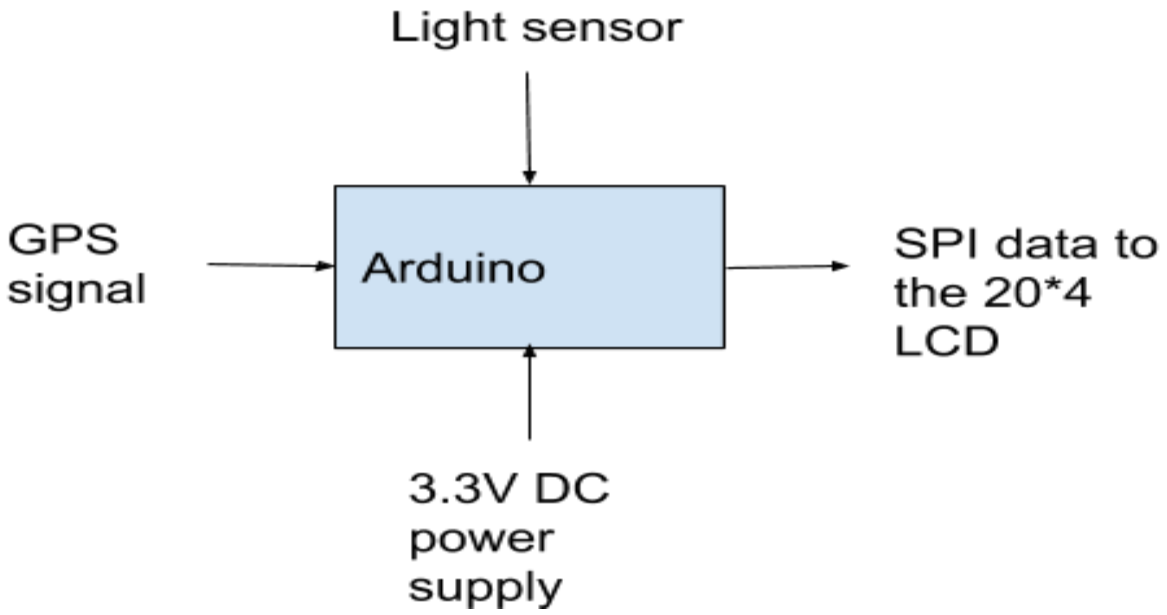
# GPS Receiver: Level 1




**For each component or module in the next-level block diagram, create a top-level block diagram of that component or module that describes its functionality, inputs, and outputs.**

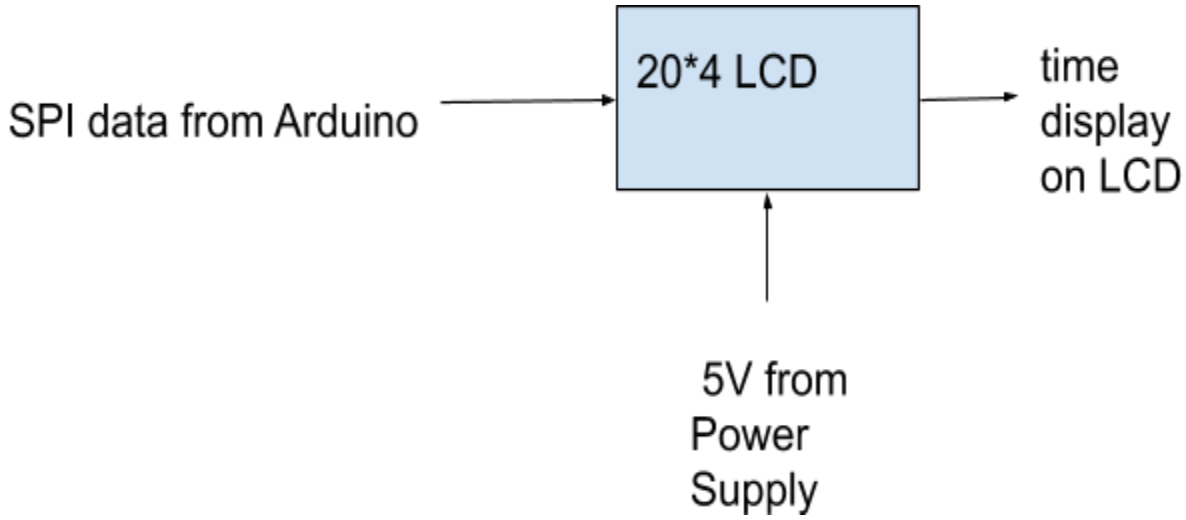
| | |
|---|---|
| Module | GPS Receiver |
| Inputs | GPS signal, 3.3V from Power Supply |
| Outputs | GPS data sent to Arduino |
| Functionality | GPS Receiver can get the user position, velocity and precise time, by processing the signal broadcast by the GPS satellites. |

# Arduino: Level 1



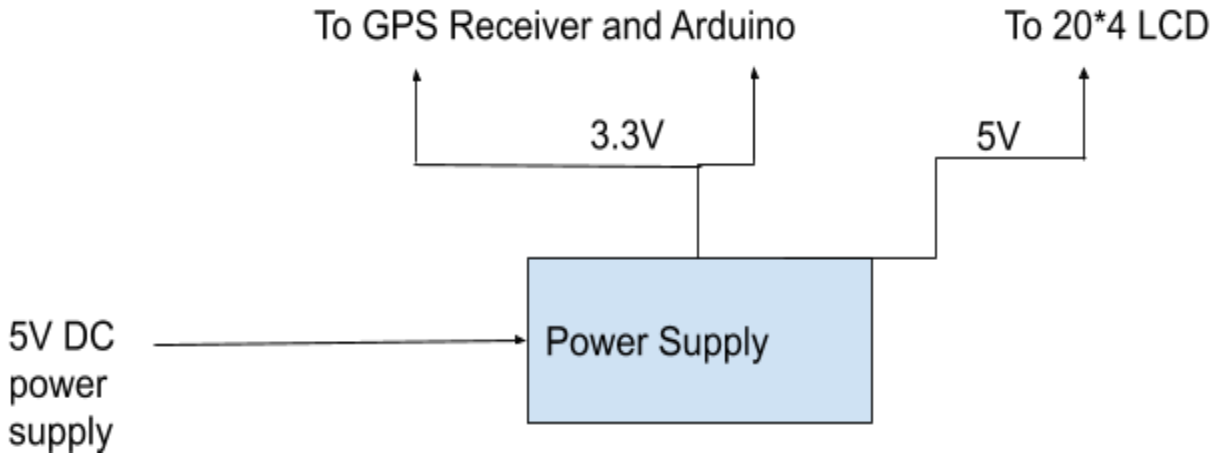

| | |
|---|---|
| Module | Arduino |
| Inputs | GPS data from GPS receiver, 3.3V from Power Supply, Light sensor |
| Outputs | SPI data to the 20*4 LCD |
| Functionality | Arduino can receive and analyze GPS information. Finally, the result is shown on LCD. Brightness to LCD should be controlled by the amount of light received at the light sensor. |

# 20*4 LCD: Level 1




| | |
|---|---|
| Module | 20*4 LCD |
| Inputs | SPI data from Arduino, 5V from Power Supply |
| Outputs | Visual information on the display screen |
| Functionality | Displaying text (time, date, etc) sent by Arduino. |

# Power Supply: Level 1




| | |
|---|---|
| Module | Power Supply |
| Inputs | 5V DC power supply |
| Outputs | 5V/3.3V DC power supply |
| Functionality | It provides the power the whole device using a 120V AC power supply to 5V DC power supply or USB. |