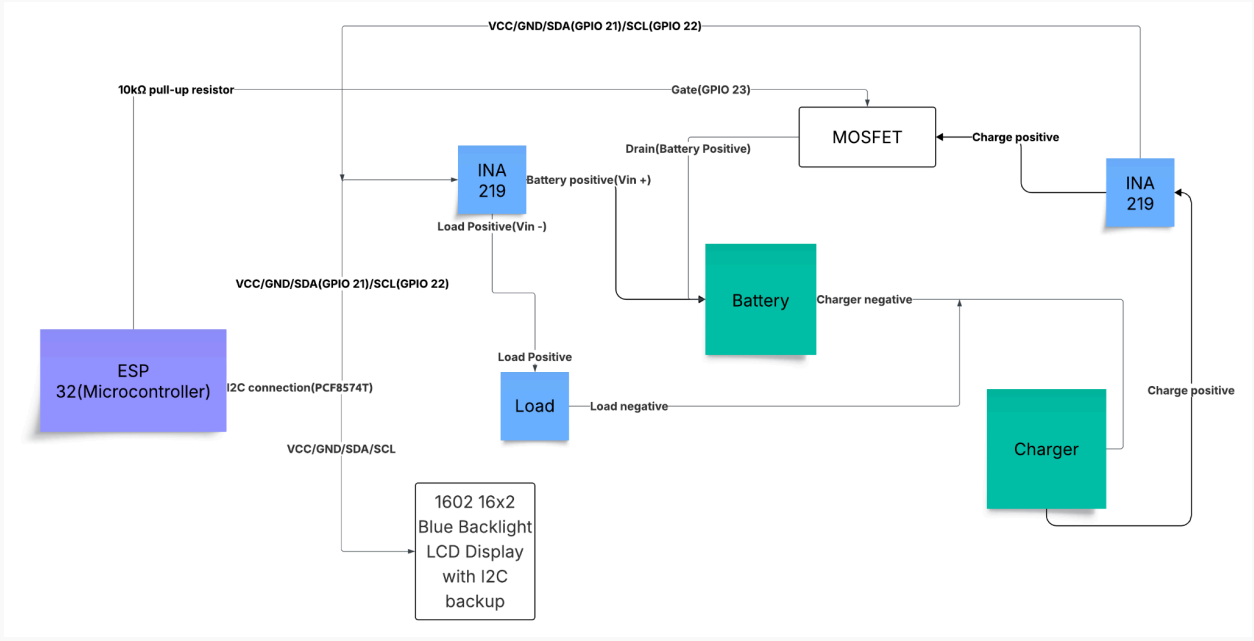
Updated Project Proposal.

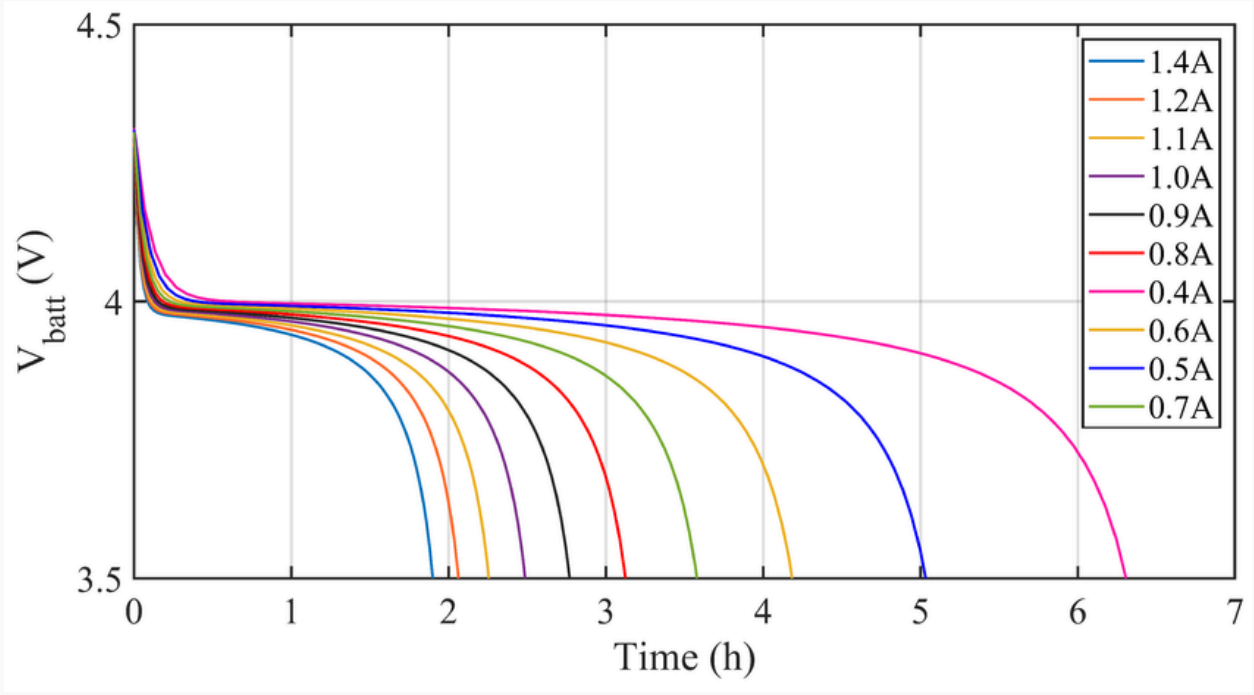
Relevant Components :
INA219 Current Monitor Voltage Sensor Module I2C 0-26V 3.2A Supply 3-5VDC - Rs.420
https://tronic.lk/product/ina219-current-monitor-voltage-sensor-module-i2c-0-26v-?srsltid=AfmBOop3T3LZ8Y2IJewfmsqibkeW2jtIms9QVPsp0FdidRe1dPagNcir
ESP 32 - Rs.1100
1602 16x2 Blue Backlight LCD Display - Rs 320
https://tronic.lk/product/1602-16x2-blue-backlight-lcd-display?srsltid=AfmBOopXBzj6PsD0DqRl6kXT6KU2xYW58dcir82kUDWxyHQuzUYldIlb
IRF540N Power MOSFET - Rs.70
https://tronic.lk/product/irf540n-power-mosfet?srsltid=AfmBOoqewqEqIg4nlYBA_cxQlp8QPsZecLCFkeRiac2KBTwUYFUJ3uXc
PCF8574T 8-bit IO Extension - Rs.320
https://tronic.lk/product/pcf8574t-8-bit-io-extension-expander-module-iic-i2c-wit?srsltid=AfmBOor4rr182MRGDxAAssaHIL-ugJe205SUk4AENJAtFFHr0F2D5o1f
Battery Charger - Rs.50
https://tronic.lk/product/tp4056-5v-1a-micro-usb-18650-special-lithium-battery-ch?srsltid=AfmBOop14VVq15i8IMJCYJFbC5WOzY3hCpCEa9Cz5Cdsie217vtOhrsM

Hardware Structure :

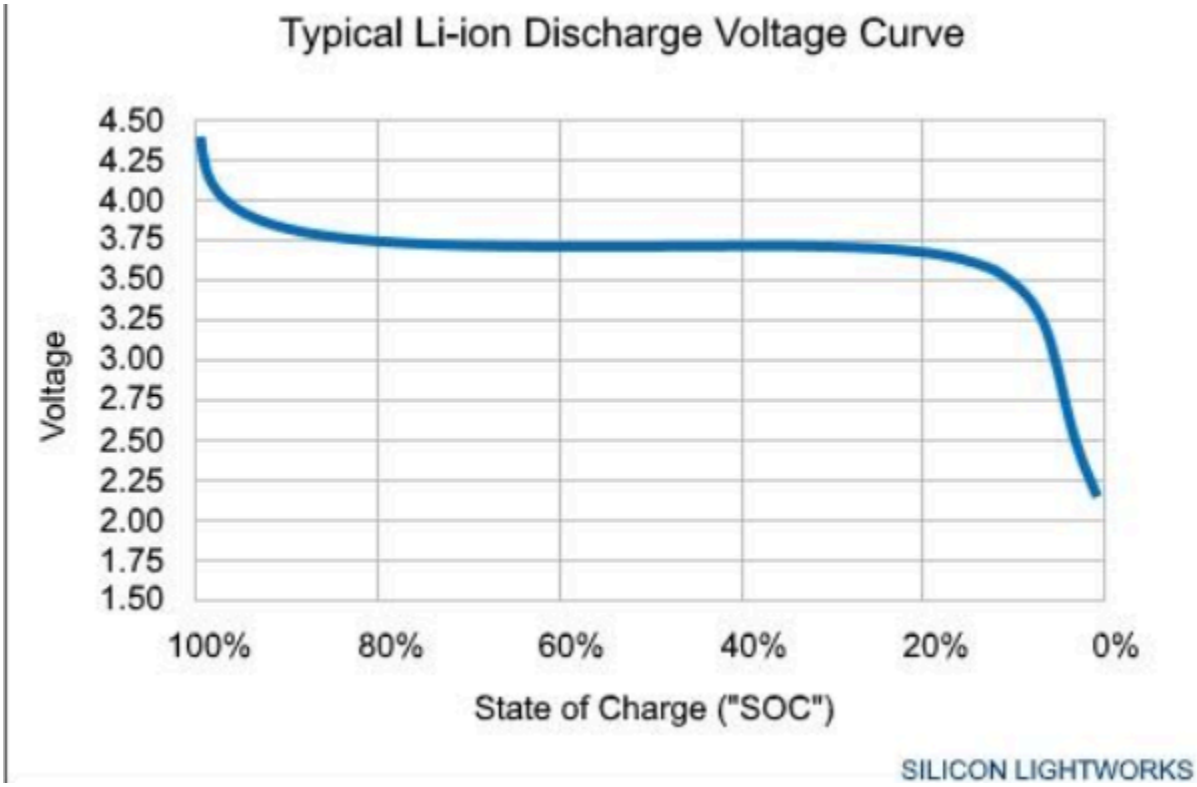


Link :
https://lucid.app/lucidchart/ab63548f-051f-4156-9031-f49bf163c6a3/edit?viewport_loc=-1075%2C-928%2C2844%2C1316%2C0_0&invitationId=inv_29a397d6-b607-4a47-abae-1adfe2832558

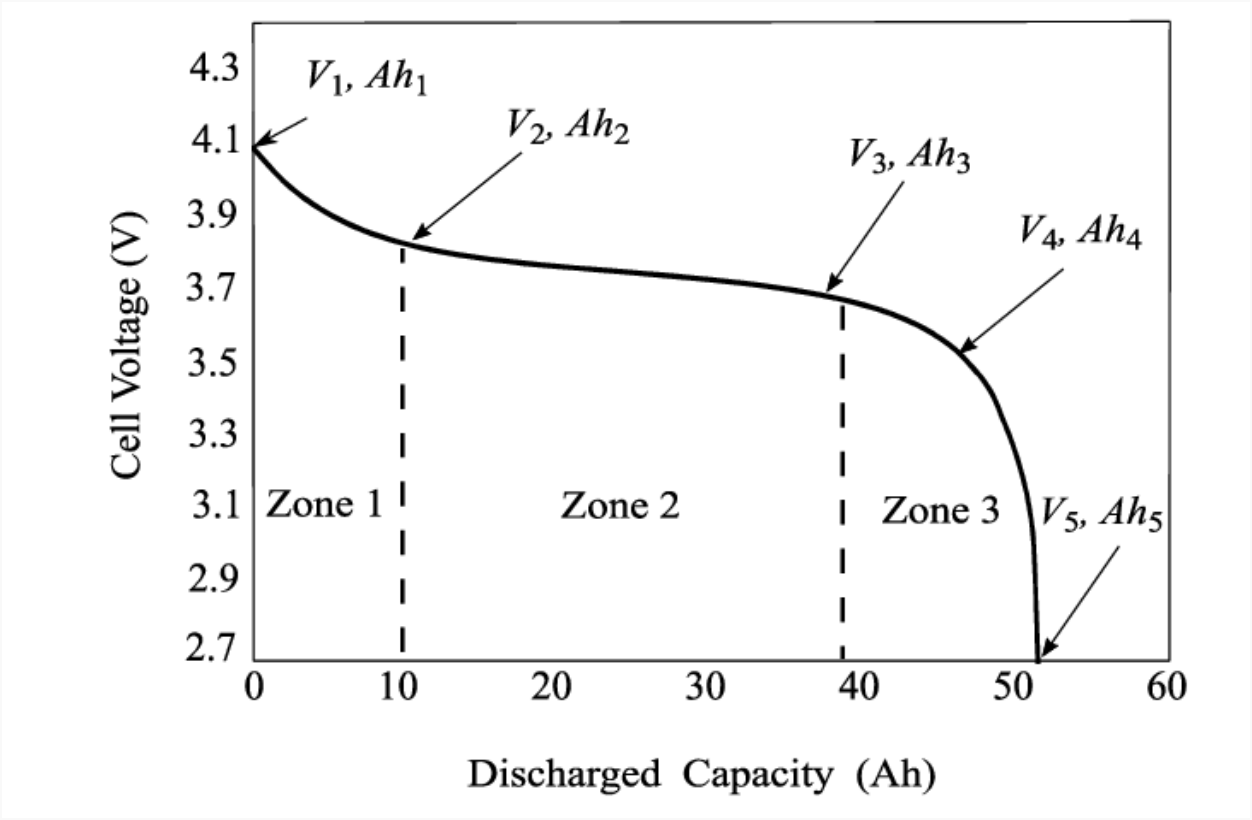
Graph analysis and algorithms :



Graph 1



Graph 2



Graph 3

Process :

- Power up the battery and calculate the voltages and current draw via INA module and use a timer in esp 32 to get the time.
- Then it breaks the connection with the charger and begins to power up the load.
- The INA module connected to the load will give the current draw and voltage of the system.
- Using a calculation the remaining time and SoC will be displayed in the LED screen.

Used algorithms

- Capacity(mAh) = Current(mA) x time
- Time = Capacity / Current

Future improvements

- Using simple machine learning model to get the output without charging inputs