

Project in ML and Electronics

Predicting the amount of LPG Gas

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THEME:

Suppose there is a Gas cylinder with an initial weight of 30 kg. During the usage of Gas, there is a decrease in the weight of the Gas cylinder continuously. We want to measure the amount of use of LPG gas after every 10 seconds.

Projective Objective

Project Challenge: Reading streaming data from Computer USB port and make excel sheet of reading and apply ML algorithms for prediction.

Hardware Used :

1. Load cell (for measuring weight)
2. Arduino
3. Amplifier (Analog to Digital Converter)

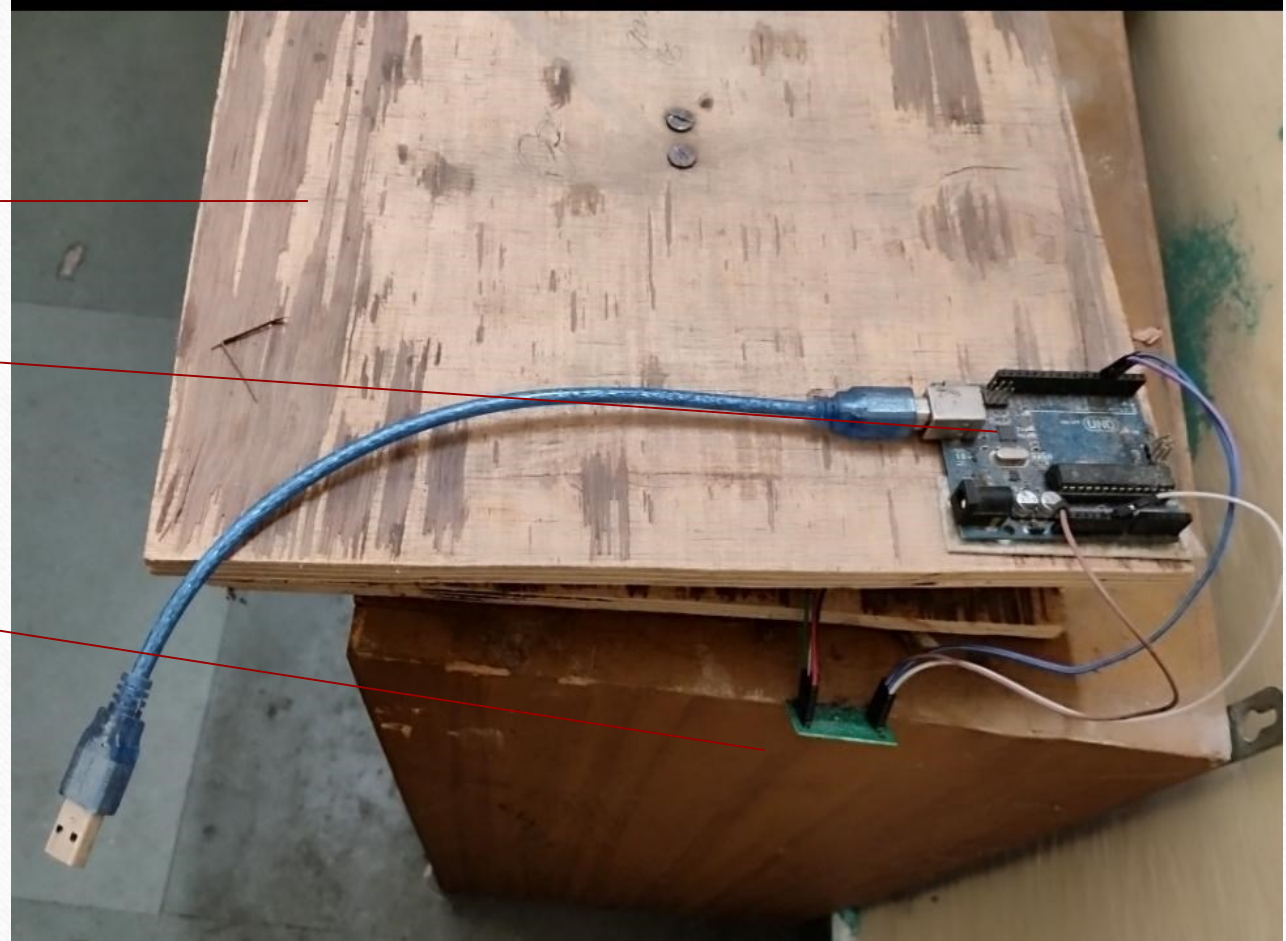
Software Used : Arduino Programming, Python Programming,
Serial Library

Top View

Plywood

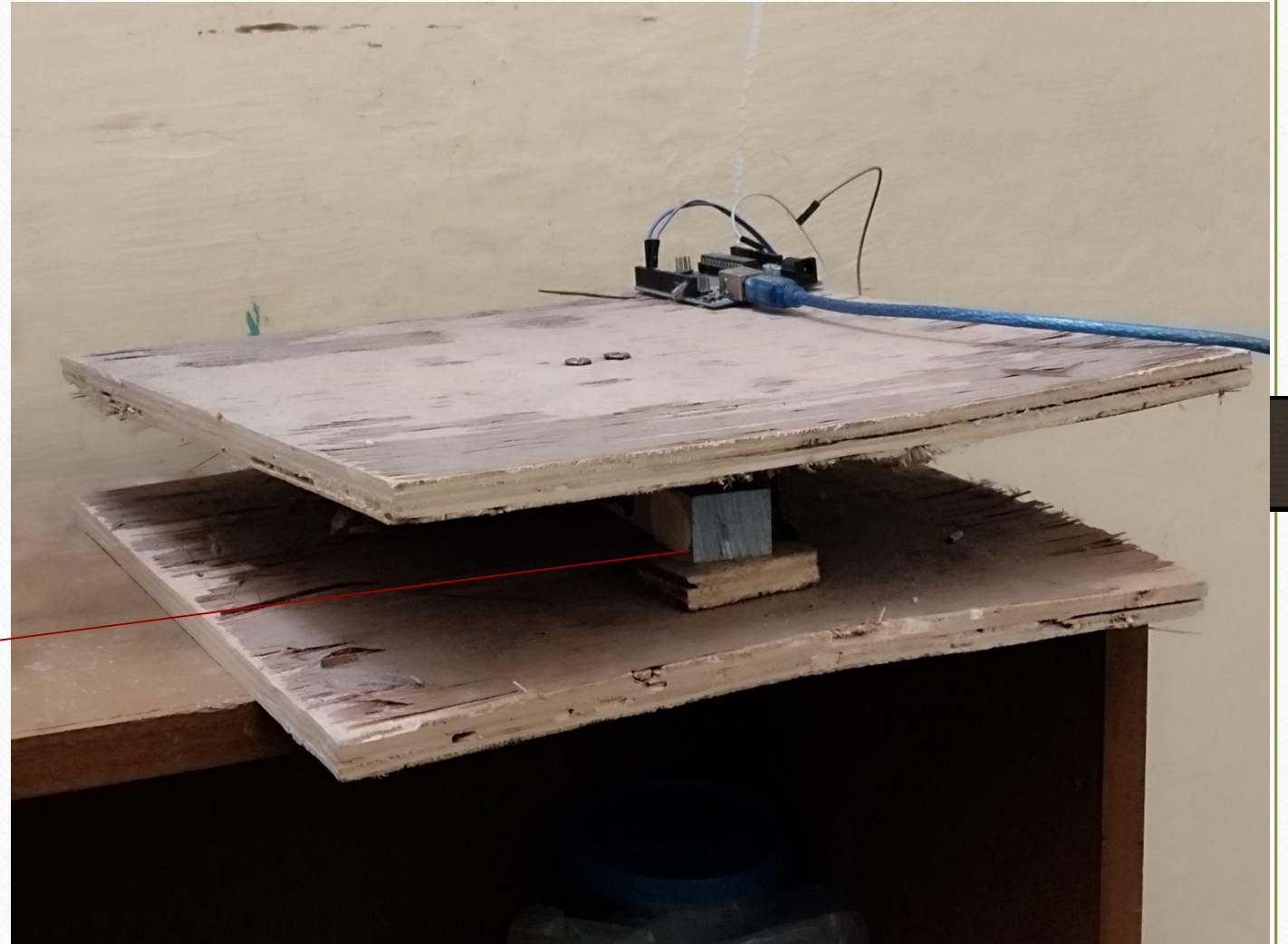
Arduino

Amplifier



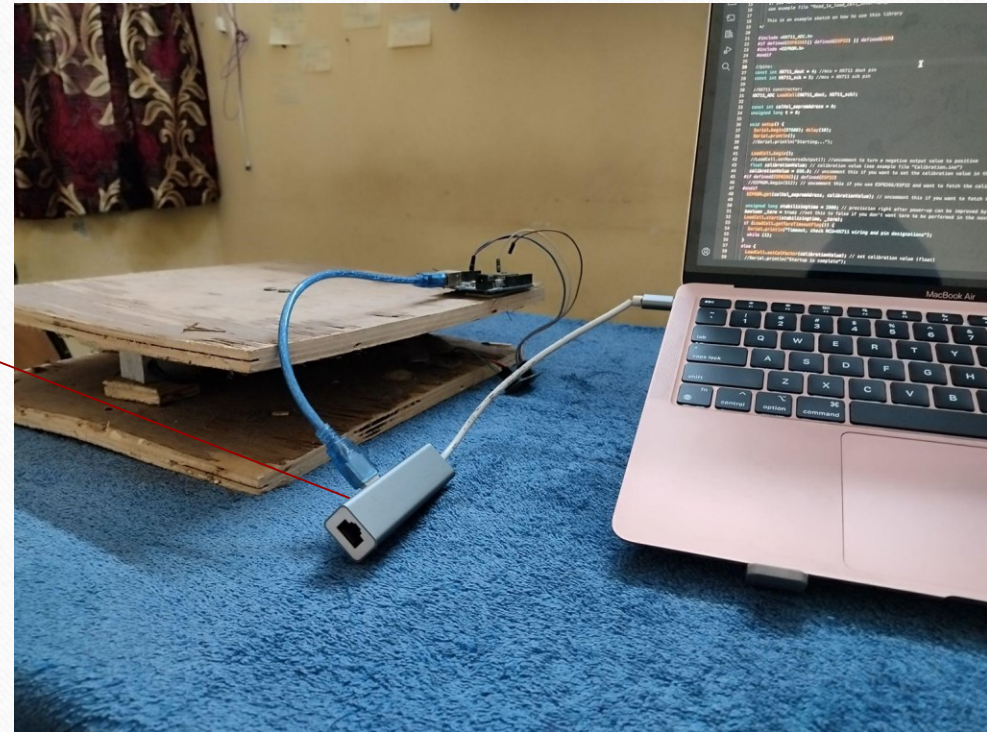
Side View

Load Cell

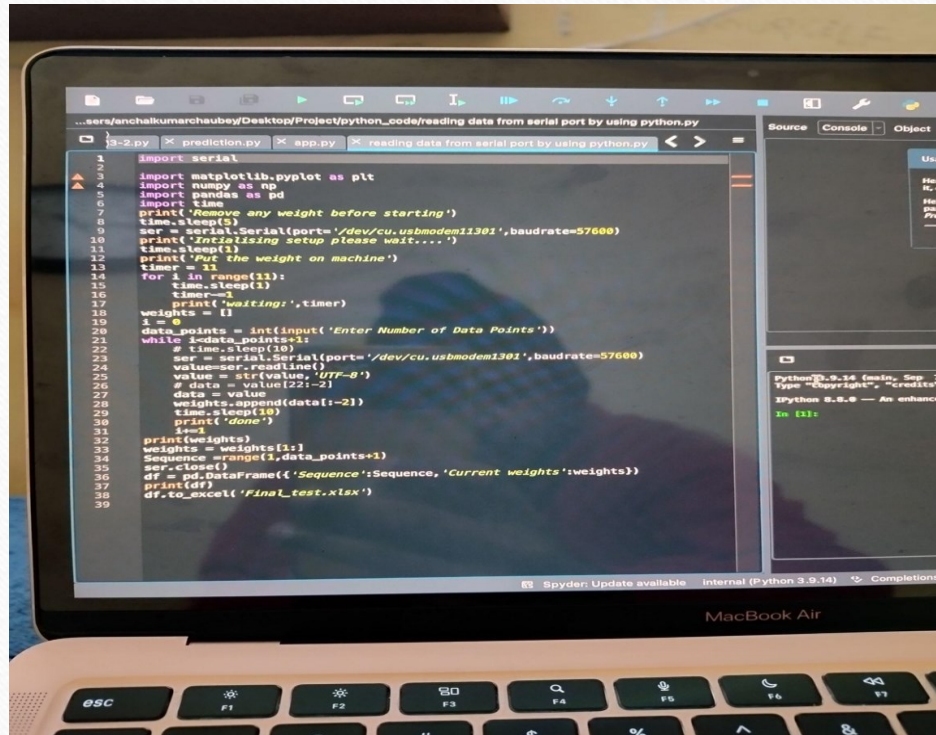


Transfer Arduino Data to USB Port

Connector



Read Data From USB Port by PYTHON SERIAL LIBRARY



```
1 import serial
2
3 import matplotlib.pyplot as plt
4 import numpy as np
5 import pandas as pd
6 import time
7 print('Remove any weight before starting')
8 time.sleep(5)
9 ser = serial.Serial(port='/dev/cu.usbmodem1301',baudrate=57600)
10 print('Initialising setup please wait...')
11 time.sleep(1)
12 print('Put the weight on machine')
13 timer = 11
14 for i in range(11):
15     time.sleep(1)
16     timer-=1
17     print('waiting: ',timer)
18     weights = []
19     i = 0
20     data_points = int(input('Enter Number of Data Points'))
21     while i<data_points+1:
22         # time.sleep(10)
23         ser = serial.Serial(port='/dev/cu.usbmodem1301',baudrate=57600)
24         value=ser.readline()
25         # data = value[22:-2]
26         data = value
27         weights.append(data[i:-2])
28         time.sleep(10)
29         print('done')
30         i+=1
31     print(weights)
32     weights = weights[1:]
33     Sequence =range(1,data_points+1)
34     ser.close()
35     df = pd.DataFrame({'Sequence':Sequence,'Current weights':weights})
36     print(df)
37     df.to_excel('Final_test.xlsx')
```

Sequence	Seconds	Current weights (in gm)	weight decreases by (in gm)
1	10	1025.51	0.00
2	20	1025.94	0.43
3	30	1025.5	-0.44
4	40	1022.96	-2.54
5	50	1016.16	-6.80
6	60	1010.78	-5.38
7	70	1005.34	-5.44
8	80	996.62	-8.72
9	90	989.31	-7.31
10	100	981.4	-7.91
11	110	973.7	-7.70
12	120	965.97	-7.73
13	130	958.46	-7.51
14	140	950.88	-7.58
15	150	943.15	-7.73
16	160	935.13	-8.02
17	170	926.94	-8.19
18	180	917.8	-9.14
19	190	910.19	-7.61
20	200	903.44	-6.75
21	210	895.13	-8.31
22	220	888.52	-6.61
23	230	879.49	-9.03
24	240	872.38	-7.11
25	250	864.63	-7.75
26	260	856.66	-7.97
27	270	849.61	-7.05
28	280	843.17	-6.44
29	290	835.22	-7.95
30	300	826.48	-8.74
31	310	818.83	-7.65
32	320	810.07	-8.76
33	330	801.9	-8.17
34	340	794.99	-6.91

Real time data in excel

Sequence ▼	Seconds ▼	Current weights (in gm) ▼	weight decreases by (in gm) ▼
1	10	1025.51	0.00
2	20	1025.94	0.43
3	30	1025.5	-0.44
4	40	1022.96	-2.54
5	50	1016.16	-6.80
6	60	1010.78	-5.38
7	70	1005.34	-5.44
8	80	996.62	-8.72
9	90	989.31	-7.31
10	100	981.4	-7.91
11	110	973.7	-7.70

Use Data For Predictions by Regression

```
1  from joblib import load
2
3  def prediction():
4      print('model can predict in range of 0 - 1000 ml')
5      try:
6          weight = int(input('Enter The weight in gm/ml to predict:'))
7          if not (weight > 0 and weight < 1000):
8              return print('Enter the value between 0-1000 ml or gm')
9      except:
10         return print('You entered invalid input')
11     test_model = load('/Users/anchalkumarchaubey/Desktop/Project/python_code/linear_model.joblib')
12     sequence = test_model.predict([[weight]])
13     hrs = (sequence*5)/60
14     return print(hrs[0,0], 'hours')
15
16 prediction()
17 prediction()
18 prediction()
```

Prediction in hours

Predictions

```
/python_code/prediction.py  
model can predict in range of 0 - 1000 ml  
Enter The weight in gm/ml to predict:100  
10.358962939292221 hours
```