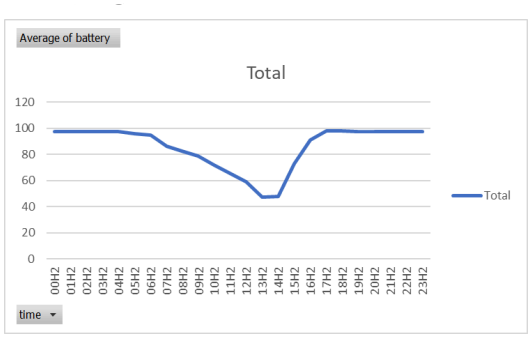
Turno is an electric autorikshaw vehicle financing company. Turno receives lat long data for various vehicles it has financed on a minute basis.

To support collections activity, analytics team is entrusted with the following data:

1. Figure the likely location of the current residence of each vehicle (hint: night location, 12:00 AM - 5:00 AM)

2. For each vehicle, figure the likely location at which the driver charges the vehicle (hint: change of battery charge with respect to time. Imagine that it goes discharged and then you put it back into charging so look at the sign of change of charge and the corresponding latitude - longitude when the derivative sign changes.Please refer the graph on battery charge for one vehicle below)



3. Figure which drivers are likely not making enough money and likely to default (hint: earning is proportional to distance covered during the day)

4. Find high density and low density areas wrt to vehicles(kmeans or other clustering)

The attached dataset looks as follows

vin	yearr	mmm	ddd	hr	half_hour	avg_lat	avg_long	avg_bat_charge
MD9EMCI	2025	1	1	4	h2	27.31245	77.77463	84
MD9EMCI	2025	1	1	16	h1	27.23726	77.8733	38.2
MD9EMCI	2025	1	1	12	h1	12.8875	80.18892	93.90909
MD9EMCI	2025	1	1	8	h2	12.88757	80.18954	95
MD9EMCI	2025	1	1	2	h1	12.90534	80.19209	97.57143
MD9EMCI	2025	1	1	14	h2	12.92181	80.16513	81.20833
MD9EMCI	2025	1	1	7	h2	12.88705	80.18966	95.08571

Link to the data

Vin - vehicle unique number
Year - year
Mmm- month
Ddd - day of the month
Hr - Hour of the day
half_hour - to keep dataset smaller, we have compressed the data in 30 mins sample(h1/h2)
h1<=30 mins, h2>30min 1.e.(First Half of hour, h1, Second Half of hour, h2)
Avg_lat - this is avg latitude value during the half hour window
Avg_long - this is the avg longitude value during the half hour window
Avg_bat_charge - this is the avg battery charge during the half hour window