



- 1- Assume that a 10 houses residential complex is a participant of smart grid. The following table shows the forecast of demand, supply as well as the day-ahead price (Ex5_data.txt). The feed-in tariff for the power exported to the network is 17 cent per kWh. Furthermore. The complex has a 240 kWh elastic load. The maximum allowed load is 100 kW.
 - a-Without optimization, calculate the profit if the elastic load will be distributed equally during the 24 hours (each hour has 10 kW additional load).
 - b- Now assume that the elastic load can be allocated any time during the day. write a program that finds the best strategy to be followed in order to maximize the profit. What is the profit?

- 2- Assume that the building in part 1 also has installed a 100 kWh battery with 90% charging and discharging efficiencies. The charge and discharge are rated at 30 kW.
Write a code that finds the best strategy to be followed in order to maximize the profit.

For each part, send the results as well as the code (R script) that you have used!

Time	Price (Euro/kWh)	Load(kW)	PV (kW)
0	0.15	10	0
1	0.20	16	0
2	0.17	11	0
3	0.13	10	0
4	0.11	20	0
5	0.10	30	0
6	0.13	50	0
7	0.18	50	0
8	0.19	20	20
9	0.18	21	30
10	0.20	25	40
11	0.20	28	50
12	0.21	20	60
13	0.23	3	60
14	0.25	6	70
15	0.27	20	70
16	0.28	46	60
17	0.35	74	30
18	0.36	84	10
19	0.37	30	0
20	0.35	30	0
21	0.30	20	0
22	0.25	20	0
23	0.20	10	0