PREDICTIVE ANALYTICS FOR BUILDING ENERGY UTILIZATION

Objective:

Assessment of heating load and cooling load requirements of buildings (energy efficiency) as a function of building parameters.

Outcome:

Building Parameters which results in lower Heating and Cooling Load requirements. Improved Energy Utilization with lower consumption and cost savings.

Study Group:

UCI performed energy analysis using 12 different building shapes. The buildings differ with respect to the glazing area, the glazing area distribution, and the orientation, amongst other parameters. They simulated various settings as functions of the afore-mentioned characteristics to obtain 768 building shapes. The dataset comprises 768 samples and 8 features, aiming to predict two real valued responses on Heating Load and Cooling Load.

Findings:

Sl No	Parameter	Optimal Value
1	Glazing Area	➢ 0.33
2	Glazing Area Distribution	➢ 2.5
3	Relative Compactness	➢ 0.86
4	Orientation	➢ 3
5	Surface Area	< 670

Parameters Used: (Category in Parenthesis)

Relative Compactness (CONSTRUCTION)
Surface Area (AREA)
Wall Area (AREA)
Roof Area (AREA)
Overall Height (CONSTRUCTION)
Orientation (CONSTRUCTION)
Glazing Area (AREA)
Glazing Area Distribution (CONSTRUCTION)
Heating Load (OUTCOME)
Cooling Load (OUTCOME)

Attributes Used:

None

Algorithm Findings:

Of the two categories listed the contribution % is as below:

a) CONSTRUCTION – 42%
b) AREA – 28%

- Parameters under CONTRUCTION category like Glazing Area Distribution, Relative Compactness and Orientation have more impact on lower Heating and Cooling Load.