

## Project Initialization and Planning Phase

Date	6 JUNE 2024
Team ID	739871
Project Title	Smart Home Temperature Prediction using Machine Learning
Maximum Marks	3 Marks

### Project Proposal (Proposed Solution) template

This project proposal outlines a solution to address a specific problem. With a clear objective, defined scope, and a concise problem statement, the proposed solution details the approach, key features, and resource requirements, including hardware, software, and personnel.

<b>Project Overview</b>	
Objective	Develop a machine learning system to predict the target value the temperature of a home.
Scope	Implement a prediction system that can reduce energy consumption by predicting the indoor temperature of a room, in order to choose whether or not to activate the HVAC system.
<b>Problem Statement: -</b>	
Description	This prediction seeks to go beyond this state of the art by utilizing smart Wi-Fi thermostat data in residences to develop dynamic predictive models for room temperature and cooling/heating demand. efforts are being made around the world to minimize greenhouse gas emissions and make progress towards a more sustainable society, global energy demand continues to rise.
Impact	implementing energy efficiency-related strategies and optimization techniques in buildings is a critical step in reducing global energy consumption.

## Proposed Solution

Approach	Utilize supervised machine learning techniques, such as Linear Regression, Random forest, LightGBM, and Xgboost. The solution will involve data preprocessing, feature engineering, model training,
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	and evaluation. Continuous monitoring and model retraining will be essential to maintain accuracy.
Key Features	<p>Real-time Prediction: The system will Predict Smart Home's Temperature Adaptive Learning: The model will continually learn from new data, improving its accuracy.</p> <p>Scalability: Designed to handle the indoor temperature of a room, in order to choose whether or not to activate the HVAC system.</p>

## Resource Requirements

Resource Type	Description	Specification/Allocation
<b>Hardware</b>		
Computing Resources	CPU/GPU specifications, number of cores	e.g., 2 x NVIDIA V100 GPUs
Memory	RAM specifications	e.g., 8 GB
Storage	Disk space for data, models, and logs	e.g., 1 TB SSD
<b>Software</b>		
Frameworks	Python frameworks	e.g., Flask , sklearn , metrics
Libraries	Additional libraries	e.g., scikit-learn, pandas, numpy

Development Environment	IDE, version control	e.g., Jupyter Notebook, Git , Google colab
<b>Data</b>		
Data	Source, size, format	e.g., Kaggle dataset, 500 images , CSV