Project Initialization and Planning Phase

Date	6 JUNE 2024
Team ID	740117
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.

Project Overview	
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.
Problem Statement: -	
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, LightGDBM, and Xgboost. The solution will involve data preprocessing, feature engineering, model training,

	and evaluation. Continuous monitoring and model retraining will be essential to maintain accuracy.
Key Features	Real-time Prediction: The system will Predict Smart Home's Temperature Adaptive Learning: The model will continually learn from new data, improving its accuracy. Scalability: Designed to handle the indoor temperature of a room, in order to choose whether or not to activate the HVAC system.

Resource Requirements

Resource Type	**Description**	**Specification/Allocation**
Hardware		
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
Software		
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
Data		
Data	Source, size, format	e.g., Kaggle dataset, 500 images , CSV