# Project Initialization and Planning Phase

| Date | 6 JUNE 2024 |
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| Team ID | 739670 |
| 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 | |
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| 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: - | |
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| 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. |

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| **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, |

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| | 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.<br> 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 |

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| Development Environment | IDE, version control | e.g., Jupyter Notebook, Git , Google colab |
| **Data** | | |
| Data | Source, size, format | e.g., Kaggle dataset, 500 images , CSV |