Project Development Phase
Model Performance Test

Date	06 May 2023
Team ID	NM2023TMID17415
Project Name	Project on A Reliable Energy Consumption Analysis System for Energy-Efficient Appliances

Data preprocessing: Ensure that the input data is properly preprocessed before training the models. This includes handling missing values, outliers, and scaling the features if necessary.

Model training: Train the linear regression model and random forest model using the prepared dataset. Verify that the models are trained successfully without any errors or warnings.

Model evaluation: Evaluate the performance of the trained models using appropriate evaluation metrics such as mean squared error (MSE), root mean squared error (RMSE), or R-squared. Check if the models provide reasonable and accurate predictions.

Debug model issues: If the models are not performing as expected, debug any potential issues. Inspect the training data, model hyperparameters, and feature selection techniques to identify potential causes of poor performance. Make necessary adjustments and retrain the models as needed.

Test prediction accuracy: Use a separate test dataset or cross-validation techniques to assess the prediction accuracy of the models. Compare the predicted energy consumption values with the actual values and calculate the evaluation metrics. Ensure that the models generalize well and can provide reliable predictions on unseen data.

Handle overfitting: Check for signs of overfitting, where the models perform well on the training data but poorly on new data. Apply regularization techniques such as L1 or L2 regularization, or adjust the hyperparameters of the models to reduce overfitting. Retest the models to confirm if the overfitting has been mitigated.

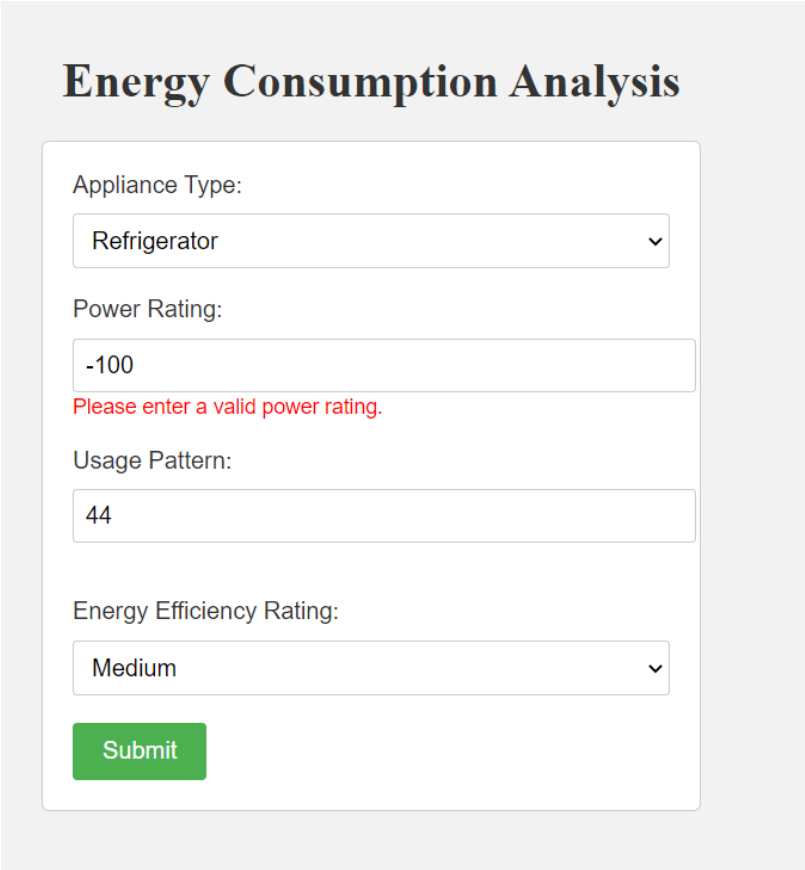
Test robustness: Evaluate the robustness of the models by introducing noise or perturbations to the input data. Assess how well the models can handle variations or outliers in the data and maintain reasonable prediction accuracy.

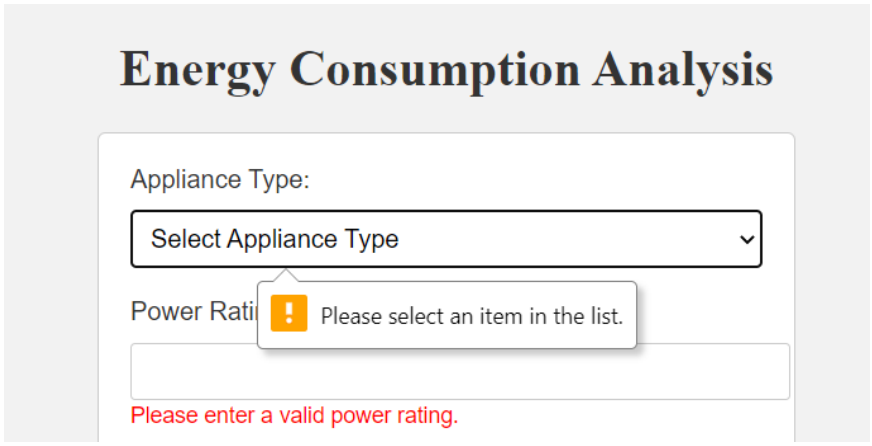
Consider feature importance: Assess the importance of different features in the models' predictions. Analyze the feature importance scores from the linear regression model and the

random forest model. Verify if the important features align with domain knowledge and make sense for energy consumption analysis.

Monitor and log errors: Implement error logging and monitoring mechanisms to track any errors or exceptions that occur during testing. Monitor the model's performance on new data and log any unexpected behaviors or exceptions. This will help identify and resolve any issues that may arise during testing.

Iterate and refine: Based on the testing results and insights gained, iterate on the models, data preprocessing techniques, or feature engineering approaches. Make necessary adjustments, bug fixes, and improvements to enhance the reliability and accuracy of the energy consumption analysis system.




Energy Consumption Analysis
Appliance Type:
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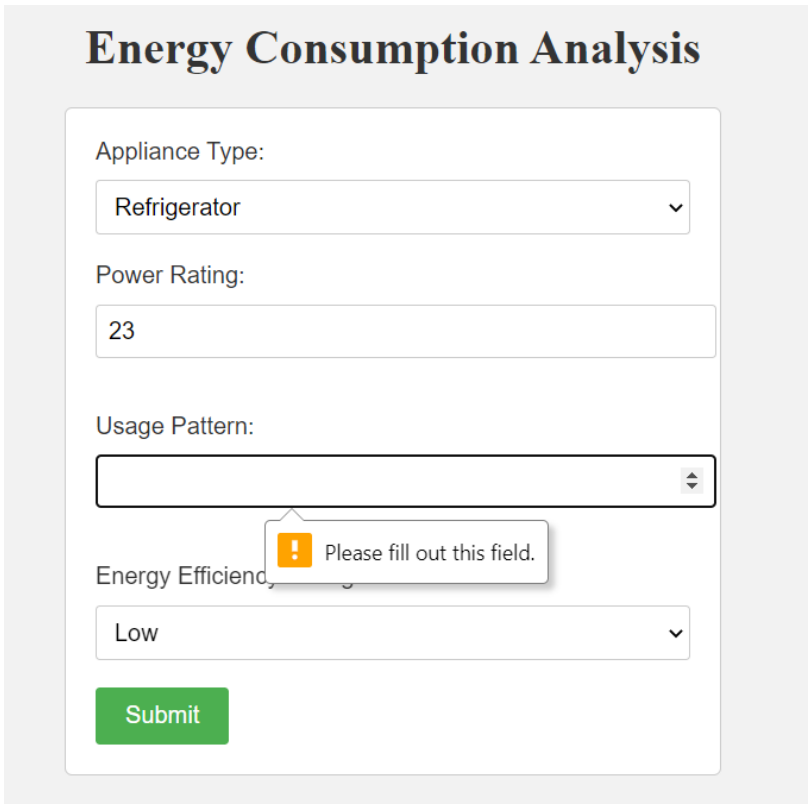
Power Rati
Please select an item in the list.
Please enter a valid power rating.


Energy Consumption Analysis
Appliance Type:
Refrigerator
Power Rating:
23
Usage Pattern:
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Energy Efficiency
Low
Submit