|  |  |  |
| --- | --- | --- |
| **Week 1** | **Project Setup & Planning** | - Define project objectives and scope - Set up GitHub for version control - Understand dataset structure and variables |
| **Week 2** | **Data Cleaning & Preprocessing** | - Handle missing values and outliers - Convert date/time formats if necessary - Perform feature engineering (e.g., adding time-based features) |
| **Week 3** | **Exploratory Data Analysis (EDA) - Part 1** | - Visualize occupancy trends over time - Identify seasonality and anomalies - Generate summary statistics |
| **Week 4** | **Exploratory Data Analysis (EDA) - Part 2** | - Perform correlation analysis - Identify key factors influencing occupancy - Finalize data selection for modeling |
| **Week 5** | **Model Selection & Baseline Implementation** | - Choose suitable ML models (Time Series, Regression, etc.) - Implement baseline models (e.g., ARIMA, Random Forest) - Evaluate initial performance with basic metrics |
| **Week 6** | **Improving Model Performance** | - Tune hyperparameters for better accuracy - Try additional models (e.g., XGBoost, Prophet, LSTMs) - Compare models and select the best-performing one |
| **Week 7** | **Feature Engineering & Advanced Insights** | - Test new features to improve model accuracy - Analyze feature importance (e.g., weather, day of the week) - Interpret key insights for decision-making |
| **Week 8** | **Finalizing Model & Evaluation** | - Optimize the best model - Perform cross-validation and assess generalization - Document final model selection and key insights |
| **Week 9** | **Final Refinements & Documentation** | - Ensure well-structured code and documentation - Organize results and insights for future reference - Validate consistency of findings |
| **Week 10** | **Project Wrap-up & Deliverables** | - Store results in a structured format - Ensure everything is reproducible for future work - Final review and cleanup |