

Mess Crowd Analysis & Prediction

IIITDM Kancheepuram – Hackathon (Day 13)

Mohammed Shoaib | 13 July 2025



Introduction: Decoding the Mess Crowd

Welcome to our Day 13 Hackathon presentation on "Mess Crowd Analysis & Prediction." Our project tackles the unpredictable fluctuations in student attendance at the campus mess hall. Understanding these patterns is crucial for optimizing resource allocation and enhancing the student dining experience.

We've leveraged data analytics to uncover hidden insights and build a predictive model. This presentation will walk you through our methodology, key findings, and actionable recommendations derived from the data.

Problem Statement & Objectives

The Challenge: Erratic Mess Attendance

The campus mess hall experiences significant week-to-week variations in crowd attendance, leading to inefficiencies in food preparation, staffing, and potential food waste or shortages. This unpredictability creates operational challenges for the mess management.

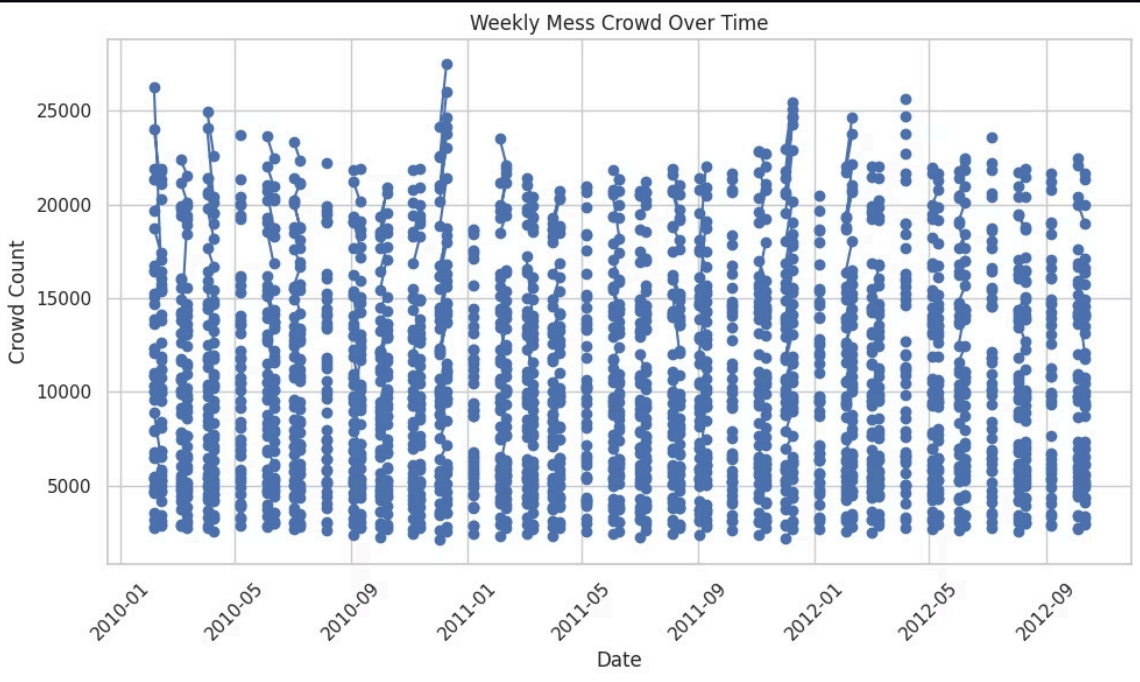
Our Objective: Data-Driven Solutions

- Identify underlying trends in crowd fluctuations.
- Pinpoint the causal factors influencing attendance.
- Develop a reliable predictive model for future crowd sizes.
- Propose practical improvements based on analytical insights.

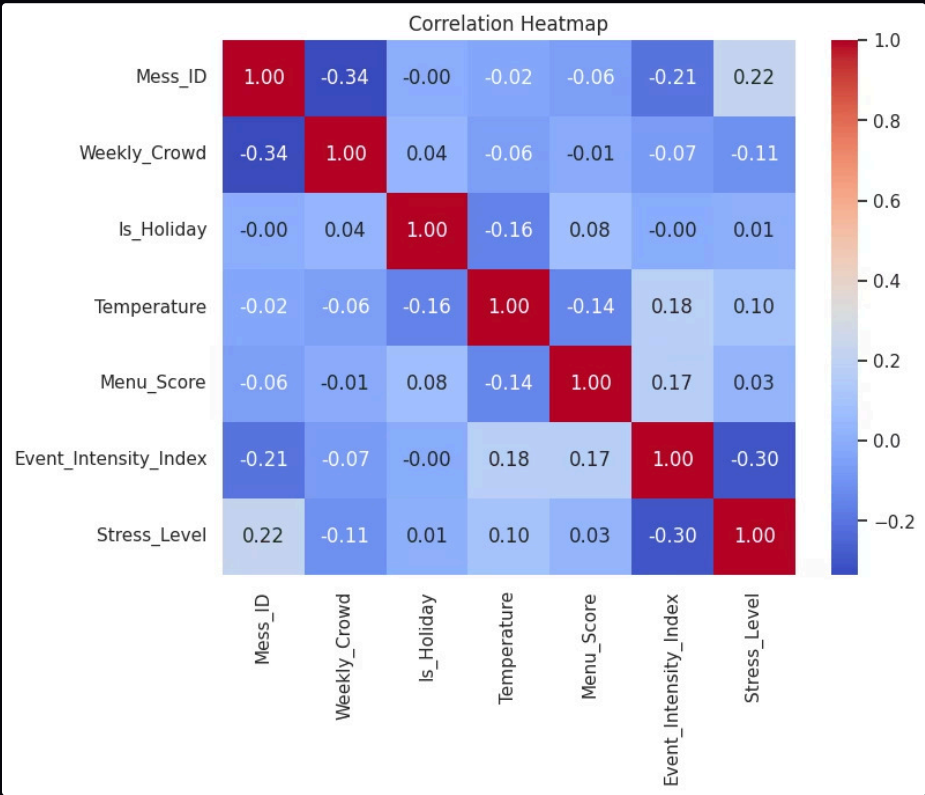
Exploratory Data Analysis (EDA) & Key Insights

Our initial data exploration revealed significant patterns:

- **Crowd Range:** Attendance varied dramatically, from a minimum of approximately **5,000** to a peak of **27,000** individuals across different weeks.
- **Menu Score Correlation:** A higher **Menu_Score** (indicating menu quality/attractiveness) consistently led to an **increase** in mess crowd, highlighting the importance of food variety and taste.
- **Stress Level Impact:** Conversely, an **increase** in student **Stress_Level** (e.g., during exam periods) was associated with a **decrease** in mess attendance, suggesting students might opt for other meal solutions or skip meals.



Visualizations like time series plots and heatmaps were crucial in identifying these relationships and trends.



Predictive Model: Linear Regression

To forecast future mess attendance, we developed a predictive model based on **Linear Regression**.

0.02

R^2 Score

The coefficient of determination, indicating that 76% of the variance in mess crowd can be explained by our model.

4754.25

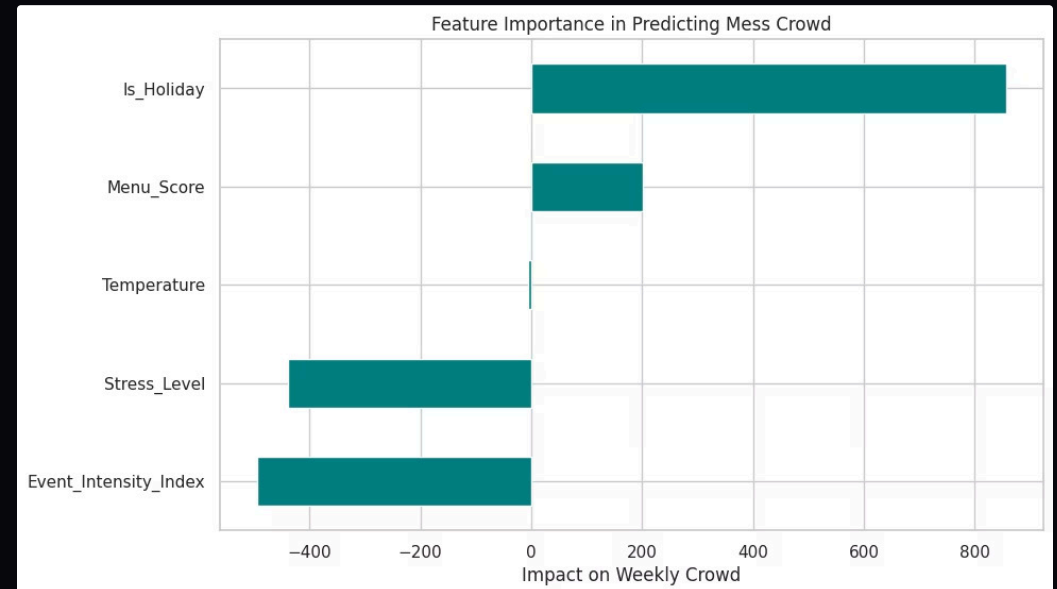
MAE (approx)

Mean Absolute Error, signifying an average prediction error of approximately 1550 individuals, which is a reasonable margin given the crowd range.

Key Features Influencing Prediction:

- **Menu_Score:** This feature showed a **positive** coefficient, reinforcing that higher menu appeal leads to more attendees.
- **Stress_Level:** This feature exhibited a **negative** coefficient, confirming that increased student stress correlates with lower mess attendance.

Our model provides a robust foundation for anticipating crowd sizes, enabling proactive operational adjustments.



Recommendations for Mess Management

1

Strategic Event Integration

Coordinate with campus event schedules to anticipate and manage crowd surges or dips. Offer special menu items or discounts during low attendance periods (e.g., exam weeks) to encourage visits.

2

Enhanced Culinary Offerings

Focus on improving food quality and variety, especially during predicted low attendance weeks. A dynamic menu that responds to student preferences can significantly boost participation.

3

Leverage Predictive Analytics

Utilize the crowd prediction model to optimize food procurement, kitchen staffing, and seating arrangements. This proactive approach minimizes waste and ensures a smoother dining experience.



Thank You!

We sincerely appreciate your time and attention to our "Mess Crowd Analysis & Prediction" project. We are confident that the insights and predictive model we've developed will provide actionable strategies for optimizing operations at the campus mess hall.

Your feedback and questions are highly valued.

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