# Assignment 02

**Deadline:** 10th November 2024 11:59 PM

To enhance restaurants' understanding of tipping behavior, helping tailor services and optimize operations develop a predictive model to estimate **tip amounts** in restaurants based on customer billing and demographic details (Tip dataset attached)

**Dataset url:** tip_dataset

**Google form:** https://forms.gle/kaPg3HabqKg4Ni4D8

1. Use **regression techniques**—including linear regression, ridge and lasso regularization, decision tree regression, ensemble methods (e.g., random forest), Support Vector Regression (SVR) and KNN. Estimate:

1. Identify which factors significantly impact tip amounts.
2. Prediction Accuracy: Build and evaluate models to forecast tips effectively.
3. Insights for Management: Provide actionable insights to improve customer service strategies and revenue management.

2. Check if the data follows a linear trend using following methods to analyze the relationship between the target variable and predictors.

- Scatter Plot
- Pair Plot for Multiple Features
- Correlation Matrix (Heatmap)
- Statistical Tests for Linearity (Rainbow Test)
- Residuals Plot
- Line Plot (for time-series data)
- Based on the trend in data apply suitable regression method and check model prediction accuracy.

**Submission:** Upload your work to a public GitHub repository and share the GitHub repository link in the provided Google form.