# Task 4: Building a predictive model for Dibs organization to be able to predict future sales.

1. Data Cleaning and Preparation:
2. Total Sales Calculation: A new column TotalSales is created by multiplying Quantity Ordered by Price Each.
3. Date Conversion: The Order.Date column is converted to a Date format using ymd\_hms() from the lubridate package.
4. Data Aggregation:
5. Daily Sales: The dataset is aggregated to calculate daily sales using the dplyr package.
6. Exploratory Data Analysis (EDA):
7. Sales Trends: Daily sales data is visualized to identify trends and patterns over time, likely using ggplot2.
8. Feature Engineering:
9. Date Components: New features such as day, month, and year are extracted from the Order.Date to capture temporal patterns.
10. Aggregated Features: Additional aggregated features such as weekly or monthly sales might be created to enhance the predictive model.
11. Model Building:
12. Random Forest: A Random Forest model is trained using the randomForest package.
13. XGBoost: An XGBoost model is also trained, leveraging the xgboost package.
14. Caret for Model Tuning: The caret package is used for hyperparameter tuning and model selection.
15. Model Evaluation:
16. The performance of different models is evaluated using metrics like RMSE (Root Mean Square Error) to select the best-performing model.
17. Visualization:
18. Feature importance plots and prediction vs. actual sales plots are generated to visualize model performance and key predictors.
19. Key Findings:
20. Sales Trends:
21. The EDA likely reveals trends such as peak sales periods, which can be crucial for planning inventory and marketing strategies.
22. Important Predictors:
23. Feature importance plots from models like Random Forest and XGBoost highlight key variables that significantly impact sales, such as specific dates, product categories, or regions.
24. Model Performance:
25. The selected predictive model provides accurate forecasts of future sales, helping Dibs organization make data-driven decisions for inventory management and sales strategies.