IDENTIFYING KEY DRIVERS OF EMPLOYEE PRODUCTIVITY IN A REMOTE WORK SETTING USING MULTIPLE LINEAR REGRESSION IN MINITAB.

1. Background & Objectives

The shift to remote work has prompted companies to reassess how various factors impact employee performance. This project aims to quantify how work hours, experience, distractions at home, and workspace quality affect productivity, using Minitab to build a reliable regression model for actionable HR insights.

2. Methodology

Data Source:

A sample dataset of 200 remote employees across industries, with variables including:

- **Dependent Variable:** Productivity Score (0–100 scale, manager-assigned)
- **Independent Variables:**
    - Weekly Work Hours
    - Years of Experience
    - Number of Household Distractions
    - Workspace Rating (1–5, self-rated)
    - Internet Stability (0 = Unstable, 1 = Stable)

Software Used:

Minitab 21

Steps Followed in Minitab:

1. **Data Import & Cleaning:**
    - Imported Excel file
    - Removed outliers using boxplot and descriptive stats
2. **Variable Encoding:**
    - Created dummy variable for internet stability

3. **Model Building:**
    - *Stat > Regression > Fit Regression Model*
    - Checked adjusted R^2 and p-values for predictor significance
4. **Assumption Testing:**
    - Used *Stat > Regression > Regression Diagnostics*
    - Examined residual plots, VIF, and normal probability plots

3. Results & Interpretation

- **Significant Predictors ($p < 0.05$):**
    - Work Hours
    - Workspace Rating
    - Internet Stability
    - Distractions (negative correlation)
- **Model Fit:**
    - $R^2 = 0.76$, Adjusted $R^2 = 0.74$
    - VIF < 2 for all predictors
    - Residuals followed normal distribution
- **Key Insights:**
    - Each additional hour worked per week increased productivity by ~0.8 points
    - Employees with stable internet scored 9.2 points higher on average
    - Workspace rating and distraction count had strong influence, reinforcing environment's importance

4. Visual Outputs (Created in Minitab)

- Bar chart: Productivity by Internet Stability
- Residual vs. Fitted Plot
- Histogram of Residuals
- Coefficient Table with 95% CI

5. Recommendations

- Offer ergonomic support and stipends to improve home workspace quality
- Encourage scheduling strategies to reduce distractions
- Provide internet support (e.g., reimbursements) to ensure stable connections

6. Future Work

- Add variables such as job role or team size to assess interaction effects
- Validate model across industries (tech, services, education)
- Run logistic regression for binary classification: "High Productivity vs. Low Productivity"

7. Stakeholder Relevance

Academic Use:

- Illustrates modern regression analysis applied to HR research
- Suitable for coursework in organizational psychology, statistics, and workforce analytics

Corporate Use (HR/Operations Teams):

- Helps HR departments make data-backed policy changes
- Useful for building productivity dashboards in enterprise tools like Power BI