Profit Analysis Report

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Data Overview

Dataset Summary :

- Number of Records: 50 observations
- Variables Analyzed
- R&D Spend
- Marketing Spend
- Administration Spend
- Profit (Target Variable)

Goals

1 . To analyze profit trends and identify strategies to enhance business profitability using data insights from Excel and Power BI.

2 . Leverage insights from Excel regression and Power BI dashboards for data-driven decision-making.

Tools Used in the Project

- SQL
  - Used to extract data from the team’s database for analysis.

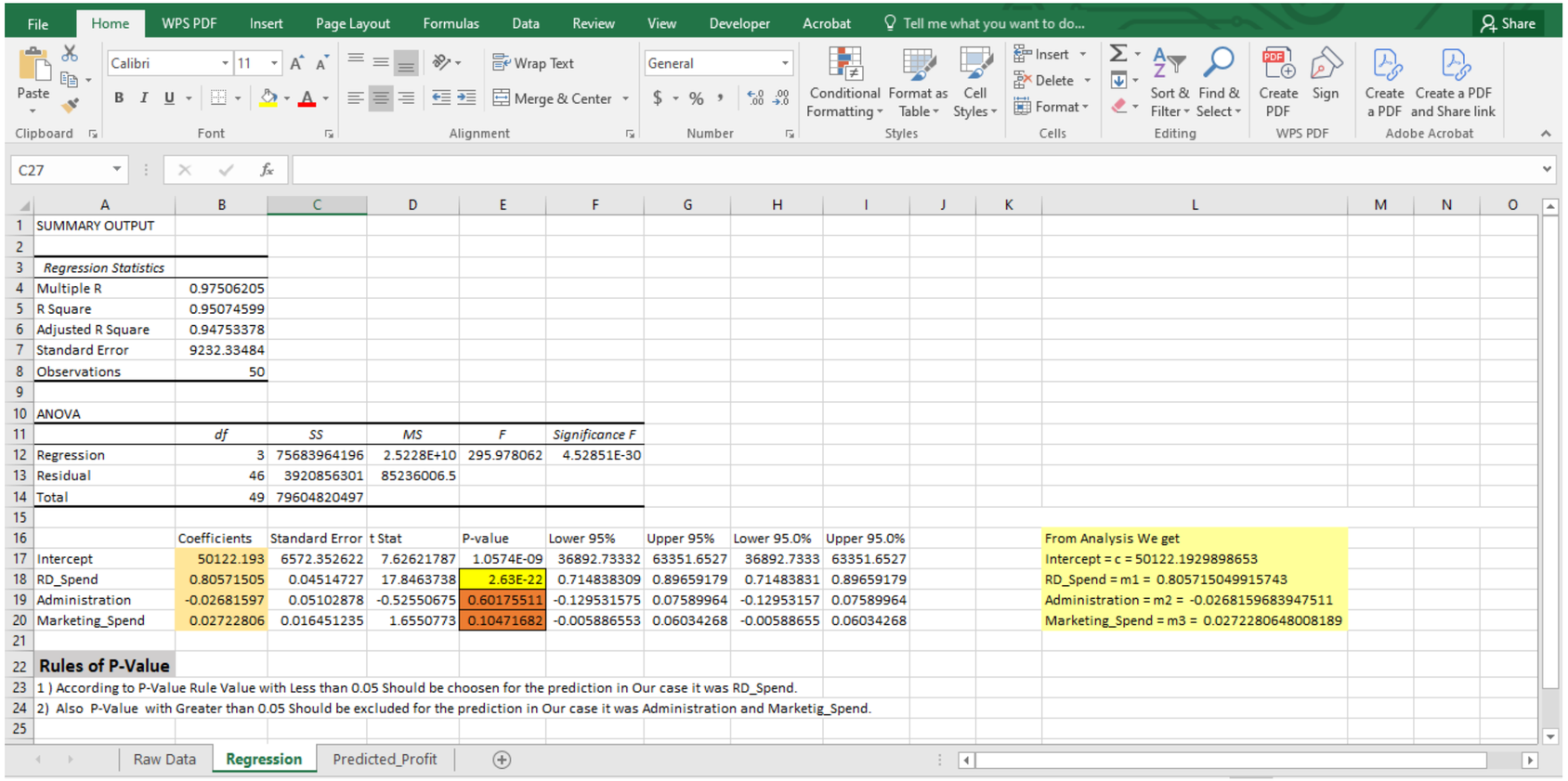
- Microsoft Excel
  - Used for data analysis and regression calculations. Excel's built-in functions, such as the Data Analysis Toolpak, were utilized to perform linear regression, identify correlations, and analyze profit-driving variables.

- Power BI
  - Used to create interactive dashboards and visualizations for better insights into profit trends. Power BI helped in visualizing sales performance, expenses, and operational efficiency across various business segments.

Regression Analysis Results

In this section, we performed a multiple regression analysis to identify the key factors influencing profits.
The analysis was conducted using Excel, which provided us with the following key outputs:

- Regression Statistics
- ANOVA Results
- Coefficients and P-Values
- Model Equation



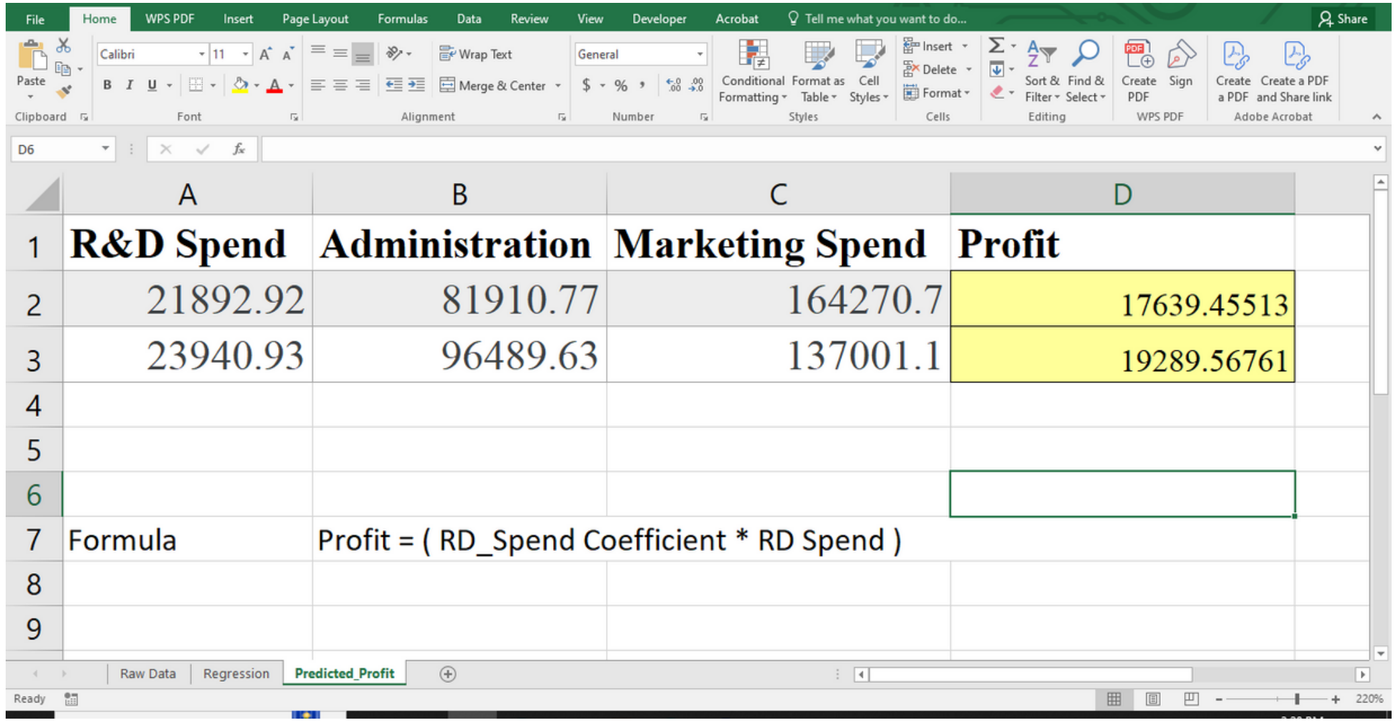
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	SUMMARY OUTPUT														
2															
3	*Regression Statistics*														
4	Multiple R	0.97506205													
5	R Square	0.95074599													
6	Adjusted R Square	0.94753378													
7	Standard Error	9232.33484													
8	Observations	50													
9															
10	ANOVA														
11		*df*	*SS*	*MS*	*F*	*Significance F*									
12	Regression	3	75683964196	2.5228E+10	295.978062	4.52851E-30									
13	Residual	46	3920856301	85236006.5											
14	Total	49	79604820497												
15															
16		Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%			From Analysis We get			
17	Intercept	50122.193	6572.352622	7.62621787	1.0574E-09	36892.73332	63351.6527	36892.7333	63351.6527			Intercept = c = 50122.1929898653			
18	RD_Spend	0.80571505	0.04514727	17.8463738	2.63E-22	0.714838309	0.89659179	0.71483831	0.89659179			RD_Spend = m1 = 0.805715049915743			
19	Administration	-0.02681597	0.05102878	-0.52550675	0.60175511	-0.129531575	0.07589964	-0.12953157	0.07589964			Administration = m2 = -0.0268159683947511			
20	Marketing_Spend	0.02722806	0.016451235	1.6550773	0.10471682	-0.005886553	0.06034268	-0.00588655	0.06034268			Marketing_Spend = m3 = 0.0272280648008189			
21															
22	**Rules of P-Value**														
23	1) According to P-Value Rule Value with Less than 0.05 Should be choosen for the prediction in Our case it was RD_Spend.														
24	2) Also P-Value with Greater than 0.05 Should be excluded for the prediction in Our case it was Administration and Marketig_Spend.														
25															

Raw Data | Regression | Predicted_Profit

Regression Analysis Results

- The model equation includes **RD_Spend** because its p-value is below 0.05, indicating a statistically significant relationship with profit.

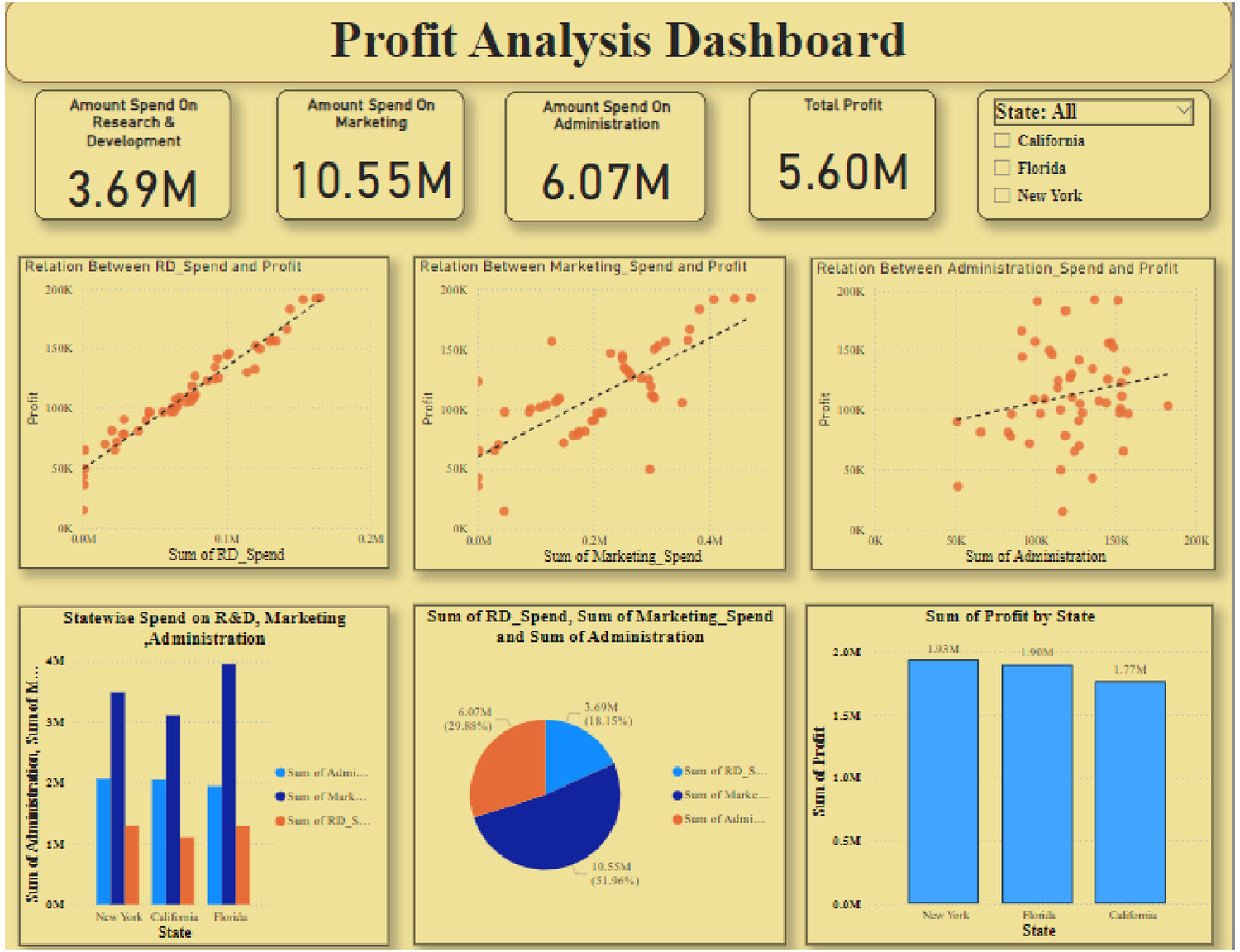
- **Administration** and **Marketing_Spend** are excluded as their p-values exceed 0.05, indicating no significant impact on profit.



	A	B	C	D
1	R&D Spend	Administration	Marketing Spend	Profit
2	21892.92	81910.77	164270.7	17639.45513
3	23940.93	96489.63	137001.1	19289.56761
4				
5				
6				
7	Formula	Profit = (RD_Spend Coefficient * RD Spend)		
8				
9				

- Formula : Profit = RD_Spend Coefficient * RD Spend

Power BI Dashboard:



Dashboard Explanation

- **Scatter Plots :** Show relationships between spending categories (R&D, Marketing, Administration) and profit.
- **Bar Chart :** Compares state-wise spending across all categories.
- **Pie Chart :** Shows the percentage contribution of each spending category.
- **Bar Chart (Profit by State) :** Highlights total profit for each state.

Actionable insights

R&D has the highest positive correlation with Profit. Increasing R&D spending is recommended.

Marketing and Administration spending show minimal impact; their budgets can be optimized

Suggestions

- Invest More in R&D
- Redirect additional resources to R&D for maximum profitability.
- Optimize Marketing Spend
- Assess the effectiveness of current campaigns and reallocate budgets to high-performing areas.
- Review Administration Costs
- Consider reducing or optimizing administrative expenses to improve cost efficiency.

Questions & Answers

Encouragement for Questions:

"Feel free to ask any questions regarding the profit analysis, spending trends, or actionable recommendations."

Key Topics for Discussion:

- Impact of R&D, Marketing, and Administration spending on profitability.
- Insights into state-wise performance and profitability.
- Suggestions for optimizing budgets and improving ROI.
- Any challenges faced during the data analysis or interpretation.

Closing Statement:

"We welcome your feedback and further queries to refine the analysis and make data-driven decisions more impactful."

Thank You