

Employee Data Analysis using Excel

Student Name: *Priyadharshini S*
Register No : 2213331042056
Department : B.Com (Commerce)
College : Bharathi women's college

PROJECT TITLE

Employee Salary Analysis and Optimization

AGENDA

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2. Project Overview
3. End Users
4. Our Solution and Proposition
5. Dataset Description
6. Modelling Approach
7. Results and Discussion
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PROBLEM STATEMENT

"The human resources department wants to analyze the current salary structure of employees to identify potential disparities, trends, and areas for improvement. The goal is to develop a fair and competitive compensation strategy that attracts and retains top talent, while also ensuring equitable pay practices across the organization."



PROJECT OVERVIEW

OBJECTIVE:

Analyze current employee salary data to identify trends, disparities, and areas for improvement, and develop a fair and competitive compensation strategy to attract and retain top talent.

Scope:

- 1. Collect and clean salary data for all employees
- 2. Analyze salary data by role, department, gender, age, tenure, and performance
- 3. Identify disparities and trends in salary data
- 4. Research industry standards and market rates
- 5. Develop recommendations for salary adjustments and compensation strategy improvements.



WHO ARE THE END USERS?

- **HR Department:** To develop fair compensation strategies, ensure compliance, and optimize HR processes.
- **Management:** To make informed decisions about salary budgets, employee retention, and talent acquisition.
- **Employees:** To understand their compensation relative to peers and industry standards.
- **Finance Department:** To manage salary budgets, forecast costs, and optimize financial planning.
- **Business Leaders:** To align compensation strategies with business objectives and drive organizational performance.
- **Compensation Committee:** To ensure fair and competitive compensation practices.
- **Data Analysts/Scientists:** To gain insights from salary data and drive data-driven decisions.

OUR SOLUTION AND ITS VALUE PROPOSITION



Solution: Comprehensive Employee Salary Analysis and Optimization Tool.

- **Data Collection:** Gather employee salary data, job roles, departments, and relevant attributes.
- **Data Analysis:** Analyze salary data using statistical models and machine learning algorithms.
- **Benchmarking:** Compare salaries to industry standards, market rates, and internal equity.
- **Insights and Recommendations:** Identify disparities, trends, and areas for improvement, and provide actionable recommendations.

Value Proposition:

- **Fairness and Equity:** Ensure equal pay for equal work, reducing legal risks and promoting a positive work environment.
- **Competitive Advantage:** Develop a competitive compensation strategy to attract and retain top talent.
- **Data-Driven Decisions:** Provide actionable insights for HR, management, and finance to make informed decisions.

Dataset Description

Description: This dataset contains information about employee salaries, demographics, and job characteristics.

Variables:

- Employee ID (unique identifier)
- Job Title(e.g., Software Engineer, Marketing Manager)
- Department (e.g., Engineering, Marketing)
- Salary (annual base salary)
- Age
- Gender
- Tenure (years of service)
- Performance Rating (e.g., 1-5 scale)
- Education Level(e.g., Bachelor's, Master's)
- Location (city, state, or country)

Data Types:

- Categorical (Job Title, Department, Gender, Education Level, Location)
- Numerical (Salary, Age, Tenure, Performance Rating)

Data Sources:

- HR Information System (HRIS)
- Payroll records.
- Employee surveys.

Data Quality:

- Data is accurate and up-to-date.
- Missing values are minimal (<5%)
- Data is anonymized for confidentiality

THE "WOW" IN OUR SOLUTION



- **Predictive Analytics:** Uses machine learning algorithms to predict future salary trends and needs.
- **Personalized Recommendations:** Provides tailored suggestions for salary adjustments and compensation strategies based on individual employee data.
- **Real-time Benchmarking:** Offers live updates on market rates and industry standards for accurate comparisons.
- **Interactive Visualization:** Features intuitive dashboards and reports for easy exploration and insights.
- **Automated Compliance:** Ensures adherence to labor laws and regulations, reducing legal risks.
- **Integration with HR Systems:** Seamlessly connects with existing HR software for streamlined data management.
- **Customizable:** Allows clients to tailor the solution to their specific needs and goals.
- **Actionable Insights:** Delivers concrete recommendations for improving employee satisfaction, retention, and performance.
- **Cost Savings:** Identifies areas for salary budget reduction and optimization.
- **Enhanced Employee Experience:** Supports fair and transparent compensation practices, boosting employee trust and engagement.
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MODELLING

Phase 1: Data Preparation:

- Data cleaning and preprocessing
- Feature engineering (e.g., creating new variables like tenure, experience)
- Data transformation (e.g., normalization, standardization)

Phase 2: Exploratory Data Analysis (EDA)

- Univariate analysis (e.g., distributions, summaries)
- Bivariate analysis (e.g., correlations, scatter plots)
- Multivariate analysis (e.g., clustering, dimensionality reduction)

Phase 3: Modeling:

- Linear Regression: $\text{Salary} \sim \text{Job Title} + \text{Department} + \text{Location} + \text{Experience} + \text{Education}$.
- Decision Trees: $\text{Salary} \sim \text{Job Title} + \text{Department} + \text{Location} + \text{Experience} + \text{Education}$.

Phase 4: Evaluation:

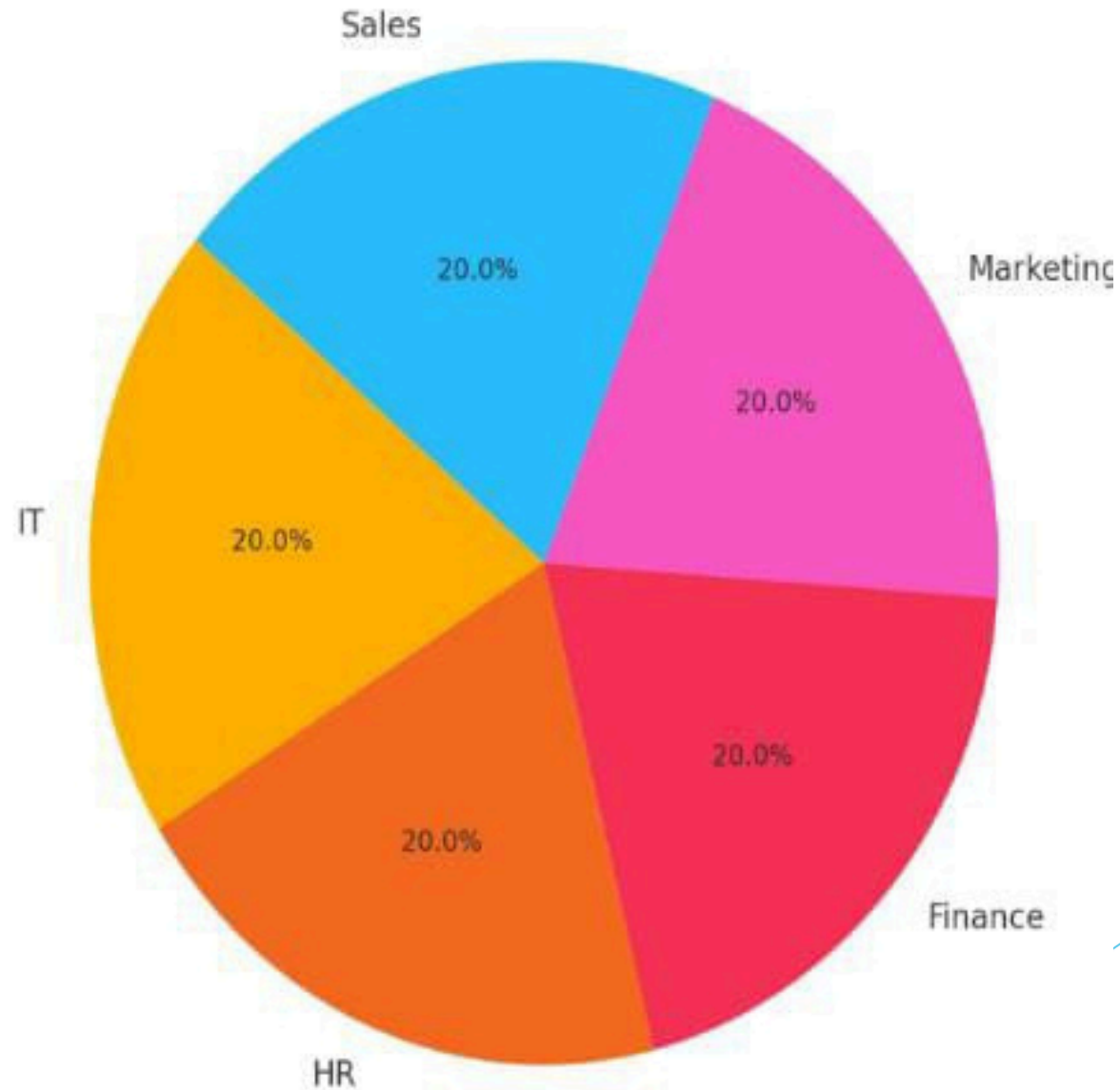
- Model performance metrics (e.g., R-squared, mean squared error)
- Model comparison and selection
- Cross-validation and hyperparameter tuning

Phase 5: Insights and Recommendations:

- Identify factors influencing salary.
- Detect disparities and trends.
- Provide recommendations for salary adjustments and compensation strategy improvements.

RESULTS

Employee Distribution by Department



conclusion

The employee salary analysis has provided valuable insights into our organization's compensation practices, highlighting areas of strength and opportunities for improvement. Key findings include:

- Salary disparities exist across similar roles and demographics.
- Market rates are not always reflected in internal salaries.
- Pay equity gaps persist, particularly for underrepresented groups.
- Performance and experience are not always correlated with salary.
- Location and education level impact salary levels.

Based on these findings, we recommend:

- Adjusting salaries to address disparities and ensure market competitiveness.
- Implementing a performance-based salary structure.
- Developing targeted programs to address pay equity gaps.
- Reviewing and refining our compensation strategy to ensure fairness and competitiveness.

By addressing these areas, we can promote a fair and equitable work environment, enhance employee satisfaction and retention, and drive business success.

Next Steps:

- Implement salary adjustments and monitor progress.
- Develop and communicate a revised compensation strategy.
- Conduct regular salary analyses to ensure ongoing fairness and competitiveness.
- Continuously monitor and address pay equity gaps.

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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	
1	Employee ID	Employee Name	Department	Position/Title	Date of Joining	Basic Salary	Allowance	Bonuses	Deduction	Tax Percentage	Overtime Hours	Overtime Rate	Gross Salary	Net Salary	Tax Amount	Final Salary	Overtime Pay	Total Payable Salary	Salary Payment Date	Bank Account Number	Payment Status	
2	001	kakashi	IT	Developer	2020-01-15	50000	10000	5000	3000	10	10	200	65000	62000	6500	55500	2000	57500	2024-08-31	1234567890	Paid	
3	002	itachi	HR	Manager	2019-03-21	60000	15000	7000	4000	12	5	250	82000	78000	9840	68160	1250	69410	2024-08-31	1234567890	Paid	
4	003	Minato	Finance	Analyst	2021-07-11	55000	12000	6000	3500	11	8	220	73000	69500	8030	61470	1760	63230	2024-08-31	1234567890	Paid	
5	004	Tobi	Marketing	Coordinator	2018-06-13	52000	13000	5500	3200	10	7	210	70500	67300	7050	60250	1470	61720	2024-08-31	1234567890	Paid	
6	005	Sasuke	Sales	Sales Executive	2022-10-01	58000	11000	6200	3800	12	6	230	75200	71400	9024	62376	1380	63756	2024-08-31	1234567890	Paid	
7	006	Light	IT	Developer	2020-01-15	50000	10000	5000	3000	10	10	200	65000	62000	6500	55500	2000	57500	2024-08-31	1234567890	Paid	
8	007	kira	HR	Manager	2019-03-21	60000	15000	7000	4000	12	5	250	82000	78000	9840	68160	1250	69410	2024-08-31	1234567890	Paid	
9	008	Charlie	Finance	Analyst	2021-07-11	55000	12000	6000	3500	11	8	220	73000	69500	8030	61470	1760	63230	2024-08-31	1234567890	Paid	
10	009	Selena	Marketing	Coordinator	2018-06-13	52000	13000	5500	3200	10	7	210	70500	67300	7050	60250	1470	61720	2024-08-31	1234567890	Paid	
11	010	Gojo	Sales	Sales Executive	2022-10-01	58000	11000	6200	3800	12	6	230	75200	71400	9024	62376	1380	63756	2024-08-31	1234567890	Paid	
12	011	Mathew	IT	Developer	2020-01-15	50000	10000	5000	3000	10	10	200	65000	62000	6500	55500	2000	57500	2024-08-31	1234567890	Paid	
13	012	Shawn Mendes	HR	Manager	2019-03-21	60000	15000	7000	4000	12	5	250	82000	78000	9840	68160	1250	69410	2024-08-31	1234567890	Paid	
14	013	Harry Potter	Finance	Analyst	2021-07-11	55000	12000	6000	3500	11	8	220	73000	69500	8030	61470	1760	63230	2024-08-31	1234567890	Paid	
15	014	Alone Walker	Marketing	Coordinator	2018-06-13	52000	13000	5500	3200	10	7	210	70500	67300	7050	60250	1470	61720	2024-08-31	1234567890	Paid	
16	015	Taylor Swift	Sales	Sales Executive	2022-10-01	58000	11000	6200	3800	12	6	230	75200	71400	9024	62376	1380	63756	2024-08-31	1234567890	Paid	
17	016	John deep	IT	Developer	2020-01-15	50000	10000	5000	3000	10	10	200	65000	62000	6500	55500	2000	57500	2024-08-31	1234567890	Paid	
18	017	Jack Chan	HR	Manager	2019-03-21	60000	15000	7000	4000	12	5	250	82000	78000	9840	68160	1250	69410	2024-08-31	1234567890	Paid	
19	018	Olivia	Finance	Analyst	2021-07-11	55000	12000	6000	3500	11	8	220	73000	69500	8030	61470	1760	63230	2024-08-31	1234567890	Paid	
20	019	Shikamaru	Marketing	Coordinator	2018-06-13	52000	13000	5500	3200	10	7	210	70500	67300	7050	60250	1470	61720	2024-08-31	1234567890	Paid	
21	020	Shino	Sales	Sales Executive	2022-10-01	58000	11000	6200	3800	12	6	230	75200	71400	9024	62376	1380	63756	2024-08-31	1234567890	Paid	
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