

Stock Data Analysis Report

1. Dataset Description

1.1 Source: Internal office employees dataset (1,000 records).

1.2 Columns:

- `employee_id` – Unique identifier
- `employee_name` – Employee's full name (939 unique, some duplicates)
- `department` – 6 unique departments (HR, Marketing, Finance, Accounts, Purchasing, etc.)
- `state` – 5 states (major share from Alaska & California)
- `salary` – Ranging from 1,006 to 9,985
- `age` – Ranging from 20 to 50 years
- `bonus` – Ranging from 500 to 2,000

1.3 Data Quality:

- No missing/null values
 - Clean and consistent dataset
 - Balanced structure with geographic and departmental diversity
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2. Operations Performed

2.1 Data Cleaning & Exploration

- Verified no missing or null values
- Checked unique values in categorical columns (`department`, `state`)
- Summarized numerical columns (`salary`, `age`, `bonus`) for mean, median, standard deviation, and interquartile range (IQR)

2.2 Descriptive Analytics & Visualizations

- Departmental employee count (pie chart)
- State-wise employee distribution (bar chart)
- Salary & Age distribution (histogram, boxplots)
- Bonus distribution (histogram)

2.3 Relationship Analysis & Visualizations

- Age vs. Salary (bubble chart with bonus as size factor)
 - Department vs. Bonus comparison (bar chart)
 - Salary variations by state (boxplot or bar chart)
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3. Key Insights

3.1 Workforce Demographics

- Age distribution centers around 25–40 years → young to mid-career employees dominate
- Average employee age: 35.3 years
- Fewer employees above 45 → lower senior-level representation

3.2 Departmental Insights

- HR has the largest workforce (171 employees)
- Other departments show fairly balanced representation
- Larger departments may indicate operational importance (e.g., HR, Marketing)

3.3 Salary Insights

- Salary range: 1,006 – 9,985
- Average salary: ~5,330; Median: 5,188
- Standard deviation \approx 2,603 → moderate spread
- Mid-level salaries dominate; few high salaries likely belong to senior executives

3.4 Bonus Trends

- Bonus range: 500 – 2,000
- Average: 1,253; Median: 1,245
- Fair distribution, suggesting performance-based incentives
- Marketing & Finance tend to receive higher bonuses

3.5 Geographic Spread

- Employees distributed across 5 states
- Alaska (209 employees) has the largest workforce concentration
- California also holds a significant share
- Smaller states host fewer employees → likely branch/satellite offices

4. Recommendations

4.1 Talent Development & Retention

- Encourage leadership training for younger employees to fill upcoming senior-level gaps
- Improve retention strategies for employees above 45 to maintain experience balance

4.2 Compensation Strategy

- Conduct pay equity analysis to reduce disparities across departments
- Align high salaries with measurable performance outcomes
- Review bonus policies for fairness and motivation

4.3 Workforce Allocation

- Reassess HR's large headcount relative to other departments → possible overstaffing
- Consider reallocating resources to core business functions (Marketing, Finance)

4.4 Geographic Operations

- Evaluate why Alaska has the highest concentration → operational necessity or imbalance
- Diversify workforce presence across other states to reduce dependency risk

4.5 Future Analytics Opportunities

- Build predictive models (attrition prediction, salary forecasting)
- Cluster employees by salary, age, and bonus for strategic HR planning
- Track department productivity vs. compensation to refine budgeting