Employee Data Analysis Report

1. Dataset Description

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

1.2 Columns:

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

1.3 Data Quality:

- o No missing values
- o Clean and consistent
- o Balanced structure with geographic and departmental diversity

1.4

2. Operations Performed

2.1 Data Cleaning & Exploration

- o No missing/null values observed
- o Checked unique values in categorical columns
- o Summarized numerical columns (mean, median, standard deviation, IQR)

2.2 Descriptive Analytics

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

2.3 Relationship Analysis

- o Age vs. Salary (bubble chart with bonus as size factor)

- o Department vs. Bonus comparison

- o Salary variations by state

3. Key Insights

3.1 Workforce Demographics

- Age distribution centers around **25–40 years** → young to mid-career dominant.

- 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**

- Salaries are moderately spread (Std Dev ≈ 2,603).

- Mid-level salaries dominate; a few very 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 likely enjoy higher bonuses.

3.5 Geographic Spread

- Employees are 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

o Encourage **leadership training** for younger employees to fill the upcoming senior-level gap.

o Improve **retention strategies** for employees above 45 to maintain experience balance.

4.2 Compensation Strategy

o Conduct **pay equity analysis** to reduce disparities across departments.

o Align high salaries with measurable performance outcomes.

o Review **bonus policies** to ensure fairness and motivation across all teams.

4.3 Workforce Allocation

o Reassess HR's large headcount relative to other departments – possible **overstaffing**.

o Consider reallocating resources to core business functions (e.g., Marketing, Finance).

4.4 Geographic Operations

o Evaluate why Alaska has the highest concentration – operational necessity or imbalance.

o Consider **diversifying workforce presence** to other states to reduce dependency risk.

4.5 Future Analytics Opportunities

o Build **predictive models** (e.g., attrition prediction, salary forecasting).

o Use **clustering** to group employees by salary, age, and bonus for strategic HR planning.

o Track **department productivity vs. compensation** to refine budgeting.