Advanced data visualization

Experiment-7

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Aim: Design basic charts using D3.js on finance dataset

Objectives:

- To explore and visualize a dataset related to Finance/Banking/Insurance/Credit using D3.js.
- To create basic visualizations (Bar chart, Pie chart, Histogram, Timeline chart, Scatter plot, Bubble plot) to understand data distribution and trends.

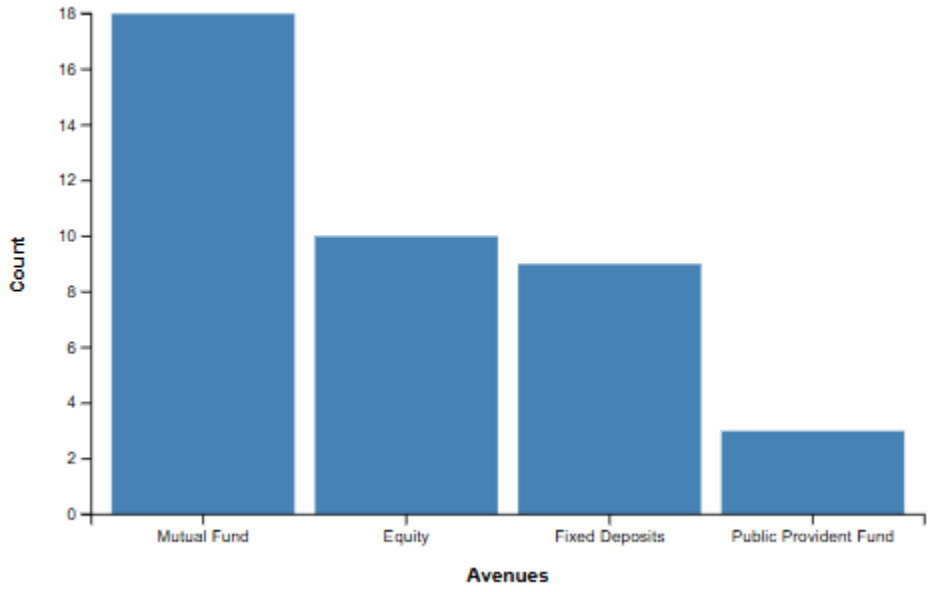
Dataset: The dataset being used is finance dataset. Attributes' details are as follows:

1. **gender**: The gender of the respondent (e.g., Male, Female).
2. **age**: The age of the respondent in years.
3. **Investment_Avenues**: Indicates if the respondent invests in different avenues (Yes/No).
4. **Mutual_Funds**: A numerical value representing investment in mutual funds.
5. **Equity_Market**: A numerical value representing investment in the equity market.
6. **Debentures**: A numerical value representing investment in debentures.
7. **Government_Bonds**: A numerical value representing investment in government bonds.
8. **Fixed_Deposits**: A numerical value representing investment in fixed deposits.
9. **PPF**: A numerical value representing investment in public provident funds.
10. **Gold**: A numerical value representing investment in gold.
11. **Stock_Marktet**: Likely refers to investments in the stock market (similar to the equity market).
12. **Factor**: Could refer to factors influencing investment choices.
13. **Objective**: Describes the financial objectives behind investments.
14. **Purpose**: The reason or purpose of the investments.
15. **Duration**: The investment duration chosen by the respondent (e.g., Less than 1 year, 3-5 years).
16. **Invest_Monitor**: Frequency of monitoring investments (e.g., Daily, Weekly, Monthly).
17. **Expect**: Expected return on investment (e.g., 10%-20%, 20%-30%).
18. **Avenue**: Preferred investment avenue (e.g., Mutual Fund, Equity).

19. **What are your savings objectives?**: Specifies the savings objectives (e.g., Retirement Plan, Health Care).
20. **Reason_Equity**: The reason for investing in equity (e.g., Capital Appreciation, Dividend).
21. **Reason_Mutual**: The reason for investing in mutual funds (e.g., Better Returns).
22. **Reason_Bonds**: The reason for investing in bonds (e.g., Safe Investment).
23. **Reason_FD**: The reason for investing in fixed deposits (e.g., Fixed Returns).
24. **Source**: The source of financial information (e.g., Internet, Newspapers).

Charts and analysis:

1. Bar Chart: Investment Avenues Distribution



- **Description**: This bar chart shows the count of different investment avenues selected by investors.
- **Analysis**:
    - **Mutual Fund** is the most popular investment avenue, with the highest count (around 16 investors).
    - **Equity** and **Fixed Deposits** are nearly equally popular, each having a count close to 10.
    - The **Public Provident Fund (PPF)** is the least selected option, with only about 2 investors choosing it.
- **Conclusion**: Investors tend to favor Mutual Funds significantly more than the other options, while PPF is the least preferred. This could indicate a higher risk tolerance or preference for liquidity.

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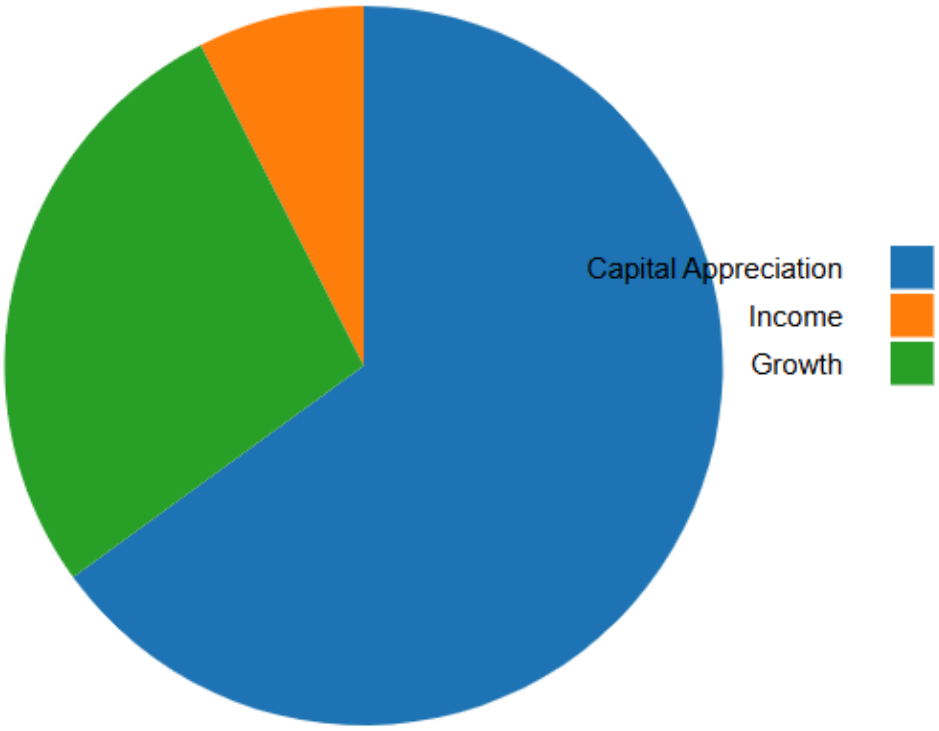
2. Pie Chart: Expected Returns by Category



- **Description**: This pie chart shows the proportions of different types of expected returns from investments.
- **Analysis**:
    - The largest portion of the pie is for **Capital Appreciation**, meaning most investors are seeking an increase in the value of their investments over time.
    - The **Growth** category is also prominent but occupies a smaller slice.
    - **Income** is the smallest category, indicating fewer investors are focused on generating consistent returns (e.g., through dividends or interest).
- **Conclusion**: Most investors are seeking capital gains rather than steady income, which could be reflective of a long-term investment strategy with a higher tolerance for risk.

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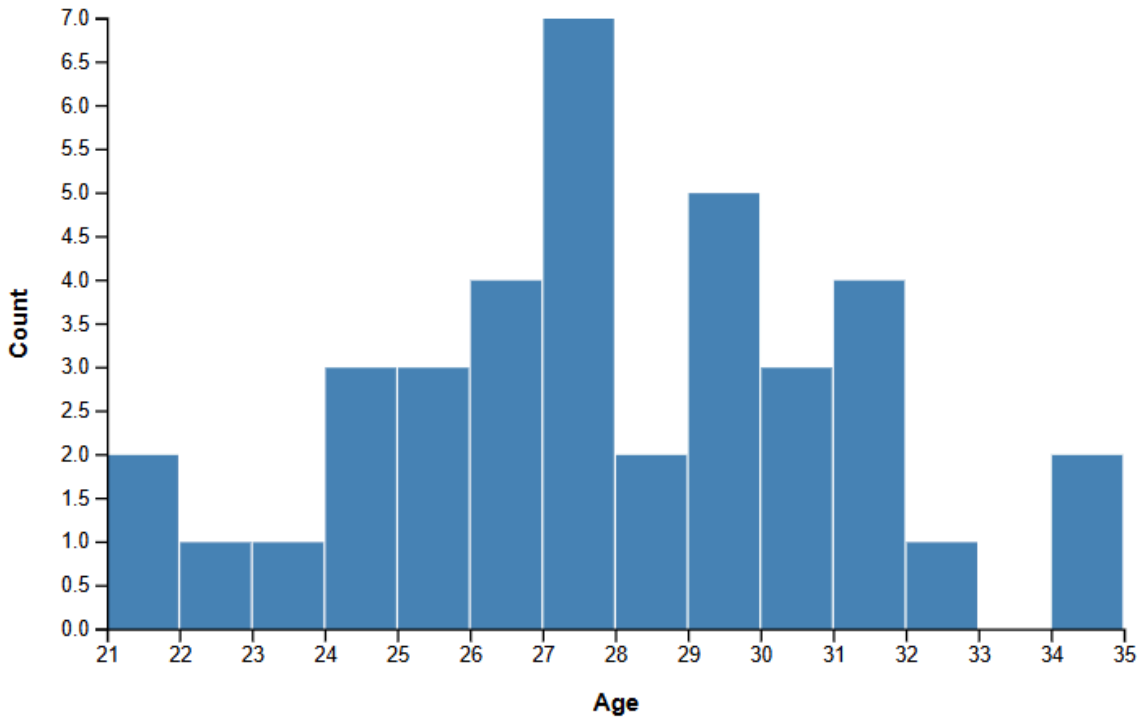
3. Histogram: Age Distribution of Investors



- **Description**: The histogram shows the distribution of investors by age.
- **Analysis**:
    - The age group **27-28 years** has the highest concentration of investors, with about 6 or 7 investors in that range.
    - There are a noticeable number of investors in their mid-20s (23-29), and the numbers drop after age 32.
    - Investors aged 21 or 34+ are fewer.
- **Conclusion**: The data shows that the majority of investors are in their late 20s, indicating that this age group might be more actively engaged in financial planning and investment compared to younger or older age groups.

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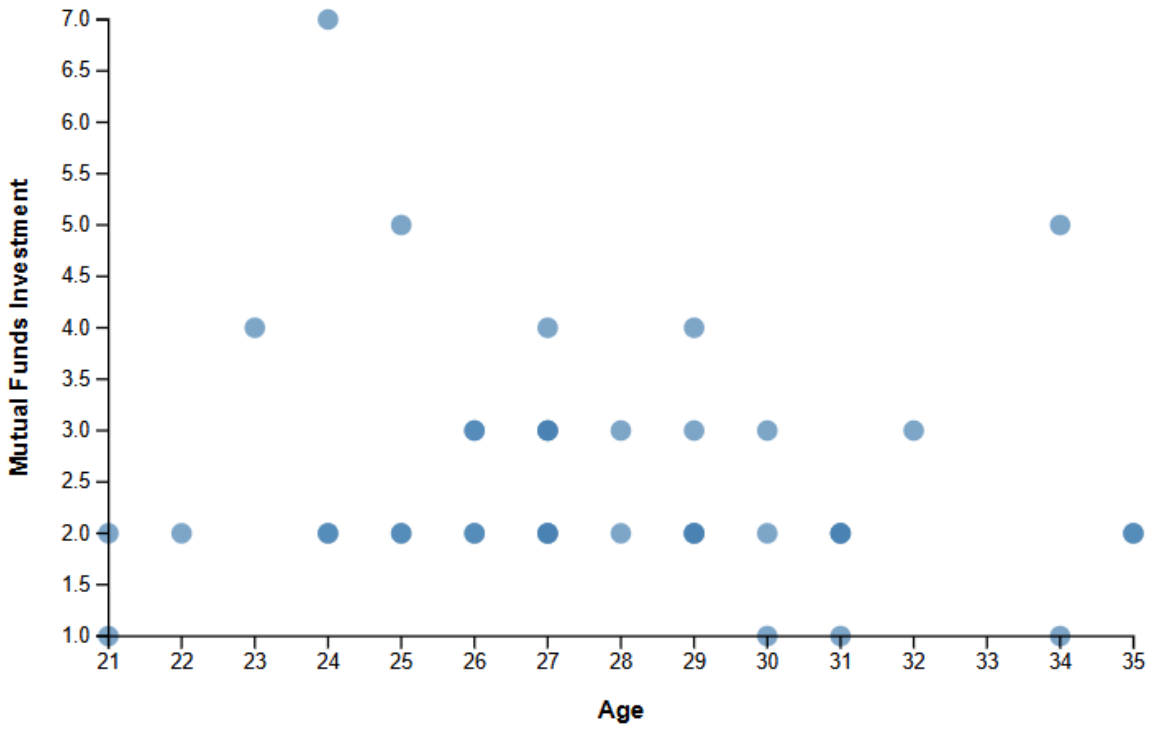
4. Scatter Plot: Age vs. Mutual Fund Investment



- **Description**: The scatter plot shows the relationship between an investor's age and their investment in mutual funds.
- **Analysis**:
    - Investors of varying ages (from 22 to 35) invest in mutual funds, but there is no strong visible trend suggesting that age directly impacts mutual fund investment.
    - However, it appears that younger investors (in their early 20s) and those in their late 20s make slightly higher mutual fund investments than others.
- **Conclusion**: While mutual fund investments are spread across various age groups, young adults, especially in their mid to late 20s, may show slightly more activity in mutual fund investments.

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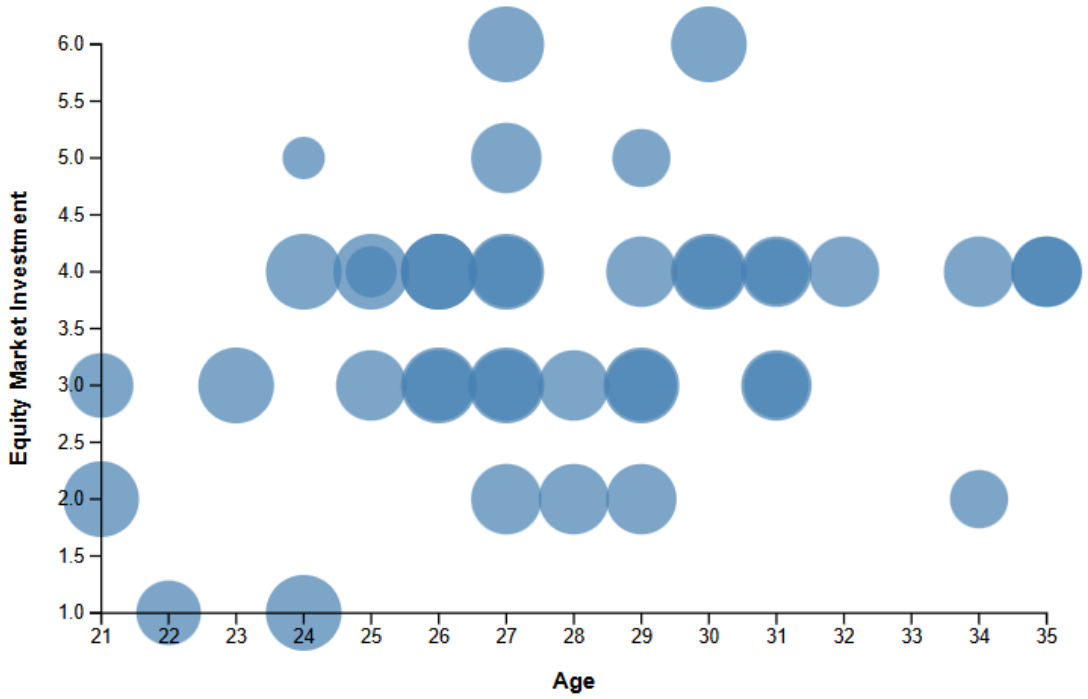
5. Bubble Plot: Age vs. Equity Market Investment



- **Description**: This bubble plot visualizes the relationship between age and equity market investment, with the bubble size representing the amount invested.
- **Analysis**:
    - Investors aged **23 to 27** appear to make more equity market investments, with some larger bubbles in this range indicating higher amounts invested.
    - The chart shows some investment activity across all age groups, but it is relatively concentrated in the 20s.
    - There are a few outliers in the age range of 30 to 35 with larger investments but not as frequent.
- **Conclusion**: Younger investors, particularly those in their mid-20s, seem to be more active in the equity market, with higher amounts invested. This may indicate a higher risk appetite among younger investors.

Conclusion:

● This experiment enables an understanding of both basic and advanced data visualizations using D3.js, giving insights into the finance domain through visual exploration.

● By performing hypothesis testing, you can statistically confirm relationships between variables, which is critical for data-driven decision-making in Finance/Banking/Insurance/Credit sectors.