

```
PS C:\Users\yash\OneDrive\Desktop\vs_code_practice\RnW> python pr_9_pandasanalyzer.py
--- Sales Analyzer Initialized ---

===== Data Analysis & Visualization Program =====
1. Load Dataset
2. Explore Data
3. Perform DataFrame Operations (Numpy/Math)
4. Handle Missing Data
5. Generate Descriptive Statistics
6. Data Visualization
7. Save Visualization
8. Exit
=====
Enter your choice: 1
Enter the path of the dataset (CSV file): c:\Users\yash\OneDrive\Desktop\vs_code_practice\RnW\sales_data.csv
Dataset loaded successfully!

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=====
Enter your choice: 2

--- Explore Data ---
1. First 5 rows
2. Last 5 rows
3. Column names
4. Data types
5. Basic info
Enter your choice: 1
   Region  Year  Sales
0  North  2021  45000
1  South  2021  38000
```

Ln 4, Col 19

```
1 South 2021 38000
2 East 2021 42000
3 West 2021 40000
4 North 2022 52000
```

```
===== Data Analysis & Visualization Program =====
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- ```
=====
```

```
Enter your choice: 2
```

```
--- Explore Data ---
```

1. First 5 rows
2. Last 5 rows
3. Column names
4. Data types
5. Basic info

```
Enter your choice: 2
```

```
Region Year Sales
3 West 2021 40000
4 North 2022 52000
5 South 2022 46000
6 East 2022 48000
7 West 2022 50000
```

```
===== Data Analysis & Visualization Program =====
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```
7. Save Visualization
```

```
8. Exit
```

```
=====
```

```
Enter your choice: 2
```

```
--- Explore Data ---
```

```
1. First 5 rows
```

```
2. Last 5 rows
```

```
3. Column names
```

```
4. Data types
```

```
5. Basic info
```

```
Enter your choice: 3
```

```
Index(['Region', 'Year', 'Sales'], dtype='str')
```

```
===== Data Analysis & Visualization Program =====
```

```
1. Load Dataset
```

```
2. Explore Data
```

```
3. Perform DataFrame Operations (Numpy/Math)
```

```
4. Handle Missing Data
```

```
5. Generate Descriptive Statistics
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```

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8. Exit
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```
=====
```

```
Enter your choice: 2
```

```
--- Explore Data ---
```

```
1. First 5 rows
```

```
2. Last 5 rows
```

```
3. Column names
```

```
4. Data types
```

```
5. Basic info
```

```
Enter your choice: 4
```

```
Region      str
```

```
Year       int64
```

```
Sales      int64
```

```
dtype: object
```

```
===== Data Analysis & Visualization Program =====
```

```
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- 

```
Enter your choice: 2
```

```
--- Explore Data ---
```

1. First 5 rows
2. Last 5 rows
3. Column names
4. Data types
5. Basic info

```
Enter your choice: 5
```

```
<class 'pandas.DataFrame'>
```

```
RangeIndex: 8 entries, 0 to 7
```

```
Data columns (total 3 columns):
```

| # | Column | Non-Null Count | Dtype |
|---|--------|----------------|-------|
| 0 | Region | 8 non-null     | str   |
| 1 | Year   | 8 non-null     | int64 |
| 2 | Sales  | 8 non-null     | int64 |

```
dtypes: int64(2), str(1)
```

```
memory usage: 324.0 bytes
```

```
None
```

```
===== Data Analysis & Visualization Program =====
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```
7. Save Visualization
```

```
8. Exit
```

```
=====
```

```
Enter your choice: 3
```

```
Original Sales Array (first 5 values): [45000 38000 42000 40000 52000]
```

```
Tax Calculation (10% of Sales, first 5 values): [4500. 3800. 4200. 4000. 5200.]
```

```
===== Data Analysis & Visualization Program =====
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```
=====
```

```
Enter your choice: 4
```

```
--- Handle Missing Data ---
```

1. Display rows with missing values
2. Fill missing values with mean (numeric only)
3. Drop rows with missing values

```
Enter your choice: 1
```

```
No missing values found.
```

```
===== Data Analysis & Visualization Program =====
```

1. Load Dataset
2. Explore Data
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4. Handle Missing Data
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6. Data Visualization
7. Save Visualization
8. Exit

```
=====
```

```
Enter your choice: 4
```

```
--- Handle Missing Data ---
```

```
7. Save Visualization
```

```
8. Exit
```

```
=====
```

```
Enter your choice: 4
```

```
--- Handle Missing Data ---
```

1. Display rows with missing values
2. Fill missing values with mean (numeric only)
3. Drop rows with missing values

```
Enter your choice: 2
```

```
Missing values filled with mean.
```

```
===== Data Analysis & Visualization Program =====
```

1. Load Dataset
2. Explore Data
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4. Handle Missing Data
5. Generate Descriptive Statistics
6. Data Visualization
7. Save Visualization
8. Exit

```
=====
```

```
Enter your choice: 4
```

```
--- Handle Missing Data ---
```

1. Display rows with missing values
2. Fill missing values with mean (numeric only)
3. Drop rows with missing values

```
Enter your choice: 3
```

```
Rows with missing values dropped.
```

```
===== Data Analysis & Visualization Program =====
```

1. Load Dataset
2. Explore Data
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4. Handle Missing Data
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```
7. Save Visualization
```

```
8. Exit
```

```
=====
```

```
Enter your choice: 5
```

```
--- Descriptive Statistics ---
```

|       | Year        | Sales      |
|-------|-------------|------------|
| count | 8.000000    | 8.0000     |
| mean  | 2021.500000 | 45125.0000 |
| std   | 0.534522    | 4882.5491  |
| min   | 2021.000000 | 38000.0000 |
| 25%   | 2021.000000 | 41500.0000 |
| 50%   | 2021.500000 | 45500.0000 |
| 75%   | 2022.000000 | 48500.0000 |
| max   | 2022.000000 | 52000.0000 |

```
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```
=====
```

```
Enter your choice: 6
```

```
--- Data Visualization ---
```

1. Bar Plot
2. Line Plot
3. Scatter Plot
4. Pie Chart
5. Histogram

```
Enter your choice: 1
```

```
Plot displayed successfully!
```

```
===== Data Analysis & Visualization Program =====
```

1. Load Dataset

```
===== Data Analysis & Visualization Program =====
```

1. Load Dataset
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  6. Data Visualization
  7. Save Visualization
  8. Exit
- 

```
Enter your choice: 6
```

```
--- Data Visualization ---
```

1. Bar Plot
2. Line Plot
3. Scatter Plot
4. Pie Chart
5. Histogram

```
Enter your choice: 2
```

```
Plot displayed successfully!
```

```
===== Data Analysis & Visualization Program =====
```

1. Load Dataset
  2. Explore Data
  3. Perform DataFrame Operations (Numpy/Math)
  4. Handle Missing Data
  5. Generate Descriptive Statistics
  6. Data Visualization
  7. Save Visualization
  8. Exit
- 

```
Enter your choice: 6
```

```
--- Data Visualization ---
```

1. Bar Plot
2. Line Plot
3. Scatter Plot
4. Pie Chart

```
5. Histogram  
Enter your choice: 3  
Enter x-axis column: 5  
Enter y-axis column: 5  
Invalid columns for Scatter Plot.  
Plot displayed successfully!
```

```
===== Data Analysis & Visualization Program =====
```

1. Load Dataset
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  4. Handle Missing Data
  5. Generate Descriptive Statistics
  6. Data Visualization
  7. Save Visualization
  8. Exit
- 

```
Enter your choice: 6
```

```
--- Data Visualization ---  
1. Bar Plot  
2. Line Plot  
3. Scatter Plot  
4. Pie Chart  
5. Histogram
```

```
Enter your choice: 4  
Enter column for Pie Chart (e.g., Region): 10  
Column not found.
```

```
Plot displayed successfully!
```

```
===== Data Analysis & Visualization Program =====
```

1. Load Dataset
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8. Exit

```
8. Exit
```

```
=====
```

```
Enter your choice: 6
```

```
--- Data Visualization ---
```

- 1. Bar Plot
- 2. Line Plot
- 3. Scatter Plot
- 4. Pie Chart
- 5. Histogram

```
Enter your choice: 5
```

```
Enter numeric column for Histogram: 10
```

```
Column not found.
```

```
Plot displayed successfully!
```

```
===== Data Analysis & Visualization Program =====
```

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- 8. Exit

```
=====
```

```
Enter your choice: 7
```

```
Enter file name to save (e.g., plot.png): sales_plot.png
```

```
Visualization saved as sales_plot.png
```

```
===== Data Analysis & Visualization Program =====
```

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- 8. Exit

```
=====
```

- 2. Explore Data
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  - 7. Save Visualization
  - 8. Exit
- 

Enter your choice: 8

Exiting the program. Goodbye!

Cleaning up resources... Goodbye!

PS C:\Users\yash\OneDrive\Desktop\vs\_code\_practice\RnW> █