Assignment No - 3

Python Libraries for Data Analysis and Visualization

NumPy (Solve using help(np) and help(np.function_name))

1. **Import the numpy package under the name np.**

```python
import numpy as np
```

2. **Print the numpy version and configuration.**

```python
print(np.__version__)
np.show_config()
```

3. **Create a null vector of size 10.**

```python
np.zeros(10)
```

4. **Find the memory size of any array.**

```python
x = np.zeros(10)
print(x.size * x.itemsize)
```

5. **Get documentation of numpy add function from the command line.**

```python
python -c "import numpy as np; help(np.add)"
```

6. **Create a null vector of size 10 with the fifth value as 1.**

```python
x = np.zeros(10)
x[4] = 1
```

7. **Create a vector with values ranging from 10 to 49.**

```python
np.arange(10, 50)
```

8. **Reverse a vector.**

```
x = np.arange(10)
x[::-1]
```

9. **Create a 3x3 matrix with values ranging from 0 to 8.**

```
np.arange(9).reshape(3, 3)
```

10. **Find indices of non-zero elements from [1,2,0,0,4,0].**

```
np.nonzero([1, 2, 0, 0, 4, 0])
```

Pandas (Solve using help(pd) and help(pd.function_name))

1. **Import pandas under the alias pd.**

```
import pandas as pd
```

2. **Print the pandas version.**

```
print(pd.__version__)
```

3. **Print version information of required libraries.**

```
pd.show_versions()
```

4. **Create a DataFrame from the given dictionary.**

```
df = pd.DataFrame(data, index=labels)
```

5. **Display a summary of the DataFrame.**

```
df.info()
```

6. **Return the first 3 rows.**

```
df.head(3)
```

7. **Select the 'animal' and 'age' columns.**

```
df[['animal', 'age']]
```

8. **Select rows [3, 4, 8] and columns ['animal', 'age'].**

```python
df.loc[df.index[[3, 4, 8]], ['animal', 'age']]
```
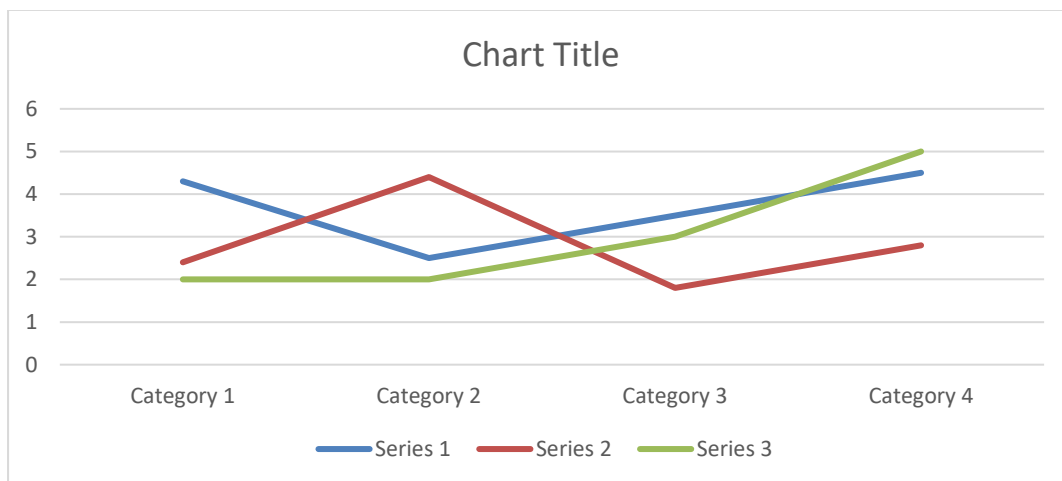
9. **Select rows where visits > 3.**

```python
df[df['visits'] > 3]
```

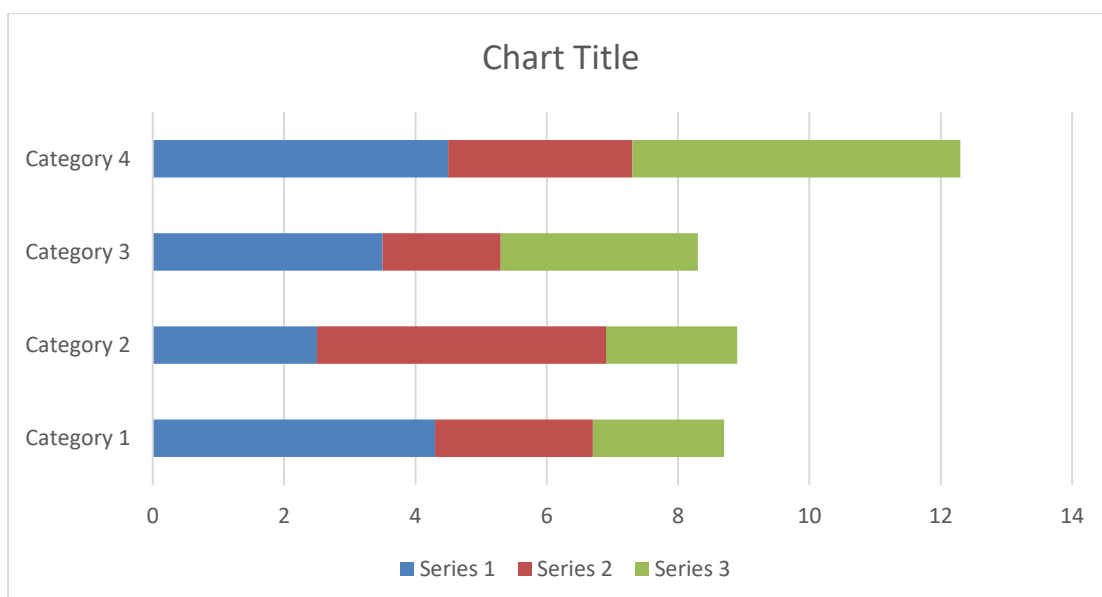10. **Select rows where age is missing (NaN).**
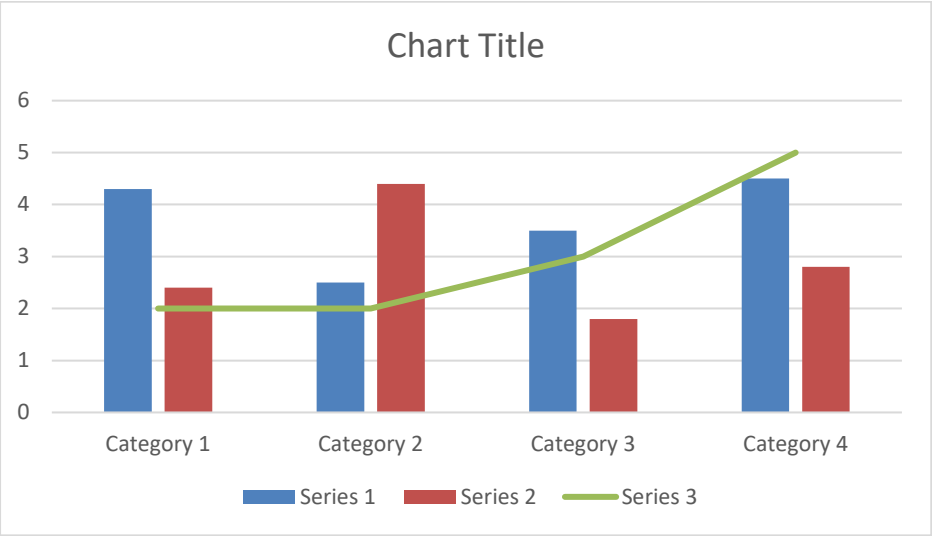
```python
df[df['age'].isna()]
```

Matplotlib

1. **Line graph**

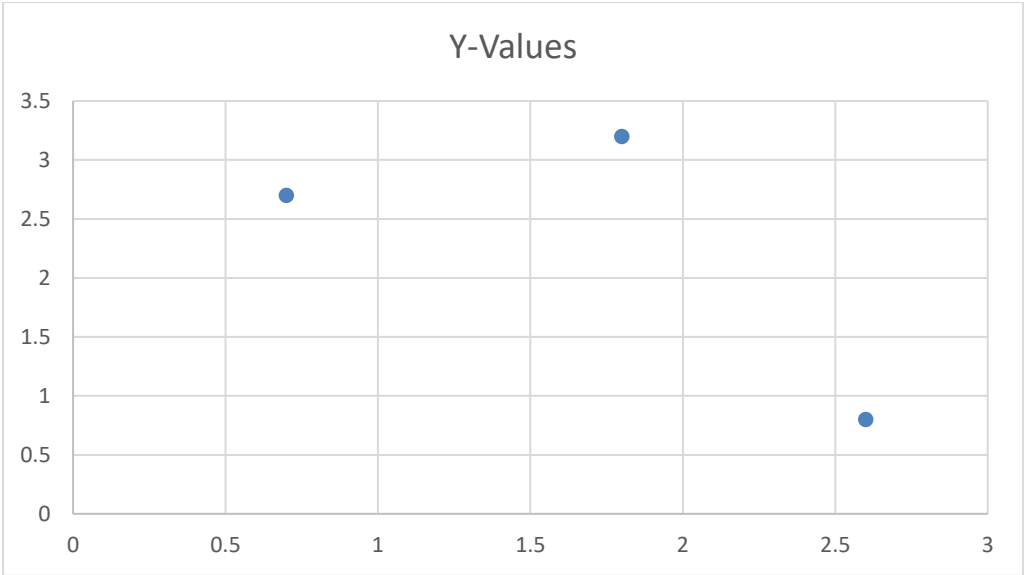2. **Bar chart**

3. Histogram

4. Scatter plot

5. Pie chart

6. Box plot

Chart Title

(Series 1, Series 2, Series 3 bar chart across Category 1–4)

7. Heatmap

Chart Title

(3D surface chart with legend 0-2, 2-4, 4-6 across Category 1–4 and Series 1–3)

8. Stack plot

9. Area chart

Chart Title

(Area chart with Series 1 and Series 2 across dates 01/05/2002 to 01/09/2002)
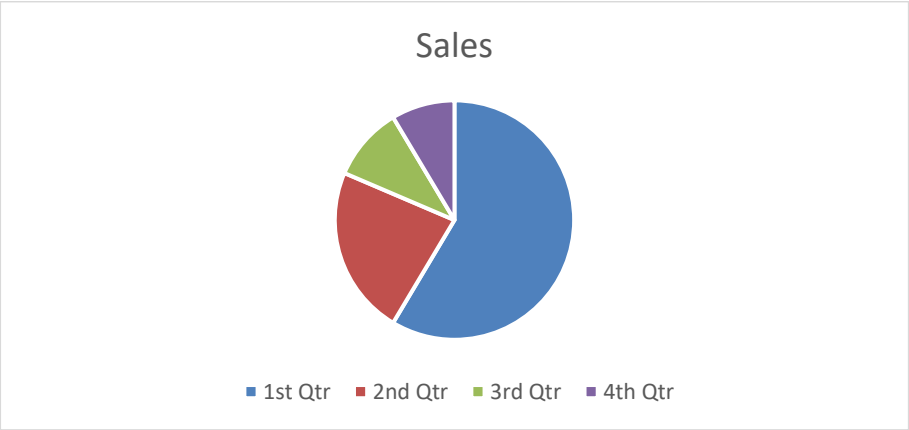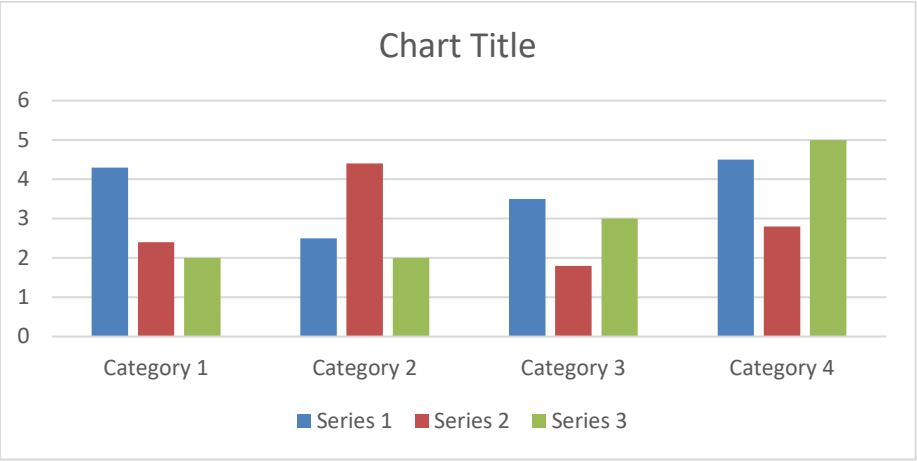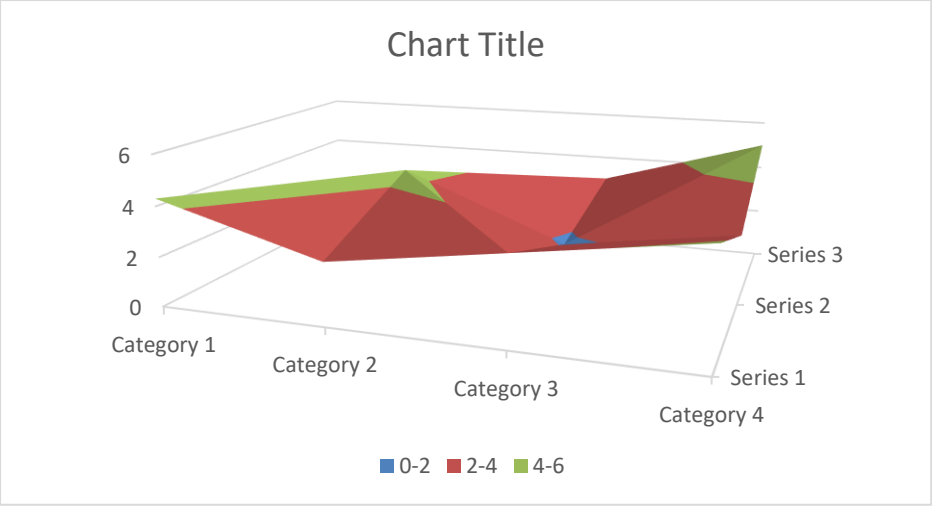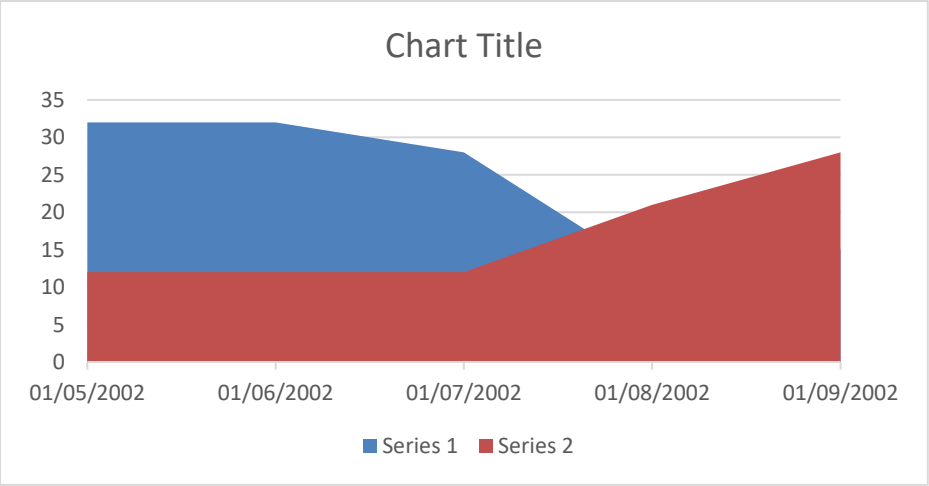
10. Violin plot

Seaborn (Draw 10 graphs with proper meaning)

1. **Distribution plot**

2. **Count plot**

3. **Box plot**

4. **Violin plot**

5. **Pair plot**

6. **Heatmap**

7. **Scatter plot**

8. **Line plot**

9. **Regression plot**

10. **Swarm plot**

THANKYOU