Question 1

In [2]:
```
import pandas as pd
import numpy as np

# Create a NumPy array with random values
np.random.seed(42)  # Setting seed
data = np.random.rand(4, 4)  # 4 features and 4 observations

# Create the DataFrame
df = pd.DataFrame(data, columns=['F1', 'F2', 'F3', 'F4'])

print(df)
```

```
         F1        F2        F3        F4
0  0.374540  0.950714  0.731994  0.598658
1  0.156019  0.155995  0.058084  0.866176
2  0.601115  0.708073  0.020584  0.969910
3  0.832443  0.212339  0.181825  0.183405
```

Question 2

In [4]:
```
# Rename the columns
df.rename(columns={
    'F1': 'Random value 1',
    'F2': 'Random value 2',
    'F3': 'Random value 3',
    'F4': 'Random value 4'
}, inplace=True)

# Print the DataFrame with renamed columns
print(df)
```

```
   Random value 1  Random value 2  Random value 3  Random value 4
0        0.374540        0.950714        0.731994        0.598658
1        0.156019        0.155995        0.058084        0.866176
2        0.601115        0.708073        0.020584        0.969910
3        0.832443        0.212339        0.181825        0.183405
```

Question 3

In [5]:
```
# Descriptive statistics of the DataFrame
statistics = df.describe()

# Print the descriptive statistics
print(statistics)
```

```
       Random value 1  Random value 2  Random value 3  Random valu
e 4
count        4.000000        4.000000        4.000000        4.000
000
mean         0.491029        0.506780        0.248122        0.654
537
std          0.291252        0.386153        0.329856        0.350
875
min          0.156019        0.155995        0.020584        0.183
405
25%          0.319910        0.198253        0.048709        0.494
845
50%          0.487828        0.460206        0.119954        0.732
417
75%          0.658947        0.768733        0.319367        0.892
110
max          0.832443        0.950714        0.731994        0.969
910
```

Question 4

In [6]:
```
# Check for null values and column types
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 4 entries, 0 to 3
Data columns (total 4 columns):
 #   Column          Non-Null Count  Dtype  
---  ------          --------------  -----  
 0   Random value 1  4 non-null      float64
 1   Random value 2  4 non-null      float64
 2   Random value 3  4 non-null      float64
 3   Random value 4  4 non-null      float64
dtypes: float64(4)
memory usage: 256.0 bytes
```

Question 5

In [7]:
```
# Display columns using label-based location method (.loc)
columns_loc = df.loc[:, ['Random value 2', 'Random value 3']]
print("Using label-based location method (.loc):")
print(columns_loc)

# Display columns using index-based location method (.iloc)
columns_iloc = df.iloc[:, [1, 2]]
print("\nUsing index-based location method (.iloc):")
print(columns_iloc)
```

```
Using label-based location method (.loc):
   Random value 2  Random value 3
0        0.950714        0.731994
1        0.155995        0.058084
2        0.708073        0.020584
3        0.212339        0.181825

Using index-based location method (.iloc):
   Random value 2  Random value 3
0        0.950714        0.731994
1        0.155995        0.058084
2        0.708073        0.020584
3        0.212339        0.181825
```

In [ ]: