AI ASSIGMENT 1 20BCR7029

TASK 1

```
[1] import pandas as pd
    import numpy as np

    np.random.seed(42)  # Set seed for reproducibility

    # Create random values using NumPy
    data = np.random.rand(4, 4)

    # Create DataFrame
    df = pd.DataFrame(data, columns=['Feature 1', 'Feature 2', 'Feature 3', 'Feature 4'])

    # Print the DataFrame
    print(df)
```

```
   Feature 1  Feature 2  Feature 3  Feature 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
```

TASK 2

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

    np.random.seed(42)  # Set seed for reproducibility

    # Create random values using NumPy
    data = np.random.rand(4, 4)

    # Create DataFrame
    df = pd.DataFrame(data, columns=['Feature 1', 'Feature 2', 'Feature 3', 'Feature 4'])

    # Rename column names
    new_column_names = {
        'Feature 1': 'Random value 1',
        'Feature 2': 'Random value 2',
        'Feature 3': 'Random value 3',
        'Feature 4': 'Random value 4'
    }

    df = df.rename(columns=new_column_names)

    # Print the DataFrame
    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
```

TASK 3

```
[3] import pandas as pd
    import numpy as np

    np.random.seed(42)  # Set seed for reproducibility

    # Create random values using NumPy
    data = np.random.rand(4, 4)

    # Create DataFrame
    df = pd.DataFrame(data, columns=['Feature 1', 'Feature 2', 'Feature 3', 'Feature 4'])

    # Rename column names
    new_column_names = {
        'Feature 1': 'Random value 1',
        'Feature 2': 'Random value 2',
        'Feature 3': 'Random value 3',
        'Feature 4': 'Random value 4'
    }

    df = df.rename(columns=new_column_names)

    # Calculate descriptive statistics
    statistics = df.describe()

    # Print descriptive statistics
    print(statistics)
```

```
[3]        Random value 1  Random value 2  Random value 3  Random value 4
    count        4.000000        4.000000        4.000000        4.000000
    mean         0.491029        0.506780        0.248122        0.654537
    std          0.291252        0.386153        0.329856        0.350875
    min          0.156019        0.155995        0.020584        0.183405
    25%          0.319910        0.198253        0.048709        0.494845
    50%          0.487828        0.460206        0.119954        0.732417
    75%          0.658947        0.768733        0.319367        0.892110
    max          0.832443        0.950714        0.731994        0.969910
```

TASK 4

```
[4] import pandas as pd
    import numpy as np

    np.random.seed(42)  # Set seed for reproducibility

    # Create random values using NumPy
    data = np.random.rand(4, 4)

    # Create DataFrame
    df = pd.DataFrame(data, columns=['Feature 1', 'Feature 2', 'Feature 3', 'Feature 4'])

    # Rename column names
    new_column_names = {
        'Feature 1': 'Random value 1',
        'Feature 2': 'Random value 2',
        'Feature 3': 'Random value 3',
        'Feature 4': 'Random value 4'
    }

    df = df.rename(columns=new_column_names)

    # Check for null values
    null_values = df.isnull().sum()

    # Find data types of columns
    data_types = df.dtypes

    # Print null values and data types
    print("Null Values:\n", null_values)
    print("\nData Types:\n", data_types)
```

```
[4] Null Values:
     Random value 1    0
    Random value 2    0
    Random value 3    0
    Random value 4    0
    dtype: int64

    Data Types:
     Random value 1    float64
    Random value 2    float64
    Random value 3    float64
    Random value 4    float64
    dtype: object
```

TASK 5

```python
import pandas as pd
import numpy as np

np.random.seed(42)  # Set seed for reproducibility

# Create random values using NumPy
data = np.random.rand(4, 4)

# Create DataFrame
df = pd.DataFrame(data, columns=['Feature 1', 'Feature 2', 'Feature 3', 'Feature 4'])

# Rename column names
new_column_names = {
    'Feature 1': 'Random value 1',
    'Feature 2': 'Random value 2',
    'Feature 3': 'Random value 3',
    'Feature 4': 'Random value 4'
}

df = df.rename(columns=new_column_names)

# Display columns using loc (label-based)
loc_columns = df.loc[:, ['Random value 2', 'Random value 3']]
print("Using loc:\n", loc_columns)

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

```
Using 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 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
```