Artificial Intelligence

Assignment – 1

Name: C. Deepthi Chowdary

Reg no.: 20BCE2445

Task 1

```
import numpy as np
import pandas as pd

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

# Create a 4x4 NumPy array with random values
data = np.random.rand(4, 4)

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

# Print the DataFrame
print(df)
```

OUTPUT:

```
----
   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

```
import numpy as np
import pandas as pd

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

# Create a 4x4 NumPy array with random values
data = np.random.rand(4, 4)

# Create the DataFrame
```

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

# Rename the 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 with updated column names
print(df)
```

Output:

	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

```
import pandas as pd
import numpy as np

# Assuming 'df' is the DataFrame we have created earlier

# Calculate descriptive statistics
df_statistics = df.describe()

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

Output:

	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

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

# Print the null values
print("Null values:\n", null_values)

# Find the data types of the columns
column_types = df.dtypes

# Print the data types
print("\nData types:\n", column_types)
```

```
Output:
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

```
#Display 'Random value 2' and 'Random value 3' columns using location
method
columns_loc = df[['Random value 2', 'Random value 3']]
print("Using location method:\n", columns_loc)

#Display 'Random value 2' and 'Random value 3' columns using index
location method
columns_index_loc = df.iloc[:, 1:3]
print("\nUsing index location method:\n", columns_index_loc)
```

```
Output:
Using location method:
    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 location method:
    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
```