PYTHON PRACTICAL EXAM – COMPLETE PRACTICE SET WITH FULL CODE

Q1: EDA – Scatter, Histogram, Pie, Bar, Line Charts

```python
import pandas as pd
import matplotlib.pyplot as plt

df = pd.read_csv("Student_Performance.csv")

plt.scatter(df["Hours Studied"], df["Performance Index"])
plt.title("Scatter Plot: Hours Studied vs Performance Index")
plt.show()

plt.hist(df["Performance Index"])
plt.title("Histogram of Performance Index")
plt.show()

plt.pie(df["Extracurricular Activities"].value_counts(),
        labels=df["Extracurricular Activities"].value_counts().index,
        autopct='%1.1f%%')
plt.title("Pie Chart of Extracurricular Activities")
plt.show()

df.groupby("Extracurricular Activities")["Performance Index"].mean().plot(kind='bar')
plt.title("Bar Chart: Mean Performance Index by Activities")
plt.show()

plt.plot(df.index, df["Performance Index"])
plt.title("Line Chart of Performance Index")
plt.show()
```

Q2: Simple Linear Regression

```python
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LinearRegression

df = pd.read_csv("Student_Performance.csv")

X = df[["Hours Studied"]]
y = df["Performance Index"]

X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2)

model = LinearRegression()
model.fit(X_train, y_train)

print("Coefficient:", model.coef_)
print("Intercept:", model.intercept_)

y_pred = model.predict(X_test)
print("Predictions:", y_pred)
```

Q3: Multiple Linear Regression

```
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LinearRegression

df = pd.read_csv("Student_Performance.csv")

X = df[["Hours Studied", "Previous Scores", "Sleep Hours",
        "Sample Question Papers Practiced"]]
y = df["Performance Index"]

X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2)

model = LinearRegression()
model.fit(X_train, y_train)

print("Coefficients:", model.coef_)
print("Intercept:", model.intercept_)
y_pred = model.predict(X_test)
print("Predicted Values:", y_pred)
```

Q4: Summary Statistics

```
import pandas as pd
df = pd.read_csv("Student_Performance.csv")

print(df.head())
print(df.describe())
print(df.isnull().sum())
```

Q5: Correlation Heatmap

```
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt

df = pd.read_csv("Student_Performance.csv")
sns.heatmap(df.corr(), annot=True)
plt.title("Correlation Heatmap")
plt.show()
```

Q6: Pairplot

```
import seaborn as sns
import pandas as pd

df = pd.read_csv("Student_Performance.csv")
sns.pairplot(df)
plt.show()
```

Q7: Boxplot

```
import matplotlib.pyplot as plt
import pandas as pd
df = pd.read_csv("Student_Performance.csv")
```

```
plt.boxplot(df["Performance Index"])
plt.title("Boxplot of Performance Index")
plt.show()
```