**Seaborn Kya Hai?**

**Seaborn ek Python library hai jo graphs banane ke liye use hoti hai — aur woh bhi bohat hi easy aur beautiful style mein.**

Ye matplotlib ke upar built hai, lekin zyada smart aur short code ke sath.

**Seaborn Use Karne Ka Flow**

import seaborn as sns

import matplotlib.pyplot as plt

import pandas as pd

# Step 1: Data load

df = sns.load\_dataset("tips") # built-in dataset

# Step 2: Plot banana

sns.barplot(x="day", y="total\_bill", data=df)

plt.show()

**Seaborn Mein Common Charts (With Simple Logic)**

| **Graph Type** | **Use** |
| --- | --- |
| **barplot** | Kisi category ka average ya comparison |
| **countplot** | Kis category ke kitne records hain |
| **boxplot** | Range + outliers dikhata hai |
| **violinplot** | boxplot + distribution |
| **lineplot** | Trend ya change over time |
| **scatterplot** | Do variables ka relationship |
| **heatmap** | Correlation ya matrix visualization |
| **pairplot** | Sab numerical features ka overall view ek sath |

1. **Barplot** → “Average Comparison”

### Use:

Kisi category ka **average value** compare karna ho.  
Jaise: Har din ka average bill.

sns.barplot(x="day", y="total\_bill", data=df)

plt.title("Har din ka average bill")

plt.show()

🔍 Har bar average total\_bill show karta hai for each day.

1. **Countplot** → “Kitne log hain?”

### Use:

Kisi category ke **kitne log** ya records hain.

sns.countplot(x="day", data=df)

plt.title("Har din kitne customers aaye")

plt.show()

🔍 Sirf ginti dikhaata hai — mean ya sum nahi.

1. **Boxplot** → “Range + Outliers”

### Use:

Kisi numeric value ka **minimum, maximum, median** aur outliers.

sns.boxplot(x="day", y="total\_bill", data=df)

plt.title("Bill ka range aur outliers (har din)")

plt.show()

🔍 Beech ki line = median, box = range, dots = outliers.

1. **Violinplot** → “Boxplot + Shape”

### Use:

Boxplot jaisa hi hota hai, **lekin shape/density** bhi dikhata hai.

sns.violinplot(x="day", y="total\_bill", data=df)

plt.title("Bill ka shape aur spread")

plt.show()

🔍 Jahan mota area hai, wahan zyada log hain.

1. **Lineplot** → “Trend ya Flow”

### Use:

Kisi cheez ka **trend dekhna ho**, jaise time ke sath badhna/ghatna.

sns.lineplot(x="size", y="tip", data=df)

plt.title("Group size ke sath tip ka trend")

plt.show()

🔍 X-axis barhta hai → Y-axis ka change dikhta hai.

1. **Scatterplot** → “Relation Check”

### Use:

Do numeric cheezon ke beech **relation dikhana**.

sns.scatterplot(x="total\_bill", y="tip", data=df)

plt.title("Bill aur Tip ka relationship")

plt.show()

🔍 Jaise bill badhta hai to kya tip bhi badhti hai?

## 7. ****Heatmap**** → “Matrix/Correlation View”

### 🧠 Use:

Numerical columns ke beech **correlation** ya matrix dikhana.

python

CopyEdit

sns.heatmap(df.corr(), annot=True, cmap="coolwarm")

plt.title("Correlation Matrix")

plt.show()

🔍 1 ka matlab strong positive link, -1 = negative.

## 8. ****Pairplot**** → “Sab Kuch Ek Sath”

### 🧠 Use:

Har numerical feature ka **combination scatterplot + histogram**

sns.pairplot(df)

plt.show()

🔍 Sab features ka automatic combination bana deta hai.

**Summary Table (with Urdu Use)**

| **Graph Type** | **Use (Urdu)** |
| --- | --- |
| **barplot** | Har category ka average compare karo |
| **countplot** | Kis category mein kitne log hain |
| **boxplot** | Range, median, aur outliers dikhata hai |
| **violinplot** | Boxplot + logon ki density shape |
| **lineplot** | Time ya size ke sath change (trend) |
| **scatterplot** | Do cheezon ka aapas ka taluq dikhata hai |
| **heatmap** | Matrix ya correlation view (numeric columns) |
| **pairplot** | Sab numeric columns ka overall view ek sath |

**Matplotlib vs Seaborn — Simple Comparison**

| **Feature** | **Matplotlib** | **Seaborn (Built on top of Matplotlib)** |
| --- | --- | --- |
| 🔧 Syntax | Thoda complex aur zyada code likhna padta | Simple aur short code |
| 🎨 Default Style | Basic, plain looking plots | Professional aur stylish charts automatically |
| 📊 DataFrame Support | Thoda manually handle karna padta | Directly pandas DataFrame ke sath kaam karta hai |
| 🔁 Built-in Plots | Kam customization | Zyada built-in plot types (barplot, violin, etc) |
| 📈 Statistical Support | Manual calculation karni padti hai | Automatically mean, CI, etc. handle kar leta hai |

### import matplotlib.pyplot as plt **kyun use hota hai Seaborn ke saath?**

Seaborn **andar se Matplotlib ka hi advanced version hai.**  
Matplotlib foundation hai — aur Seaborn us par built hai.

### 🔍 Isliye:

Jab tum Seaborn se graph banate ho (like sns.barplot()),  
to graph to ban jata hai **lekin display (show) karne ka kaam** matplotlib.pyplot karta hai.