Q1: Five plots in Seaborn and their uses

Seaborn is a **Python library for statistical data visualization**, built on top of Matplotlib. It simplifies creating attractive plots and works well with Pandas DataFrames.

Five plots in Seaborn:

Plot	Function	Use
Line plot	`sns.lineplot()`	Show trends over time or continuous variables.
Box plot	`sns.boxplot()`	Visualize distribution, median, quartiles, and outliers.
Histogram / Distribution plot	`sns.histplot()`	Show frequency distribution of a variable.
Scatter plot	`sns.scatterplot()`	Visualize relationship between two variables.
Heatmap	`sns.heatmap()`	Visualize correlations or matrix-like data.

Other plots include **pairplot**, **violin plot**, **bar plot**, etc.

Q2: Line plot using the fmri dataset

Code:

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

# Load dataset
fmri = sns.load_dataset("fmri")

# Plot line plot
sns.lineplot(data=fmri, x="timepoint", y="signal", hue="event",
style="region")
plt.title("FMRI Signal over Time")
plt.xlabel("Timepoint")
```

```
plt.ylabel("Signal")
plt.show()
```

✅ This will show **signal trends over time** for different **events and brain regions**.

Q3: Box plots using Titanic dataset

Code:

```
# Load dataset
titanic = sns.load_dataset("titanic")

# Box plot: Age by Pclass
plt.figure(figsize=(8,4))
sns.boxplot(data=titanic, x="pclass", y="age")
plt.title("Box Plot of Age by Pclass")
plt.show()

# Box plot: Fare by Pclass
plt.figure(figsize=(8,4))
sns.boxplot(data=titanic, x="pclass", y="fare")
plt.title("Box Plot of Fare by Pclass")
plt.show()
```

✅ These plots help visualize **age and fare distributions across passenger classes**.

Q4: Histogram of diamonds price with hue for cut

Code:

```
# Load dataset
diamonds = sns.load_dataset("diamonds")

# Histogram
plt.figure(figsize=(10,5))
```

```
sns.histplot(data=diamonds, x="price", hue="cut", multiple="stack",
palette="Set2")
plt.title("Histogram of Diamond Prices by Cut")
plt.xlabel("Price")
plt.ylabel("Count")
plt.show()
```

✅ This shows **distribution of diamond prices** for different **cut qualities**.

Q5: Pair plot using the iris dataset

Code:

```
# Load dataset
iris = sns.load_dataset("iris")

# Pair plot
sns.pairplot(data=iris, hue="species", palette="bright")
plt.suptitle("Pair Plot of Iris Dataset", y=1.02)
plt.show()
```

✅ Pair plots help visualize **relationships between all numeric variables**, colored by **species**.

Q6: Heatmap using the flights dataset

- Flights dataset contains **passengers by month and year**.
- We need to pivot the data to create a matrix suitable for heatmap.

Code:

```
# Load dataset
flights = sns.load_dataset("flights")

# Pivot dataset
flights_pivot = flights.pivot("month", "year", "passengers")
```

```
# Plot heatmap
plt.figure(figsize=(12,6))
sns.heatmap(flights_pivot, annot=True, fmt="d", cmap="YlGnBu")
plt.title("Heatmap of Flight Passengers")
plt.show()
```

✅ This shows **passenger counts across months and years** as a heatmap.