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MACHINE LEARNING

1.

Machine learning is a powerful technology that enables computers to automatically learn patterns from data and make smart decisions without being explicitly programmed for every task. When models are trained with examples, they begin to understand trends and can apply that knowledge to new, unseen data. This allows ML to be used in many real-world applications such as image recognition, sales forecasting, personalised recommendations, fraud detection and more. Machine learning includes supervised, unsupervised and reinforcement learning, each suited for different types of problems. The success of any ML system depends heavily on the quality of data, feature selection, model choice and proper evaluation methods. It is also important to consider fairness, privacy and transparency so that models behave responsibly. As data availability and computing power continue to grow, machine learning is rapidly expanding and becoming an essential part of modern technology, helping industries work smarter and improving everyday life.

2.

Applications of ML

1.Medical Diagnostics

2.Automated car and vehicle

3.Fraud Detection

4.Image Search

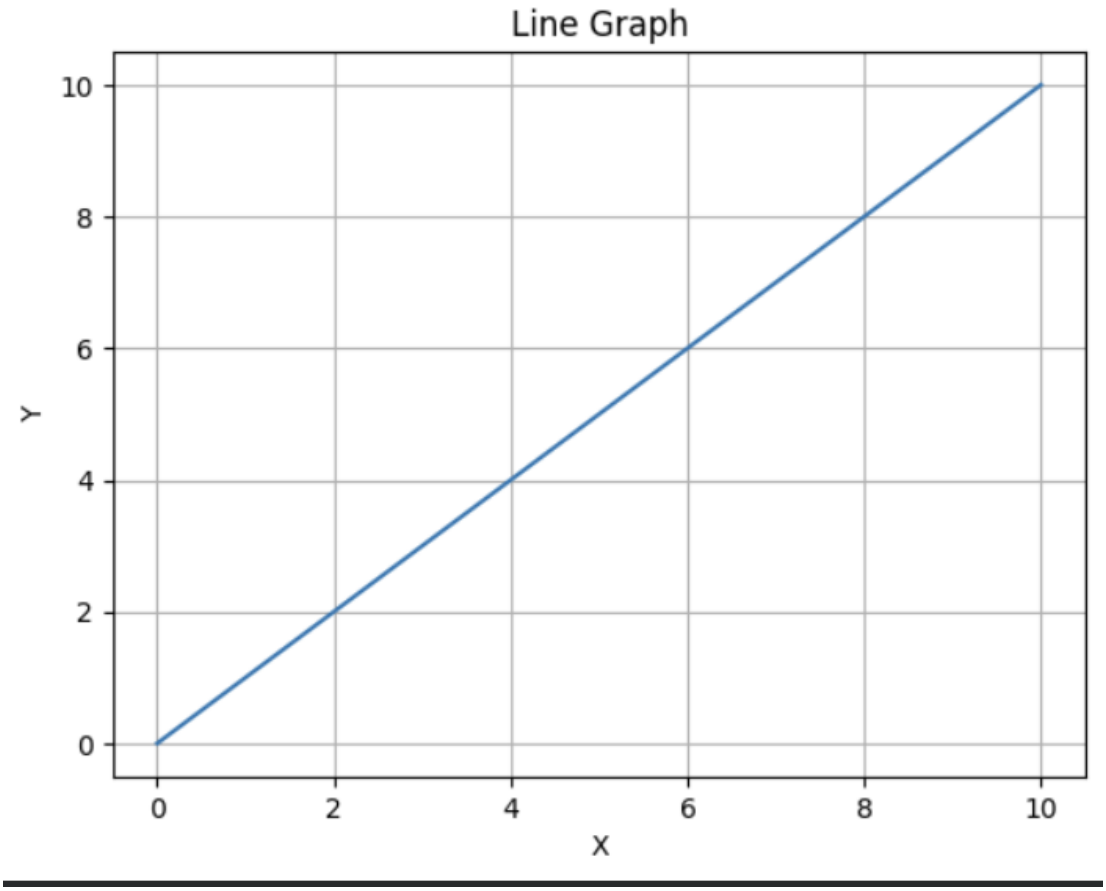
5.Feature Predictions

6.Image Distinction and identification

3.

```
import numpy as np
import matplotlib.pyplot as plt
x=np.linspace(0, 10, 100)
y=x
plt.plot(x, y)
```

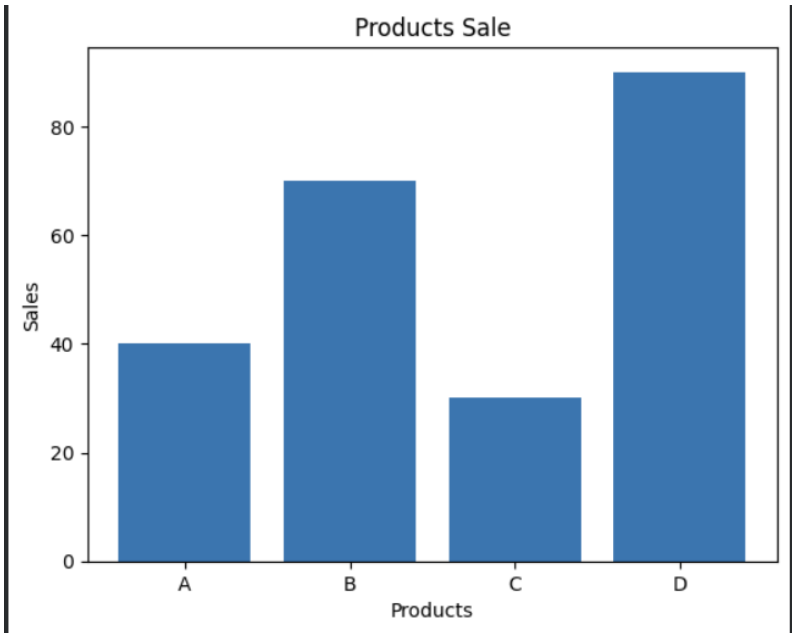
```
plt.title("Line Graph")
plt.xlabel("X")
plt.ylabel("Y")
plt.grid(True)
plt.show()
```



4.

```
import matplotlib.pyplot as plt
products=['A', 'B', 'C', 'D']
sales=[40,70,30,90]
plt.bar(products, sales)
plt.title("Products Sale")
plt.xlabel("Products")
```

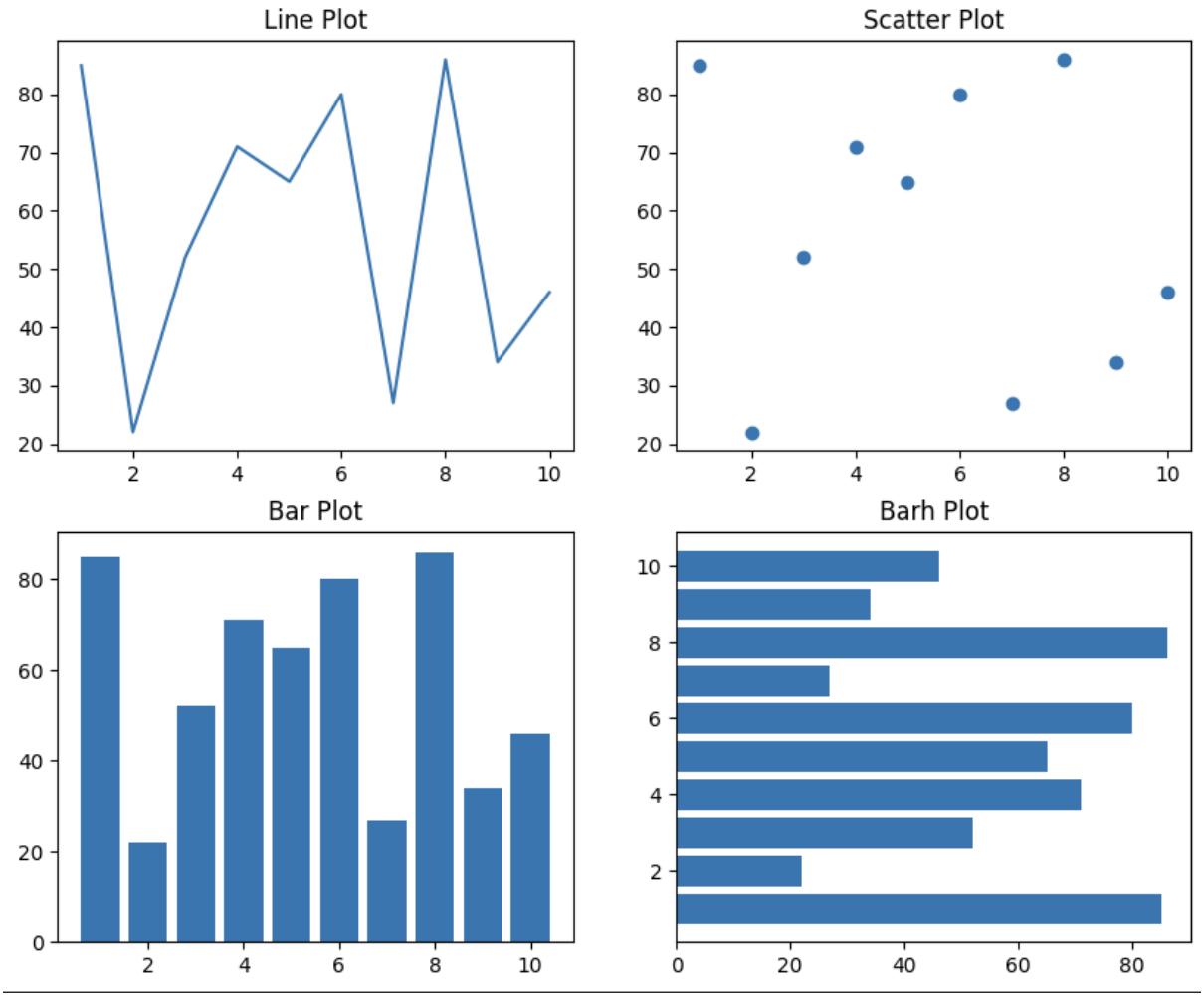
```
plt.ylabel("Sales")
plt.show()
```



5.

```
import numpy as np
import matplotlib.pyplot as plt
import pandas as pd
np.random.seed(40)
data={
    "x": np.arange(1, 11),
    "y": np.random.randint(15, 89, size=10)
}
df = pd.DataFrame(data)
fig, axes = plt.subplots(2, 2, figsize=(10, 8))
axes[0,0].plot(df['x'], df['y'])
axes[0,0].set_title("Line Plot")
axes[0,1].scatter(df['x'], df['y'])
axes[0,1].set_title("Scatter Plot")
axes[1,0].bar(df['x'], df['y'])
axes[1,0].set_title("Bar Plot")
```

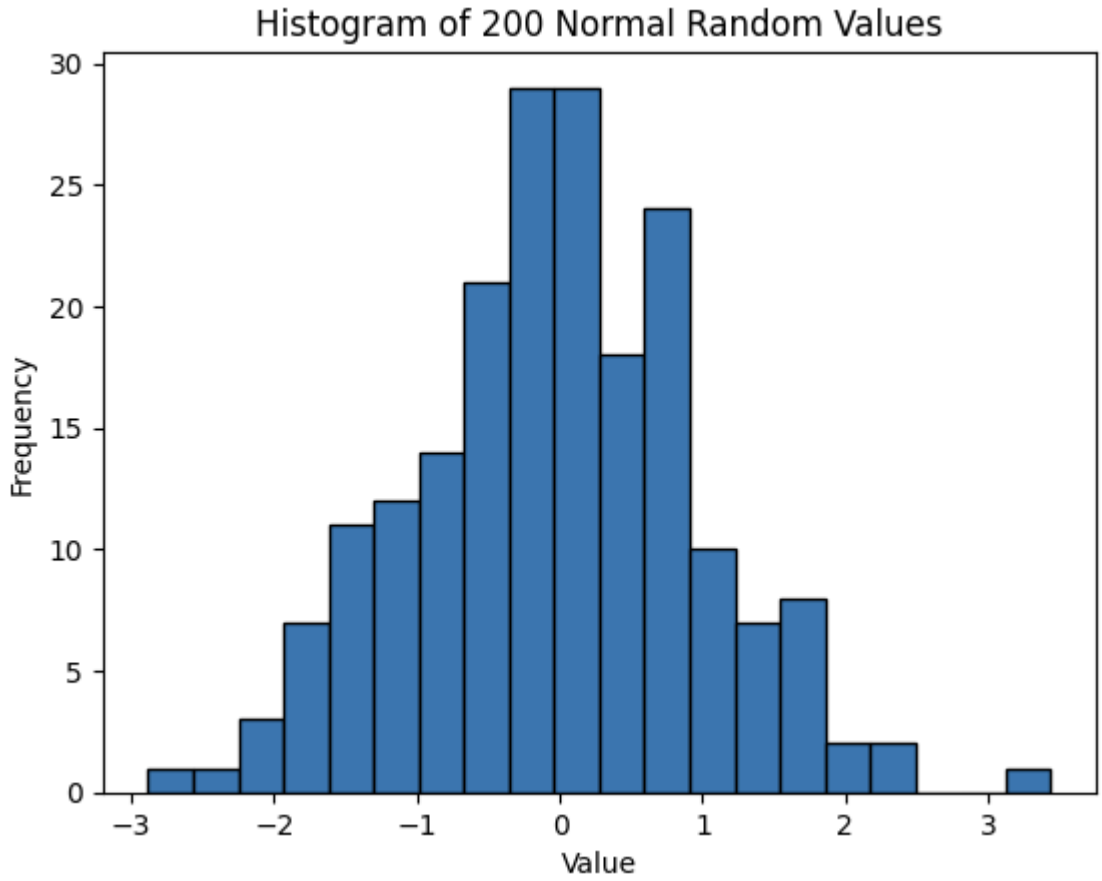
```
axes[1,1].barh(df['x'], df['y'])
axes[1,1].set_title("Barh Plot")
plt.show()
```



6.

```
import numpy as np
import matplotlib.pyplot as plt
np.random.seed(40)
values = np.random.normal(0, 1, 200)
plt.hist(values, bins=20, edgecolor='black')
plt.title("Histogram of 200 Normal Random Values")
plt.xlabel("Value")
plt.ylabel("Frequency")
```

plt.show()


Histogram of 200 Normal Random Values
Frequency
Value
0
5
10
15
20
25
30
−3
−2
−1
0
1
2
3