

EDS PROJECT

SALARY PREDICTOR

GUIDED BY-Madhavi Nimkar

OUR TEAM



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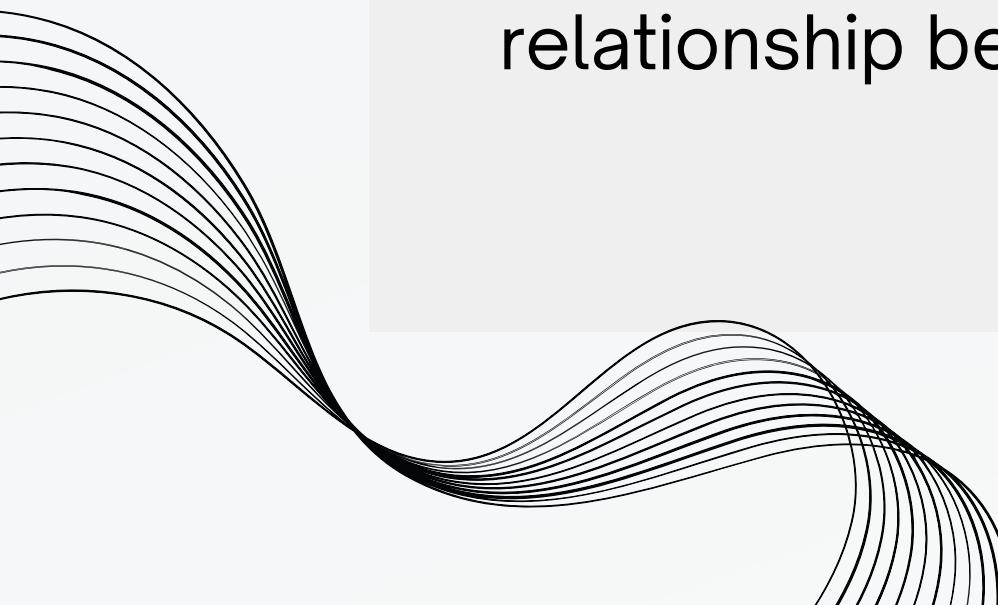


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INTRODUCTION

- Data science is a multidisciplinary field that involves extracting insights and knowledge from data to solve complex problems and make data-driven decisions
- NumPy is a fundamental library for scientific computing in Python. It provides powerful N-dimensional array objects
- Pandas is a library that offers high-performance data manipulation and analysis tools
- It provides data structures like DataFrames and Series, which allow you to work with structured data easily
- Linear regression is a fundamental statistical modeling technique used to establish a linear relationship between a dependent variable and one or more independent variables.





MOTIVATION

- The sink of Salary dataset always makes curiosity in mostly Students .
- How it to be manage huge dataset which includes enough no .of parameters to understand the python & data science can be understand with that dataset makes easy to understand
- Salary makes it includes numerical as well as character data types

DETAILS OF DATASET

Name: Salary dataset

Number of Features:

Age: The age of individuals in the dataset

- **Education Level:** The highest level of education completed by individuals
- **Years of Experience:** The number of years of professional experience of individuals

Job Title: The specific job title or position held by individuals

Gender : Gender of individual

Number of records: Rows: 6704

Columns: 6

DATA MANIPULATION

```
import pandas as pd  
df  
=pd.read_csv("/content/sample_data/salary.csv")  
#print all records of dataset  
print(df)  
  
# save DataFrame to a CSV file  
df1.to_csv("Salary.csv",index=True)  
# print all record through salary_data  
salary_data=  
pd.read_csv('/content/sample_data/salary.csv')  
salary_data  
  
# compute basic summary statistics of salary_data  
salary_data.describe()
```

OUTPUT:

	Age	Years of Experience	Salary
count	6702.000000	6701.000000	6699.000000
mean	33.620859	8.094687	115326.964771
std	7.614633	6.059003	52786.183911
min	21.000000	0.000000	350.000000
25%	28.000000	3.000000	70000.000000
50%	32.000000	7.000000	115000.000000
75%	38.000000	12.000000	160000.000000
max	62.000000	34.000000	250000.000000

```
# selecting salary >100000  
print(df.loc[df['Salary']>100000])
```

```
# Apply multiple aggregation functions to Salary  
df.groupby('Salary').agg(['mean', 'max', 'min'])
```

OUTPUT:

	Age	Gender	Education Level	Job Title
2	45.0	Male	PhD	Senior Manager
4	52.0	Male	Master's	Director
6	42.0	Female	Master's	Product Manager
9	38.0	Male	PhD	Senior Scientist
11	48.0	Female	Bachelor's	HR Manager
...
6690	42.0	Male	Bachelor's Degree	Financial Manager
6693	43.0	Female	Master's Degree	Sales Manager
6697	51.0	Female	Master's Degree	Senior Product Marketing Manager
6699	49.0	Female	PhD	Director of Marketing
6702	46.0	Male	Master's Degree	Marketing Manager
	Years of Experience	Salary		
2	15.0	150000.0		
4	20.0	200000.0		
6	12.0	120000.0		
9	10.0	110000.0		
11	18.0	140000.0		
...		
6690	13.0	130000.0		
6693	14.0	140000.0		
6697	19.0	190000.0		
6699	20.0	200000.0		
6702	14.0	140000.0		

OUTPUT:

	Age			Years of Experience		
	mean	max	min	mean	max	min
Salary						
350.0	29.000000	29.0	29.0	1.500000	1.5	1.5
500.0	31.000000	31.0	31.0	4.000000	4.0	4.0
550.0	25.000000	25.0	25.0	1.000000	1.0	1.0
579.0	23.000000	23.0	23.0	1.000000	1.0	1.0
25000.0	24.781955	33.0	21.0	0.315789	1.0	0.0
...
220000.0	48.000000	49.0	44.0	21.090909	22.0	16.0
225000.0	50.000000	50.0	50.0	23.000000	23.0	23.0
228000.0	49.000000	49.0	49.0	23.000000	23.0	23.0
240000.0	51.000000	51.0	51.0	24.000000	24.0	24.0
250000.0	49.000000	52.0	45.0	23.333333	25.0	21.0

```
# group by column and compute the given value  
from salary column  
print(df.groupby('Salary').get_group(250000))
```

OUTPUT:

```
Age Gender Education Level Job Title \  
30 50.0 Male Bachelor's CEO  
83 52.0 Male PhD Chief Technology  
Officer  
5001 45.0 Male Bachelor's Degree Financial  
Manager
```

Years of Experience Salary

```
30 25.0 250000.0  
83 24.0 250000.0  
5001 21.0 250000.0
```

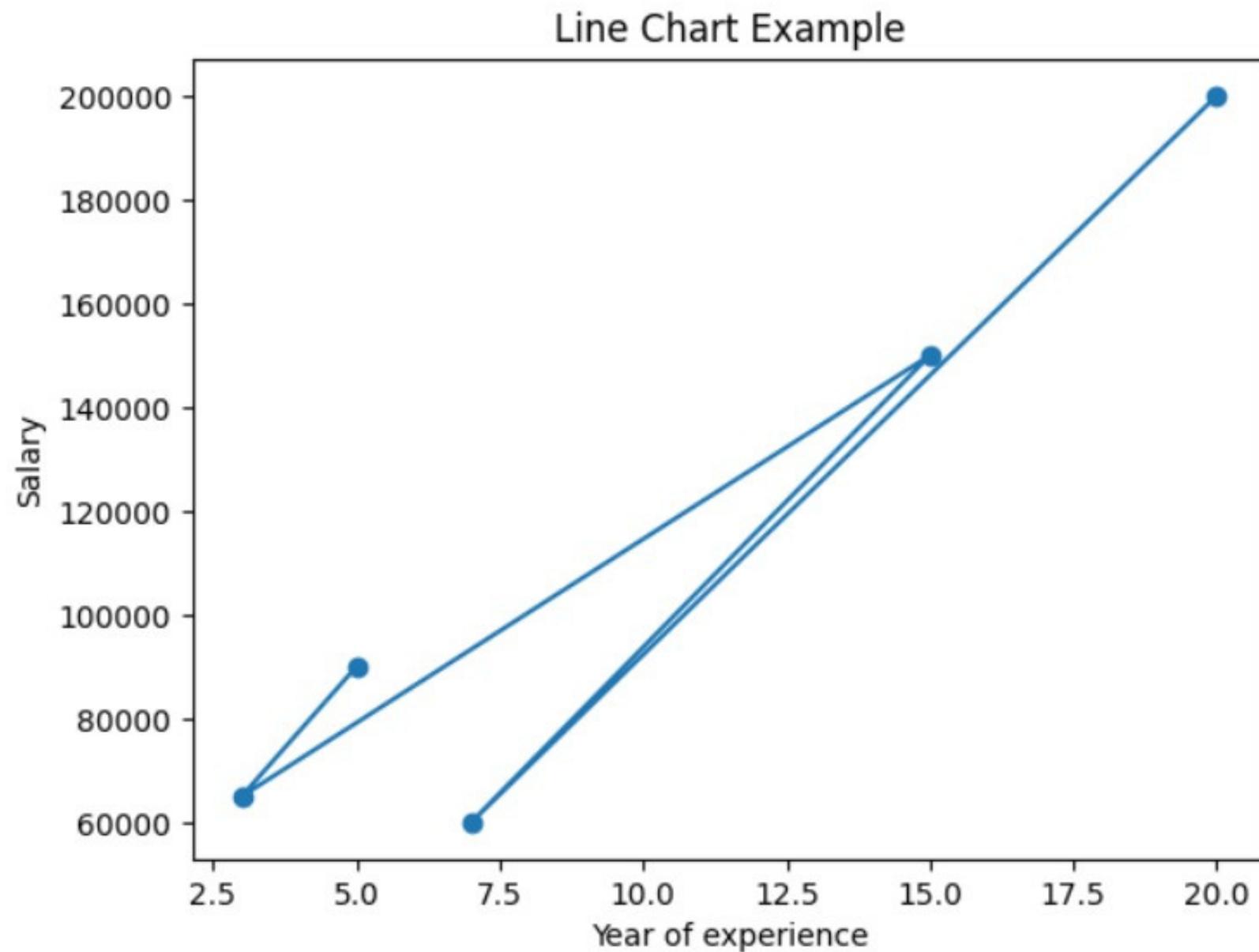
```
# compute the correlation between columns  
print(df.corr())
```

OUTPUT:

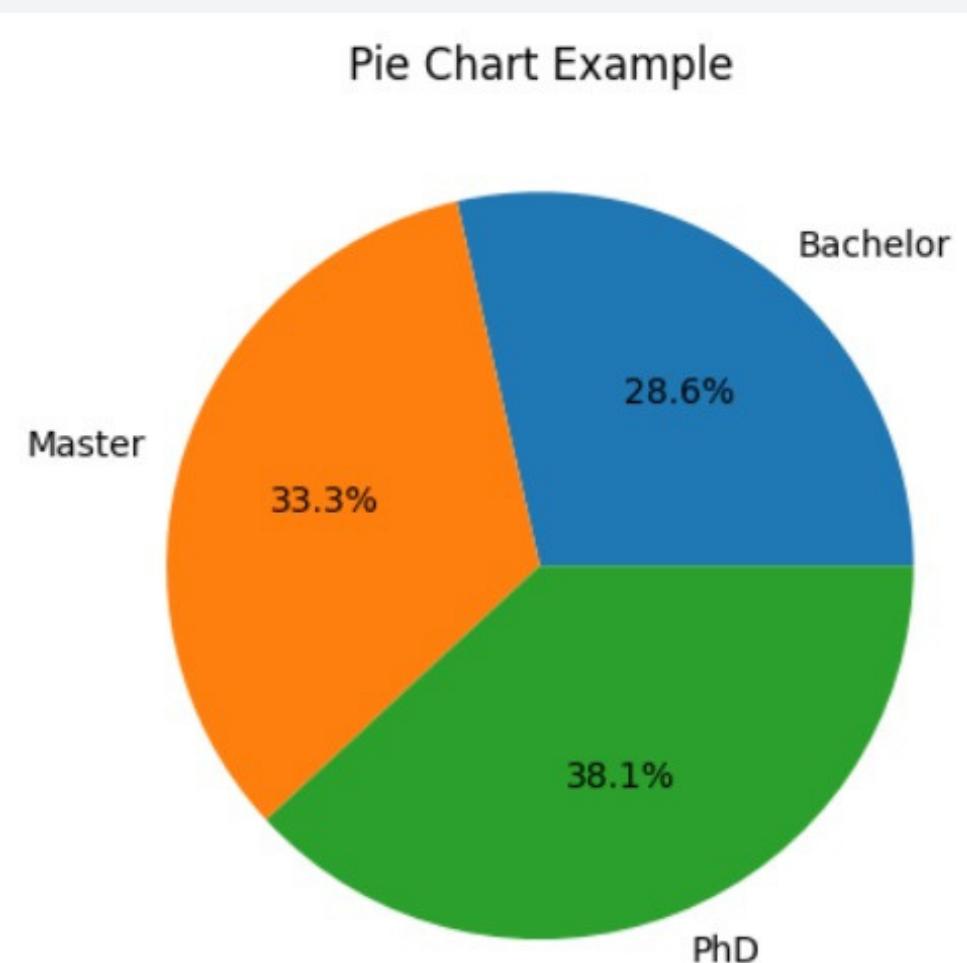
	Age	Years of Experience	Salary
Age	1.000000	0.937655	0.728053
Years of Experience	0.937655	1.000000	0.808969
Salary	0.728053	0.808969	1.000000

DATA VISUALIZATION

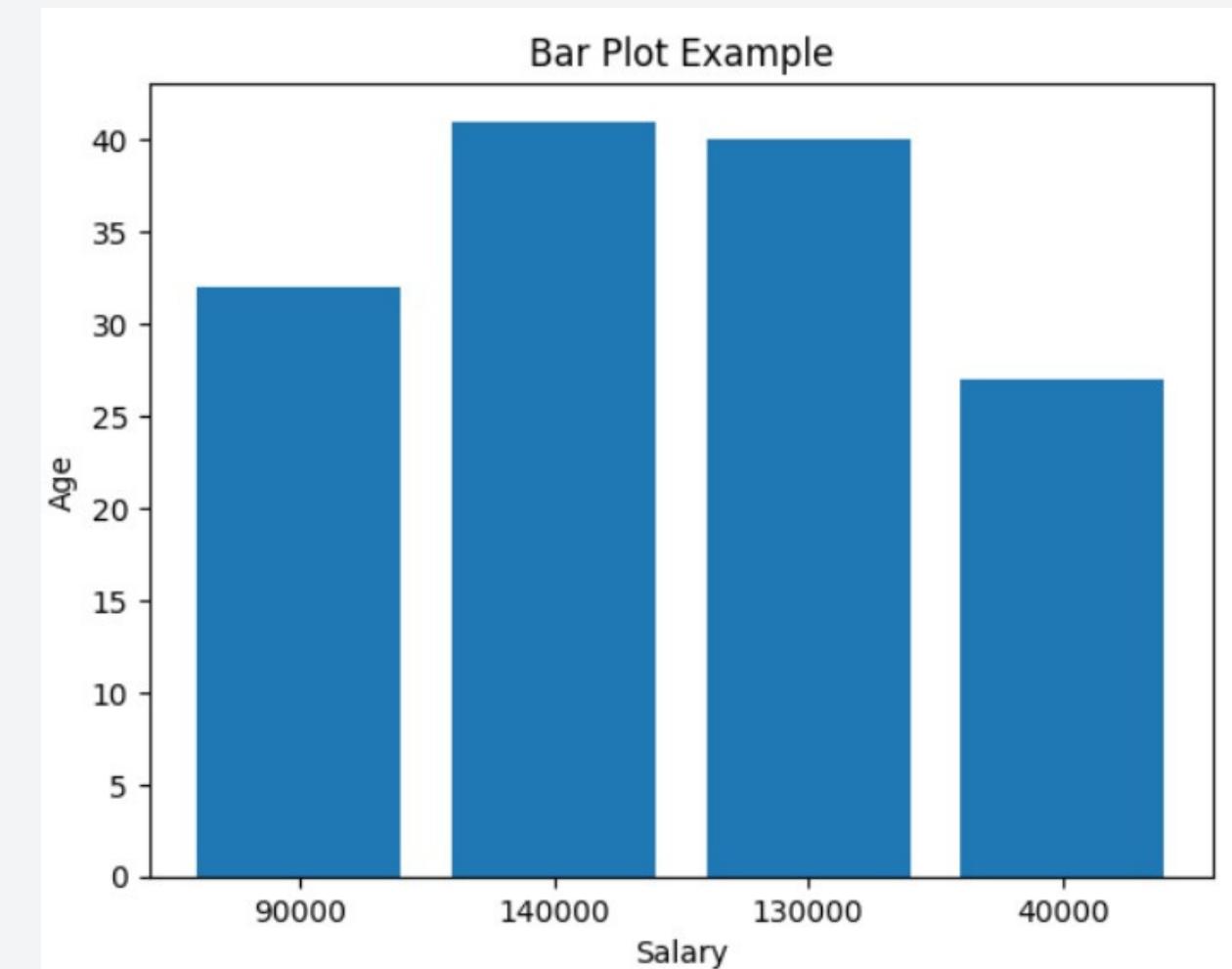
```
import matplotlib.pyplot as plt  
import pandas as pd  
df = pd.read_csv("/content/salary.csv")  
df.head()  
  
#Sample data  
x= [5,3,15,7,20] # x-axis values (Year of experience)  
y=[90000,65000,150000,60000,200000] # y-axis values (Salary)  
  
# Create a line chart  
plt.plot(x, y, marker='o')  
  
# Customize the chart  
plt.title("Line Chart Example")  
plt.xlabel("Year of experience")  
plt.ylabel("Salary")  
  
# Display the chart  
plt.show()
```



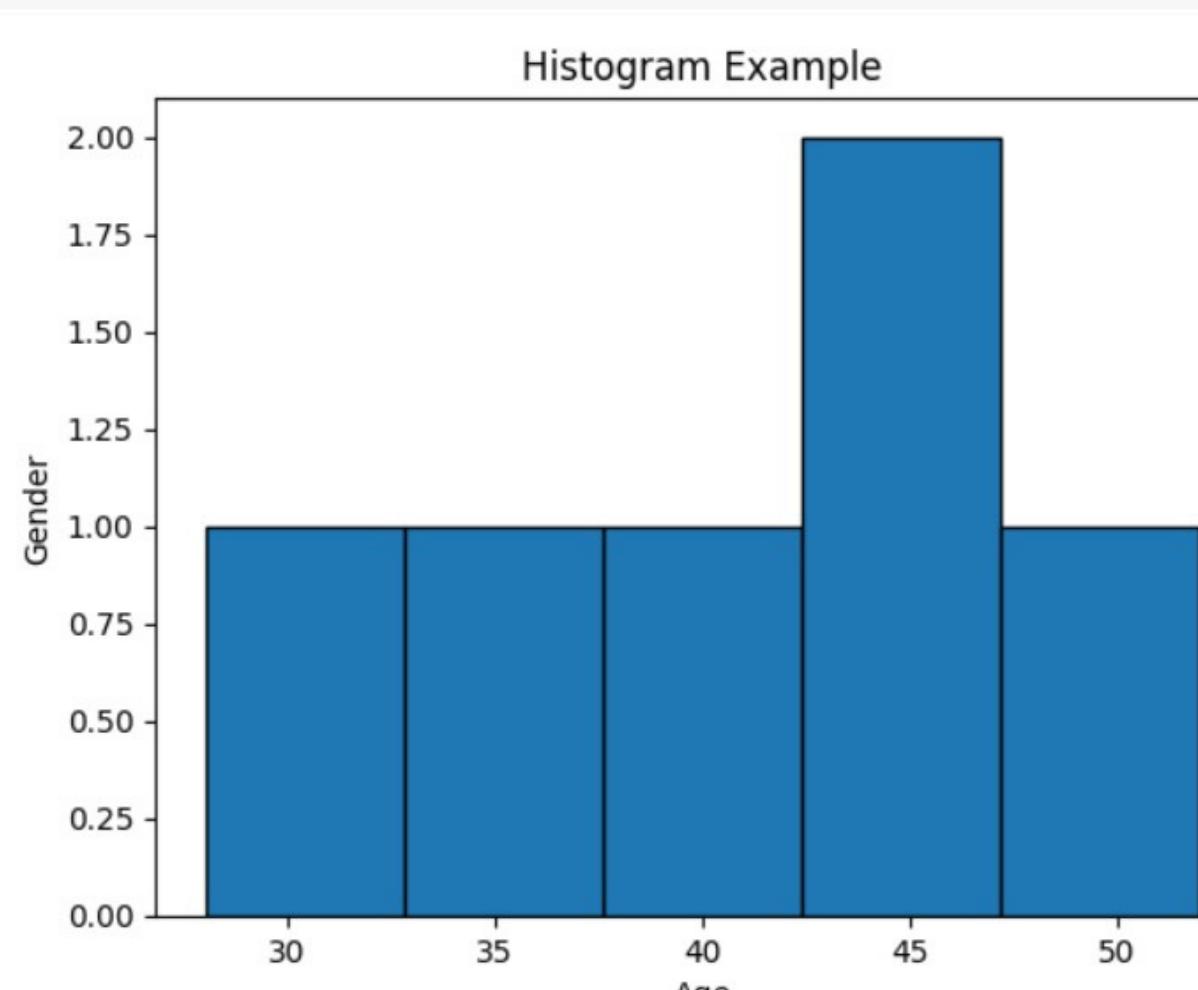
```
import matplotlib.pyplot as plt  
  
# Example data  
Education = ['Bachelor','Master','PhD']  
Age = [30,35,40]  
  
# Plotting the pie chart  
plt.pie(Age,labels=Education, autopct='%1.1f%%')  
  
# Adding a title  
plt.title('Pie Chart Example')  
  
# Displaying the pie chart  
plt.show()
```



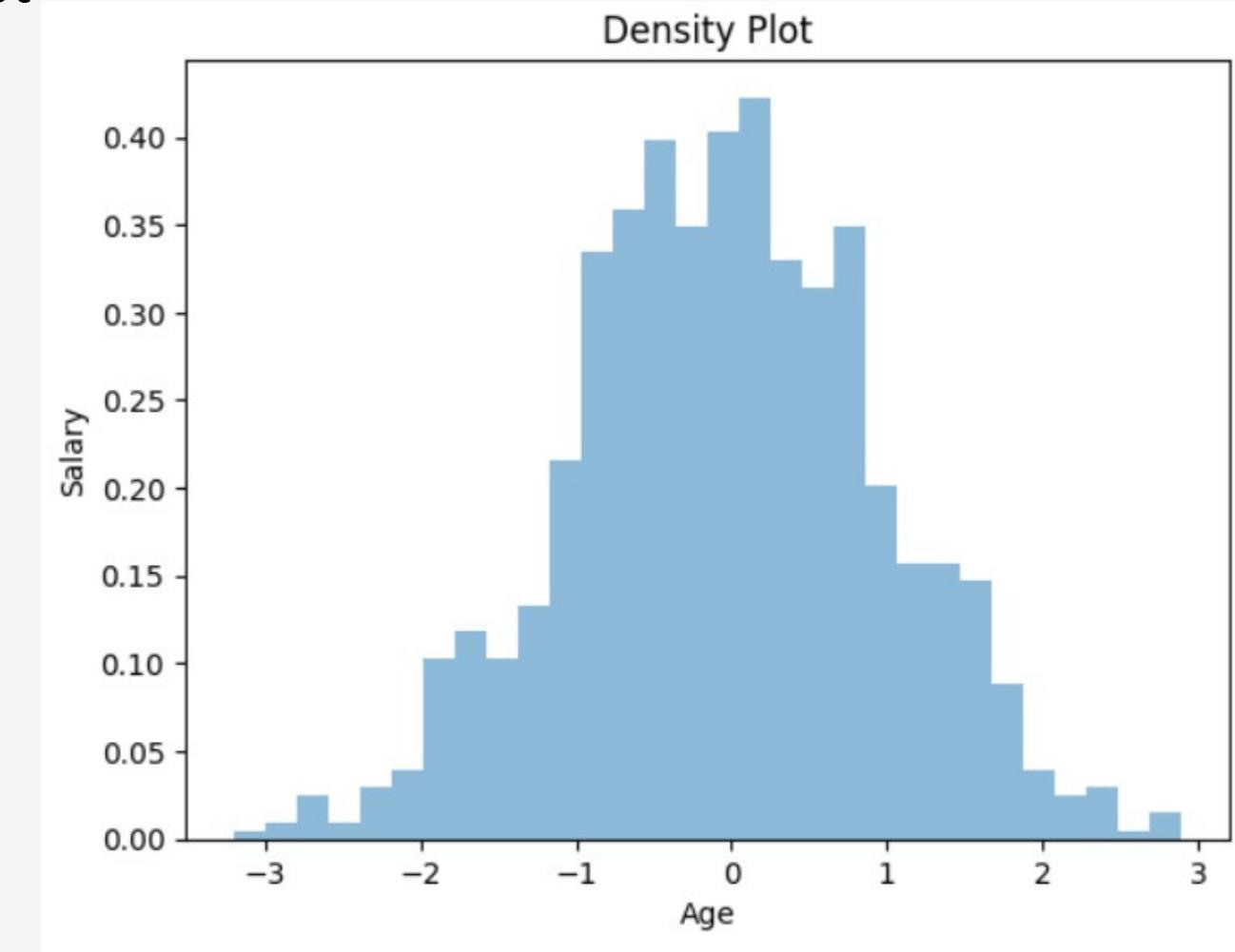
```
import matplotlib.pyplot as plt  
  
# Sample data  
Salary = ['90000', '140000', '130000','40000']  
Age = [32, 41, 40, 27]  
  
# Create a bar plot  
plt.bar(Salary, Age) # Customize the plot  
plt.title("Bar Plot Example")  
  
plt.xlabel("Salary")  
plt.ylabel("Age")  
  
# Display the plot  
plt.show()
```



```
import matplotlib.pyplot as plt  
  
# Example data  
  
data = [45,28,45,36,52,40]  
#Plotting the histogram  
plt.hist(data, bins=5, edgecolor="black")  
  
# Adding labels and title  
plt.xlabel('Age')  
plt.ylabel('Gender')  
plt.title('Histogram Example')  
  
# Displaying the histogram  
plt.show()
```



```
import matplotlib.pyplot as plt  
import numpy as np  
  
# Generate some random data  
data = np.random.randn(1000)  
  
# Create a density plot  
plt.hist(data, density=True, bins=30, alpha=0.5)  
  
# Add labels and title  
plt.xlabel('Age')  
plt.ylabel('Salary')  
plt.title('Density Plot')  
  
# Show the plot  
plt.show()
```



Predictive Technique (LR)

```
import pandas as pd  
df = pd.read_csv('/content/salary.csv')  
print(df)
```

```
df1 = df.groupby('Age').max()  
print(df1)  
plt.plot(df1.index, df1['Salary'], marker='o')
```

```
from sklearn.model_selection import train_test_split  
from sklearn.linear_model import LinearRegression  
X = df['Years of Experience']  
df = df.dropna()  
Y = df['Salary']
```

```
X = np.array(df['Years of Experience']).reshape(-1,1)  
Y = np.array(df['Salary']).reshape(-1,1)
```

```
# Dropping any rows with Nan Values  
X_train , X_test , y_train , y_test = train_test_split(X, Y, test_size = 0.25)
```

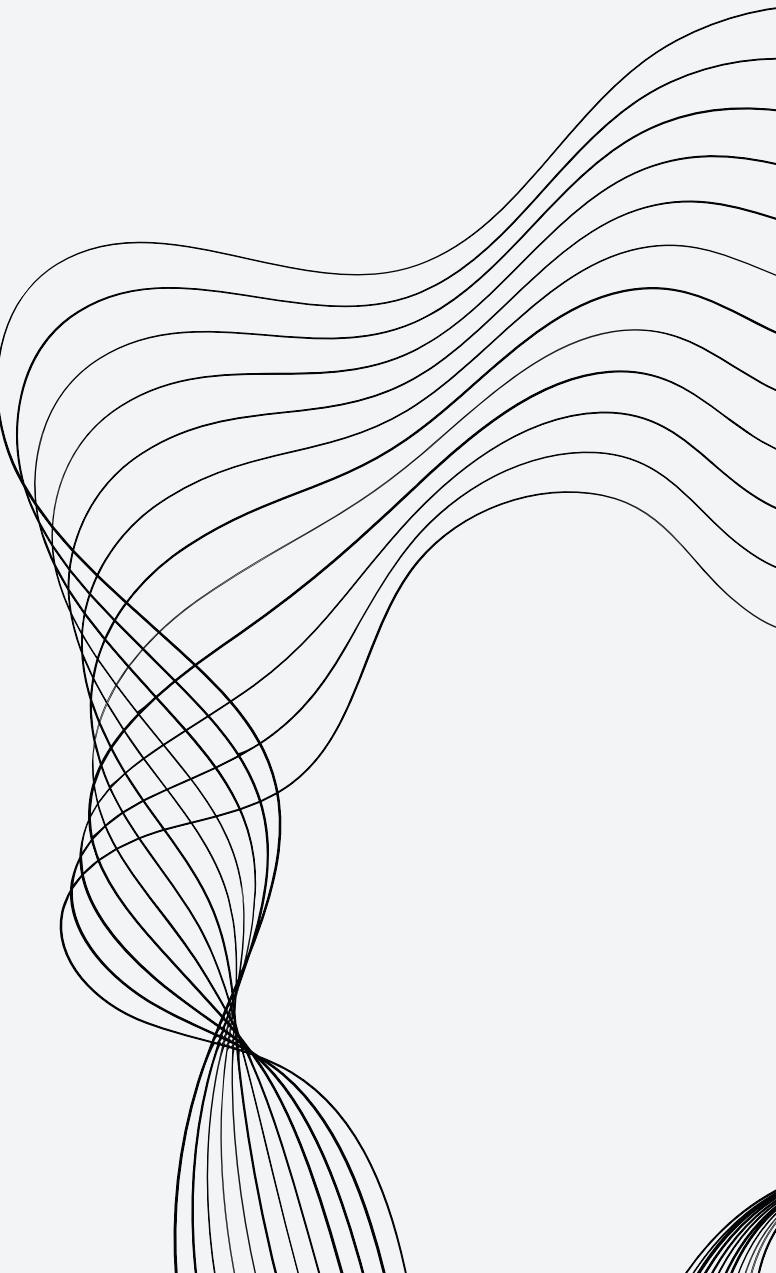
```
#Splitting the data into training and testing data  
regr = LinearRegression()
```

```
regr.fit(X_train , y_train)  
print(regr.score(X_test , y_test))
```

Linear Regression

OUTPUT:

0.6394789681695328



Application

- By performing data manipulation techniques such as cleaning, filtering, and transforming the dataset, you can gain a deeper understanding of the data. Exploring summary statistics, distributions, and correlations between variables can provide insights into the characteristics and relationships within the dataset.
- Visualizing the Salary dataset can help uncover patterns, trends, and relationships between variables.
- Plots such as histograms, scatter plots and bar charts can provide visual representations.
- After performing data manipulation, visualizing the data, and clustering using Kmeans, the resulting clusters can serve as new features for predictive modeling.
- The cluster labels can be used as input features to build a classification model to predict survival or any other relevant outcome

Conclusion

- In conclusion, our analysis of the Salary dataset has provided valuable insights into the Employee information
- We discovered significant correlations between Employee and salarys such as age, gender, Education level, Job and Salary
 - Through data cleaning, preprocessing, visualization, and modeling, we were able to extract meaningful information

THANK YOU

