EDS PROJECT

SALARY OF EMPLOYEES

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INTRODUCTION

- Data science is a field that uses scientific methods, processes, algorithms, and systems to extract knowledge and insights from data. It is a multidisciplinary field that combines elements of statistics, computer science, mathematics, and business.

- NumPy is a Python library that provides a high-performance multidimensional array object. It is the fundamental package for scientific computing in Python.

- Pandas is a Python library that provides high-performance, easy-to-use data structures and data analysis tools.

- Linear regression is a statistical method that is used to model the relationship between two or more variables.

MOTIVATION

- A salary dataset is a collection of data that includes information about salaries, such as the job title, department,name of the employees, and the salary itself.

- Salary datasets are interesting to use in projects because they can provide insights into a variety of topics, such as the job market, the salaries etc.They can also be used to identify trends in salaries over time.

- Salary datasets can be used to create an analysis of the factors that affect salaries etc.

DETAILS OF DATASET

Name : Salary Dataset

Number of Features : 6

Employee Id
First Name
Last Name
Job Title
Department
Salary

Number of Records : Rows - 500
Columns - 6

DATA MANIPULATION

```
import pandas as pd
df =pd.read_csv("/content/employee-records.xlsx - Sheet1.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/employee-records.xlsx - Sheet1.csv')

# compute basic summary statistics of salary_data
salary_data.describe()
```

```
     Unnamed: 0  Employee ID First Name Last Name            Job Title  \
0           NaN          161      Peter    Wilson                  CFO
1           NaN          383      Susan  Thompson           HR Manager
2           NaN          211      Peter  Thompson           Accountant
3           NaN          460       John    Wilson           HR Manager
4           NaN          375    Michael    Wilson  Sales Representative
..          ...          ...        ...       ...                  ...
495         NaN          247    Michael     Smith     Software Engineer
496         NaN          399  Elizabeth     Jones    Marketing Manager
497         NaN          152      Sarah     Jones  Sales Representative
498         NaN          287       Mary    Taylor                  CFO
499         NaN           53      Susan     Jones           HR Manager

      Department  Salary
0          Sales  124500
1     Accounting   85200
2             IT  108708
3     Management   52179
4    Engineering   79078
..           ...     ...
495   Management   65164
496           IT   62125
497   Management   69345
498        Sales  134704
499        Sales   76954

[500 rows x 7 columns]
```

	Unnamed: 0	Employee ID	Salary
count	0.0	500.000000	500.000000
mean	NaN	249.754000	100102.426000
std	NaN	144.790878	29297.147686
min	NaN	2.000000	50136.000000
25%	NaN	129.000000	74922.250000
50%	NaN	246.500000	101358.500000
75%	NaN	380.000000	126063.000000
max	NaN	498.000000	149890.000000

#selecting salary>10000

```
print(df.loc[df['Salary']>10000])
```

```
[500 rows x 7 columns]
     Unnamed: 0  Employee ID First Name Last Name            Job Title  \
0           NaN          161      Peter    Wilson                  CFO
1           NaN          383      Susan  Thompson            HR Manager
2           NaN          211      Peter  Thompson            Accountant
3           NaN          460       John    Wilson            HR Manager
4           NaN          375    Michael    Wilson  Sales Representative
..          ...          ...        ...       ...                   ...
495         NaN          247    Michael     Smith     Software Engineer
496         NaN          399  Elizabeth     Jones     Marketing Manager
497         NaN          152      Sarah     Jones  Sales Representative
498         NaN          287       Mary    Taylor                  CFO
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497   Management   69345
498        Sales  134704
499        Sales   76954

[500 rows x 7 columns]
```

#apply multiple aggregation functions

```
df.groupby('Salary').agg(['mean','max','min'])
```

	Unnamed: 0			Employee ID		
	mean	max	min	mean	max	min
Salary						
50136	NaN	NaN	NaN	431.0	431	431
50387	NaN	NaN	NaN	7.0	7	7
50493	NaN	NaN	NaN	473.0	473	473
51118	NaN	NaN	NaN	328.0	328	328
51200	NaN	NaN	NaN	194.0	194	194
...	...	...	...	...	...	...
148943	NaN	NaN	NaN	117.0	117	117
149012	NaN	NaN	NaN	226.0	226	226
149272	NaN	NaN	NaN	299.0	299	299
149676	NaN	NaN	NaN	271.0	271	271
149890	NaN	NaN	NaN	196.0	196	196

499 rows × 6 columns

#selecting salary>10000

```
print(df.groupby("Salary").get_group(141000)).
```

```
     Unnamed: 0  Employee ID First Name Last Name          Job Title
278         NaN          93       Mary    Wilson  Marketing Manager

     Department  Salary
278  Accounting  141000
```

#compute the correlation between columns

```
print(df.corr())
```

```
               Unnamed: 0  Employee ID    Salary
Unnamed: 0            NaN          NaN       NaN
Employee ID           NaN     1.000000 -0.037357
Salary                NaN    -0.037357  1.000000
```

DATA VISUALIZATION

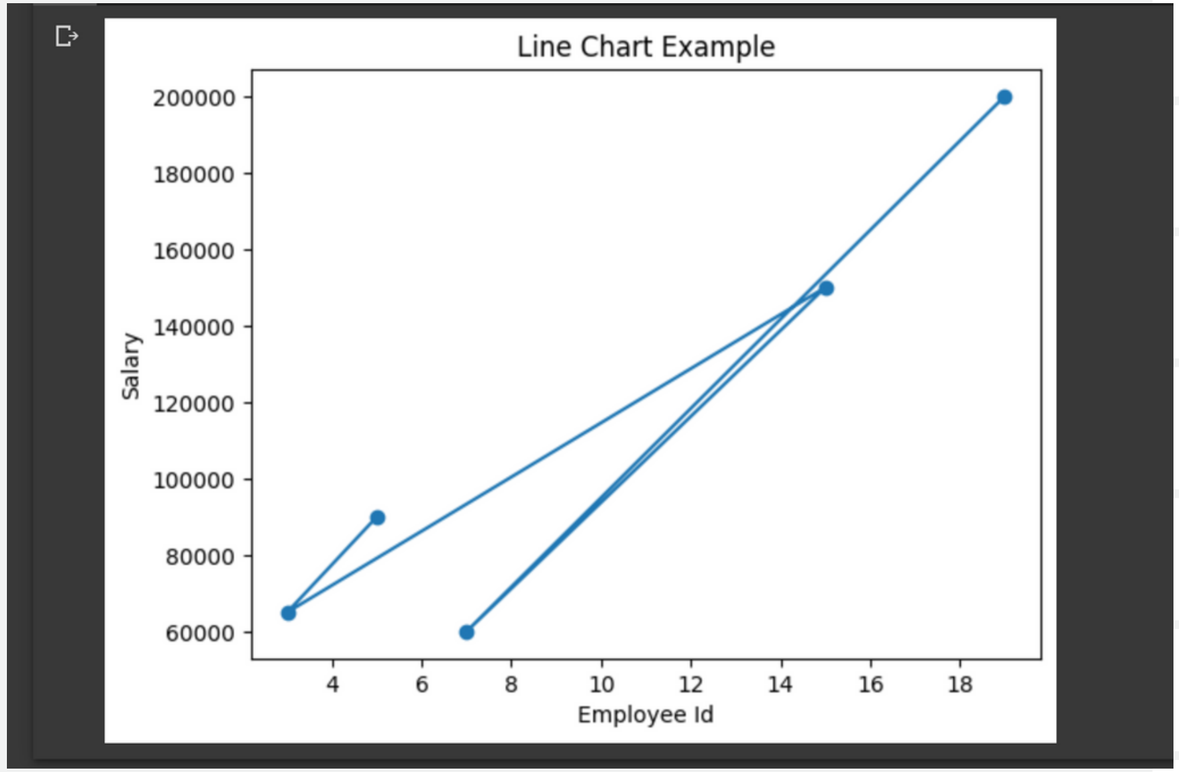
```
import matplotlib.pyplot as plt
import pandas as pd
df=pd.read_csv("/content/employee-records.xlsx - Sheet1.csv")
df.head()

#sample data
x=[5,3,15,7,19] #x-axis values(Employee Id)
y=[90000,65000,150000,60000,200000] #y-axis values(Salary)

#creation of line chart
plt.plot(x,y,marker='o')

#customization of the chart
plt.title("Line Chart Example")
plt.xlabel("Employee Id")
plt.ylabel("Salary")

#display the chart
plt.show()
```



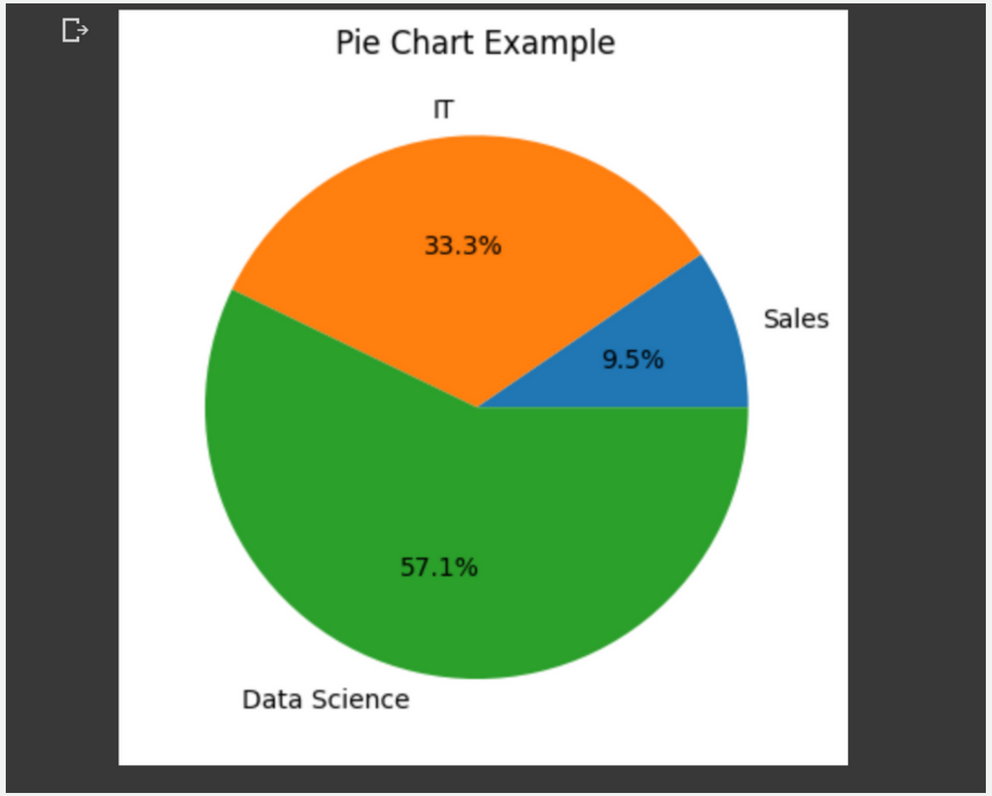
```
import matplotlib.pyplot as plt

# Sample data
Department = ['Sales', 'IT','Data Science']
Salary = [10000, 35000, 60000]

# Plotting of Pie Chart
plt.pie(Salary, labels=Department, autopct='%1.1f%%')

# Addition of title
plt.title('Pie Chart Example')

# Display the chart
plt.show()
```

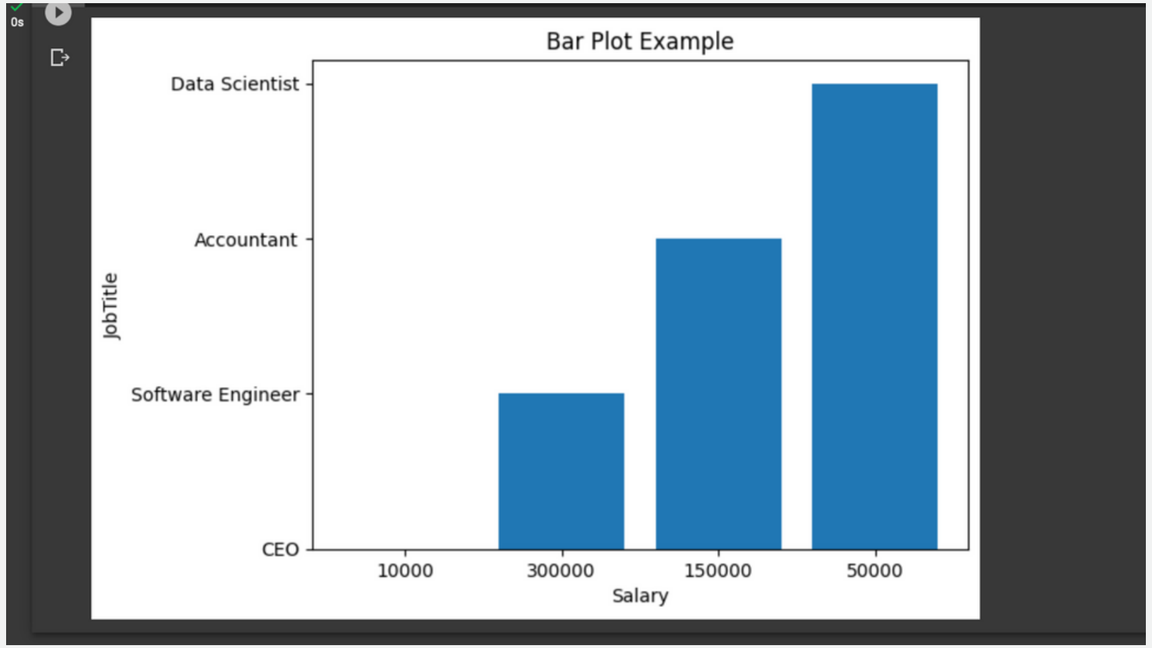


```
import matplotlib.pyplot as plt

#Sample Data
Salary=['10000','300000','150000','50000']
JobTitle=['CEO','Software Engineer','Accountant','Data Scientist']

#Poltting of bar
plt.bar(Salary,JobTitle)
plt.xlabel("Salary")
plt.ylabel("JobTitle")
plt.title("Bar Plot Example")

#Display the plot
plt.show()
```



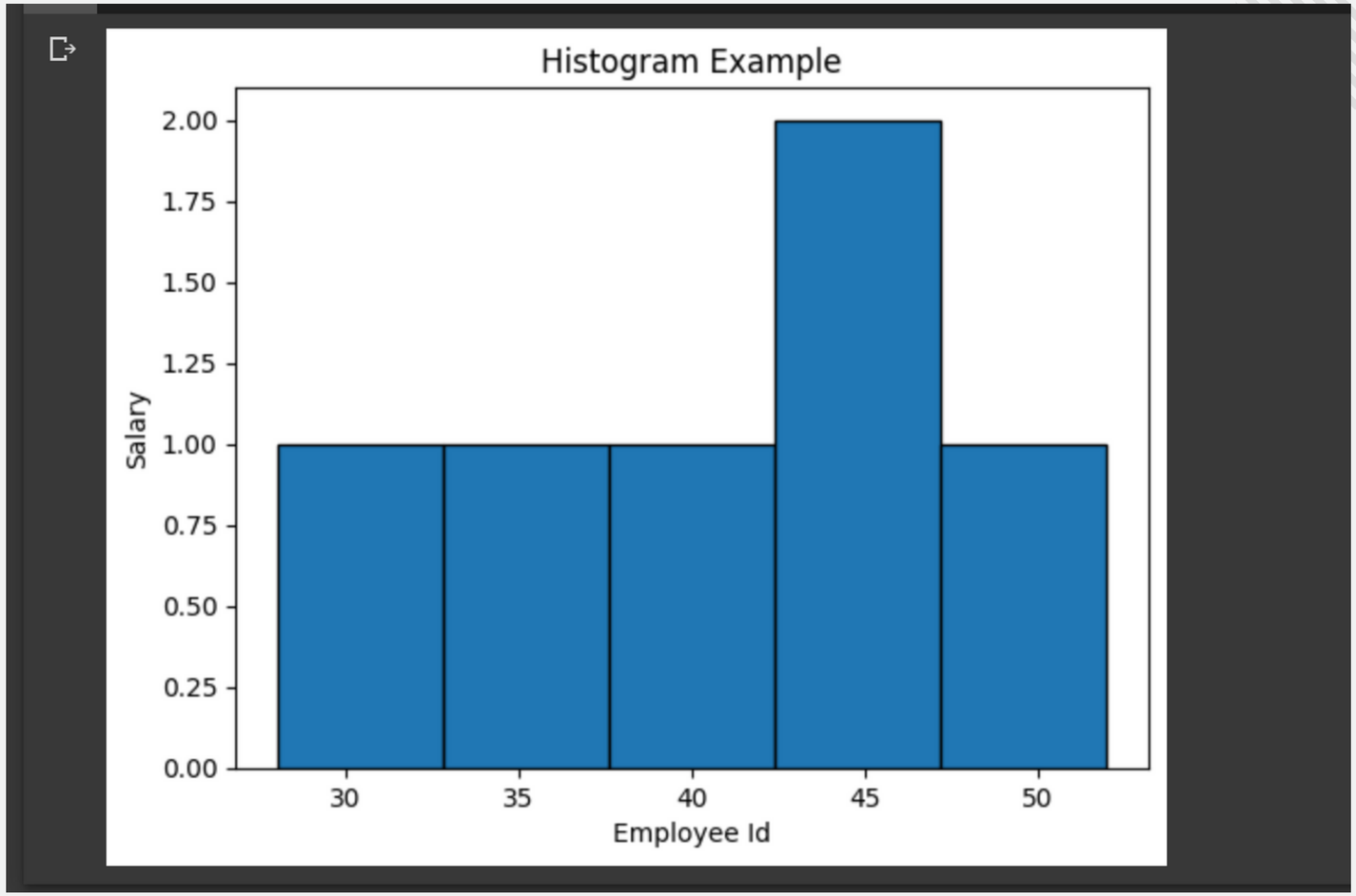
```
import matplotlib.pyplot as plt

#Sample data
data=[45,28,45,36,52,40]

#Plotting of histogram
plt.hist(data,bins=5,edgecolor="black")

#Customization
plt.xlabel('Employee Id')
plt.ylabel('Salary')
plt.title('Histogram Example')

#Display the histogram
plt.show()
```



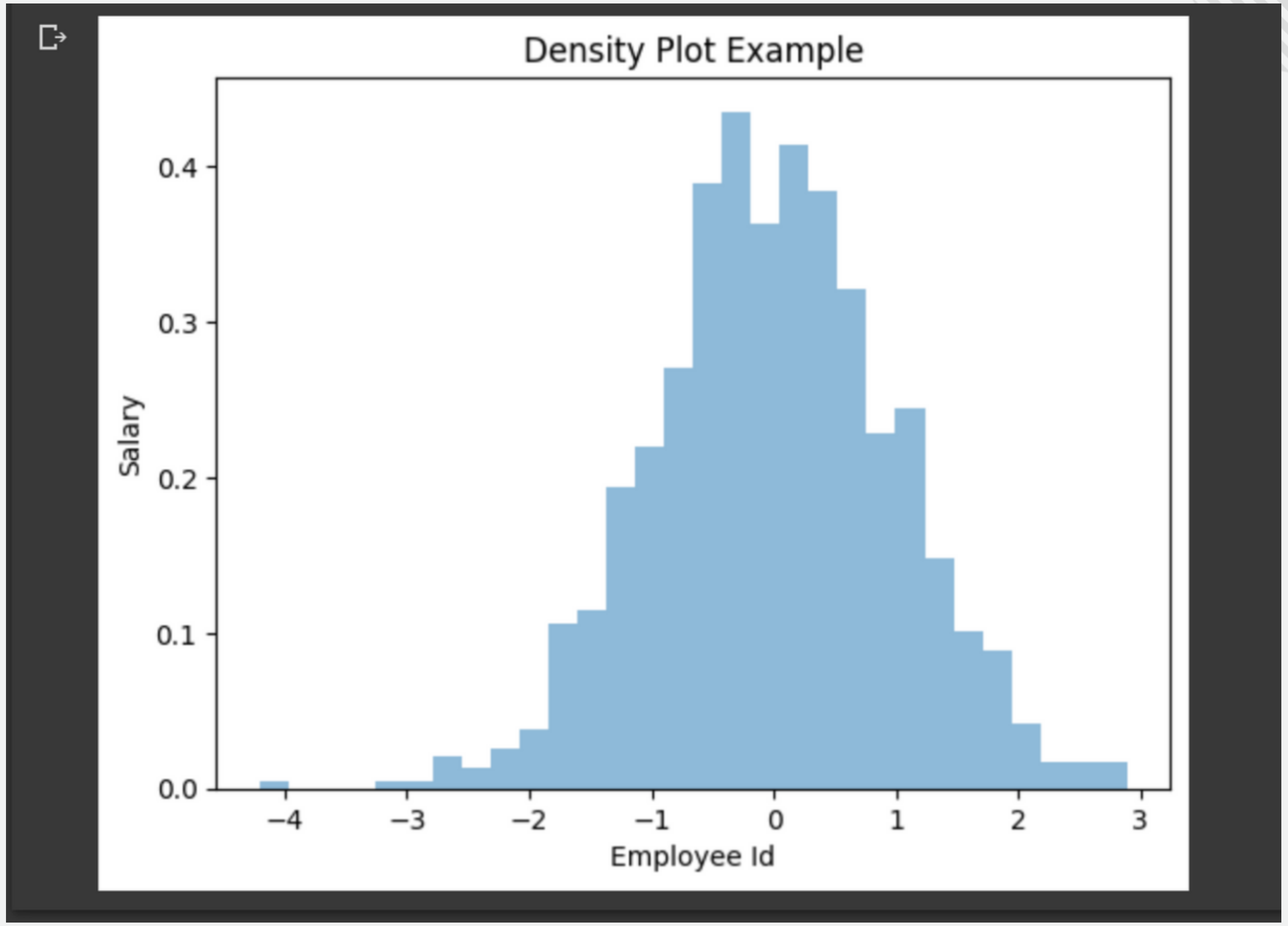
```
import matplotlib.pyplot as plt
import numpy as np

#Generate some random data
data=np.random.randn(1000)

#Create density plot
plt.hist(data,density=True,bins=30,alpha=0.5)

#Addition of labels and title
plt.xlabel('Employee Id')
plt.ylabel('Salary')
plt.title('Density Plot Example')

#Display the plot
plt.show()
```



PREDICTIVE TECHNIQUE

```
import pandas as pd
df=pd.read_csv('/content/employee-records.xlsx - Sheet1.csv')
print(df)
df1=df.groupby('Salary').max()
print(df1)
plt.plot(df1.index,df1['Department'],marker='o')

from sklearn.model_selection import train_test_split
from sklearn.linear_model import LinearRegression
X=df['Salary']
df=df.dropna()
Y=df['Department']

X=np.array(df['Salary']).reshape(-1,1)
Y=np.array(df['Department']).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 data into training and testing data
regr=LinearRegression()
regr.fit(X_train,y_train)
print(regr.score(X_test,y_test))
```

APPLICATION

- Data manipulation is a powerful tool that can be used to improve the quality, accuracy, and usability of data. It is a key part of many data science and machine learning workflows.
- Data visualization is the process of transforming data into a visual format that makes it easier to understand and interpret. It is a powerful tool that can be used to communicate insights from data to a wide range of audiences.
- Plots such as line,bar,histogram,pie chart 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

- Our analysis of the Salary dataset has provided valuable insights into the Employee's information.

- We discovered significant correlations between Employee and salaries such as Employee Id, Job Title,Department and Salary.

- Through data cleaning, preprocessing, visualization, and modeling, we were able to extract meaningful information.

THANK YOU