EDS PROJECT

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INTRODUCTION

- Data analytics is the process of examining vast volumes of data to extract meaningful patterns, trends, and correlations.
- In the context of the this dataset, data analysis becomes a window through which we can do various analysis such as data manipulation, data visualization ,etc.

MOTIVATION

The dataset provides information about the JEE marks of the students with their basic details including Gender and Age.
This data allows us to analyze that a particular student has got specific marks out of 300. Thus we can perform any operation on this data.

DETAILS OF DATASET

- Name: Students_Marks
- Number of students: 20
- Number of columns: 5
- Name of Columns: Sr No., Student Name, JEE Mains Marks, Age, Gender

DATA MANIPULATION

Data manipulation is a fundamental process in data analysis that involves transforming and preparing raw data to make it suitable for further exploration and analysis.

```
import pandas as pd

# Read the CSV file from Google Drive
df = pd.read_csv('/content/drive/MyDrive/EDS Minor
Project/Dataset.csv')
```

```
from google.colab import drive
drive.mount('/content/drive')
```

```
## 1.Find the student who got the maximum marks?
```

```
# Find the student with the maximum marks
max_marks = df['JEE Mains Marks'].max()
student max marks = df.loc[df['JEE Mains Marks'] == max marks, 'Student
Name'].values[0]

# Print the student with the maximum marks
print(f"The student with the maximum marks is: {student_max_marks}")
```

```
The student with the maximum marks is: Arjun Gupta
```

```
## 2.Find the average marks of female students?
```

```
# Filter the DataFrame for female students
female_students = df[df['Gender'] == 'Female']

# Calculate the average marks of female students
avg_marks_female = female_students['JEE Mains Marks'].mean()

# Print the average marks of female students
print("Average marks of female students:", avg_marks_female)
```

```
Average marks of female students: 186.2
```

##3.How many boys got above 190 marks?

```
# Filter the DataFrame for boys who scored above 190 marks
boys_above_190 = df[(df['Gender'] == 'Male') & (df['JEE Mains Marks'] > 190)]

# Count the number of boys above 190 marks
num boys above 190 = len(boys above 190)

# Print the number of boys above 190 marks
```

```
print("Number of boys with marks above 190:", num_boys_above_190)
```

```
Number of boys with marks above 190: 2
```

##4.Find the students who got the same marks?

```
# Group the DataFrame by JEE Mains Marks and retrieve groups with more than one student
same_marks_group = df.groupby('JEE Mains Marks').filter(lambda group: len(group) > 1)

# Get the unique marks for which multiple students have scored
same marks = same marks group['JEE Mains Marks'].unique()

# Iterate through each unique marks value and print the names of students with the same marks
for marks in same_marks:
    students_with_same_marks = same_marks_group[same_marks_group['JEE Mains Marks'] == marks]
    student_names = students_with_same_marks['Student Name'].tolist()
    print("Students with marks", marks, ":", student names)
```

```
Students with marks 180 : ['Aarav Sharma', 'Isha Singh', 'Shivam Gupta']
Students with marks 195 : ['Aanya Patel', 'Harsh Joshi', 'Kavya Kapoor', 'Sanvi Singh']
Students with marks 175 : ['Advait Singh', 'Mihir Patel']
Students with marks 185 : ['Aishwarya Desai', 'Rohan Kumar']
Students with marks 190 : ['Akash Verma', 'Pranav Bhatia']
Students with marks 200 : ['Arjun Gupta', 'Nandini Sharma']
Students with marks 188 : ['Karthik Nair', 'Vaishnavi Patel']
```

###5.How many boys and girls are there?

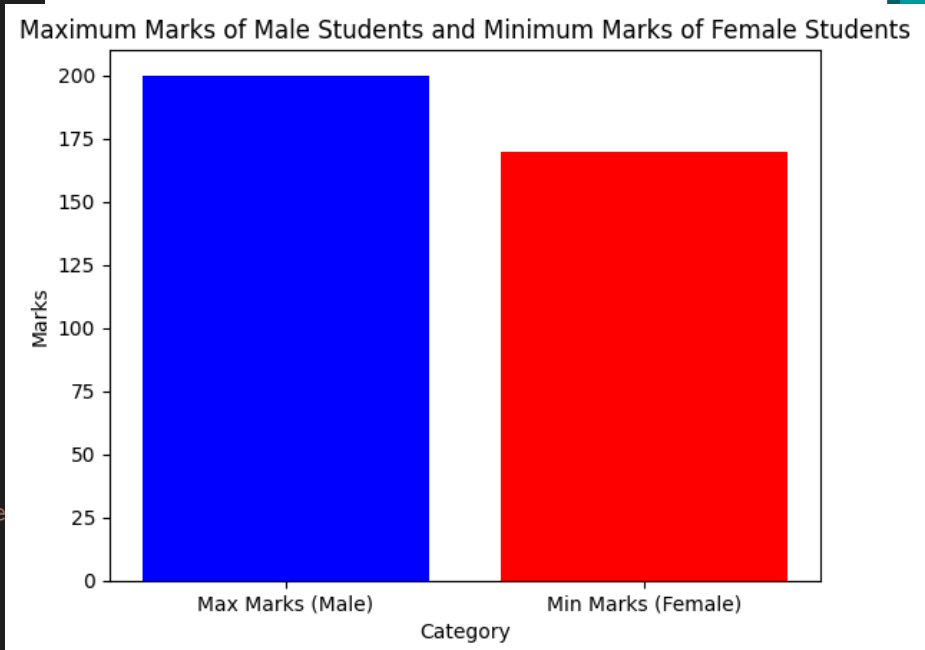
```
# Count the number of boys and girls
num_boys = df[df['Gender'] == 'Male'].shape[0]
num_girls = df[df['Gender'] == 'Female'].shape[0]

# Print the counts
print("Number of boys:", num_boys)
print("Number of girls:", num girls)
```

```
Number of boys: 10
Number of girls: 10
```

DATA VISUALIZATION

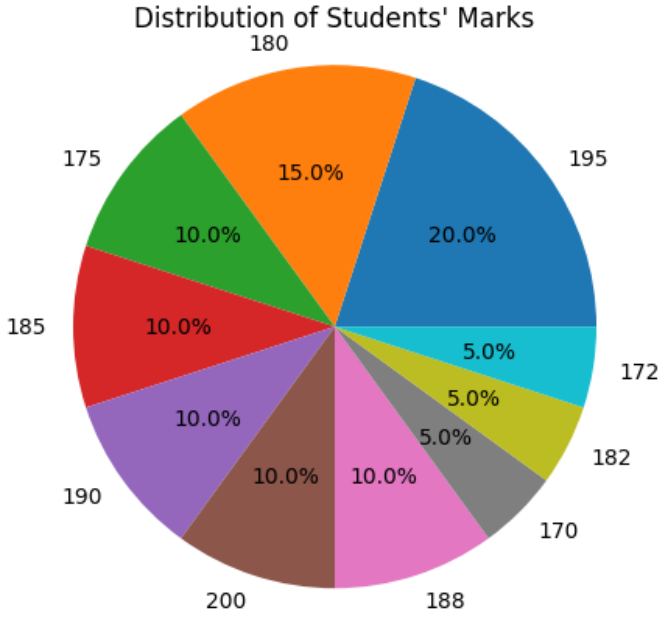
Plot a graph of maximum marks of male and minimum marks of female student

```
# Find the maximum marks of male students and the minimum marks of
female students
max_marks_male = male_students['JEE Mains Marks'].max()
min_marks_female = female_students['JEE Mains Marks'].min()

# Create the bar plot
plt.bar(['Max Marks (Male)', 'Min Marks (Female)'], [max_marks_male,
min_marks_female], color=['blue', 'red'])

# Set the labels for X and Y axes
plt.xlabel('Category')
plt.ylabel('Marks')

# Set the title of the graph
plt.title('Maximum Marks of Male Students and Minimum Marks of Female
Students')

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



##6.Make a pie chart of marks scored by students

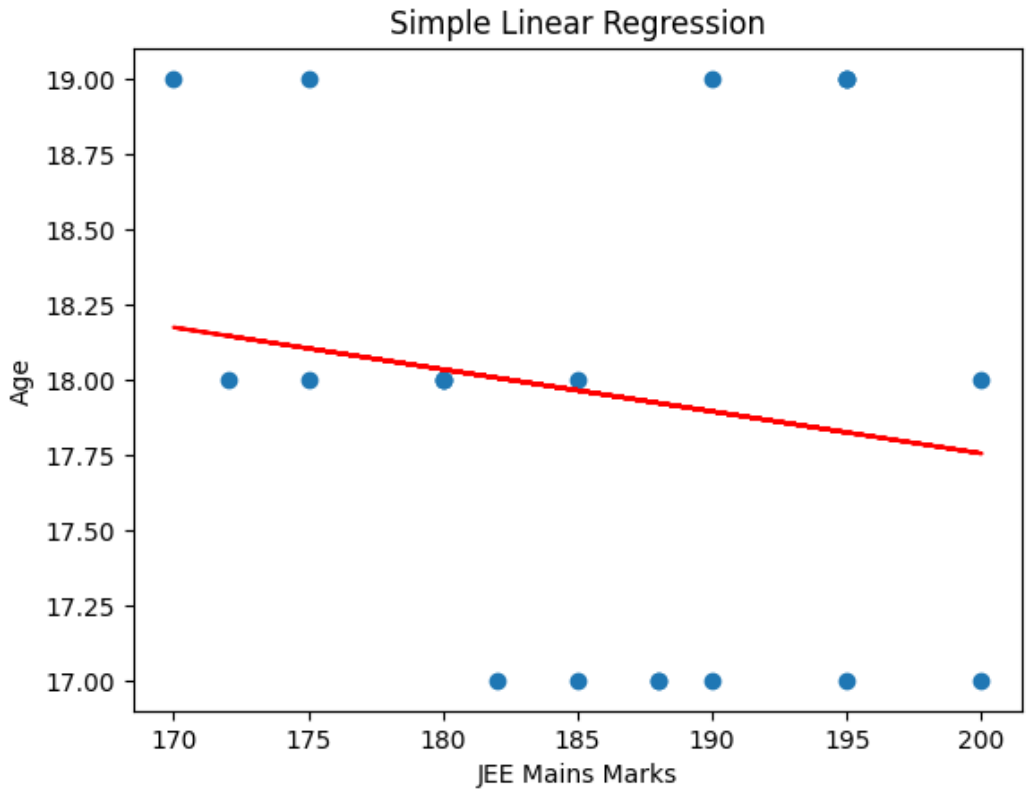
```
# Group the DataFrame by marks and count the number of students in each category
marks_count = df['JEE Mains Marks'].value_counts()

# Plot the pie chart
plt.pie(marks_count, labels=marks_count.index, autopct='%1.1f%%')

# Set the aspect ratio to 'equal' for a circular pie chart
plt.axis('equal')

# Set the title
plt.title('Distribution of Students\' Marks')

# Show the pie chart
plt.show()
```



PREDICTIVE TECHNIQUES

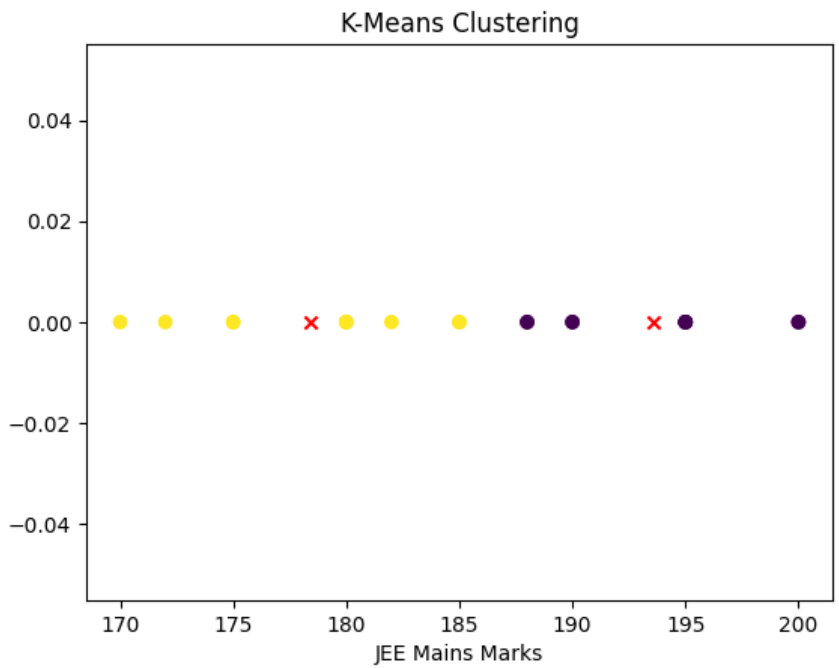
##9.K-NN Classification

```
import matplotlib.pyplot as plt
from sklearn.linear_model import LinearRegression



# Split the data into features (JEE Mains Marks) and target (Age)
X = df[['JEE Mains Marks']]
y = df['Age']

# Create a linear regression model
model = LinearRegression()

# Fit the model to the data
model.fit(X, y)

# Get the coefficients and intercept
coef = model.coef_[0]
intercept = model.intercept

# Print the equation of the line
print("Linear Regression Equation: Age = {:.2f} * JEE Mains Marks +
{:.2f}".format(coef, intercept))

# Plot the data points and regression line
plt.scatter(X, y)
plt.plot(X, model.predict(X), color='red')
plt.xlabel('JEE Mains Marks')
plt.ylabel('Age')
plt.title('Simple Linear Regression')
plt.show()
```



##10.K-Means Clustering

```
import pandas as pd
import matplotlib.pyplot as plt
from sklearn.cluster import KMeans

# Get the features (JEE Mains Marks)
X = df[['JEE Mains Marks']]

# Create a K-Means clustering model with 2 clusters
kmeans = KMeans(n_clusters=2, random_state=42)

# Fit the model to the data
kmeans.fit(X)

# Get the cluster labels
labels = kmeans.labels_

# Plot the data points and clusters
plt.scatter(X, [0] * len(X), c=labels, cmap='viridis')
plt.scatter(kmeans.cluster_centers_, [0, 0], c='red', marker='x')
plt.xlabel('JEE Mains Marks')
plt.title('K-Means Clustering')
plt.show()
```



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.
- After performing data manipulation, visualizing the data, and clustering using K-means, the resulting clusters can serve as new features for predictive modeling.

CONCLUSION

- In Conclusion, our dataset has provided the JEE marks of the students with their basic details including Gender and Age.
- Through data cleaning, preprocessing, visualization, and modeling, we were able to extract meaningful information.

THANK YOU!

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