CASE STUDY 5 PYTHON FOR ENGINEERS

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```
#Read the given .xlxs file.
with open('xlsx.txt', 'r') as file:
    content = file.read()
    print(content)
```

```
Hello My name is Shreya.
 I am in ECE department.
```

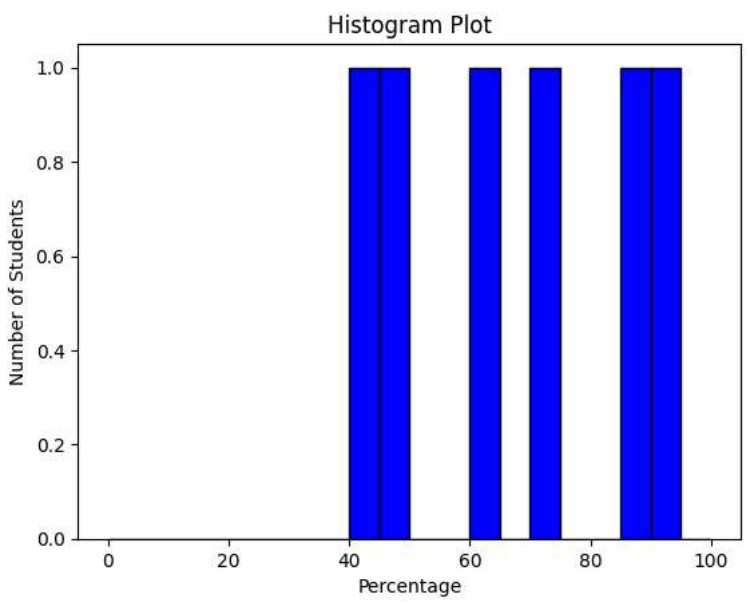
```
# Define categories
greater_75 = []
between_60_75 = []
less_60 = []

# Open and read the file
with open('student.txt', 'r') as file:
    for line in file:
        name, mark_str = line.strip().split(',')
        mark = int(mark_str)
        percentage = (mark / 15) * 100

        # Categorize based on percentage
        if percentage > 75:
            greater_75.append((name, mark, round(percentage, 2)))
        elif 60 <= percentage <= 75:
            between_60_75.append((name, mark, round(percentage, 2)))
        else:
            less_60.append((name, mark, round(percentage, 2)))

# Print results
print("Students with >75%:")
for student in greater_75:
    print(student)

print("\nStudents with 60%-75%:")
for student in between_60_75:
    print(student)

print("\nStudents with <60%:")
for student in less_60:
    print(student)
```

```
Students with >75%:
('Alice', 13, 86.67)
('Eva', 14, 93.33)
('Grace', 12, 80.0)

Students with 60%-75%:
('Bob', 11, 73.33)
('Charlie', 9, 60.0)

Students with <60%:
('David', 7, 46.67)
('Frank', 6, 40.0)
```

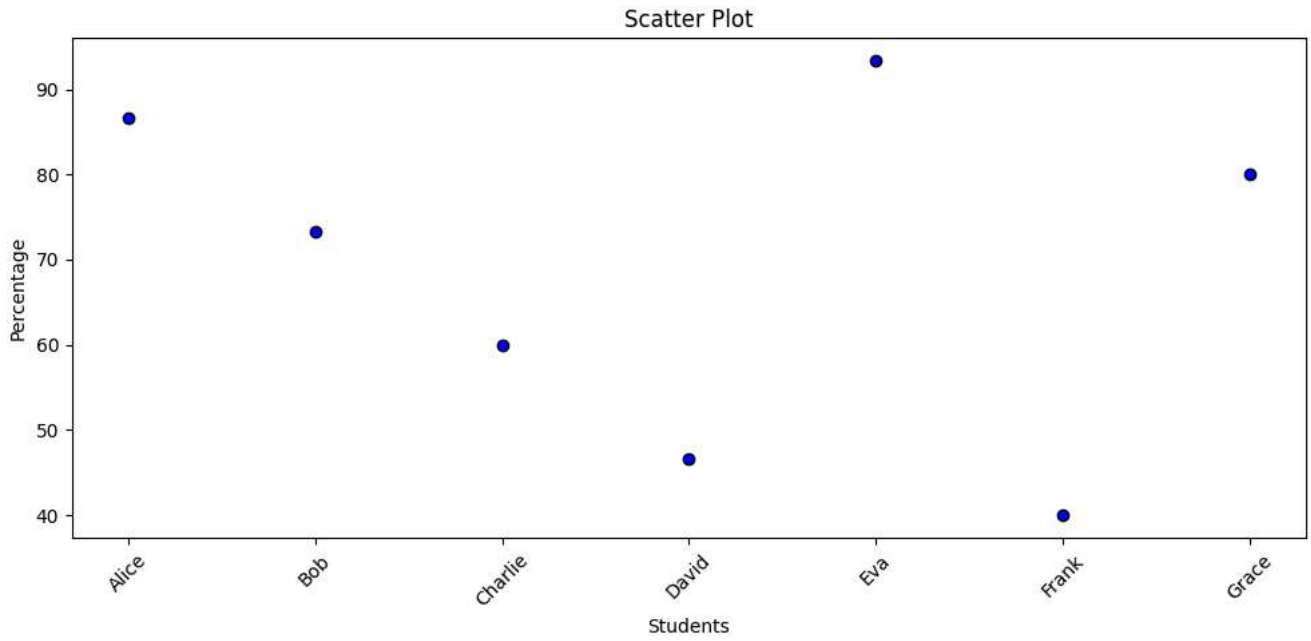
```
pip install matplotlib
```

```
Requirement already satisfied: matplotlib in /usr/local/lib/python3.11/dist-packages (3.10.0)
Requirement already satisfied: contourpy>=1.0.1 in /usr/local/lib/python3.11/dist-packages (from matplotlib) (1.3.2)
Requirement already satisfied: cycler>=0.10 in /usr/local/lib/python3.11/dist-packages (from matplotlib) (0.12.1)
Requirement already satisfied: fonttools>=4.22.0 in /usr/local/lib/python3.11/dist-packages (from matplotlib) (4.57.0)
Requirement already satisfied: kiwisolver>=1.3.1 in /usr/local/lib/python3.11/dist-packages (from matplotlib) (1.4.8)
Requirement already satisfied: numpy>=1.23 in /usr/local/lib/python3.11/dist-packages (from matplotlib) (2.0.2)
Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.11/dist-packages (from matplotlib) (24.2)
Requirement already satisfied: pillow>=8 in /usr/local/lib/python3.11/dist-packages (from matplotlib) (11.2.1)
Requirement already satisfied: pyparsing>=2.3.1 in /usr/local/lib/python3.11/dist-packages (from matplotlib) (3.2.3)
Requirement already satisfied: python-dateutil>=2.7 in /usr/local/lib/python3.11/dist-packages (from matplotlib) (2.9.0.post0)
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.11/dist-packages (from python-dateutil>=2.7->matplotlib) (1.17.0)
```

```
#Plot the Histogram of the above category in which width of each bar must be 5, outline the bars as black
#and fill the bars blue (x-axis: Percentage, y-axis: Number of Students, Title: Histogram Plot)
import matplotlib.pyplot as plt

# Example percentages for students (replace with actual data from your file)
percentages = [86.67, 73.33, 60.0, 46.67, 40.0, 93.33]  # This would come from your processed list

# Plotting the histogram
plt.hist(percentages, bins=range(0, 101, 5), edgecolor='black', color='blue')

# Labels and title
plt.xlabel('Percentage')
plt.ylabel('Number of Students')
plt.title('Histogram Plot')

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




```
#Plot the Scatter plot of the above category (x-axis: Students, y-axis: Percentage, Title: Scatter Plot
import matplotlib.pyplot as plt

# Sample data from previous step — replace with your real data
students = ['Alice', 'Bob', 'Charlie', 'David', 'Eva', 'Frank', 'Grace']
percentages = [86.67, 73.33, 60.0, 46.67, 93.33, 40.0, 80.0]  # Ensure order matches names

# Create scatter plot
plt.figure(figsize=(10, 5))
plt.scatter(students, percentages, color='blue', edgecolors='black')

# Labels and title
plt.xlabel('Students')
plt.ylabel('Percentage')
plt.title('Scatter Plot')

# Optional: Rotate x-axis labels if names overlap
plt.xticks(rotation=45)

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


Scatter Plot
Percentage
90
80
70
60
50
40
Alice
Bob
Charlie
David
Eva
Frank
Grace
Students