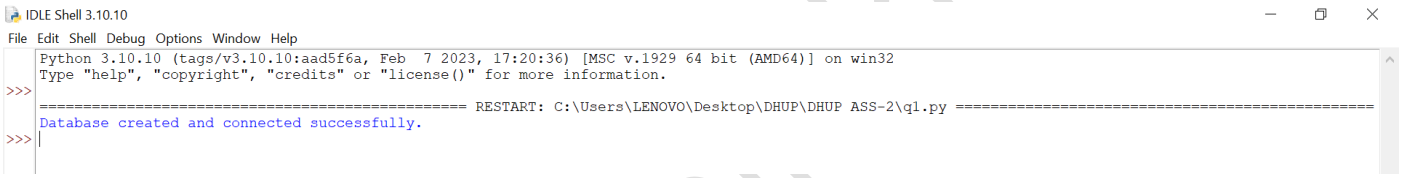
ASSIGNMENT - 2

1. Write Python code to Create database 'Student_Information.db'

```
import sqlite3
try:
    conn = sqlite3.connect("Student_Information.db")
    print("Database created and connected successfully.")
except Exception as e:
    print("Error creating database:", e)
finally:
    conn.close()
```



2. Write python code to Create table Student with following constrains.

a. RollNumber text primary key

b. Name text Not null

c. PYTHON int not null marks must greater than 0 and less than 100

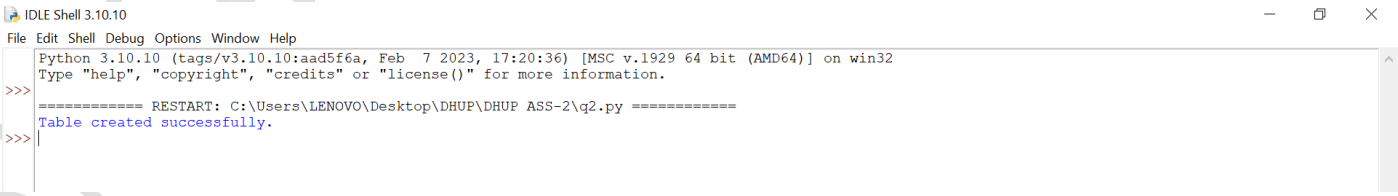
d. OOPS int not null marks must greater than 0 and less than 100

e. WEB int not null marks must greater than 0 and less than 100

f. MIL int not null marks must greater than 0 and less than 100

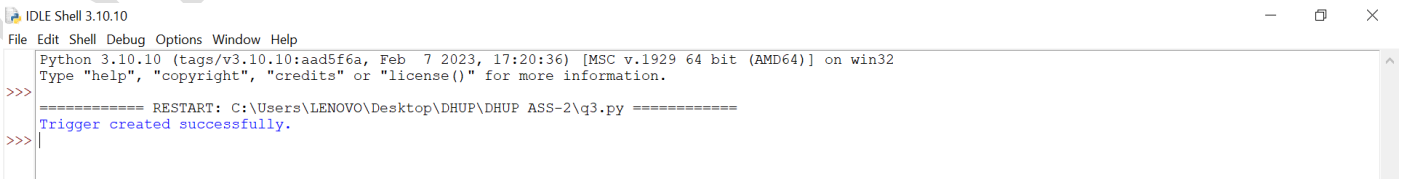
g. STATE int not null marks must greater than 0 and less than 100

```
import sqlite3


try:
    conn = sqlite3.connect("Student_Information.db")
    cur = conn.cursor()
    cur.execute("""
    CREATE TABLE IF NOT EXISTS Student (
        RollNumber TEXT PRIMARY KEY,
        Name TEXT NOT NULL,
        PYTHON INTEGER NOT NULL CHECK(PYTHON > 0 AND PYTHON < 100),
        OOPS INTEGER NOT NULL CHECK(OOPS > 0 AND OOPS < 100),
        WEB INTEGER NOT NULL CHECK(WEB > 0 AND WEB < 100),
        MIL INTEGER NOT NULL CHECK(MIL > 0 AND MIL < 100),
        STATE INTEGER NOT NULL CHECK(STATE > 0 AND STATE < 100)
    )
    """)
    print("Table created successfully.")
except Exception as e:
    print("Error creating table:", e)
finally:
    conn.commit()
    conn.close()
```



3. Write python code to create trigger named as 'rollnumbercheck' which check for the RollNumber must starts with 'R/r'.

```
import sqlite3


try:
    conn = sqlite3.connect("Student_Information.db")
    cur = conn.cursor()
    cur.execute("""
    CREATE TRIGGER IF NOT EXISTS rollnumbercheck
    BEFORE INSERT ON Student
    FOR EACH ROW
    BEGIN
       SELECT CASE
          WHEN NEW.RollNumber NOT LIKE 'R%' AND NEW.RollNumber NOT LIKE 'r%'
          THEN RAISE(ABORT, 'RollNumber must start with R or r')
       END;
    END;
    """)
    print("Trigger created successfully.")
except Exception as e:
    print("Error creating trigger:", e)
finally:
    conn.commit()
    conn.close()
```

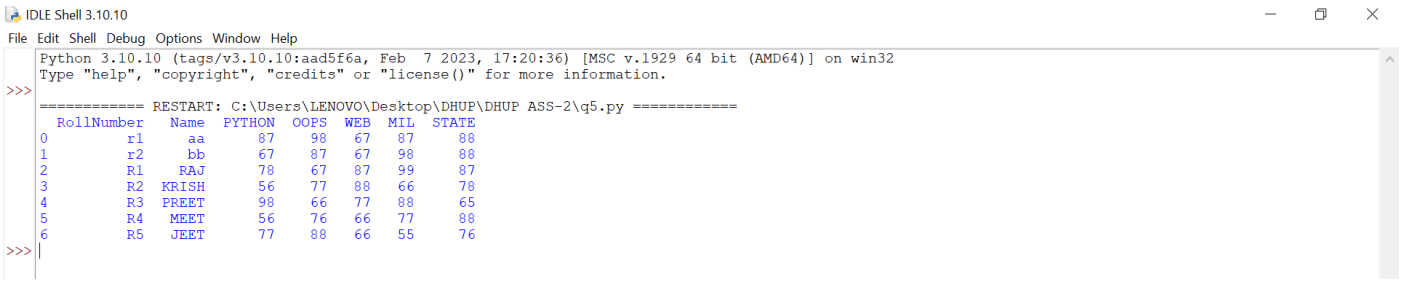


4. Write python code to insert user inputted data into the table by taking appropriate inputs from the user. (Ask user to take number of students to be inserted)

```
import sqlite3


try:
    conn = sqlite3.connect("Student_Information.db")
    cur = conn.cursor()
    n = int(input("Enter number of students: "))
    for _ in range(n):
        roll = input("Enter Roll Number: ")
        name = input("Enter Name: ")
        python_m = int(input("PYTHON marks: "))
        oops_m = int(input("OOPS marks: "))
        web_m = int(input("WEB marks: "))
        mil_m = int(input("MIL marks: "))
        state_m = int(input("STATE marks: "))
        cur.execute("INSERT INTO Student VALUES (?, ?, ?, ?, ?, ?, ?)",
                    (roll, name, python_m, oops_m, web_m, mil_m, state_m))
    print("Data inserted successfully.")
except Exception as e:
    print("Error inserting data:", e)
finally:
    conn.commit()
    conn.close()
```

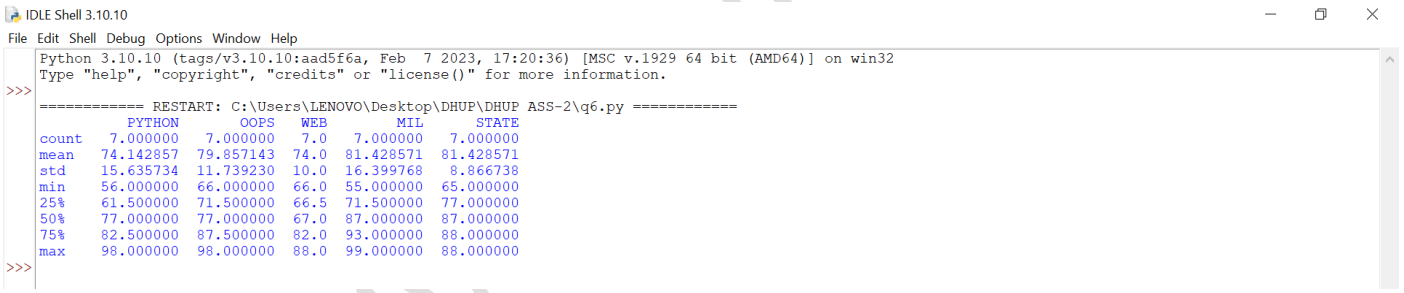
5. Write a python code to fetch all the data from the table and display it in appropriate table.

```
import sqlite3
import pandas as pd

try:
    conn = sqlite3.connect("Student_Information.db")
    df = pd.read_sql_query("SELECT * FROM Student", conn)
    print(df)
except Exception as e:
    print("Error fetching data:", e)
finally:
    conn.close()
```



6. Write a python code to fetch all the records in data frame. Use the appropriate method to describe all the data.

```
import sqlite3
import pandas as pd

try:
    conn = sqlite3.connect("Student_Information.db")
    df = pd.read_sql_query("SELECT * FROM Student", conn)
    print(df.describe())
except Exception as e:
    print("Error describing data:", e)
finally:
    conn.close()
```



7. Write a python code to add following columns to data frame. Use appropriate methods of pandas module.

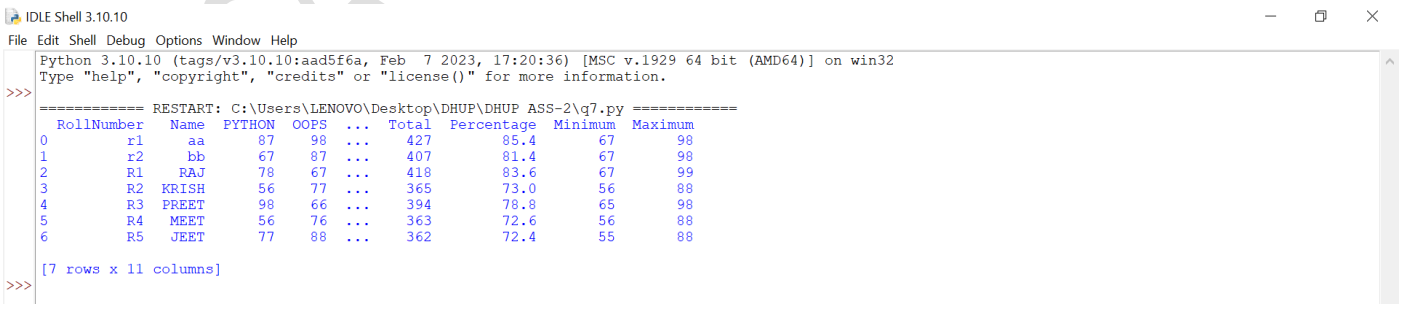
a. Total

b. Percentage

c. Minimum

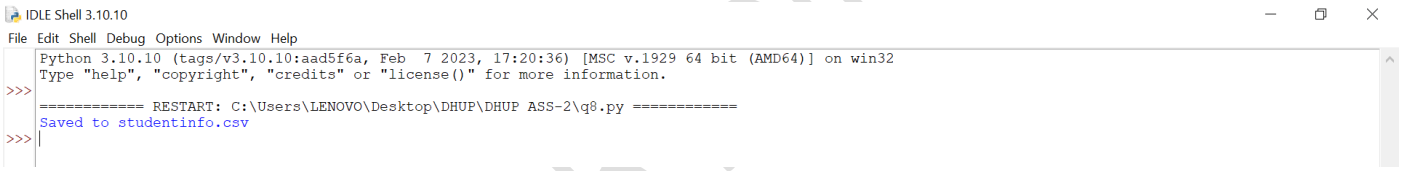
d. Maximum

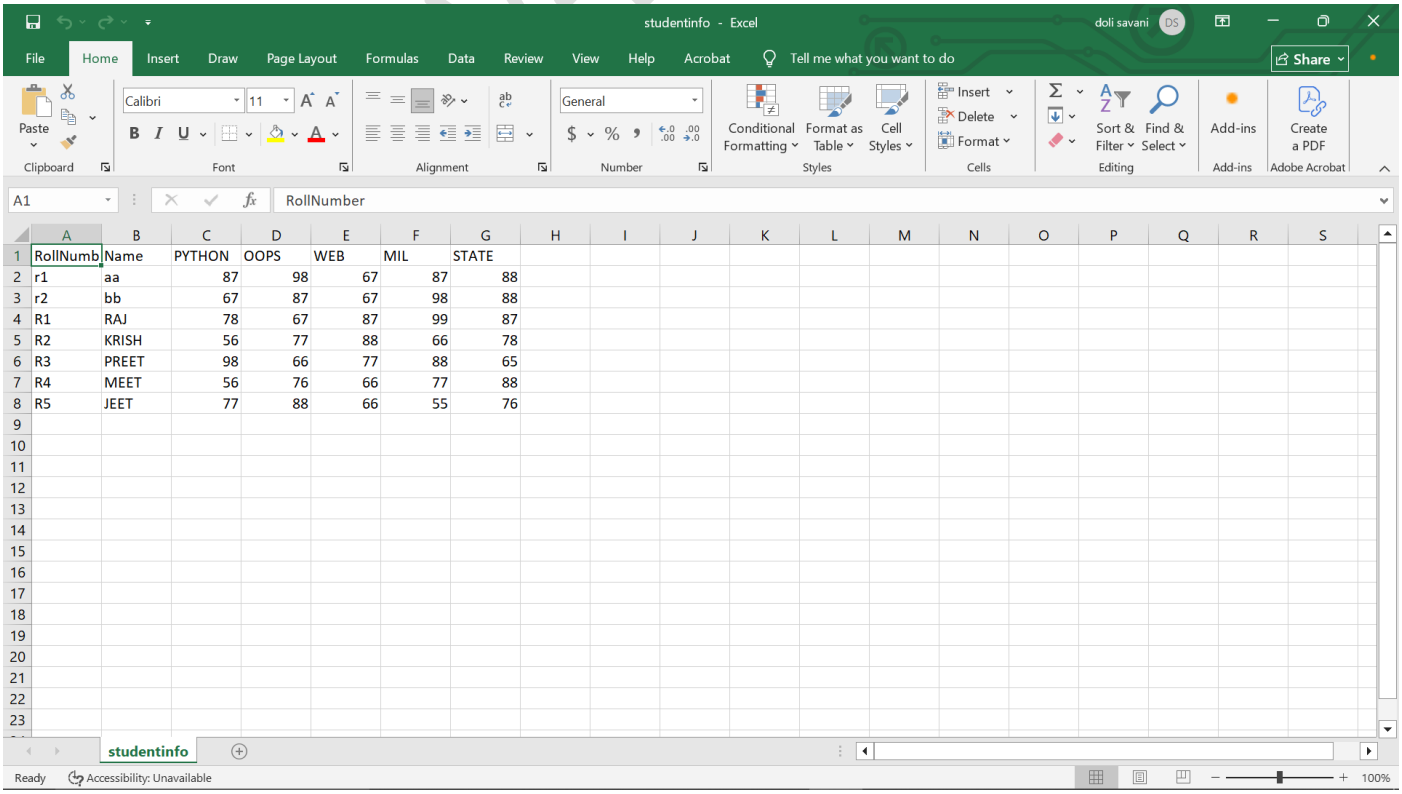
```
import sqlite3
import pandas as pd


try:
    conn = sqlite3.connect("Student_Information.db")
    df = pd.read_sql_query("SELECT * FROM Student", conn)
    df['Total'] = df[['PYTHON','OOPS','WEB','MIL','STATE']].sum(axis=1)
    df['Percentage'] = df['Total'] / 5
    df['Minimum'] = df[['PYTHON','OOPS','WEB','MIL','STATE']].min(axis=1)
    df['Maximum'] = df[['PYTHON','OOPS','WEB','MIL','STATE']].max(axis=1)
    print(df)
except Exception as e:
    print("Error adding columns:", e)
finally:
    conn.close()
```



8. Write a python code to write the data frame in the csv file. Name csv file as “studentinfo.csv”

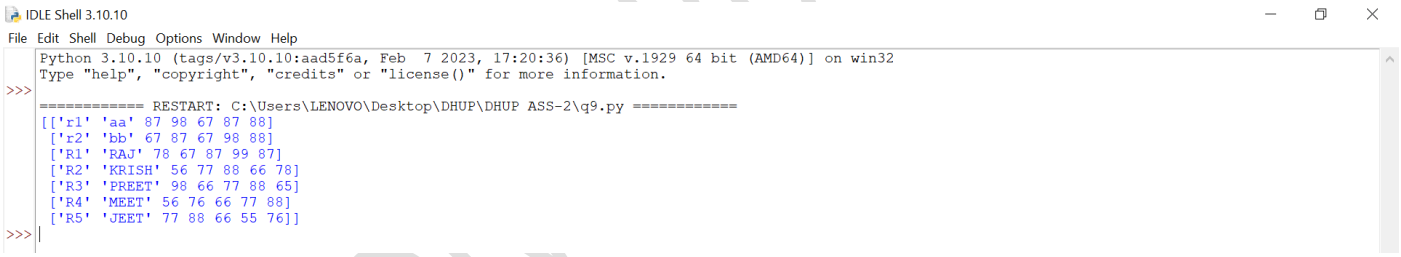
```
import sqlite3
import pandas as pd

try:
    conn = sqlite3.connect("Student_Information.db")
    df = pd.read_sql_query("SELECT * FROM Student", conn)
    df.to_csv("studentinfo.csv", index=False)
    print("Saved to studentinfo.csv")
except Exception as e:
    print("Error saving CSV:", e)
finally:
    conn.close()
```





9. Convert the data frame into the numpy ndarray and display it.

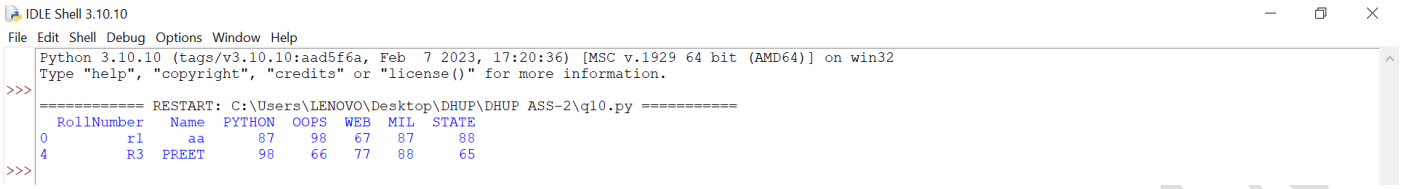
```
import sqlite3
import pandas as pd
import numpy as np

try:
    conn = sqlite3.connect("Student_Information.db")
    df = pd.read_sql_query("SELECT * FROM Student", conn)
    arr = df.to_numpy()
    print(arr)
except Exception as e:
    print("Error converting to NumPy:", e)
finally:
    conn.close()
```



10. Display all details of student who get more than 85 marks in Python.

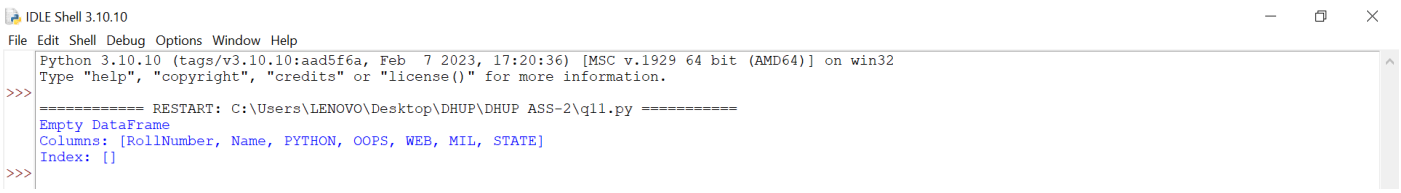
```
import sqlite3
import pandas as pd

try:
    conn = sqlite3.connect("Student_Information.db")
    df = pd.read_sql_query("SELECT * FROM Student", conn)
    print(df[df['PYTHON'] > 85])
except Exception as e:
```

```
    print("Error filtering data:", e)
finally:
    conn.close()
```



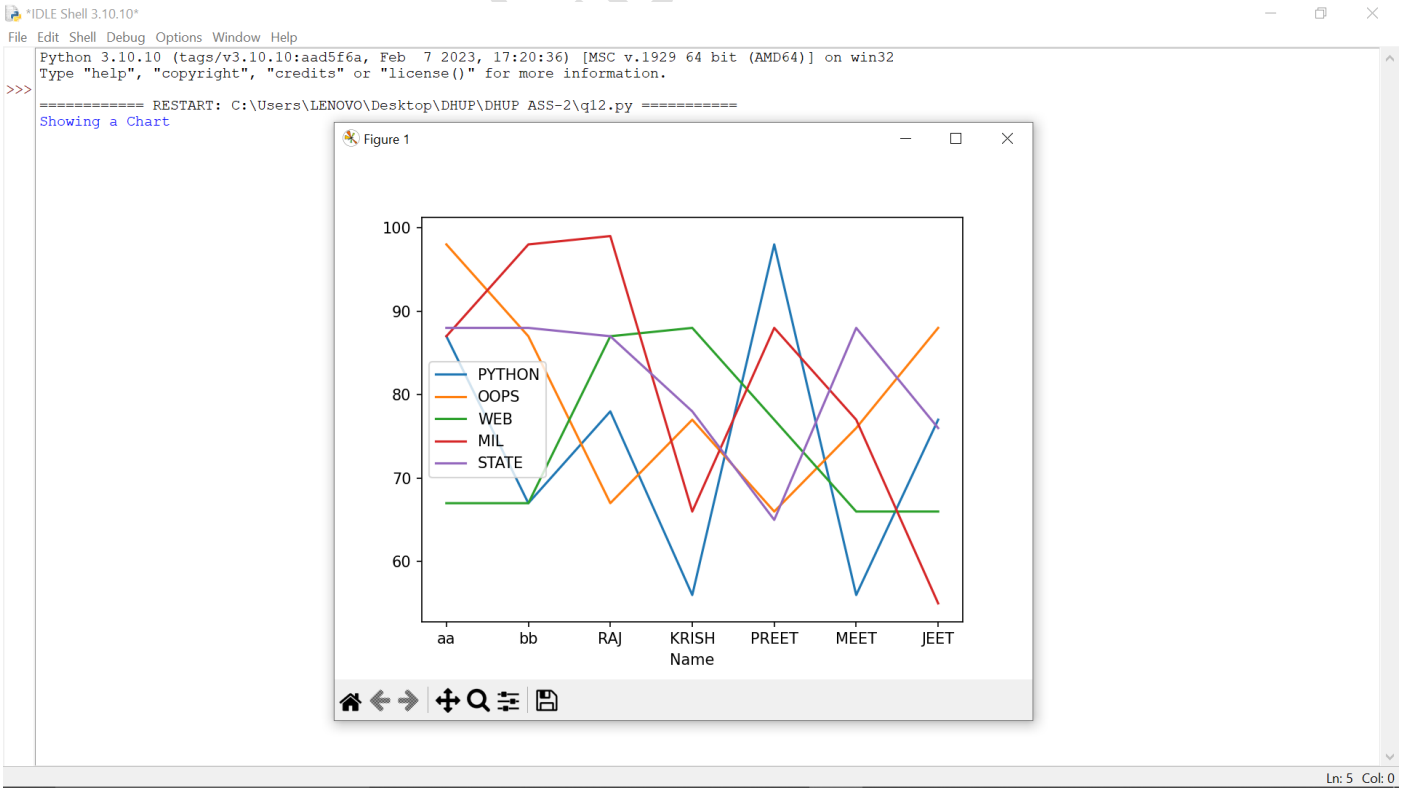
11. Write a python code to display all the students who get less than 36 Marks in any subject.

```
import sqlite3
import pandas as pd

try:
    conn = sqlite3.connect("Student_Information.db")
    df = pd.read_sql_query("SELECT * FROM Student", conn)
    low = df[(df['PYTHON'] < 36) | (df['OOPS'] < 36) | (df['WEB'] < 36) | (df['MIL'] < 36) | (df['STATE'] < 36)]
    print(low)
except Exception as e:
    print("Error filtering data:", e)
finally:
    conn.close()
```



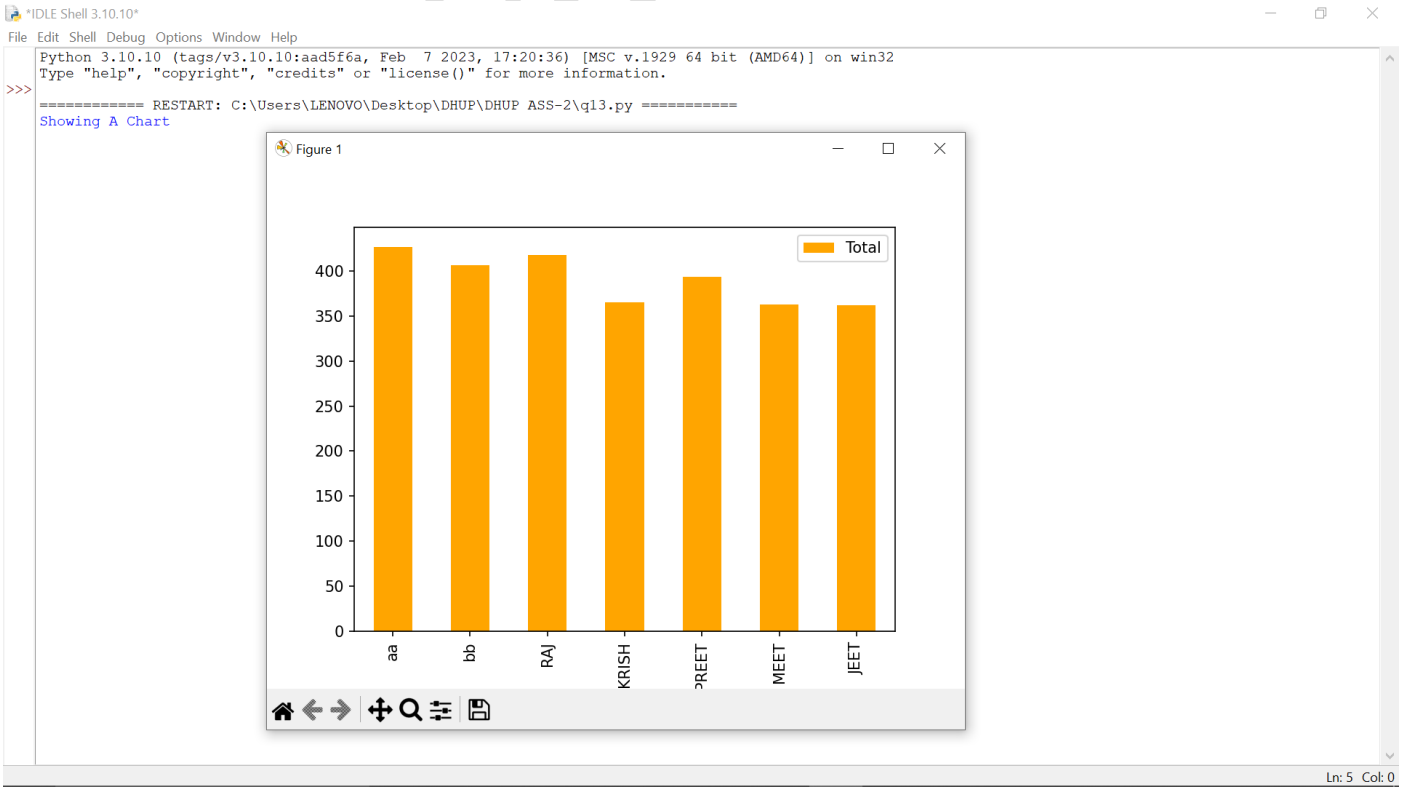
12. Write a python code to plot all the marks of students in line chart. Use appropriate legend to describe the lines.

```
import sqlite3
import pandas as pd
import matplotlib.pyplot as plt

try:
    conn = sqlite3.connect("Student_Information.db")
    df = pd.read_sql_query("SELECT * FROM Student", conn)
    df.plot(x='Name', y=['PYTHON','OOPS','WEB','MIL','STATE'], kind='line')
    print("Showing a Chart")
    plt.show()
    print("Chart Created Successfuly")
except Exception as e:
    print("Error plotting chart:", e)
finally:
    conn.close()
```



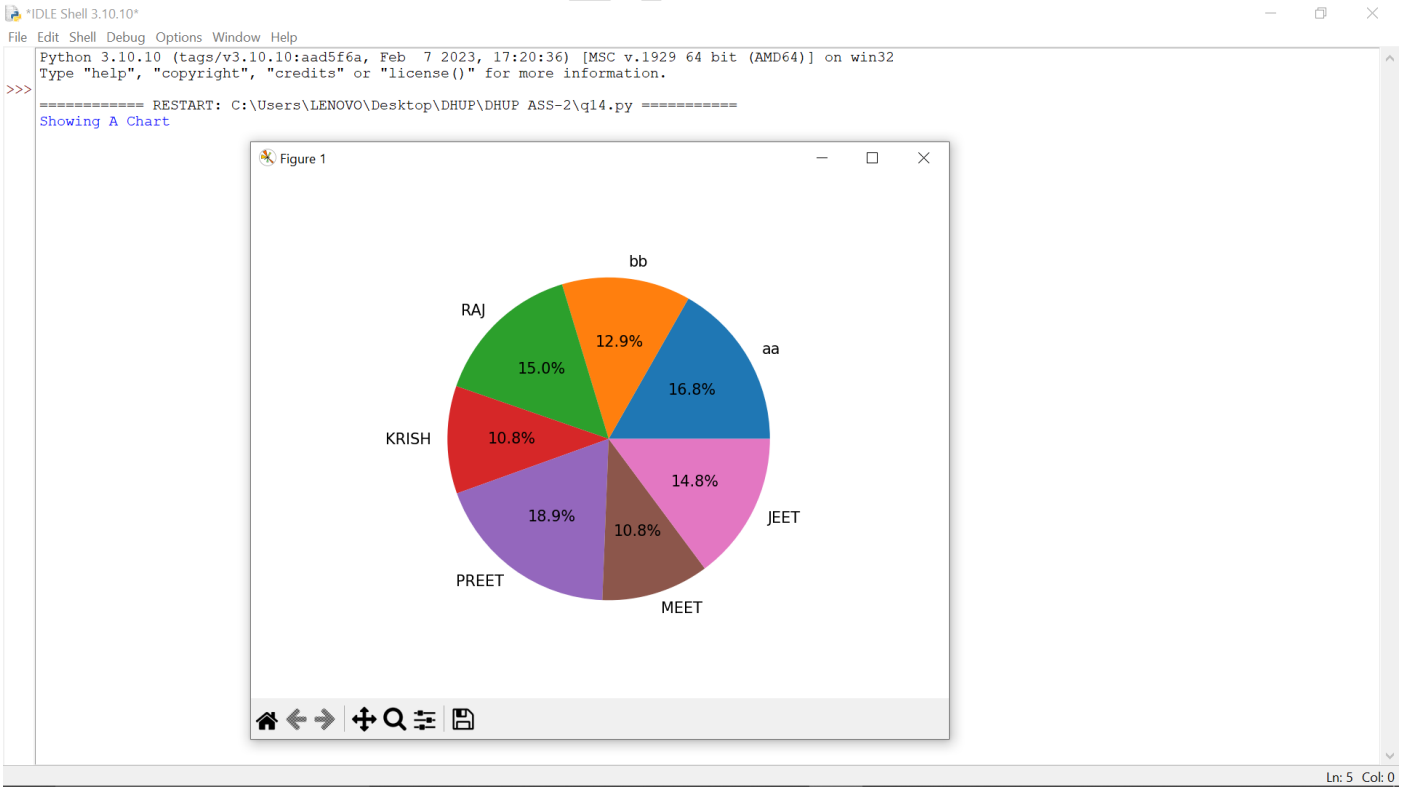
13. Create a bar chart of the student's Total marks.

```
import sqlite3
import pandas as pd
import matplotlib.pyplot as plt

try:
    conn = sqlite3.connect("Student_Information.db")
    df = pd.read_sql_query("SELECT * FROM Student", conn)
    df['Total'] = df[['PYTHON','OOPS','WEB','MIL','STATE']].sum(axis=1)
    df.plot(x='Name', y='Total', kind='bar', color='orange')
    print("Showing A Chart")
    plt.show()
    print("Chart Created Successfuly")
except Exception as e:
    print("Error plotting bar chart:", e)
finally:
    conn.close()
```



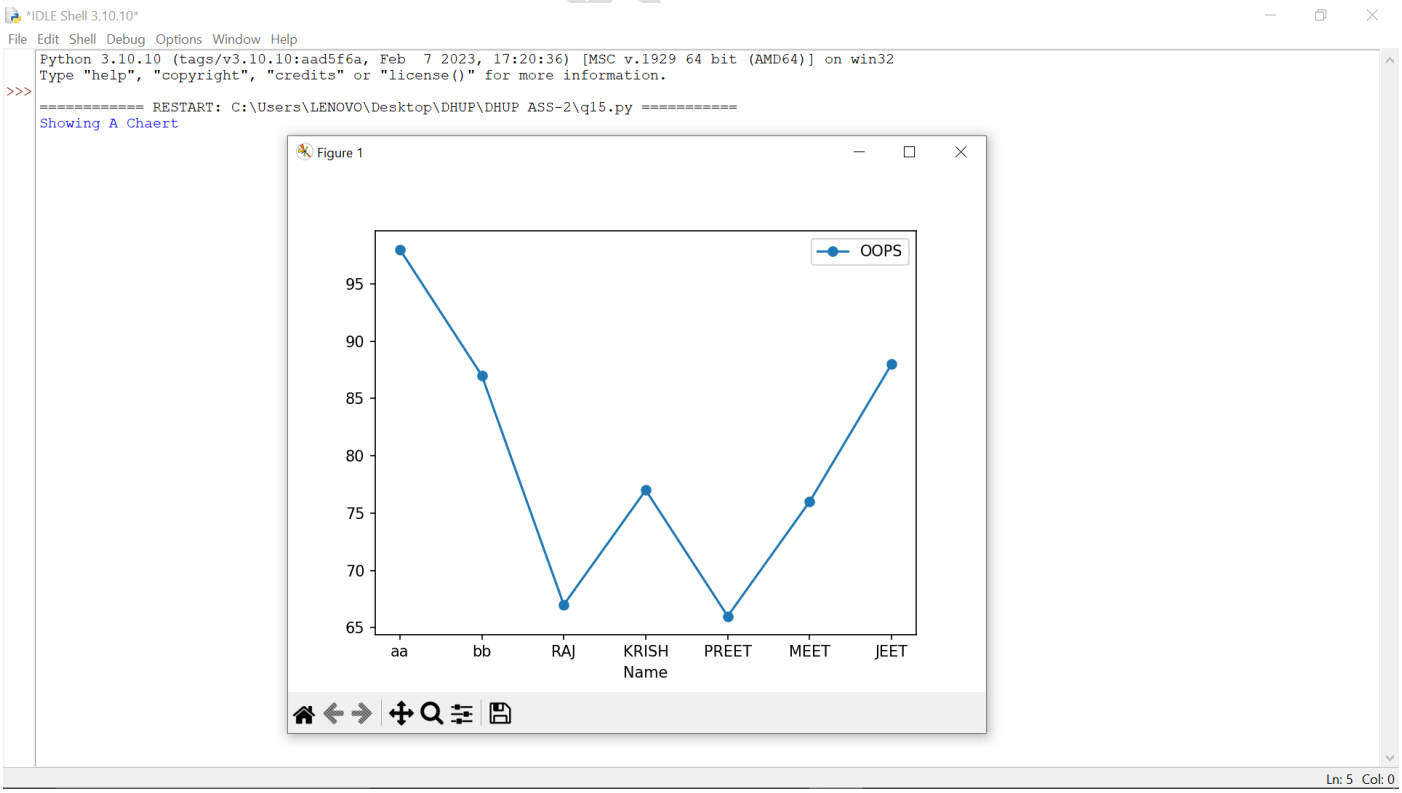
14. Create pie charts for the PYTHON subject.

```
import sqlite3
import pandas as pd
import matplotlib.pyplot as plt

try:
    conn = sqlite3.connect("Student_Information.db")
    df = pd.read_sql_query("SELECT * FROM Student", conn)
    plt.pie(df['PYTHON'], labels=df['Name'], autopct='%1.1f%%')
    print("Showing A Chart")
    plt.show()
    print("Chart Created Successfuly")
except Exception as e:
    print("Error plotting pie chart:", e)
finally:
    conn.close()
```

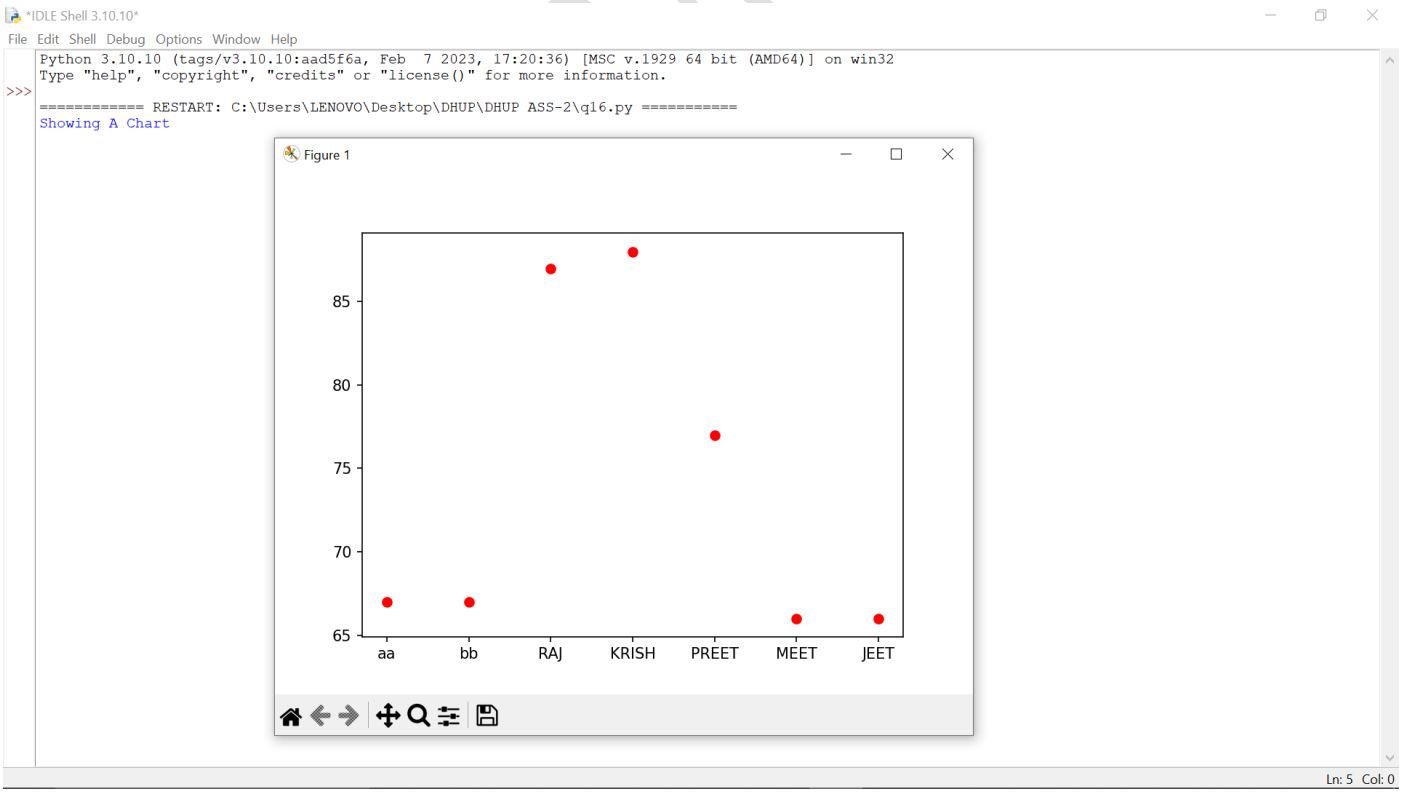
15. Create line chart for the OOPS marks.

```
import sqlite3
import pandas as pd
import matplotlib.pyplot as plt

try:
    conn = sqlite3.connect("Student_Information.db")
    df = pd.read_sql_query("SELECT * FROM Student", conn)
    df.plot(x='Name', y='OOPS', kind='line', marker='o')
    print("Showing A Chaert")
    plt.show()
    print("Chart Created Successfuly")
except Exception as e:
    print("Error plotting OOPS chart:", e)
finally:
    conn.close()
```

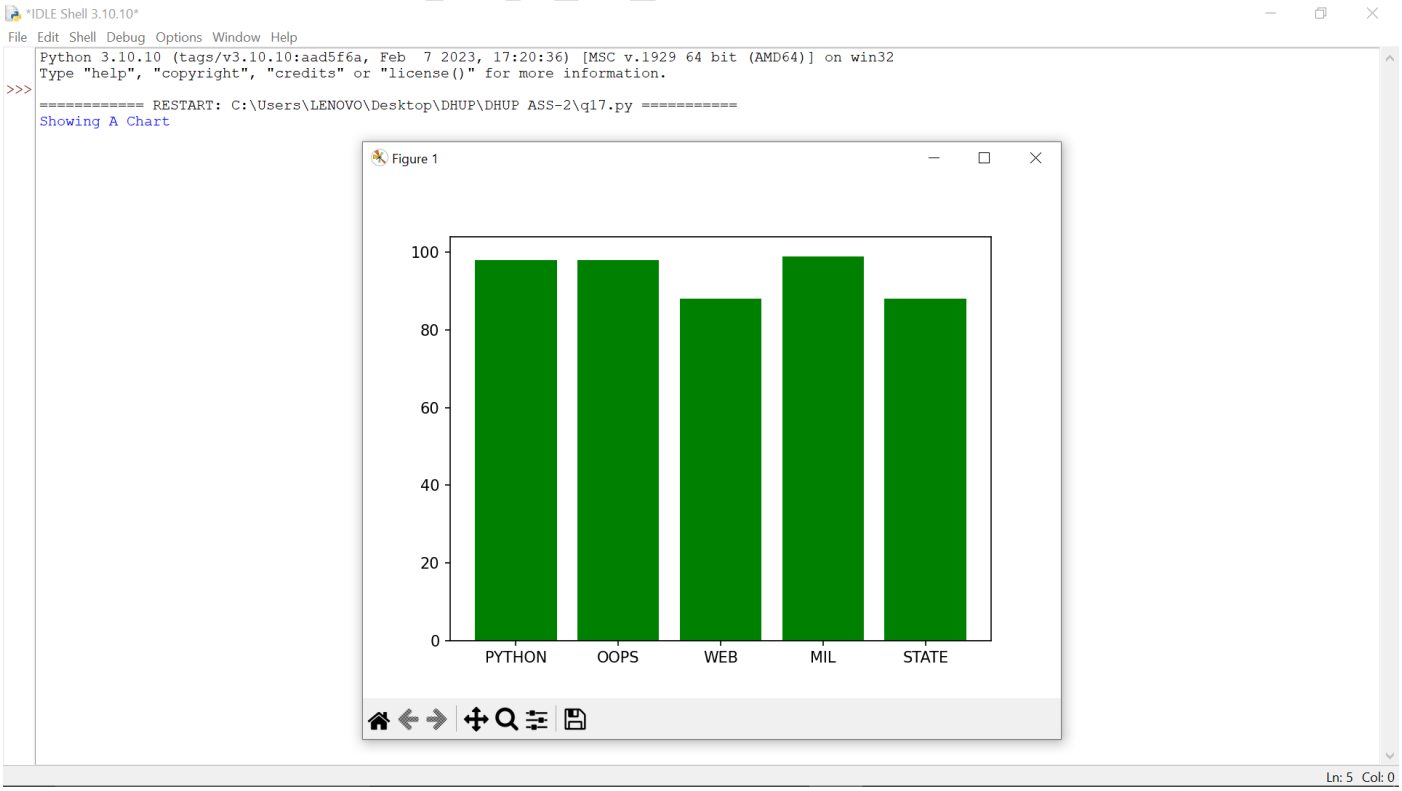
16. Create a scatter plot chart for the web marks.

```
import sqlite3
import pandas as pd
import matplotlib.pyplot as plt
try:
    conn = sqlite3.connect("Student_Information.db")
    df = pd.read_sql_query("SELECT * FROM Student", conn)
    plt.scatter(df['Name'], df['WEB'], color='red')
    print("Showing A Chart")
    plt.show()
    print("Chart Created Successfuly")
except Exception as e:
    print("Error plotting scatter:", e)
finally:
    conn.close()
```



17. Find highest marks in each subject and make a bar chart of the same.

```
import sqlite3
import pandas as pd
import matplotlib.pyplot as plt
try:
    conn = sqlite3.connect("Student_Information.db")
    df = pd.read_sql_query("SELECT * FROM Student", conn)
    subjects = ['PYTHON','OOPS','WEB','MIL','STATE']
    max_marks = [df[s].max() for s in subjects]
    plt.bar(subjects, max_marks, color='green')
    print("Showing A Chart")
    plt.show()
    print("Chart Created Successfuly")
except Exception as e:
    print("Error plotting highest marks:", e)
finally:
    conn.close()
```



18. Create a pie chart of the student's Total marks and save this marks in a file named as "result.png"

```
import sqlite3
import pandas as pd
import matplotlib.pyplot as plt
try:
    conn = sqlite3.connect("Student_Information.db")
    df = pd.read_sql_query("SELECT * FROM Student", conn)
    df['Total'] = df[['PYTHON','OOPS','WEB','MIL','STATE']].sum(axis=1)
    plt.pie(df['Total'], labels=df['Name'], autopct='%1.1f%%')
    plt.savefig("result.png")
    print("Pie chart saved as result.png In Your Folder")
except Exception as e:
    print("Error saving pie chart:", e)
finally:
    conn.close()
```