

1 Introduction

In this project we create various modules using Python to create databases (as CSV files) in which we can store information about students , courses , batches, departments and marks obtained by students in a particular examination. We can also display pie charts , histograms etc. on the basis of the data stored in the csv files

1.1 Objective

To create various Python modules for a **Student Examination Portal**

1.2 Organization of the Project

We create 5 modules by the name of STUDENT , COURSE , BATCH , DEPARTMENT and EXAMINATION using Python IDLE(3.10.8). Each of these modules have various functions defined which they can perform.

The Functions each module can perform are as follows -

STUDENT.py - Create a new Student , Update Student Details , Delete a Student from the database , Generate Report Card of a Student with Grade.

COURSE.py - Create a new Course ,View performance of all students in a course, Histogram showing course statistics.

BATCH.py - Create a new Batch , View list of all students in the batch , View list of all courses in the batch , Pie Chart of % of all students

DEPARTMENT.py - Create a new Department , View all batches in department , Line plot showing Department statistics.

EXAMINATION.py - Enter marks of students for an examination , View performance of all students in the exam ,Scatter plot of marks obtained by students.

2 Database Descriptions

There are 5 databases used in this project , they are stored as CSV files, they are as follows:

STUDENT.csv-Stores data related to the students like student id , name , roll , batch etc.

COURSE.csv-Stores data related to the courses like Course id , Details of students enrolled etc.

BATCH.csv-Stores data related to the students like student id , name , roll , batch etc.

DEPARTMENT.csv-Stores data related to the batches like Batch id , Department etc.

EXAMINATION.csv-Stores data related to the examinations like course, students and marks obtained.

2.1 Database Samples

Screenshots of the sample databases created are provided below-

STUDENT.csv-

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1	student ID	Name	Class Roll Number	Batch Name	Batch ID														
2	CSE2201	ASMIT BANDYOPADHYAY	70	CSE2022-26	CSE22														
3	CSE2101	AKASH KUNDU	62	CSE2022-26	CSE21														
4	ECE2201	AMBHRIN ROY	45	ECE2022-26	ECE22														
5	ECE2202	TANISHA SAHA	35	ECE2022-26	ECE22														

COURSE.csv-

A	B	C	D	E	F	G	H	I
1	Course ID	Course Name	Dictionary of [Student Name,Student ID,Roll no.,Marks]					
2	C001	PYTHON PROGRAMMING	{[ASMIT BANDYOPADHYAY,CSE2201,70,97],[AKASH KUNDU,CSE2101,62,86],[AMBHRIN ROY,ECE2201,45,90],[TANISHA SAHA,ECE2202,35,84]}					
3	C002	PHYSICS	{[ASMIT BANDYOPADHYAY,CSE2201,70,85],[AKASH KUNDU,CSE2101,62,95],[AMBHRIN ROY,ECE2201,45,75],[TANISHA SAHA,ECE2202,35,93]}					

BATCH.csv-

File Home Insert Page Layout Formulas Data Review View Help

AutoSave (1) BATCH v Search asmitbondycapdhay08@outlook.com A D Share Comments

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POSSIBLE DATA LOSS Some features might be lost if you save this workbook in the comma-delimited (.csv) format. To preserve these features, save it in an Excel file format. Don't show again Save As...

BATCH ID	BATCH NAME	DEPARTMENT NAME	LIST OF COURSES	LIST OF STUDENTS
CSE22	CSE2022-26	CSE	[C001,C002]	[CSE2201]
CSE21	CSE2022-26	CSE	[C001,C002]	[CSE2101]
ECE22	ECE2022-26	ECE	[C002]	[ECE2201,ECE2202]
5				
6				
7				
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9				
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26				

BATCH

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DEPARTMENT.csv-

EXAMINATION.csv-

The screenshot shows a Microsoft Excel spreadsheet titled "EXAMINATION.csv". The data is organized into three columns: "COURSE NAME" (Column A), "STUDENT'S ROLL NO." (Column B), and "MARKS" (Column C). The data entries are:

COURSE NAME	STUDENT'S ROLL NO.	MARKS
PHYSICS	[70,62,45,35]	[85,95,75,93]
PYTHON PROGRAMMING	[70,62,45,35]	[97,86,90,84]
MATHEMATICS	[70,62,45,35]	[98,95,100,90]

SAMPLE REPORT CARD CREATED USING STUDENT MODULE(.txt file - REPORTCARD.txt) :-

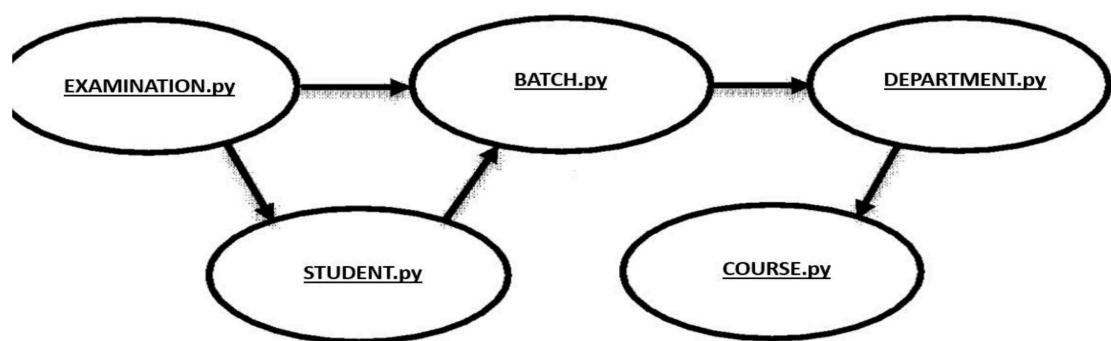
The screenshot shows a Windows desktop environment. In the center is a Notepad window titled "REPORTCARD - Notepad". The content of the window is as follows:

```
'ASMIT BANDYOPADHYAY'      'PYTHON PROGRAMMING'      A
```

The Notepad window has a standard menu bar with "File", "Edit", and "View". Below the menu is a status bar showing "Ln 1, Col 1", "Windows (CRLF)", "UTF-8", and system icons for battery, signal, and date/time (13:17 02-01-2023). The desktop background is visible behind the window, showing a blue sky and clouds.

3 Data Flow and E-R Diagram:

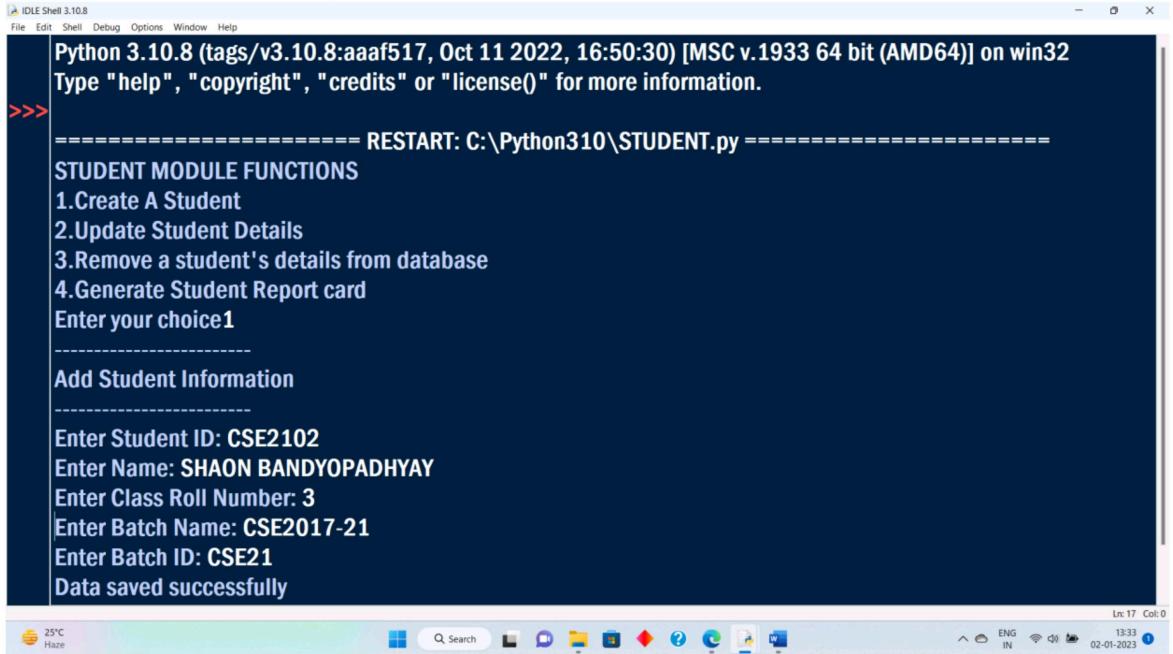
The dependence on the created python modules for the marks of students is shown in the diagram -



5 Outputs

Sample outputs for the different functions of the modules are given below as screenshots(For displaying the histogram,pie chart etc numpy and matplotlib.pyplot libraries need to be downloaded by pip)-

A) For STUDENT.py:



```
Python 3.10.8 (tags/v3.10.8:aaaf517, Oct 11 2022, 16:50:30) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

>>> ===== RESTART: C:\Python310\STUDENT.py =====
STUDENT MODULE FUNCTIONS
1.Create A Student
2.Update Student Details
3.Remove a student's details from database
4.Generate Student Report card
Enter your choice1

Add Student Information

Enter Student ID: CSE2102
Enter Name: SHAON BANDYOPADHYAY
Enter Class Roll Number: 3
Enter Batch Name: CSE2017-21
Enter Batch ID: CSE21
Data saved successfully
```

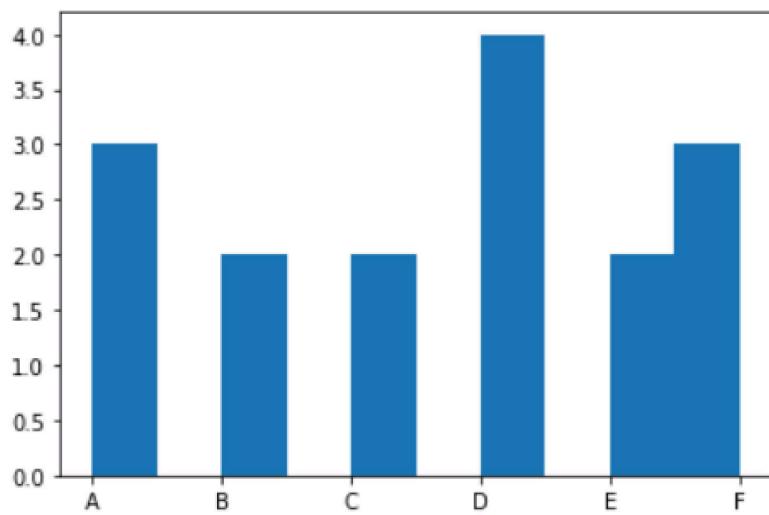
B)For COURSE.py:

```
Python 3.10.8 (tags/v3.10.8:aaaf517, Oct 11 2022, 16:50:30) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

>>> ===== RESTART: C:\Python310\COURSE.py =====
COURSE MODULE FUNCTIONS
1.Create New Course
2.Performance of students in Course
3.Course statistics as Histogram
Enter your choice1
-----
Create New Course
-----
Enter Course ID: C001
Enter Course Name: PYTHON PROGRAMMING
Enter Student Name,Student ID,Roll,Score as a Dictionary(multiple student records can be stored as a sub dictionary(ex:{},{})): {{ASMIT BANDYOPADHYAY,CSE2201,70,97},{AKASH KUNDU,CSE2101,62,86},{AMBHRIN ROY,ECE2201,45,90},{TANISHA SAHA,ECE2202,35,84}}
New Course saved successfully
Press any key to continue
```

```
Python 3.10.8 (tags/v3.10.8:aaaf517, Oct 11 2022, 16:50:30) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

>>> ===== RESTART: C:\Python310\COURSE.py =====
COURSE MODULE FUNCTIONS
1.Create New Course
2.Performance of students in Course
3.Course statistics as Histogram
Enter your choice2
{{ASMIT BANDYOPADHYAY,CSE2201,70,97},{AKASH KUNDU,CSE2101,62,86},{AMBHRIN ROY,ECE2201,45,90},{TANISHA SAHA,ECE2202,35,84}}
{{ASMIT BANDYOPADHYAY,CSE2201,70,85},{AKASH KUNDU,CSE2101,62,95},{AMBHRIN ROY,ECE2201,45,75},{TANISHA SAHA,ECE2202,35,93}}
>>>
```



C) **FOR BATCH.PY:**

```

IDLE Shell 3.10.8
File Edit Shell Debug Options Window Help
Python 3.10.8 (tags/v3.10.8:aaaf517, Oct 11 2022, 16:50:30) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

>>> ===== RESTART: C:\Python310\BATCH.py =====
BATCH MODULE FUNCTIONS
1.Create New Batch
2.List of students in batch
3.List of courses in batch
4.Batch Statistics in pie plot
Enter your choice1

-----
Add Batch Information

-----
Enter BATCH ID: CSE22
Enter BATCH NAME: CSE2022-26
Enter DEPARTMENT NAME: CSE
Enter LIST OF COURSES: [C001,C002]
Enter LIST OF STUDENTS: CSE2201
Data saved successfully

```

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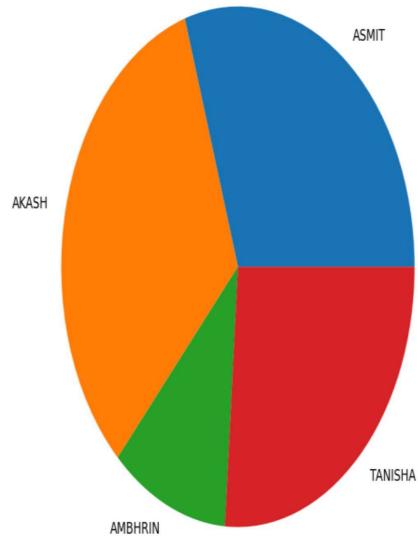
Q Search

18:09 02-01-2023

```
IODE Shell 3.10.8
File Edit Shell Debug Options Window Help
Type "help", "copyright", "credits" or "license()" for more information.

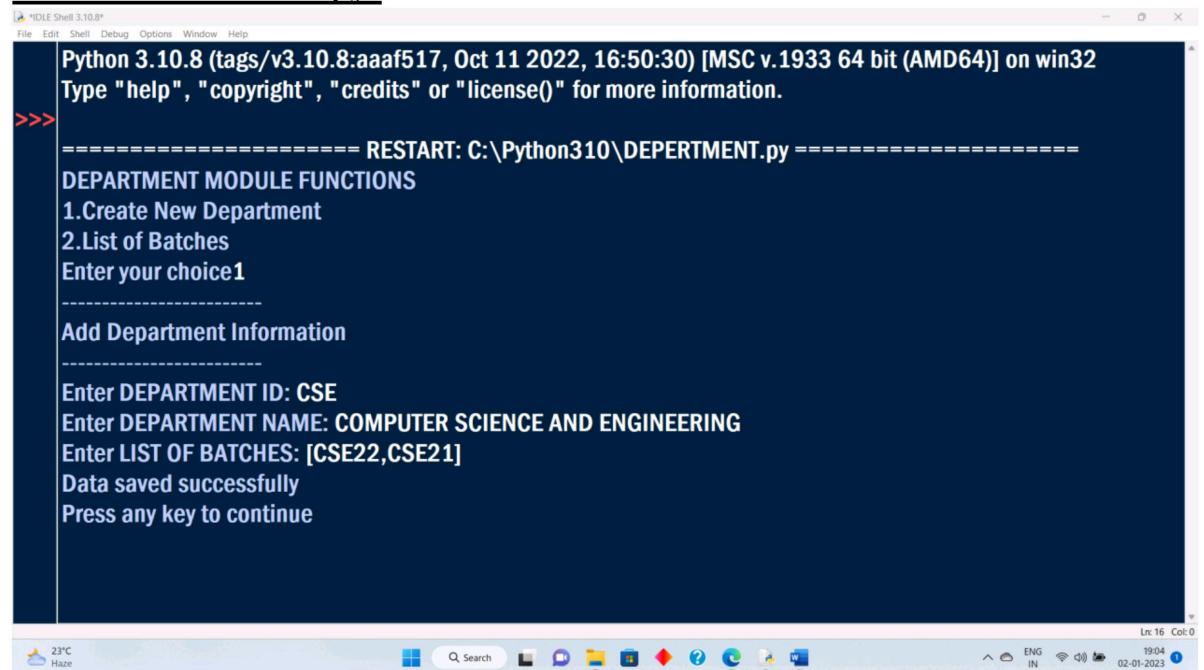
>>> ===== RESTART: C:\Python310\BATCH.py =====
BATCH MODULE FUNCTIONS
1.Create New Batch
2.List of students in batch
3.List of courses in batch
4.Batch Statistics in pie plot
Enter your choice2
CSE2201
>>> ===== RESTART: C:\Python310\BATCH.py =====
BATCH MODULE FUNCTIONS
1.Create New Batch
2.List of students in batch
3.List of courses in batch
4.Batch Statistics in pie plot
Enter your choice3
[C001,C002]
```

Figure 1



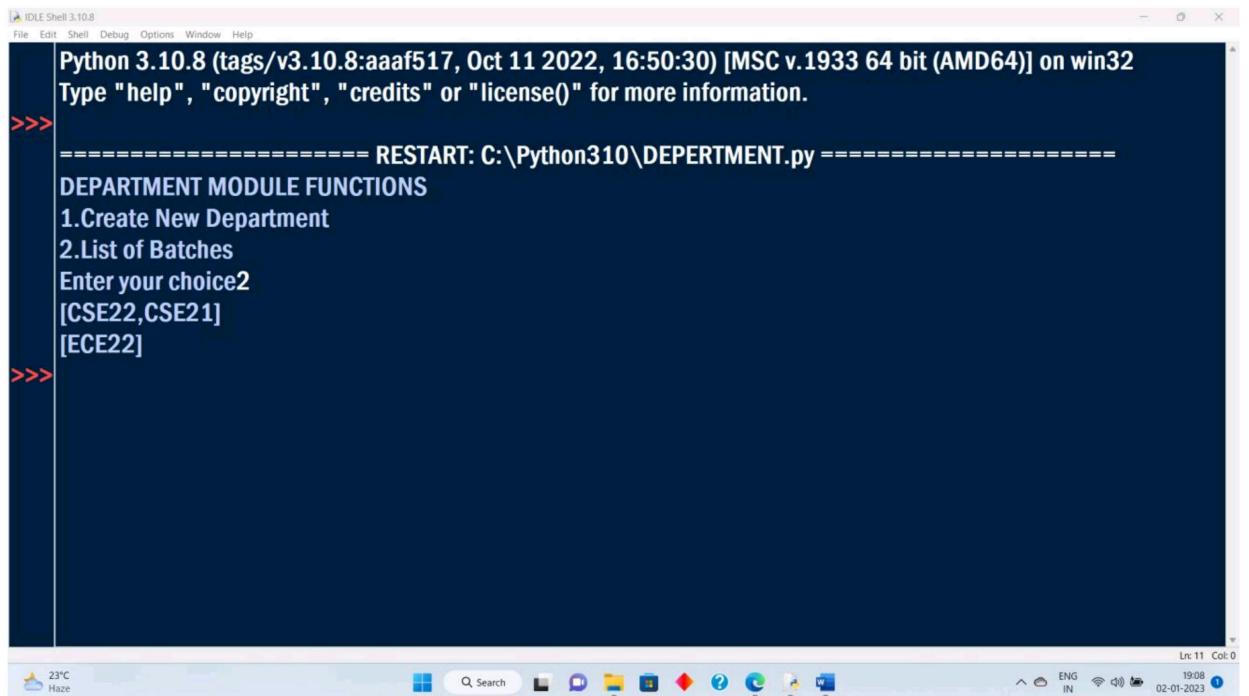
D)

For DEPARTMENT.py:



```
Python 3.10.8 (tags/v3.10.8:aaaf517, Oct 11 2022, 16:50:30) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

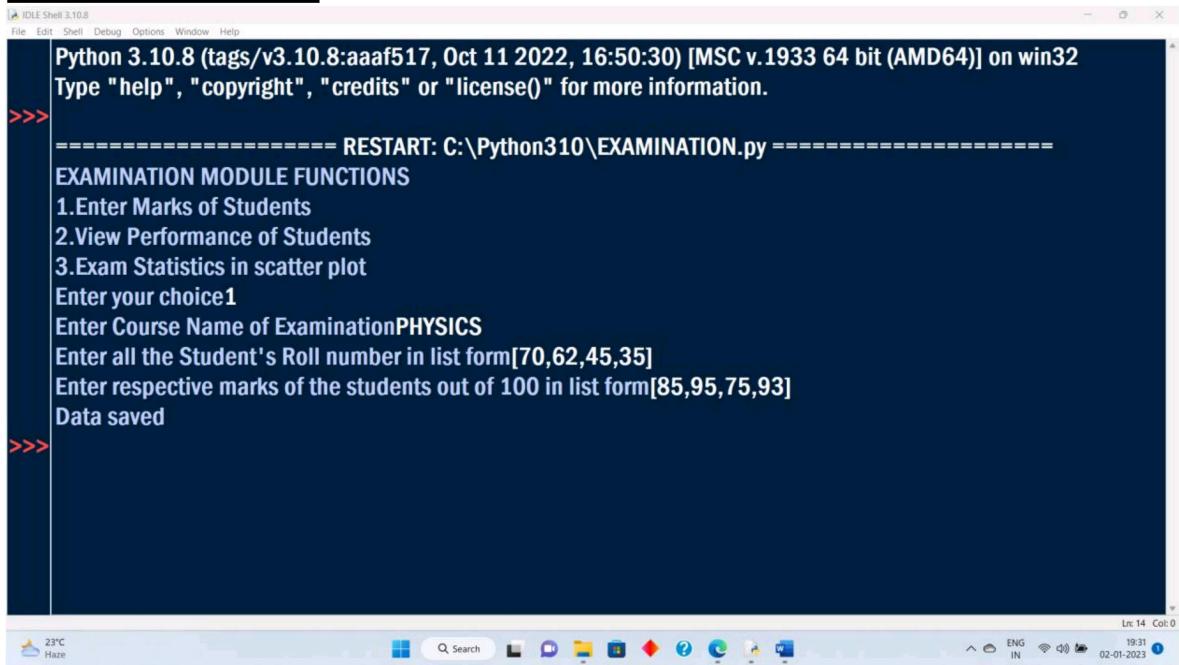
>>> ===== RESTART: C:\Python310\DEPERTMENT.py =====
DEPARTMENT MODULE FUNCTIONS
1.Create New Department
2.List of Batches
Enter your choice1
-----
Add Department Information
-----
Enter DEPARTMENT ID: CSE
Enter DEPARTMENT NAME: COMPUTER SCIENCE AND ENGINEERING
Enter LIST OF BATCHES: [CSE22,CSE21]
Data saved successfully
Press any key to continue
```



```
Python 3.10.8 (tags/v3.10.8:aaaf517, Oct 11 2022, 16:50:30) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

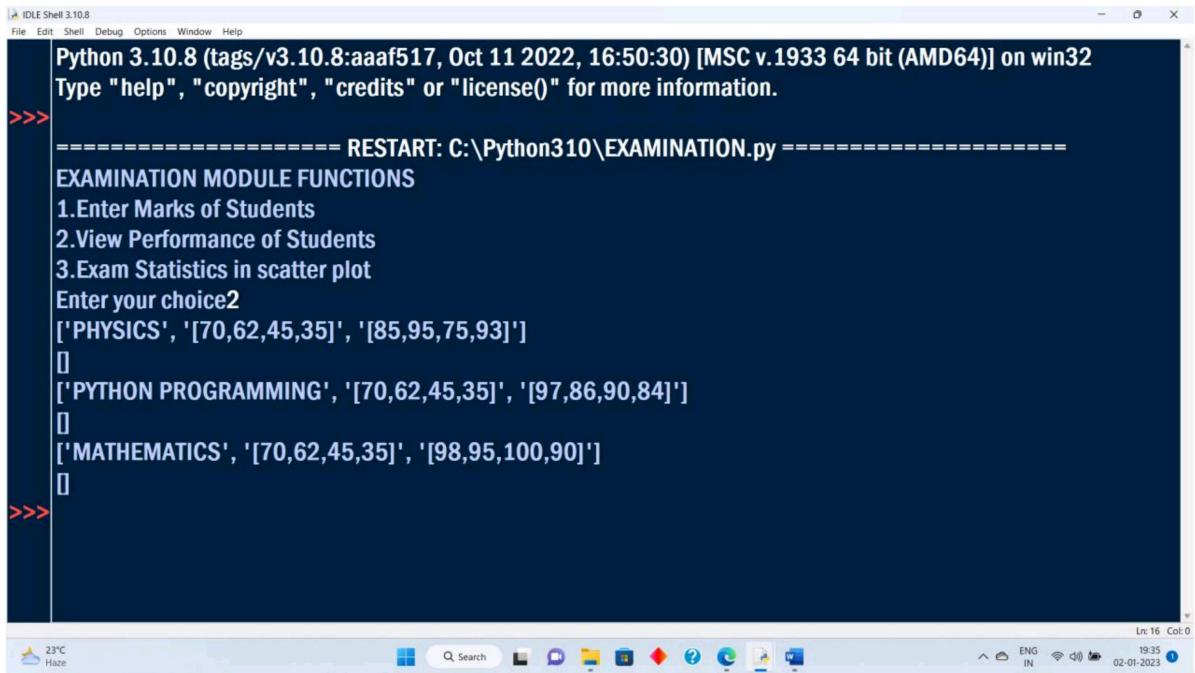
>>> ===== RESTART: C:\Python310\DEPERTMENT.py =====
DEPARTMENT MODULE FUNCTIONS
1.Create New Department
2.List of Batches
Enter your choice2
[CSE22,CSE21]
[ECE22]
```

E) FOR EXAMINATION.PY



```
Python 3.10.8 (tags/v3.10.8:aaaf517, Oct 11 2022, 16:50:30) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

>>> ===== RESTART: C:\Python310\EXAMINATION.py =====
EXAMINATION MODULE FUNCTIONS
1.Enter Marks of Students
2.View Performance of Students
3.Exam Statistics in scatter plot
Enter your choice1
Enter Course Name of ExaminationPHYSICS
Enter all the Student's Roll number in list form[70,62,45,35]
Enter respective marks of the students out of 100 in list form[85,95,75,93]
Data saved
>>>
```



```
Python 3.10.8 (tags/v3.10.8:aaaf517, Oct 11 2022, 16:50:30) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

>>> ===== RESTART: C:\Python310\EXAMINATION.py =====
EXAMINATION MODULE FUNCTIONS
1.Enter Marks of Students
2.View Performance of Students
3.Exam Statistics in scatter plot
Enter your choice2
['PHYSICS', '[70,62,45,35]', '[85,95,75,93]']
[]
['PYTHON PROGRAMMING', '[70,62,45,35]', '[97,86,90,84]']
[]
['MATHEMATICS', '[70,62,45,35]', '[98,95,100,90]']
>>>
```

