EXAMINATION SYSTEM

ITI Graduation Project

2022

Jihad Ahmed Saber

Esraa Hassan El-Sayed

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Requirements

- Student has name (First and last name), address (city), email, password, age, gender and unique Identification number.
- Every Student must belong to a department and must be enrolled in a course, and must be taught by a professor.
- Department has a name and a unique Id.
- A department may not have students but must has a manager, and may have a course
- Department must have more than one professor.
- Professor has a name (first and last), email, password and a unique Id
- Professor must be assigned to a department but may manage a department and the professor may teach a course, and has to generate questions for the exam and may teach to a student.
- Course has name, duration and a unique number and may be taught by an professor and it may has one or more student.
- Each course may have a topic or more
- Each topic has a name and unique number and must be in a course.
- Each course must have a questions.
- The question has a unique Id, question header, model answer, a score (point of that question) for each question and more than one choice with a letter for each one(a,b,c,d).
- Questions
- It must be modified by a Professor to insert, update or delete it.
- Student must take Exam and answer questions but not all of them
- Each student take the Exam has his own answer and his grade.
- Each Exam has a question Id and unique Id for the exam.
- Exam must have many questions.
-

ERD

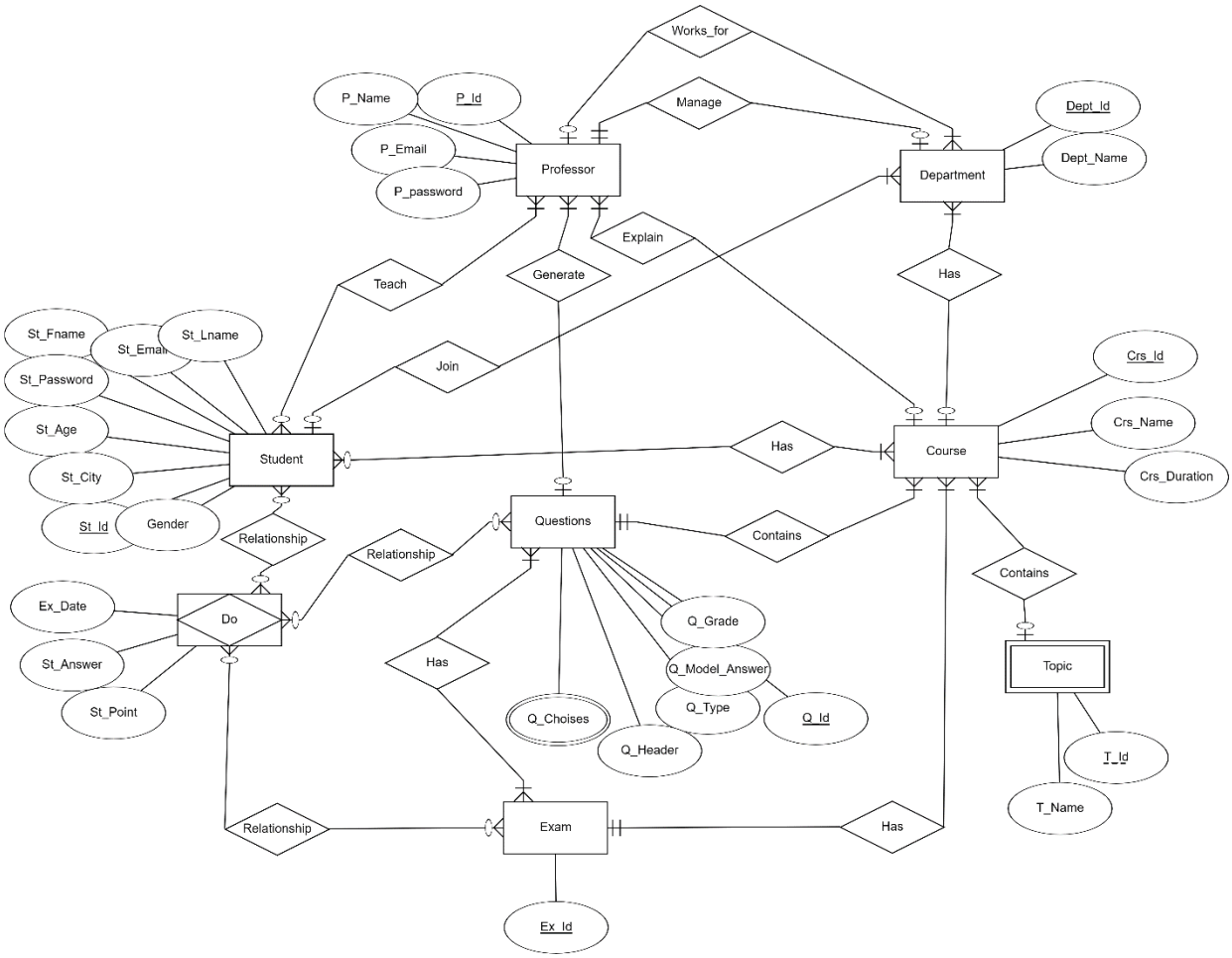


Figure 1 :ERD

Database

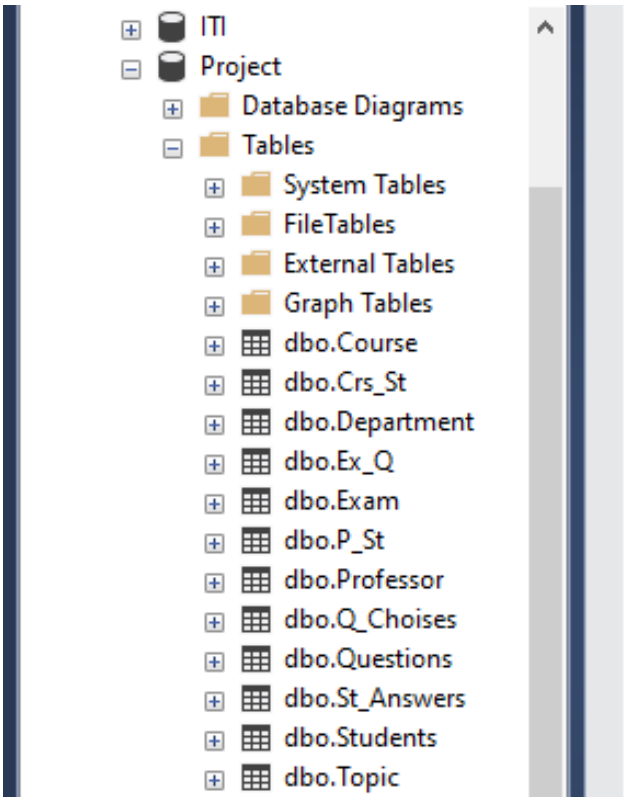


Figure 2: DB

Data base Diagram

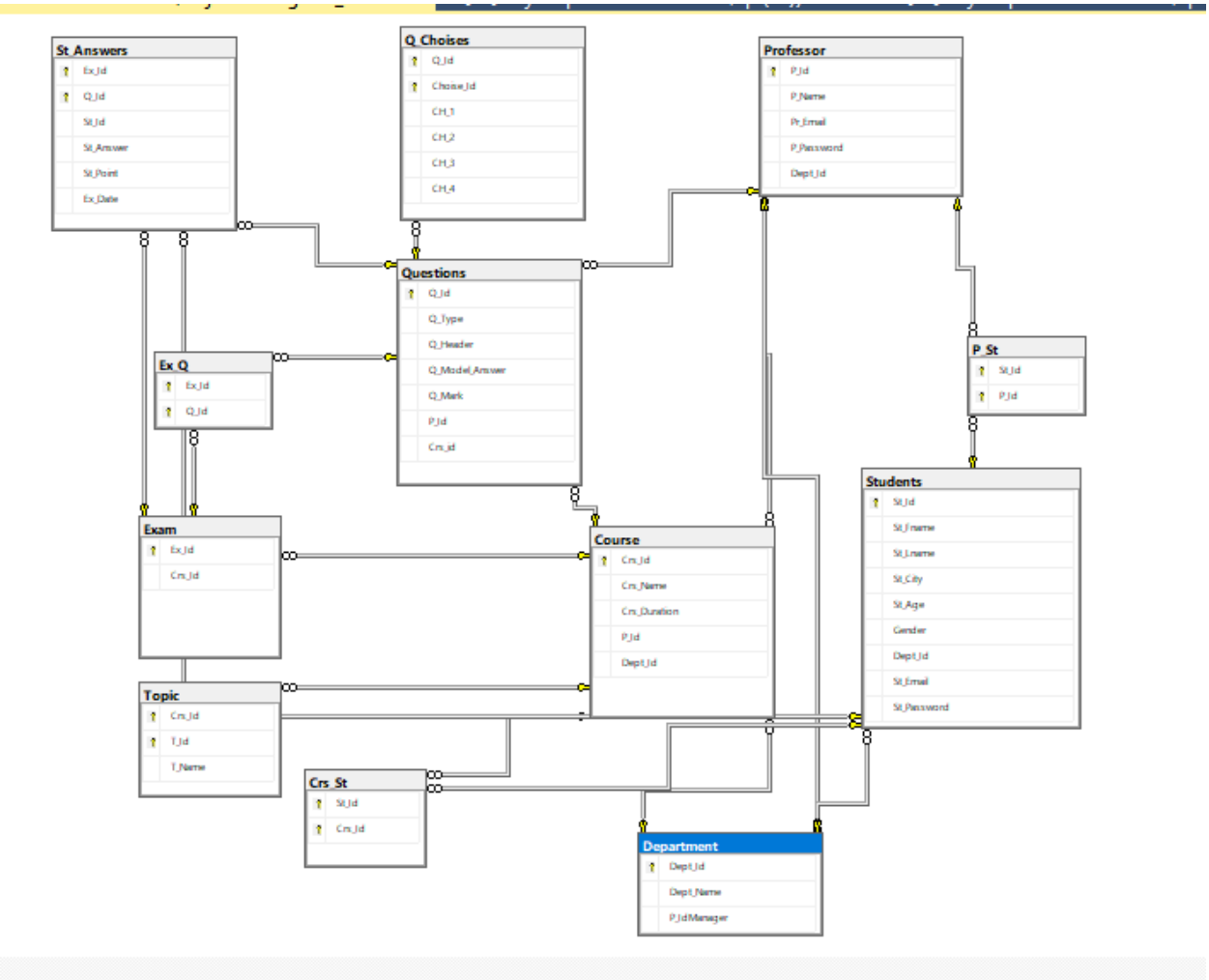


Figure 3: DB Diagram

Stored procedures

Every table in project database has four stored procedures. Select ,Insert, Update and Delete. In addition to that, We created stored procedures for the Exam, and the Reports.

Tables procedures:

Example for the query used:

```
1) course

--select (Get+ Table name)
create proc GetCourse @id int
as
if exists ( select Crs_Id from Course where Crs_Id=@id)
  select *
  from Course
  where Crs_Id=@id
  else
  select 'invalid'
  --execution
  GetCourse 100
-----------------------------------------
--insert (Ins+ table name)
Create proc InsCourse @id int, @name nvarchar(50)
as
  if not exists (select crs_id from Course where Crs_Id=@id)
   insert into Course (Crs_Id,Crs_Name)
   values (@id,@name)
   else
   select 'Duplicate id'
   --execution
   InsCourse 300 , 'power bi'
-----------------------------------------
--update (Up+ table name)
create proc UpCourse @oldname nvarchar(50) ,@newname
nvarchar(50)
as
```

```
if exists ( select Crs_Name from Course where
Crs_Name=@oldname)
  update Course
  set Crs_Name=@newname
  where Crs_Name= @oldname
  else
  select 'error'
  --execution
  UpCourse 'oop','power bi'
-----------------------------------------
--delete(D+ table name)
create proc DCourse @id int, @duration int
as
  if exists(select crs_id, Crs_Duration from Course where
Crs_Id=@id and Crs_Duration=@duration)
  delete from Course
  where Crs_Id=@id and Crs_Duration=@duration
  else
  select 'invalid info'
  --execute
  DCourse 100,2
```

Mapping

Student

St_Id	St_Fname	St_Lname	St_Age	City	St_Email	Dept_Id	St_password	Gender

Course

Crs_Id	Crs_Name	Crs_Duration	Dept_Id	P_Id

Topic

T_Id	Crs_Id	T_Name

Questions

Q_Id	Q_type	Q_Header	Q_Model_Answer	Q_Grade	Crs_Id	P_Id

Q_Choice

CH_1	Q_Id	Choise_Id	CH_2	CH_3	CH_4

Exam

Exam_Id	Crs_Id	MCQ_Id	TF_Id

Professor

Ins_Id	Ins_Fname	Ins_Lname	Salary	Dept_Id
———				- - - - - -

Department

P_Id	P_Name	P_Email	P_Password	Dept_Id
———				- - - - - -

St_Answer

Ex_Id	Q_Id	Ex_Date	St_Id	St_Answer	St_Point
———	———		-------		

P_St

St_Id	P_Id
———	———

Crs_St

St_Id	Crs_Id
———	———

Ex_Q

Ex_Id	Q_Id
———	———

Exam Procedures

1- Exam Creation

```
USE [Project]
GO
/****** Object:  StoredProcedure [dbo].[GenerateExam2]
Script Date: 10/29/2022 10:54:11 PM ******/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
ALTER proc [dbo].[GenerateExam2] @crsname nvarchar(50) ,
@nomcq int, @notf int
as
begin
declare @exid int =(SELECT MAX(EX_ID)+1 FROM EXAM) ,
@crsid int=(select Crs_Id from Course where
Crs_Name=@crsname)
CREATE table #test2
(Q_Id int
,Q_Header nvarchar(260)
,CH_1 nvarchar(260)
,CH_2 nvarchar(260)
,CH_3 nvarchar(260)
,CH_4 nvarchar(260)
,Ex_Id int
 )
 insert into #test2
select *
from
(
(select top (@notf) q.Q_Id,  Q_Header,CH_1,CH_2,''AS
CH_3,''AS CH_4 ,@exid as Ex_Id
from Questions q
left join Q_Choises c on q.Q_Id=c.Q_Id
inner join Course s on s.Crs_Id=q.Crs_id
where Crs_Name=@crsname and Q_Type ='T or F'
```

```
 ORDER BY NEWID())
 union
 (select top (@nomcq) q.Q_Id, Q_Header,CH_1,CH_2,CH_3,CH_4
,@exid as Ex_Id
from Questions q
left join Q_Choises c on q.Q_Id=c.Q_Id
inner join Course s on s.Crs_Id=q.Crs_id
where Crs_Name=@crsname and Q_Type ='MCQ' ORDER BY
NEWID())
) as l
select * from #test2

--------------------------
insert into EXAM (Ex_Id ,Crs_Id)
VALUES (@exid, @crsid)
--------------------------
insert into Ex_Q (Ex_Id,Q_Id)
select * from
(
select  Ex_Id, Q_Id from  #test2

)as m
end
--
```

2- Student Answers

```
USE [Project]
GO
/****** Object:  StoredProcedure [dbo].[GetAnswers]
Script Date: 10/29/2022 9:40:37 PM ******/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
ALTER PROC [dbo].[GetAnswers] @Ex_Id int ,@St_Id int ,
@Answer nvarchar(260)
AS
```

```
DECLARE @qid int =(SELECT ex.Q_Id
                   FROM Ex_Q ex
                   INNER JOIN Questions Q  ON ex.Q_Id=
q.Q_Id
                   INNER JOIN Q_Choises ch ON ch.Q_Id
=q.Q_Id
                   WHERE (@Answer = CH_1
                          OR @Answer =CH_2
                          OR @Answer= CH_3
                          OR @Answer= CH_4)
                  AND ex.Ex_Id=@Ex_Id)


INSERT INTO St_Answers (Ex_Id,Q_Id,St_Id,St_Answer,St_Point)
VALUES
( @Ex_Id,@qid,@St_Id,@Answer,
CASE
     WHEN @Answer=(select Q_Model_Answer
                          from Questions
                               where Q_Id=@qid) THEN 1
      WHEN @Answer!=(select Q_Model_Answer
                          from Questions
                               where Q_Id=@qid) THEN 0
     END)
```

3- Exam Correction

```
USE [Project]
GO
/****** Object:  StoredProcedure [dbo].[CORRECTION]
Script Date: 10/29/2022 11:14:09 PM ******/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
ALTER PROC [dbo].[CORRECTION] @exid int, @stid int
AS
CREATE TABLE #CORR (GRADE INT)
INSERT INTO #CORR
SELECT * FROM
```

```
(SELECT sum(st_point) over(partition by ex_id, st_id) as
Grade
FROM St_Answers
where Ex_Id=@exid
and St_Id=@stid) AS Q
  SELECT TOP 1 (GRADE*100)/10 FROM #CORR
```

Report Procedures

1- **Report for getting Student information according to Department No. parameter**

```
-------R1-----
USE [Project]
GO
/****** Object:  StoredProcedure [dbo].[GetStudentsR1]
Script Date: 10/30/2022 1:42:17 AM ******/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
ALTER proc [dbo].[GetStudentsR1] @Dept_ID int as
select * from Students
where Dept_Id=@Dept_ID
-----------------------------------------------------------
```

2- **Report for taking student Id and returns the grades of the student in all courses.**

```
------R2------
USE [Project]
GO
/****** Object:  StoredProcedure [dbo].[GetGradesR2]
Script Date: 10/30/2022 1:42:51 AM ******/
SET ANSI_NULLS ON
```

```
GO
SET QUOTED_IDENTIFIER ON
GO
ALTER proc [dbo].[GetGradesR2] @Student_ID int as
select sa.St_id, c.Crs_Name , (sum (sa.St_Point)*100)/10 as
Grades
from St_Answers as sa
inner join Exam as e on sa.Ex_Id =e.Ex_Id
inner join course as c on e.Crs_Id =c.Crs_Id
where sa.St_Id=@Student_ID
group by sa.St_id, c.crs_Name
order by c.crs_Name
------------------------------------------------------------
-----------------------
```

3- Report that takes the professor Id and returns the name of the courses that he teaches and the number of students per course

```
------R3------
USE [Project]
GO
/****** Object:  StoredProcedure [dbo].[GetNumStR3]
Script Date: 10/30/2022 1:43:09 AM ******/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
ALTER proc [dbo].[GetNumStR3] @Instructor_ID int as
select p.P_Id,c.Crs_Name, count(cs.St_Id) as 'Number Of
Students'
from Professor as p
inner join Course as c on p.P_Id=c.P_Id
inner join Crs_St as cs on c.Crs_Id=cs.Crs_Id
where p.P_Id=@Instructor_ID
group by p.P_Id,c.Crs_Name
order by c.Crs_Name
------------------------------------------------------------
-----------------------
```

4- Report that takes course ID and return its topics

```
-----R4-------
USE [Project]
GO
/****** Object:  StoredProcedure [dbo].[GetCrsTopicsR4]
Script Date: 10/30/2022 1:44:31 AM ******/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
ALTER proc [dbo].[GetCrsTopicsR4] @Course_ID int as
select Crs_Id, T_Name
from Topic
where Crs_Id=@Course_ID
order by T_Name
------------------------------------------------------------
------------------------
```

5- Report that takes exam number and returns questions in it

```
-----R5-------
USE [Project]
GO
/****** Object:  StoredProcedure [dbo].[GetExQuestionsR5]
Script Date: 10/30/2022 1:43:46 AM ******/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
ALTER proc [dbo].[GetExQuestionsR5] @Exam_ID int as
select e.Ex_Id, q.Q_Header,CH_1 ,CH_2 ,CH_3 ,CH_4
from Ex_Q as e
inner join Questions as q on e.Q_Id = q.Q_Id
inner join Q_Choises ch on q.Q_Id=ch.Q_Id
where e.Ex_Id=@Exam_ID
------------------------------------------------------------
------------------------
```

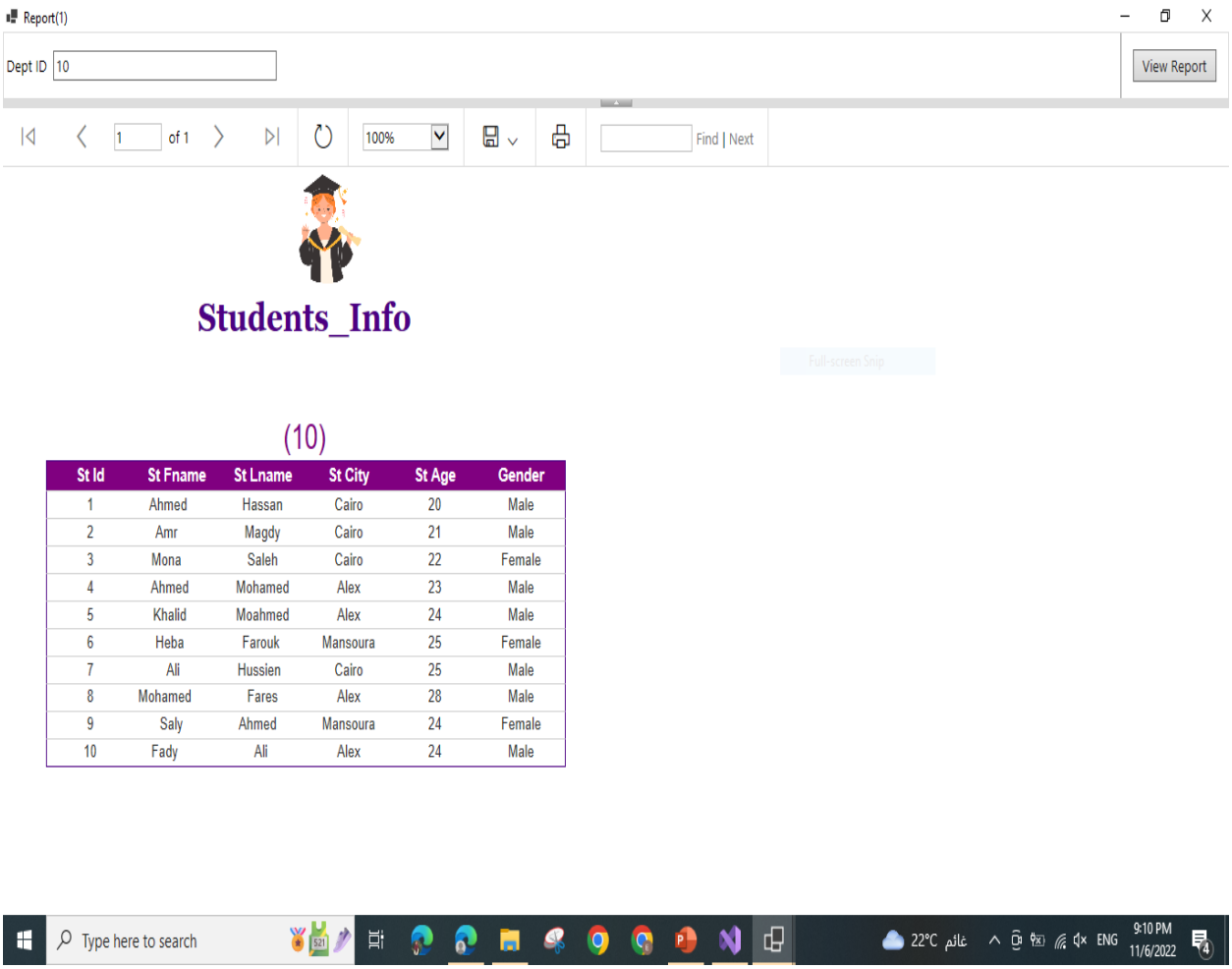
6- Report that takes exam number and the student Id then returns the question in this exam with the student answers

```
 ------R6------
USE [Project]
GO
/****** Object:  StoredProcedure [dbo].[GetStAnswersR6]
Script Date: 10/30/2022 1:44:45 AM ******/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
ALTER proc [dbo].[GetStAnswersR6] @Exam_ID int , @Student_ID
int as
select q.Q_Header,CH_1, CH_2, CH_3, CH_4 ,sa.St_Answer
from St_Answers as sa
left join Questions as q on sa.Q_Id=q.Q_Id
inner join Q_Choises ch on q.Q_Id=ch.Q_Id
where sa.Ex_Id=@Exam_ID
and sa.St_Id=@Student_ID
```

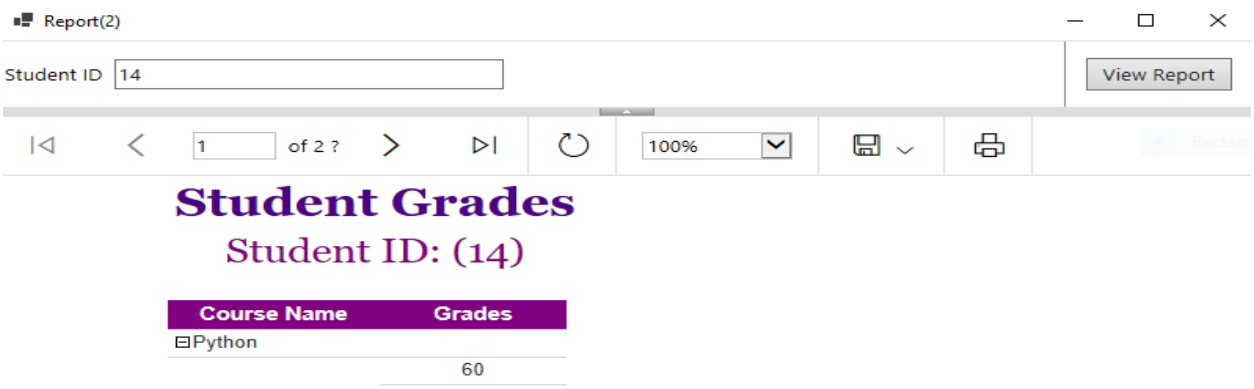
Reports with SSRS

- Reports were done through Visual Studio using SQL Server Reporting Service extension and were publish on the local host
- Connection was to our database (project)

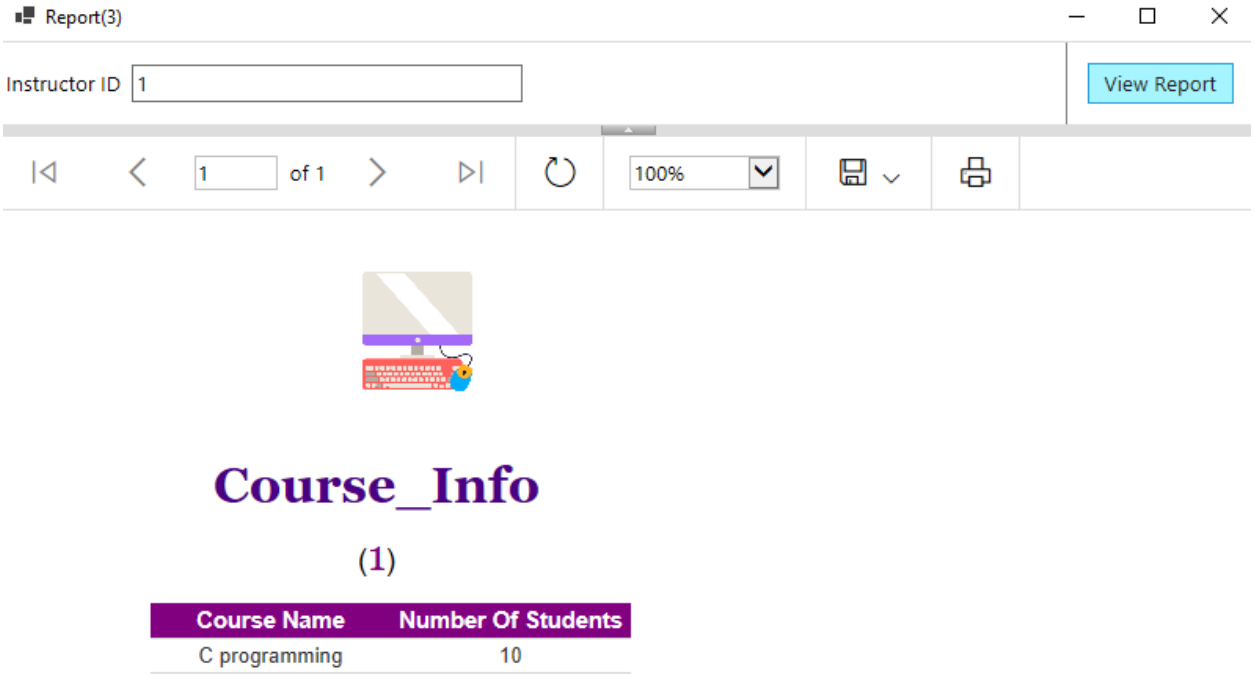
-Report 1



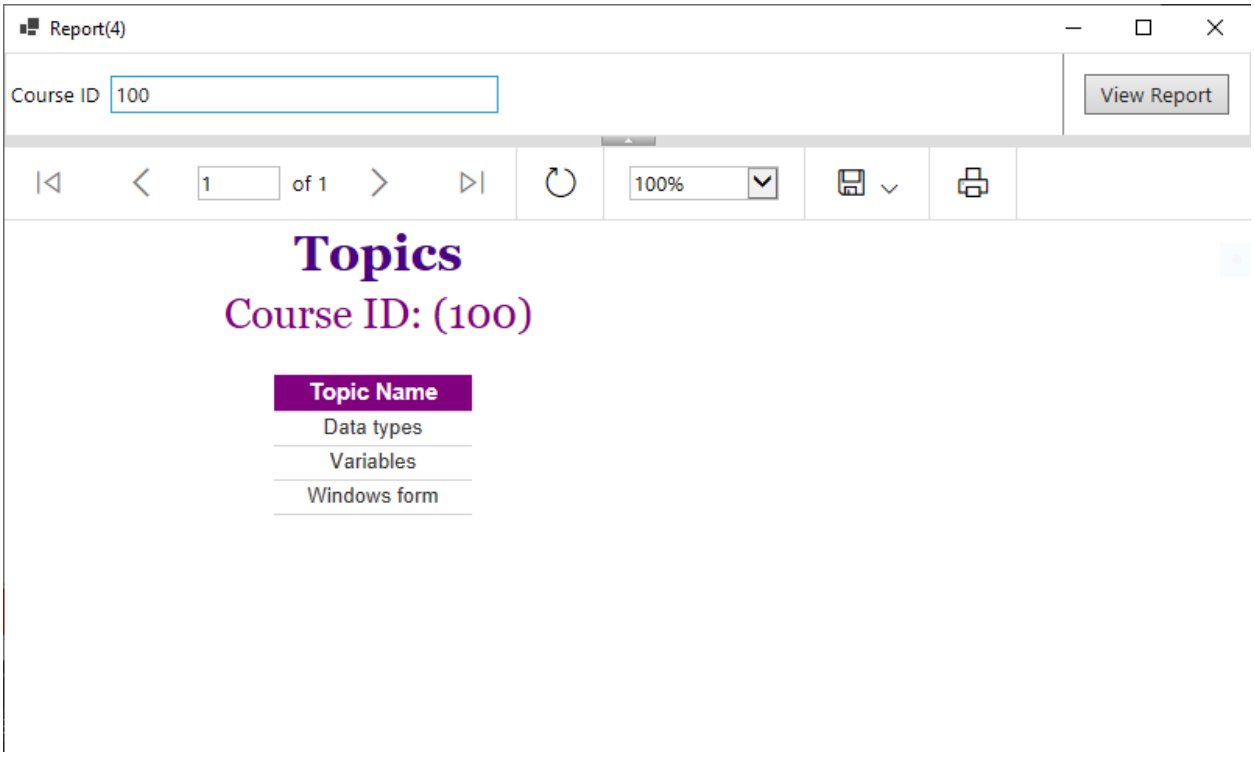
Report 2


Report(2)
Student ID
14
View Report
1
of 2 ?
100%
Student Grades
Student ID: (14)
Course Name
Grades
Python
60

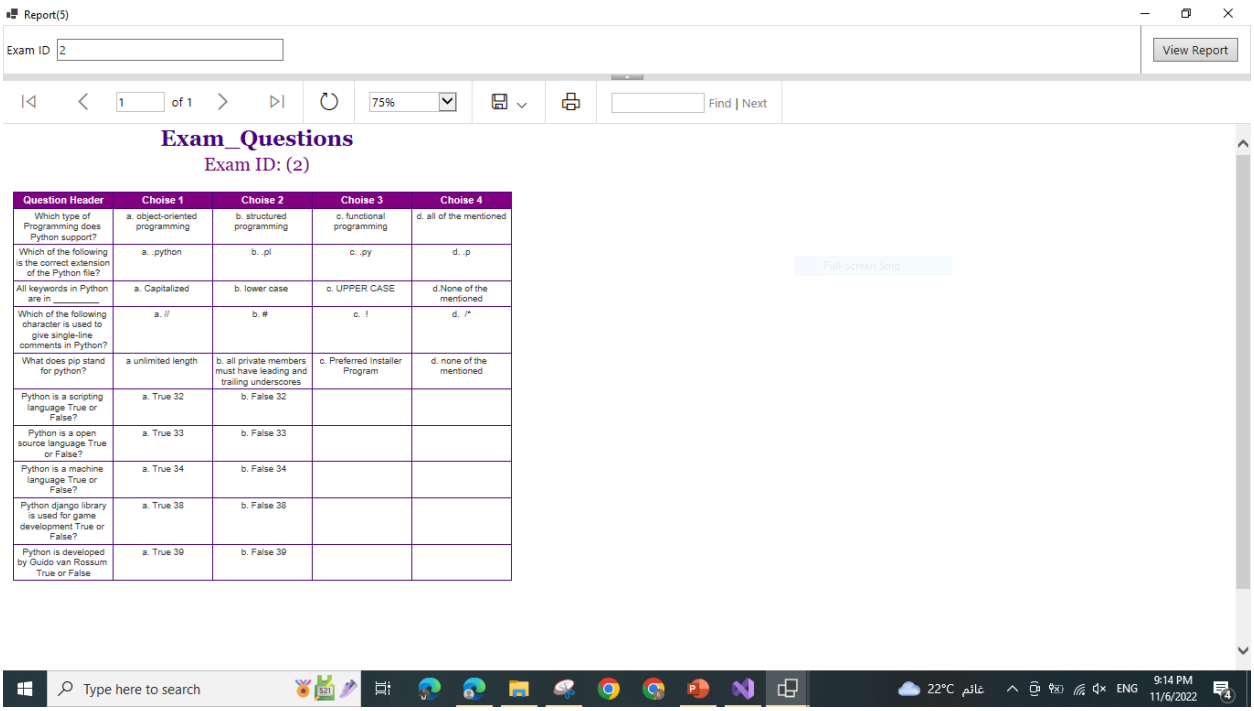
Report3


Report(3)
Instructor ID
1
View Report
1
of 1
100%
Course_Info
(1)
Course Name
Number Of Students
C programming
10

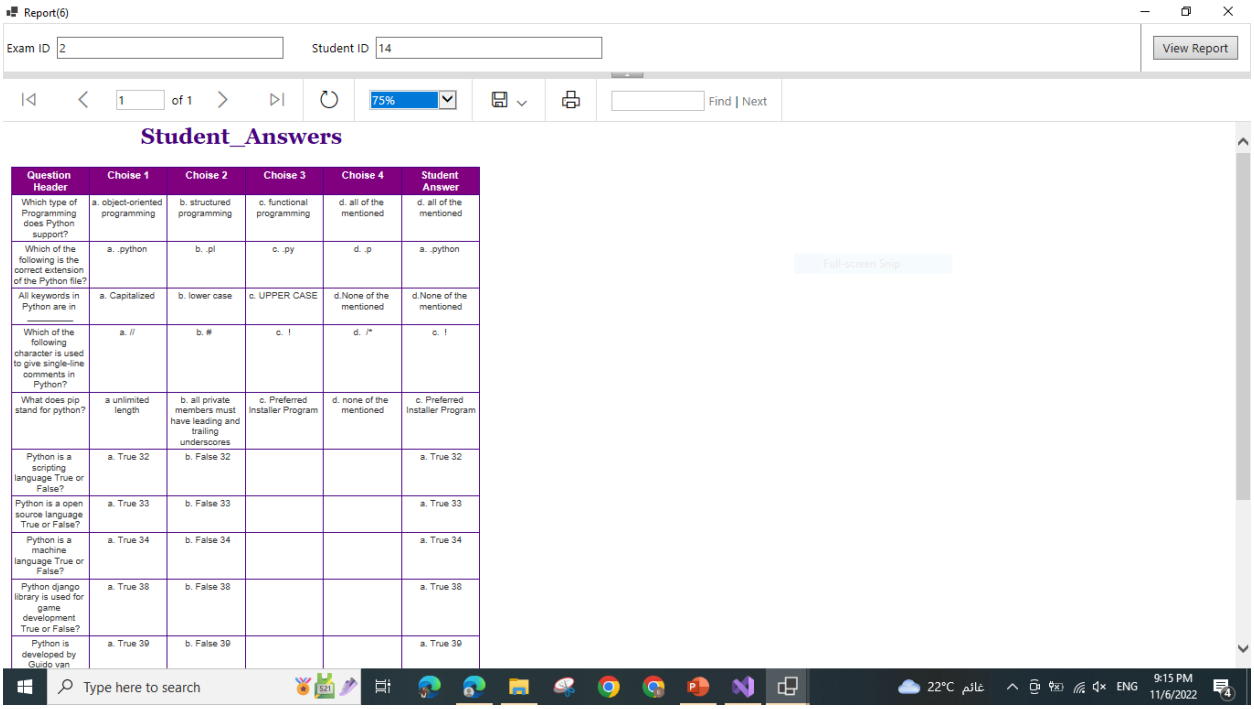
Report4



Report 5



Report 6

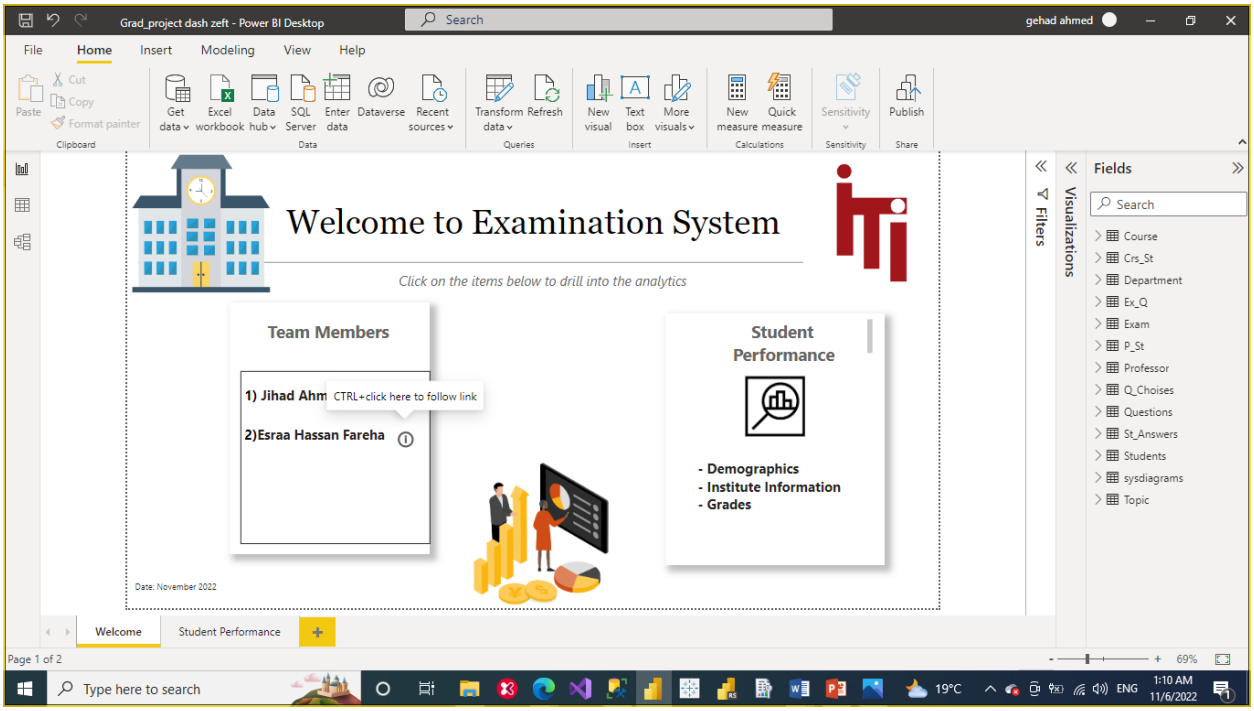


Question Header	Choise 1	Choise 2	Choise 3	Choise 4	Student Answer
Which type of Programming does Python support?	a. object-oriented programming	b. structured programming	c. functional programming	d. all of the mentioned	d. all of the mentioned
Which of the following is the correct extension of the Python file?	a. .python	b. .pl	c. .py	d. .p	a. .python
All keywords in Python are in _____	a. Capitalized	b. lower case	c. UPPER CASE	d.None of the mentioned	d.None of the mentioned
Which of the following character is used to give single-line comments in Python?	a. //	b. #	c. !	d. /*	c. !
What does pip stand for python?	a unlimited length	b. all private members must have leading and trailing underscores	c. Preferred Installer Program	d. none of the mentioned	c. Preferred Installer Program
Python is a scripting language True or False?	a. True 32	b. False 32			a. True 32
Python is a open source language True or False?	a. True 33	b. False 33			a. True 33
Python is a machine language True or False?	a. True 34	b. False 34			a. True 34
Python django library is used for game development True or False?	a. True 38	b. False 38			a. True 38
Python is developed by Guido van	a. True 39	b. False 39			a. True 39

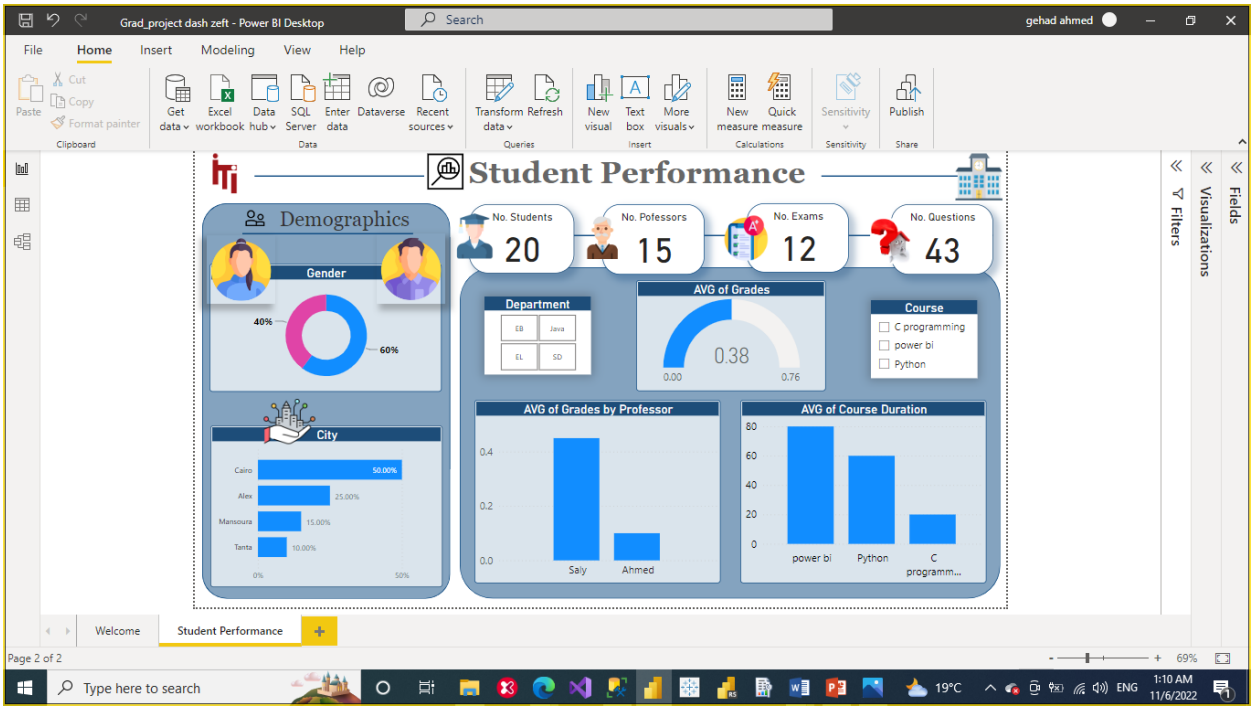
Visualization with Power Bi

- 2 Dashboards were made with storytelling style to visualize our projects

- **Dashboard 1**



- **Dashboard 2**

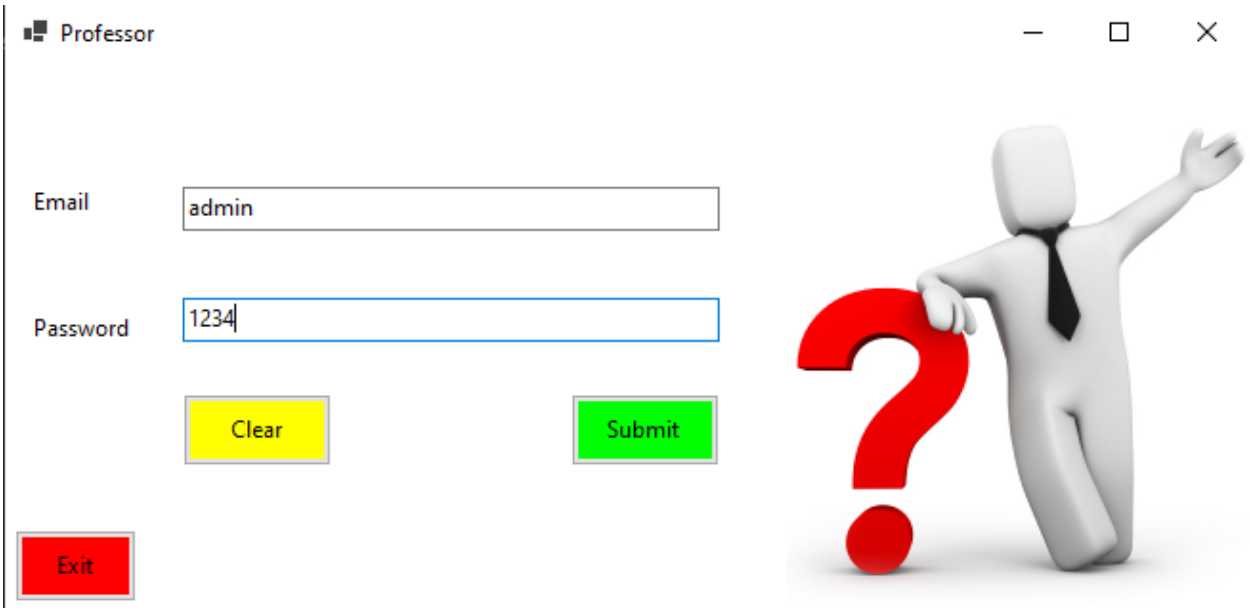


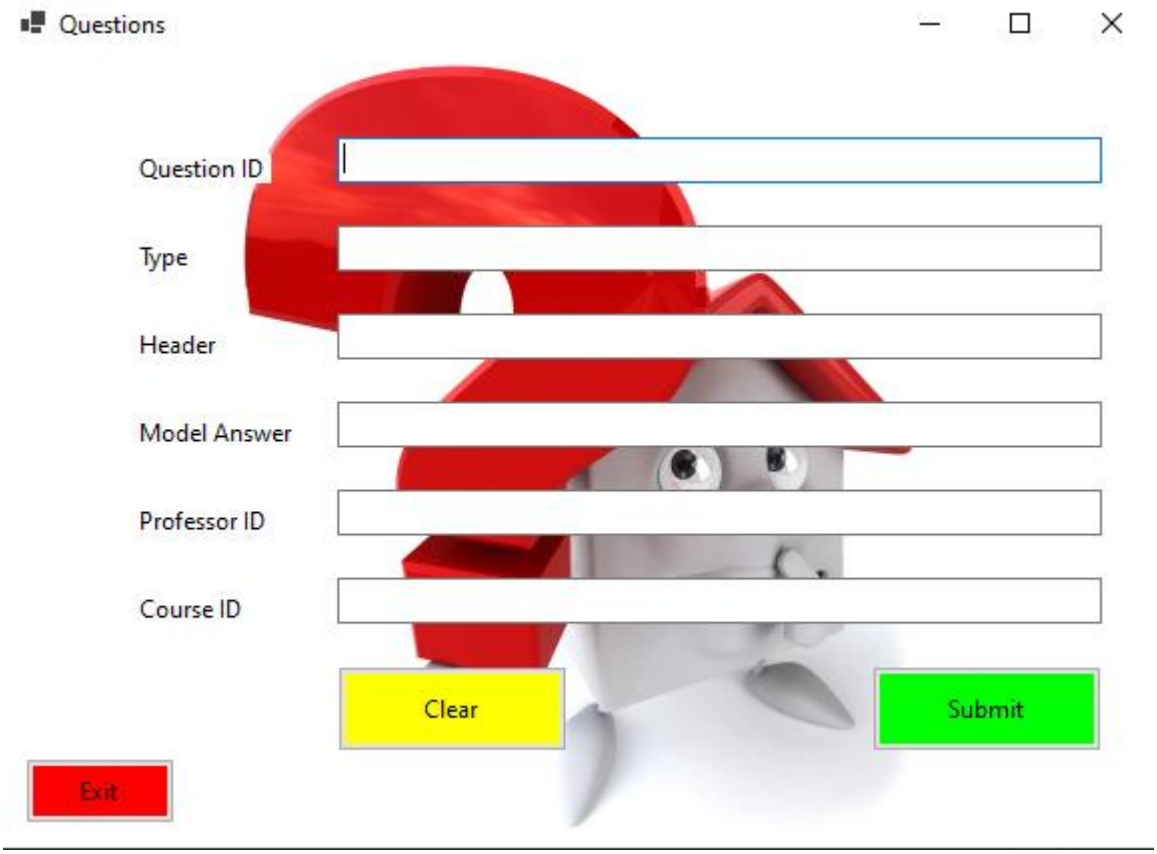
- **Link to the dashboard:**

https://app.powerbi.com/view?r=eyJrIjoiNjk2OThlZDgtY2M2OS00YmIzLWI3YTItNDc1ZTk2NDIwODg5IiwidCI6ImRmODY3OWNkLWE4MGUtNDVkOC05OWFjLWM4M2VkN2ZmOTVhMCJ9

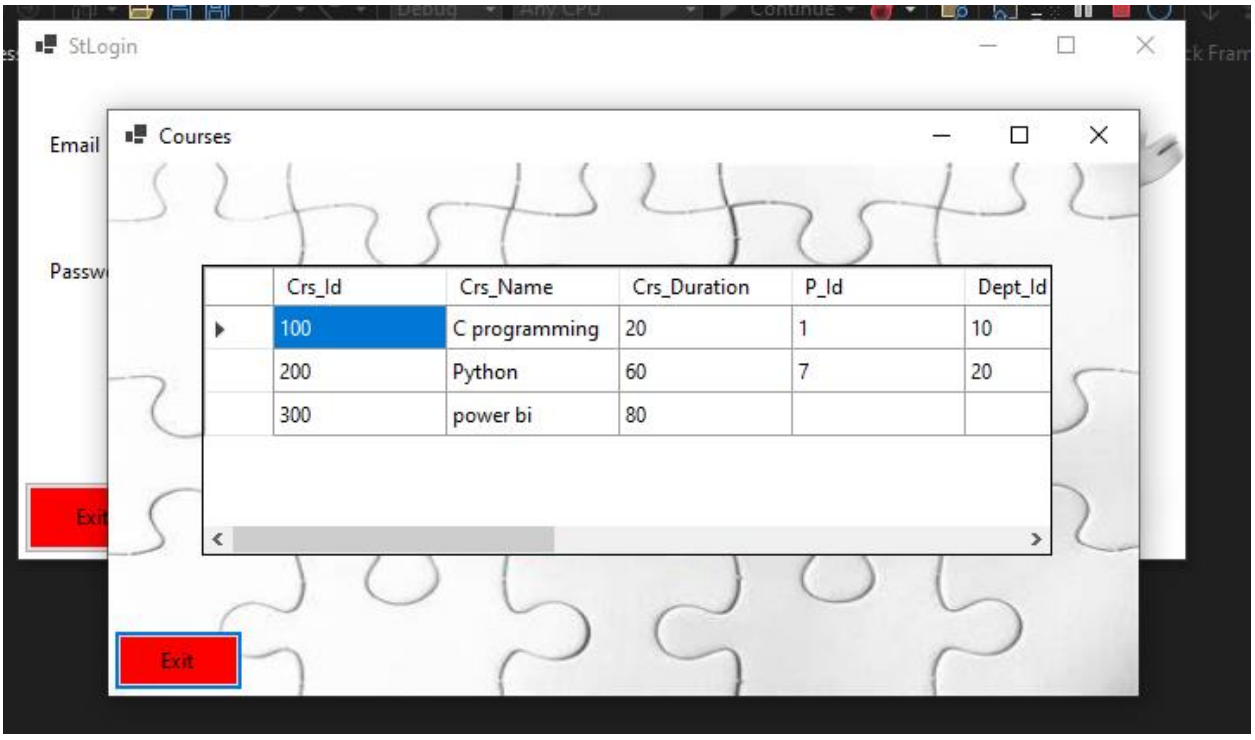
Windows form Application

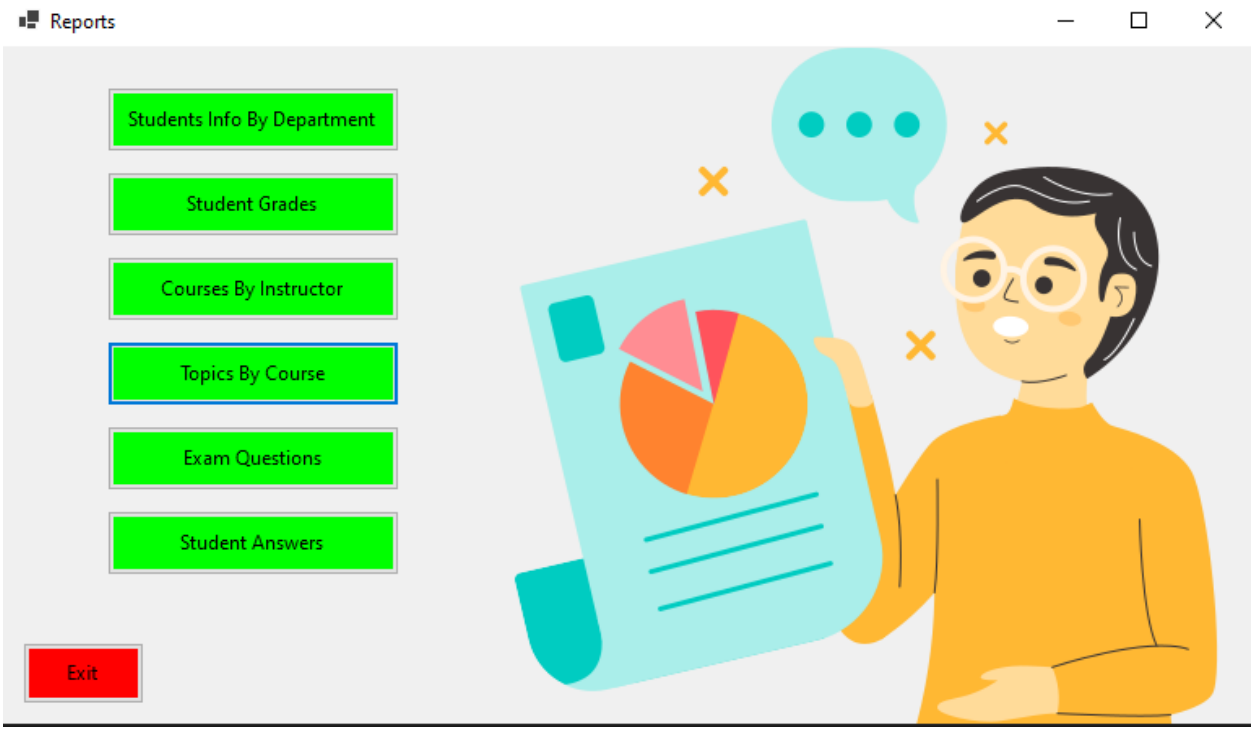
-


Professor
Email
admin
Password
1234
Clear
Submit
Exit


Questions
Question ID
Type
Header
Model Answer
Professor ID
Course ID
Clear
Submit
Exit

StLogin
Email
Ahmed@gmail.com
Password
Ahmed
Clear
Submit
Exit


StLogin
Email
Courses
Crs_Id
Crs_Name
Crs_Duration
P_Id
Dept_Id
100
C programming
20
1
10
200
Python
60
7
20
300
power bi
80
Exit


Reports
Students Info By Department
Student Grades
Courses By Instructor
Topics By Course
Exam Questions
Student Answers
Exit