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Examination@.

Data Dictionary

2/25/2022

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Examination@.

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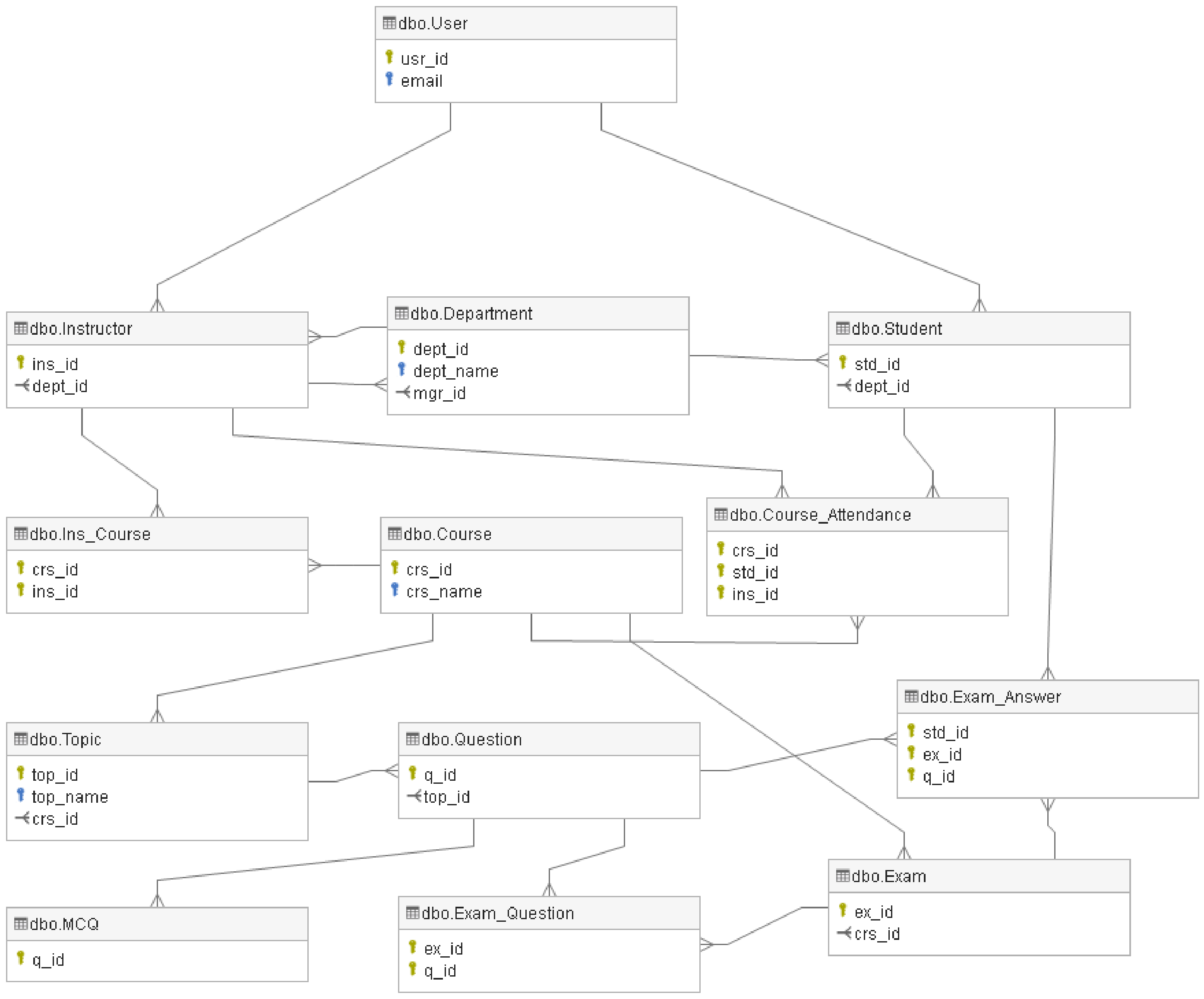

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2. Tables

2.1. Tables

2.1.1. Table: dbo.Course

Columns

		Name	Data type	Description / Attributes
▦	🔑	crs_id	int	Identity / Auto increment
▦	🔑	crs_name	varchar(100)	

Linked from

	Table	Join	Title / Name / Description
⤙	dbo.Course_Attendance	**dbo.Course**.crs_id = dbo.Course_Attendance.crs_id	FK__Course_At__crs_i__7FEBC895
⤙	dbo.Exam	**dbo.Course**.crs_id = dbo.Exam.crs_id	FK__Exam__crs_id__13F2C142
⤙	dbo.Ins_Course	**dbo.Course**.crs_id = dbo.Ins_Course.crs_id	FK__Ins_Cours__crs_i__04B07DB2
⤙	dbo.Topic	**dbo.Course**.crs_id = dbo.Topic.crs_id	FK__Topic__crs_id__1022305E

Unique keys

	Columns	Name / Description
🔑	crs_id	PK__Course__ECAF537571B58B0B
🔑	crs_name	UQ__Course__775BF427AD31A700

2.1.2. Table: dbo.Course_Attendance

Columns

		Name	Data type	Description / Attributes
▦	🔑	crs_id	int	**References**: dbo.Course
▦	🔑	std_id	int	**References**: dbo.Student
▦	🔑	ins_id	int	**References**: dbo.Instructor
▦		grade	int	**Nullable** **Computed**: ([dbo].[getStudentGrade]([crs_id],[std_id]))

Links to

	Table	Join	Title / Name / Description
≻—	dbo.Course	**dbo.Course_Attendance**.crs_id = dbo.Course.crs_id	FK__Course_At__crs_i__7FEBC895
≻—	dbo.Instructor	**dbo.Course_Attendance**.ins_id = dbo.Instructor.ins_id	FK__Course_At__ins_i__01D41107
≻—	dbo.Student	**dbo.Course_Attendance**.std_id = dbo.Student.std_id	FK__Course_At__std_i__00DFECCE

Unique keys

	Columns	Name / Description
🔑	crs_id, std_id, ins_id	PK__Course_A__7D83C003762BDF94

2.1.3. Table: dbo.Department

Columns

		Name	Data type	Description / Attributes
▦	🔑	dept_id	int	**Identity / Auto increment**
▦	🔑	dept_name	varchar(100)	
▦		mgr_id	int	**References**: dbo.Instructor

Links to

	Table	Join	Title / Name / Description
>—	dbo.Instructor	**dbo.Department**.mgr_id = dbo.Instructor.ins_id	FK__Departmen__mgr_i__0A695708

Linked from

	Table	Join	Title / Name / Description
—<	dbo.Instructor	**dbo.Department**.dept_id = dbo.Instructor.dept_id	Instructor_fk_1
—<	dbo.Student	**dbo.Department**.dept_id = dbo.Student.dept_id	Student_fk_1

Unique keys

	Columns	Name / Description
🔑	dept_id	PK__Departme__DCA65974552919D8
🔑	dept_name	UQ__Departme__C7D39AE18A95EAA4

2.1.4. Table: dbo.Exam

Columns

		Name	Data type	Description / Attributes
	🔑	ex_id	int	**Identity / Auto increment**
		date	date	**Default**: getdate()
		crs_id	int	**References**: dbo.Course

Links to

	Table	Join	Title / Name / Description
≻	dbo.Course	**dbo.Exam**.crs_id = dbo.Course.crs_id	FK__Exam__crs_id__13F2C142

Linked from

	Table	Join	Title / Name / Description
≺	dbo.Exam_Answer	**dbo.Exam**.ex_id = dbo.Exam_Answer.ex_id	FK__Exam_Answ__ex_id__1A9FBED1
≺	dbo.Exam_Question	**dbo.Exam**.ex_id = dbo.Exam_Question.ex_id	FK__Exam_Ques__ex_id__16CF2DED

Unique keys

	Columns	Name / Description
🔑	ex_id	PK__Exam__F6D3E489B1F15388

2.1.5. Table: dbo.Exam_Answer

Columns

		Name	Data type	Description / Attributes
▦	🔑	std_id	int	**References**: dbo.Student
▦	🔑	ex_id	int	**References**: dbo.Exam
▦	🔑	q_id	int	**References**: dbo.Question
▦		std_answer	varchar(1)	**Nullable**
▦		std_mark	int	**Nullable** **Computed**: ([dbo].[getQuestionMark]([q_id],[ex_id]))

Links to

	Table	Join	Title / Name / Description
⤚	dbo.Exam	**dbo.Exam_Answer**.ex_id = dbo.Exam.ex_id	FK__Exam_Answ__ex_id__1A9FBED1
⤚	dbo.Question	**dbo.Exam_Answer**.q_id = dbo.Question.q_id	Exam_Answer_fk_1
⤚	dbo.Student	**dbo.Exam_Answer**.std_id = dbo.Student.std_id	FK__Exam_Answ__std_i__19AB9A98

Unique keys

	Columns	Name / Description
🔑	std_id, ex_id, q_id	PK__Exam_Ans__95522241CAB6BE38

2.1.6. Table: dbo.Exam_Question

Columns

		Name	Data type	Description / Attributes
▦	🔑	ex_id	int	**References**: dbo.Exam
▦	🔑	q_id	int	**References**: dbo.Question

Links to

	Table	Join	Title / Name / Description
≻—	dbo.Exam	**dbo.Exam_Question**.ex_id = dbo.Exam.ex_id	FK__Exam_Ques__ex_id__16CF2DED
≻—	dbo.Question	**dbo.Exam_Question**.q_id = dbo.Question.q_id	Exam_Question_fk_1

Unique keys

	Columns	Name / Description
🔑	ex_id, q_id	PK__Exam_Que__E5067FB8B640039F

2.1.7. Table: dbo.Ins_Course

Columns

		Name	Data type	Description / Attributes
		crs_id	int	**References**: dbo.Course
		ins_id	int	**References**: dbo.Instructor
		evaluation	int	**Nullable**

Links to

	Table	Join	Title / Name / Description
	dbo.Course	**dbo.Ins_Course**.crs_id = dbo.Course.crs_id	FK__Ins_Cours__crs_i__04B07DB2
	dbo.Instructor	**dbo.Ins_Course**.ins_id = dbo.Instructor.ins_id	FK__Ins_Cours__ins_i__05A4A1EB

Unique keys

	Columns	Name / Description
	crs_id, ins_id	c_CA_PK

2.1.8. Table: dbo.Instructor

Columns

		Name	Data type	Description / Attributes
		ins_id	int	**References**: dbo.User
		salary	money	**Nullable**
		degree	varchar(50)	**Nullable**
		dept_id	int	**References**: dbo.Department
		hire_date	date	**Nullable** **Default**: getdate()

Links to

	Table	Join	Title / Name / Description
	dbo.Department	**dbo.Instructor**.dept_id = dbo.Department.dept_id	Instructor_fk_1
	dbo.User	**dbo.Instructor**.ins_id = dbo.User.usr_id	FK__Instructo__ins_i__7A32EF3F

Linked from

	Table	Join	Title / Name / Description
	dbo.Course_Attendance	**dbo.Instructor**.ins_id = dbo.Course_Attendance.ins_id	FK__Course_At__ins_i__01D41107
	dbo.Department	**dbo.Instructor**.ins_id = dbo.Department.mgr_id	FK__Departmen__mgr_i__0A695708
	dbo.Ins_Course	**dbo.Instructor**.ins_id = dbo.Ins_Course.ins_id	FK__Ins_Cours__ins_i__05A4A1EB

Unique keys

	Columns	Name / Description
	ins_id	PK__Instruct__9CB72D20884B1418

2.1.9. Table: dbo.MCQ

Columns

		Name	Data type	Description / Attributes
		q_id	int	**References**: dbo.Question
		ch_a	varchar(300)	
		ch_b	varchar(300)	
		ch_c	varchar(300)	
		ch_d	varchar(300)	

Links to

	Table	Join	Title / Name / Description
	dbo.Question	**dbo.MCQ**.q_id = dbo.Question.q_id	FK__MCQ__q_id__251D4D44

Unique keys

	Columns	Name / Description
	q_id	PK__MCQ__3D59B3102731E5B5

2.1.10. Table: dbo.Question

Columns

Name			Data type	Description / Attributes
▦	🔑	q_id	int	**Identity / Auto increment**
▦		q_type	varchar(3)	
▦		q_text	varchar(300)	
▦		corr_answer	varchar(1)	
▦		top_id	int	**References**: dbo.Topic

Links to

Table		Join	Title / Name / Description
≻—	dbo.Topic	**dbo.Question**.top_id = dbo.Topic.top_id	FK__Question__top_id__1E704FB5

Linked from

Table		Join	Title / Name / Description
—≺	dbo.Exam_Answer	**dbo.Question**.q_id = dbo.Exam_Answer.q_id	Exam_Answer_fk_1
—≺	dbo.Exam_Question	**dbo.Question**.q_id = dbo.Exam_Question.q_id	Exam_Question_fk_1
—≺	dbo.MCQ	**dbo.Question**.q_id = dbo.MCQ.q_id	FK__MCQ__q_id__251D4D44

Unique keys

Columns		Name / Description
🔑	q_id	PK__Question__3D59B3103AA8487C

2.1.11. Table: dbo.Student

Columns

		Name	Data type	Description / Attributes
	🔑	std_id	int	**References**: dbo.User
		dept_id	int	**References**: dbo.Department

Links to

	Table	Join	Title / Name / Description
≻—	dbo.Department	**dbo.Student**.dept_id = dbo.Department.dept_id	Student_fk_1
≻—	dbo.User	**dbo.Student**.std_id = dbo.User.usr_id	FK__Student__std_id__76625E5B

Linked from

	Table	Join	Title / Name / Description
—≺	dbo.Course_Attendance	**dbo.Student**.std_id = dbo.Course_Attendance.std_id	FK__Course_At__std_i__00DFECCE
—≺	dbo.Exam_Answer	**dbo.Student**.std_id = dbo.Exam_Answer.std_id	FK__Exam_Answ__std_i__19AB9A98

Unique keys

	Columns	Name / Description
🔑	std_id	PK__Student__0B0245BA6C2C6B33

2.1.12. Table: dbo.Topic

Columns

		Name	Data type	Description / Attributes
		top_id	int	**Identity / Auto increment**
		top_name	varchar(100)	
		crs_id	int	**References**: dbo.Course

Links to

	Table	Join	Title / Name / Description
	dbo.Course	**dbo.Topic**.crs_id = dbo.Course.crs_id	FK__Topic__crs_id__1022305E

Linked from

	Table	Join	Title / Name / Description
	dbo.Question	**dbo.Topic**.top_id = dbo.Question.top_id	FK__Question__top_id__1E704FB5

Unique keys

	Columns	Name / Description
	top_id	PK__Topic__B582A63DE394FC69
	top_name	UQ__Topic__A87EDAD622BAAB2F

2.1.13. Table: dbo.User

Columns

		Name	Data type	Description / Attributes
▤	🔑	usr_id	int	Identity / Auto increment
▤		user_type	varchar(1)	
▤		f_name	varchar(50)	
▤		l_name	varchar(50)	
▤		address	varchar(150)	Nullable
▤	🔑	email	varchar(90)	
▤		hashed_password	varchar(255)	

Linked from

	Table	Join	Title / Name / Description
⟜	dbo.Instructor	dbo.User.usr_id = dbo.Instructor.ins_id	FK__Instructo__ins_i__7A32EF3F
⟜	dbo.Student	dbo.User.usr_id = dbo.Student.std_id	FK__Student__std_id__76625E5B

Unique keys

	Columns	Name / Description
🔑	usr_id	PK__User__60621ABCA8F90BB0
🔑	email	UQ__User__AB6E6164DF8EB0C1

3. Views

3.1. Views

3.1.1. View: dbo.v_Instructor

Columns

		Name	Data type	Description / Attributes
▦		usr_id	int	
▦		f_name	varchar(50)	
▦		l_name	varchar(50)	
▦		address	varchar(150)	Nullable
▦		email	varchar(90)	
▦		salary	money	Nullable
▦		degree	varchar(50)	Nullable
▦		dept_id	int	
▦		dept_name	varchar(100)	

3.1.2. View: dbo.v_Students

Columns

		Name	Data type	Description / Attributes
▦		usr_id	int	
▦		f_name	varchar(50)	
▦		l_name	varchar(50)	
▦		address	varchar(150)	Nullable
▦		email	varchar(90)	
▦		dept_id	int	
▦		dept_name	varchar(100)	

4. Functions

4.1. Functions

4.1.1. Function: dbo.getQuestionMark

Input/Output

	Name	Data type	Description
→@→	Returns	int	
→@	q_id	int	
→@	ex_id	int	

4.1.2. Function: dbo.getSolvedExamsForStudents

Input/Output

	Name	Data type	Description
	Returns	table type	
	std_id	int	

4.1.3. Function: dbo.getStudentGrade

Input/Output

	Name	Data type	Description
	Returns	int	
	crs_id	int	
	std_id	int	

4.1.4. Function: dbo.getStudentsWhoSolvedExams

Input/Output

	Name	Data type	Description
@	Returns	table type	

5. Other

5.1. Procedures

5.1.1. Procedure: dbo.answerExam

Input/Output

	Name	Data type	Description
→@	std_id	int	
→@	ex_id	int	
→@	answer1	varchar(1)	
→@	answer2	varchar(1)	
→@	answer3	varchar(1)	
→@	answer4	varchar(1)	
→@	answer5	varchar(1)	
→@	answer6	varchar(1)	
→@	answer7	varchar(1)	
→@	answer8	varchar(1)	
→@	answer9	varchar(1)	
→@	answer10	varchar(1)	

Script

```
CREATE   PROCEDURE answerExam @std_id int, @ex_id int, @answer1 varchar(1),
                                                                   @answer2 varchar(1), @answer3 varchar(1),@answer4
varchar(1),
                                                                    @answer5 varchar(1),@answer6 varchar(1), @answer7
varchar(1),
                                                                     @answer8 varchar(1), @answer9 varchar(1),@answer10
varchar(1)
AS
BEGIN
           IF NOT EXISTS(select ex_id from Exam where ex_id = @ex_id)
                      SELECT 'Exam not found'
           ELSE
                      BEGIN
                                 IF NOT EXISTS(select std_id from Exam_Answer where std_id = @std_id AND ex_id = @ex_id)
                                            SELECT 'exam is not generated for student yet'
                                 ELSE
                                            BEGIN
                                                       -- select the question ids from the exam_question table using cursor
                                                       declare q_id_cursor cursor for
                                                       select eq.q_id
                                                       from Exam e
                                                       inner join Exam_Question eq
                                                       on e.ex_id = eq.ex_id
                                                       where e.ex_id = @ex_id;

                                                       -- add the answers to temp table and for answer cursor
                                                       DECLARE @answers_table TABLE (answer varchar(1))
                                                       INSERT INTO @answers_table values
                                                                                                 (@answer1), (@answer2), (@answer3),
                                                                                                 (@answer4), (@answer5), (@answer6),
                                                                                                 (@answer7), (@answer8), (@answer9),
(@answer10);

                                                       DECLARE answers_cursor CURSOR FOR
                                                                  SELECT answer
                                                                  FROM @answers_table

                                                       declare @q_counter int = 0;

                                                       -- update the answers
                                                       OPEN answers_cursor
                                                       OPEN q_id_cursor
                                                       declare @q_id int
                                                       declare @answer varchar(1)
                                                       FETCH NEXT FROM q_id_cursor INTO @q_id
                                                       WHILE @@FETCH_STATUS = 0 and @q_counter < 10
                                                       BEGIN
                                                                  FETCH NEXT FROM answers_cursor INTO @answer
                                                                  UPDATE Exam_Answer
                                                                  SET std_answer = @answer
                                                                  WHERE ex_id = @ex_id AND std_id = @std_id AND q_id = @q_id
                                                                  FETCH NEXT FROM q_id_cursor INTO @q_id
                                                                  select @q_counter = @q_counter + 1;
                                                       END
                                                       CLOSE q_id_cursor
                                                       CLOSE answers_cursor
                                                       DEALLOCATE q_id_cursor
                                                       DEALLOCATE answers_cursor

                                            END
                      END
END
```

5.1.2. Procedure: dbo.answerExamQuestion

Input/Output

	Name	Data type	Description
→@	ex_id	int	
→@	q_id	int	
→@	std_answer	varchar(1)	

Script

```
CREATE   PROC answerExamQuestion @ex_id int, @q_id int, @std_answer varchar(1)
AS
BEGIN
           Update Exam_Answer
           SET std_answer = @std_answer
           WHERE q_id = @q_id AND ex_id = @ex_id
END
```

5.1.3. Procedure: dbo.answerExamQuestion_uprotected

Input/Output

	Name	Data type	Description
→@	std_id	int	
→@	ex_id	int	
→@	q_id	int	
→@	std_answer	varchar(1)	

Script

```
CREATE   PROC answerExamQuestion_uprotected @std_id int, @ex_id int, @q_id int, @std_answer varchar(1)
AS
BEGIN
           Update Exam_Answer
           SET std_answer = @std_answer
           WHERE q_id = @q_id AND ex_id = @ex_id AND std_id = @std_id;
           end
```

5.1.4. Procedure: dbo.answerExamQuestionV2

Input/Output

	Name	Data type	Description
→@	std_id	int	
→@	ex_id	int	
→@	q_id	int	
→@	answer	varchar(1)	

Script

```
CREATE   PROC answerExamQuestionV2 @std_id int, @ex_id int, @q_id int, @answer varchar(1)
AS
BEGIN
           IF NOT EXISTS(select ex_id from Exam where ex_id = @ex_id)
                      SELECT 'Exam not found'
           ELSE
                      BEGIN
                                 IF NOT EXISTS(select q_id from Question where q_id = @q_id)
                                            SELECT 'Question not found'
                                 ELSE
                                            BEGIN
                                                       IF NOT EXISTS(select std_id from Exam_Answer where std_id = @std_id
AND ex_id = @ex_id AND q_id = @q_id)
                                                                  SELECT 'exam is not generated for student yet'
                                                       ELSE
                                                                  BEGIN
                                                                             BEGIN TRY
                                                                             BEGIN TRANSACTION
                                                                                        UPDATE Exam_Answer
                                                                                        SET std_answer = @answer
                                                                                        WHERE std_id = @std_id AND ex_id =
@ex_id AND q_id = @q_id
                                                                             COMMIT
                                                                             END TRY
                                                                             BEGIN CATCH
                                                                                        SELECT 'Failed to answer the
question'
                                                                                        ROLLBACK;
                                                                             END CATCH
                                                                  END
                                            END
                      END
END
```

5.1.5. Procedure: dbo.Assign_Course_to_Instructor

Input/Output

	Name	Data type	Description
→@	crs_name	varchar(20)	
→@	ins_id	int	

Script

```
/* ------------------------------------------------------------------------------- */
/*                  Course, Instructor CRUDs (Ins_Course table)                  */
/* ------------------------------------------------------------------------------- */

/* ------------------------------------------------------------------------------- */
/*                         Assign Instructor to Course                          */
/* ------------------------------------------------------------------------------- */

create   procedure Assign_Course_to_Instructor @crs_name varchar(20), @ins_id int
as
if exists (select crs_name from [Course] where crs_name = @crs_name)
           begin
                      if exists (select @ins_id from [Instructor] where ins_id = @ins_id)
                                 begin try
                                            insert into [Ins_Course] (crs_id, ins_id)
                                            values ((select crs_id from [Course] where crs_name = @crs_name), @ins_id)
                                 end try
                                 begin catch
                                            select 'the Instructor is already assgined to this course'
                                 end catch
                      else
                                 select 'There is no Instructor ID ' + @ins_id
           end
else
           select 'There is no Course named ' + @crs_name
```

5.1.6. Procedure: dbo.Courses_and_Students_of_Instructor

Input/Output

	Name	Data type	Description
→@	ins_id	int	

Script

```
/* ------------------------------------------------------------------------------- */
/*    Report that takes the instructor ID and returns the name of the courses      */
/*    that he teaches and the number of student per course.                       */
/* ------------------------------------------------------------------------------- */

create   proc Courses_and_Students_of_Instructor @ins_id int
as
if exists (select ins_id from [Instructor] where ins_id = @ins_id)
           begin
                      select c.crs_name, count(ca.std_id) as 'number of students per course'
                      from Instructor i
                      inner join Ins_Course ic
                      on i.ins_id = ic.ins_id
                      inner join Course c
                      on ic.crs_id = c.crs_id
                      inner join Course_Attendance ca
                      on (c.crs_id = ca.crs_id and ca.ins_id = @ins_id)
                      where i.ins_id = @ins_id
                      group by c.crs_name
           end
else
           select CONCAT('There is no instructor with this ID ', @ins_id)
```

5.1.7. Procedure: dbo.Delete_Course

Input/Output

	Name	Data type	Description
➔@	crs_name	varchar(20)	

Script

```
/* ------------------------------------------------------------------------------- */
/*                                Delete Course                                  */
/* ------------------------------------------------------------------------------- */

create   procedure Delete_Course @crs_name varchar(20)
as
if exists (select crs_name from [Course] where crs_name = @crs_name)
           delete from [Course] where crs_name = @crs_name
else
           select 'There is no course named ' + @crs_name
```

5.1.8. Procedure: dbo.Delete_Department

Input/Output

	Name	Data type	Description
→@	dept_name	varchar(20)	

Script

```
/* ------------------------------------------------------------------------- */
/*                           Delete Department                              */
/* ------------------------------------------------------------------------- */

create   procedure Delete_Department @dept_name varchar(20)
as
if exists (select dept_name from [Department] where dept_name = @dept_name)
begin
           begin try
                      delete from [Department] where dept_name = @dept_name
                      return  1 -- deleted successfully
           end try
           begin catch
                      select 'Please check for instructors and students in this department'
                      return 0
           end catch
end
else
begin
           select 'No department with name ' + @dept_name
           return 0
end
```

5.1.9. Procedure: dbo.Delete_Topic

Input/Output

	Name	Data type	Description
@	top_name	varchar(20)	

Script

```
/* ------------------------------------------------------------------------------- */
/*                                  Delete Topic                                  */
/* ------------------------------------------------------------------------------- */

create   procedure Delete_Topic @top_name varchar(20)
as
if exists (select top_name from [Topic] where top_name = @top_name)
           begin
           begin try
                                 delete from Topic where top_name = @top_name
           end try
           begin catch
                                 select 'Error'
           end catch
           end
else
           select 'There is no topic named ' + @top_name
```

5.1.10. Procedure: dbo.deleteExam

Input/Output

	Name	Data type	Description
→@	ex_id	int	

Script

```
-- TODO : Handle Student/Course enrollement

/* -------------------------------------------------------------------------------- */
/*                                    Delete Exam                                  */
/* -------------------------------------------------------------------------------- */

CREATE   PROC deleteExam @ex_id int
AS
BEGIN
           IF NOT EXISTS(select ex_id from Exam where ex_id = @ex_id)
                      SELECT 'Exam not found'
           ELSE
                      BEGIN
                                 BEGIN TRY
                                 BEGIN TRANSACTION -- Fathy Comment: Should we adjust other update procedures to include
transaction as well? Because If update fails, identity values get messed up
                                            -- Get the corresponding student and course and delete the grades of that student
                                            DECLARE @std_id int, @crs_id int
                                            SELECT @std_id = std_id from Exam_Answer WHERE ex_id = @ex_id
                                            SELECT @crs_id = crs_id from Exam WHERE ex_id = @ex_id

                                            -- Delete the Exam Answers
                                            DELETE FROM Exam_Answer
                                            WHERE ex_id = @ex_id

                                            -- Delete the Exam Questions
                                            DELETE FROM Exam_Question
                                            WHERE ex_id = @ex_id

                                            -- Delete the Exam itself
                                            DELETE FROM Exam
                                            WHERE ex_id = @ex_id
                                 COMMIT
                                 END TRY
                                 BEGIN CATCH
                                            SELECT 'Failed to delete the exam'
                                            ROLLBACK;
                                 END CATCH
                      END
END
```

5.1.11. Procedure: dbo.deleteInstructor

Input/Output

	Name	Data type	Description
→@	ins_id	int	

Script

```
/* ------------------------------------------------------------------------- */
/*                           Delete Instructor                              */
/* ------------------------------------------------------------------------- */

CREATE   PROCEDURE deleteInstructor
    @ins_id INTEGER
AS
BEGIN
    BEGIN TRY
    -- FIXME delete course attendance
    -- FIXME handle Ins_Course
    -- FIXME handle if instructor is a manager of a department


    DELETE FROM [Instructor]
    WHERE ins_id = @ins_id;

    DELETE FROM [User]
    WHERE usr_id = @ins_id;
    END TRY
    BEGIN CATCH
        SELECT 'failed to delete instructor' as [Error Message];
    END CATCH
END
```

5.1.12. Procedure: dbo.deleteQuestion

Input/Output

	Name	Data type	Description
→@	q_id	int	

Script

```
/* ------------------------------------------------------------------------------- */
/*                              Delete Question                                  */
/* ------------------------------------------------------------------------------- */

CREATE   PROC deleteQuestion @q_id int
AS
BEGIN
           IF EXISTS (select q_id from MCQ where q_id = @q_id)
           BEGIN
                      BEGIN TRY
                                 DELETE FROM MCQ
                                 WHERE q_id = @q_id
                                 ---------------------
                                 DELETE FROM Question
                                 WHERE q_id = @q_id
                      END TRY
                      BEGIN CATCH
                                 select 'This MCQ has been answered in an exam before'
                      END CATCH
           END
           ELSE
           BEGIN
                      BEGIN TRY
                                 DELETE FROM Question
                                 WHERE q_id = @q_id
                      END TRY
                      BEGIN CATCH
                                 select 'This TFQ has been answered in an exam before'
                      END CATCH
           END
END
```

5.1.13. Procedure: dbo.deleteStudent

Input/Output

	Name	Data type	Description
→@	std_id	int	

Script

```
/* -------------------------------------------------------------------------- */
/*                              Delete Student                              */
/* -------------------------------------------------------------------------- */

CREATE   PROCEDURE deleteStudent
    @std_id INTEGER
AS
BEGIN
    BEGIN TRY
    -- FIXME delete course attendance
    -- FIXME delete exam answers

    DELETE FROM [Student]
    WHERE std_id = @std_id;

    DELETE FROM [User]
    WHERE usr_id = @std_id;
    END TRY
    BEGIN CATCH
        SELECT 'failed to delete student' as [Error Message];
    END CATCH
END
```

5.1.14. Procedure: dbo.End_Course_for_Student

Input/Output

	Name	Data type	Description
→@	crs_name	varchar(20)	
→@	std_id	int	

Script

```
/* ------------------------------------------------------------------------------- */
/*                             End Course for Student                              */
/* ------------------------------------------------------------------------------- */

create   procedure End_Course_for_Student @crs_name varchar(20), @std_id int
as
BEGIN
if exists (select crs_name from [course] where crs_name = @crs_name)
           begin
                      if exists (select std_id from [Student] where std_id = @std_id)
                                 begin
                                            declare @id_course int
                                            select @id_course = crs_id from [Course] where crs_name = @crs_name
                                                       if exists (select crs_id, std_id from [Course_Attendance]
                                                                                       where (crs_id = @id_course and std_id
= @std_id))
                                                                  begin
                                                                             delete from [Course_Attendance]
                                                                             where (crs_id = @id_course and std_id = @std_id)
                                                                  end
                                                       else
                                                                  RETURN 0;
                                 end
                      else
                                 RETURN 0;
           end
else
           RETURN 0;

           RETURN 1;
           END
```

5.1.15. Procedure: dbo.End_Course_with_Instructor

Input/Output

	Name	Data type	Description
➔@	crs_name	varchar(20)	
➔@	ins_id	int	

Script

```
/* ------------------------------------------------------------------------------ */
/*                         End Course with Instructor                             */
/* ------------------------------------------------------------------------------ */

create   procedure End_Course_with_Instructor @crs_name varchar(20), @ins_id int
as
if not exists (select crs_name from [course] where crs_name = @crs_name)
           begin
                      if not exists (select ins_id from [Instructor] where ins_id = @ins_id)
                                 begin
                                            delete from [Ins_Course] where
                                            (ins_id = @ins_id and
                                            crs_id = (select crs_id from [Course] where crs_name = @crs_name))
                                 end
                      else
                                 select 'There is no Instructor with this ID'
           end
else
           select 'There is no Course named ' + @crs_name
```

5.1.16. Procedure: dbo.generateExam

Input/Output

	Name	Data type	Description
→@	crs_name	varchar(100)	
→@	std_id	int	
→@→	ex_id	int	

Script

```
CREATE   PROC generateExam @crs_name varchar(100), @std_id int, @ex_id int output
AS
BEGIN
           IF NOT EXISTS(SELECT crs_name FROM Course WHERE crs_name = @crs_name) OR NOT EXISTS (Select std_id from Student
WHERE std_id = @std_id)
                      SELECT 'Course or Student not found'
           ELSE
                      BEGIN
                      -- Get course ID
                                 DECLARE @crs_id int;
                                 SELECT @crs_id = crs_id FROM Course Where crs_name = @crs_name
                      IF NOT EXISTS (Select std_id from Course_Attendance WHERE std_id = @std_id AND crs_id = @crs_id)
                                 SELECT 'Student not enrolled in this course'
                      ELSE
                                 BEGIN
                                            -- Create exam instance and get the exam ID
                                            INSERT INTO Exam(date, crs_id)
                                                       VALUES(GETDATE(), @crs_id)
                                            SELECT @ex_id = SCOPE_IDENTITY()

                                            -- Create Cursor for row by row insertion in other tables
                                            DECLARE C1 Cursor
                                            -- Statement will return 10 random questions IDs for specified course
                                            -- with this assumption in mind ( 3 TF & 7 MCQ )
                                            FOR SELECT *
                                                                  FROM (SELECT top(3)q.q_id
                                                                                        FROM Question q, Topic t, Course c
                                                                                        WHERE q_type ='TF'
                                                                                                   AND q.top_id = t.top_id
                                                                                                   AND c.crs_id = t.crs_id
                                                                                                   AND c.crs_name = @crs_name
                                                                                        ORDER BY NEWID()) TF
                                                                  UNION ALL
                                                                  SELECT *
                                                                  FROM (
                                                                                        SELECT top(7)q.q_id
                                                                                        FROM Question q, Topic t, Course c
                                                                                        WHERE q_type ='MCQ'
                                                                                                   AND q.top_id = t.top_id
                                                                                                   AND c.crs_id = t.crs_id
                                                                                                   AND c.crs_name = @crs_name
                                                                                        ORDER BY NEWID()) M
                                            FOR read only
                                            DECLARE @q_id int
                                            OPEN C1
                                            FETCH C1 INTO @q_id

                                            WHILE @@FETCH_STATUS = 0
                                            BEGIN
                                                       -- INSERT the q_id in tables Exam_Answer & Exam_Question
                                                       INSERT INTO Exam_Question (ex_id, q_id)
                                                                  VALUES (@ex_id, @q_id)
                                                                  -- NOTE: @ex_id is a fixed value and doesn't change with
the cursor

                                                       INSERT INTO Exam_Answer( std_id, ex_id, q_id)
                                                                  VALUES(@std_id, @ex_id, @q_id)
                                                                  -- NOTE: @ex_id and @std_id are fixed values and don't
change with the cursor

                                                       FETCH C1 INTO @q_id
                                            END
                                            CLOSE C1
                                            DEALLOCATE C1
                                 END

                      END
END
```

5.1.17. Procedure: dbo.GET_QUESTIONS_for_STUDENT_EXAM

Input/Output

	Name	Data type	Description
→@	exam_id	int	
→@	stduent_id	int	

Script

```
/*      --------------------------------------------------------------------------------     */
/*                    Report that takes exam number and the student ID then
/*                               returns the Questions in this exam with the student answers.
*/
/*     --------------------------------------------------------------------------------      */

create   procedure GET_QUESTIONS_for_STUDENT_EXAM @exam_id int, @stduent_id int
as
if exists (select ex_id from [Exam] where ex_id = @exam_id)
           begin
                      if exists (select std_id from Student where std_id = @stduent_id)
                                 begin
                                            select q.q_text, q.q_type, ea.std_answer, q.corr_answer
                                            from Exam_Answer ea
                                            inner join Exam_Question eq
                                            on ea.ex_id = eq.ex_id
                                            inner join Question q
                                            on eq.q_id = q.q_id
                                            where (ea.ex_id = @exam_id and ea.std_id = @stduent_id)
                                 end
                      else
                                 select CONCAT('There is no student with this ID', @stduent_id)
           end
else
           select CONCAT('There is no exam with this ID', @exam_id)
```

5.1.18. Procedure: dbo.Get_Questions_in_Exam

Input/Output

	Name	Data type	Description
→@	ex_id	int	

Script

```
/* -------------------------------------------------------------------------------- */
/*    Report that takes exam number and returns the Questions in it and choices            */
/* -------------------------------------------------------------------------------- */

-- Fathy Comment: It is mentioned it should be a "Freeform report", refer to this link
-- https://docs.microsoft.com/en-us/sql/reporting-services/tutorial-creating-a-free-form-report-report-builder?view=sql-
server-ver15

create   procedure Get_Questions_in_Exam @ex_id int
as
if exists(select ex_id from Exam where ex_id = @ex_id)
begin
           select q.q_text, q.q_type, mcq.ch_a, mcq.ch_b, mcq.ch_c, mcq.ch_d
           from Exam e
           inner join Exam_Question eq
           on e.ex_id = eq.ex_id
           inner join Question q
           on eq.q_id = q.q_id
           left join MCQ mcq
           on q.q_id = mcq.q_id
           where e.ex_id = @ex_id
end
else
           select 'Wrong Exam ID'
```

5.1.19. Procedure: dbo.getAllCourses

Script

```
/* ------------------------------------------------------------------------------ */
/*                                 Course CRUDs                                  */
/* ------------------------------------------------------------------------------ */

/* ------------------------------------------------------------------------- */
/*                              get all courses                             */
/* ------------------------------------------------------------------------- */


CREATE   PROCEDURE [dbo].[getAllCourses]
AS
BEGIN
           SELECT * FROM [dbo].[Course];
END
```

5.1.20. Procedure: dbo.getAllDepartments

Script

```
/* ------------------------------------------------------------------------- */
/*                              Read Department                            */
/* ------------------------------------------------------------------------- */

CREATE   PROCEDURE getAllDepartments
AS
BEGIN
    SELECT *
    FROM Department;
END
```

5.1.21. Procedure: dbo.GetAllExamAnswers

Script

```
/* ------------------------------------------------------------------------------ */
/*                              Get All Exam Answers                              */
/* ------------------------------------------------------------------------------ */

CREATE   PROC GetAllExamAnswers
AS
BEGIN
SELECT * FROM Exam_Answer
END
RETURN
```

5.1.22. Procedure: dbo.getAllExams

Script

```
/* ------------------------------------------------------------------------------ */
/*                                Exam table CRUDs                               */
/* ------------------------------------------------------------------------------ */

/* ------------------------------------------------------------------------------ */
/*                         Generate Exam for a specific course                    */
/* ------------------------------------------------------------------------------ */

CREATE   PROC getAllExams
AS
           SELECT * from Exam;
```

5.1.23. Procedure: dbo.getAllInstructors

Script

```
/* ------------------------------------------------------------------------ */
/*                             Read Instructor                             */
/* ------------------------------------------------------------------------ */

CREATE   PROCEDURE getAllInstructors
AS
BEGIN
    SELECT *
    FROM v_Instructor;
END
```

5.1.24. Procedure: dbo.getAllStudents

Script

```
/* -------------------------------------------------------------------------- */
/*                              Read Student                                  */
/* -------------------------------------------------------------------------- */


CREATE   PROCEDURE getAllStudents
AS
BEGIN
    SELECT *
    FROM v_Students;
END
```

5.1.25. Procedure: dbo.getAvailableCoursesForExam

Input/Output

	Name	Data type	Description
→@	std_id	int	

Script

```
create     PROC [dbo].[getAvailableCoursesForExam] @std_id int
AS
    BEGIN
        select c.crs_name
        from Course c, Course_Attendance ca, Student s
        where c.crs_id = ca.crs_id and ca.std_id = s.std_id and s.std_id = @std_id
        EXCEPT
                      select c.crs_name
                      from Course c
                      INNER JOIN Course_Attendance ca
                      ON c.crs_id = ca.crs_id
                      INNER JOIN Student s
                      ON ca.std_id = s.std_id
                      INNER JOIN Exam e
                      ON c.crs_id = e.crs_id
                      and e.ex_id in (select ex_id from getSolvedExamsForStudents(@std_id))
                      where s.std_id = @std_id
           END
```

5.1.26. Procedure: dbo.getDepartment

Input/Output

	Name	Data type	Description
→@	dept_id	int	

Script

```
CREATE   PROCEDURE getDepartment
    @dept_id INT
AS
BEGIN
    IF EXISTS (SELECT dept_id FROM Department WHERE dept_id = @dept_id)
        BEGIN
            SELECT D.dept_name, D.mgr_id, U.f_name + ' ' + U.l_name AS [Manager Name]
            FROM Department D, [User] U
            WHERE D.mgr_id = U.usr_id
        END
    ELSE
        SELECT 'Department ID does not exist' AS [Error Message]
END
```

5.1.27. Procedure: dbo.getDeptData

Input/Output

	Name	Data type	Description
➔@	dept_id	int	

Script

```
/* -------------------------------------------------------------------------- */
/*                            Read Department                               */
/* -------------------------------------------------------------------------- */

-- Fathy Comment: This procedure was missing

CREATE   PROCEDURE getDeptData
    @dept_id INT
AS
BEGIN
    IF EXISTS (SELECT dept_id FROM Department WHERE dept_id = @dept_id)
        BEGIN
            SELECT D.dept_name, D.mgr_id, U.f_name + ' ' + U.l_name AS [Manager Name]
            FROM Department D, [User] U
            WHERE D.mgr_id = U.usr_id
        END
    ELSE
        SELECT 'Department ID does not exist' AS [Error Message]
END
```

5.1.28. Procedure: dbo.getInsForStdCourse

Input/Output

	Name	Data type	Description
→@	std_id	int	
→@	crs_name	varchar(40)	

Script

```
CREATE   PROC getInsForStdCourse @std_id int, @crs_name varchar(40)
AS
BEGIN
           select u.f_name+' '+u.l_name as[full_name]
           from Ins_Course i, Course_Attendance ca, [User] u, Student s, Course c
           where u.usr_id = i.ins_id and ca.ins_id = i.ins_id and s.std_id = ca.std_id and c.crs_id = ca.crs_id
                                 and s.std_id = @std_id and c.crs_name =@crs_name
END
```

5.1.29. Procedure: dbo.getInstructorsInDepartment

Input/Output

	Name	Data type	Description
→@	dept_id	int	

Script

```
CREATE   PROCEDURE getInstructorsInDepartment
    @dept_id INTEGER
AS
BEGIN
    SELECT usr_id, f_name,
        l_name,
        address,
        email,
        salary,
        degree
    FROM v_Instructors
    WHERE dept_id = @dept_id;
END
```

5.1.30. Procedure: dbo.getQuestionAndStudentAnswer

Input/Output

	Name	Data type	Description
→@	ex_id	int	

Script

```
CREATE   PROC getQuestionAndStudentAnswer @ex_id int
AS
BEGIN
           select ea.*, c.crs_name, t.top_name
           from Exam_Answer ea, Course c, Topic t, Question q, Exam e
           where ea.ex_id = @ex_id AND ea.q_id = q.q_id AND t.top_id = q.top_id AND e.crs_id = c.crs_id AND t.crs_id =
c.crs_id AND e.ex_id = @ex_id
END
```

5.1.31. Procedure: dbo.getStudentAnswer

Input/Output

	Name	Data type	Description
→@	exam_id	int	
→@	stduent_id	int	

Script

```
/*      --------------------------------------------------------------------------------     */
/*                    Report that takes exam number and the student ID then
/*                               returns the Questions in this exam with the student answers.
*/
/*     --------------------------------------------------------------------------------      */

create   procedure getStudentAnswer @exam_id int, @stduent_id int
as
if exists (select ex_id from [Exam] where ex_id = @exam_id)
           begin
                      if exists (select std_id from Student where std_id = @stduent_id)
                                 begin
                                            select q.q_text, q.q_type, ea.std_answer, q.corr_answer ,mcq.ch_a, mcq.ch_b,
mcq.ch_c, mcq.ch_d
                                            from Exam_Answer ea
                                            inner join Exam_Question eq
                                            on ea.ex_id = eq.ex_id and ea.q_id = eq.q_id
                                            inner join Question q
                                            on eq.q_id = q.q_id
                                            left join MCQ mcq
                                            on q.q_id = mcq.q_id
                                            where (ea.ex_id = @exam_id and ea.std_id = @stduent_id)
                                 end
                      else
                                 select CONCAT('There is no student with this ID', @stduent_id)
           end
else
           select CONCAT('There is no exam with this ID', @exam_id)
```

5.1.32. Procedure: dbo.getStudentsInDepartment

Input/Output

	Name	Data type	Description
→@	dept_id	int	

Script

```
/*      -------------------------------------------------------------------------------     */
/*    Report that returns the students information according to Department No parameter     */
/*     -------------------------------------------------------------------------------      */

CREATE   PROCEDURE getStudentsInDepartment
    @dept_id INTEGER
AS
BEGIN
    SELECT usr_id, f_name,
        l_name,
        address,
        email
    FROM v_Students
    WHERE dept_id = @dept_id;
END
```

5.1.33. Procedure: dbo.GetUser

Input/Output

	Name	Data type	Description
→@	email	varchar(90)	
→@	password	varchar(255)	

Script

```
/* ------------------------------------------------------------------------- */
/*         Get User according to E-mail and password (used in login form)     */
/* ------------------------------------------------------------------------- */

CREATE   PROC GetUser @email VARCHAR(90), @password VARCHAR(255)
AS
BEGIN
DECLARE @hashed_password AS VARCHAR(255)
SELECT @hashed_password = HASHBYTES('SHA2_256', @password+'seed');
SELECT *
FROM [User] U
WHERE U.email = @email AND @hashed_password = U.hashed_password
END
```

5.1.34. Procedure: dbo.Insert_Course

Input/Output

	Name	Data type	Description
→@	crs_name	varchar(20)	

Script

```
/* ------------------------------------------------------------------------------ */
/*                              Insert Course                                   */
/* ------------------------------------------------------------------------------ */

create   procedure Insert_Course @crs_name varchar(20)
as
BEGIN
if not exists (select @crs_name from [Course] where crs_name = @crs_name)
           insert into [course] values(@crs_name)
else
           RETURN 0;

RETURN 1;
END
```

5.1.35. Procedure: dbo.Insert_Department

Input/Output

	Name	Data type	Description
→@	dept_name	varchar(20)	
→@	id_mgr	int	
→@→	dept_id	int	

Script

```
/* ----------------------- required helping procedure ----------------------- */

/* -------------------------------------------------------------------------- */
/*                           Create Department                              */
/* -------------------------------------------------------------------------- */

-- Department [dept_id, dept_name, mgr_id]
create   procedure Insert_Department @dept_name varchar(20), @id_mgr int, @dept_id int output
as
           if exists (select ins_id from [Instructor] where ins_id = @id_mgr)
           begin
                      insert into [Department] values (@dept_name, @id_mgr)
                      select @dept_id = dept_id from Department where dept_name = @dept_name
                      return 1
           end
           else
           begin
                      select 'no instructor with ID ' + cast(@id_mgr as varchar) +' found'
                      return 0
           end
------------------------------------------------------------------------
```

5.1.36. Procedure: dbo.Insert_Department_With_Manager

Input/Output

	Name	Data type	Description
→@	dept_name	varchar(100)	
→@	f_name	varchar(50)	
→@	l_name	varchar(50)	
→@	address	varchar(150)	
→@	email	varchar(90)	
→@	password	varchar(255)	
→@	salary	money	
→@	degree	varchar(50)	
→@→	dept_id	int	
→@→	mgr_id	int	

Script

```
/* -------------------------------------------------------------------------- */
/*                    Create Department with manager                         */
/* -------------------------------------------------------------------------- */

CREATE   PROCEDURE [dbo].[Insert_Department_With_Manager]
    @dept_name varChar(100),
    @f_name varChar(50),
    @l_name varChar(50),
    @address varChar(150),
    @email varChar(90),
    @password varChar(255),
    @salary MONEY,
    @degree varChar(50),
    @dept_id INTEGER OUTPUT,
    @mgr_id INTEGER OUTPUT
AS
BEGIN
    -- TODO use try catch for errors
    ALTER TABLE Instructor NOCHECK CONSTRAINT Instructor_fk_1;
    DECLARE @_no_dep INT = 0;
    Exec [dbo].[Insert_Instructor] @f_name, @l_name, @address, @email, @password, @salary, @degree, @_no_dep, @mgr_id OUTPUT;
    -- TODO replace this with the real procedure
    Exec [dbo].[Insert_Department] @dept_name, @mgr_id, @dept_id OUTPUT;
    UPDATE Instructor SET dept_id = @dept_id WHERE ins_id = @mgr_id;
    ALTER TABLE Instructor CHECK CONSTRAINT Instructor_fk_1;

END
```

5.1.37. Procedure: dbo.Insert_Instructor

Input/Output

Name		Data type	Description
→@	f_name	varchar(50)	
→@	l_name	varchar(50)	
→@	address	varchar(150)	
→@	email	varchar(90)	
→@	password	varchar(255)	
→@	salary	money	
→@	degree	varchar(50)	
→@	dept_id	int	
→@→	ins_id	int	

Script

```
/* ---------------------------------------------------------------------------- */
/*                         Create Instructor                                   */
/* ---------------------------------------------------------------------------- */

-- Instructor [ins_id, salary, degree, dept_id]
/*
user has type 'I' capital I
*/
CREATE   PROCEDURE [dbo].[Insert_Instructor]
    @f_name varChar(50),
    @l_name varChar(50),
    @address varChar(150),
    @email varChar(90),
    @password varChar(255),
    @salary MONEY,
    @degree varChar(50),
    @dept_id INTEGER,
    @ins_id INTEGER OUTPUT
AS
BEGIN
    BEGIN TRY
    DECLARE @usr_id INTEGER;
    Exec [PRIVATE].[Insert_User] 'I', @f_name, @l_name, @address, @email, @password, @usr_id OUTPUT;
    INSERT INTO [Instructor]
        (ins_id, salary, degree, dept_id)
    VALUES
        (
            @usr_id,
            @salary,
            @degree,
            @dept_id
    );
    SET @ins_id = @usr_id;
    END TRY
    BEGIN CATCH
        SELECT 'failed to insert instructor' as [Error Message];
    END CATCH
END
```

5.1.38. Procedure: dbo.Insert_Student

Input/Output

	Name	Data type	Description
→@	f_name	varchar(50)	
→@	l_name	varchar(50)	
→@	address	varchar(150)	
→@	email	varchar(90)	
→@	password	varchar(255)	
→@	dept_id	int	
→@→	stu_id	int	

Script

```
/* -------------------------------------------------------------------------- */
/*                             Create Student                                */
/* -------------------------------------------------------------------------- */

-- Student [std_id, dept_id]
/*
user has type 'S' capital S
*/
CREATE   PROCEDURE [dbo].[Insert_Student]
    @f_name varChar(50),
    @l_name varChar(50),
    @address varChar(150),
    @email varChar(90),
    @password varChar(255),
    @dept_id INTEGER,
    @stu_id INTEGER OUTPUT
AS
BEGIN
    begin try
    Exec [PRIVATE].[Insert_User] 'S', @f_name, @l_name, @address, @email, @password, @stu_id OUTPUT;
    INSERT INTO [Student]
    VALUES
        (
            @stu_id,
            @dept_id
    );
           RETURN 1;
    END TRY
    BEGIN CATCH
        RETURN 0;
    END CATCH
END
```

5.1.39. Procedure: dbo.Insert_Topic

Input/Output

	Name	Data type	Description
→@	top_name	varchar(20)	
→@	crs_name	varchar(20)	

Script

```
/* ------------------------------------------------------------------------------ */
/*                                  Topic CRUDs                                  */
/* ------------------------------------------------------------------------------ */

/* ------------------------------------------------------------------------------ */
/*                                  Insert Topic                                 */
/* ------------------------------------------------------------------------------ */

create   procedure Insert_Topic @top_name varchar(20), @crs_name varchar(20)
as
BEGIN
declare @id_crs int
if not exists (select top_name from [Topic] where top_name = @top_name)
           begin
                      begin try
                                 select @id_crs = crs_id from [Course] where crs_name = @crs_name
                                 insert into Topic values (@top_name, @id_crs)
                      end try
                      begin catch
                                 RETURN 0;
                      end catch
           end
else
           RETURN 0;
RETURN 1;
END
```

5.1.40. Procedure: dbo.insertMCQ

Input/Output

	Name	Data type	Description
→@	top_id	int	
→@	q_text	varchar(300)	
→@	ch_a	varchar(300)	
→@	ch_b	varchar(300)	
→@	ch_c	varchar(300)	
→@	ch_d	varchar(300)	
→@	corr_answer	varchar(1)	
→@→	q_id	int	

Script

```
/* ------------------------------------------------------------------------------- */
/*                            MCQ Question                                       */
/* ------------------------------------------------------------------------------- */

-- MCQ [q_id, ch_a, ch_b, ch_c, ch_d]
CREATE   PROC insertMCQ
                      @top_id int,
                      @q_text varchar(300),
                      @ch_a varchar(300),
                      @ch_b varchar(300),
                      @ch_c varchar(300),
                      @ch_d varchar(300),
                      @corr_answer varchar(1),
                      @q_id int output
AS
BEGIN
           IF NOT EXISTS( SELECT top_id FROM Topic WHERE top_id = @top_id)
                      SELECT 'Make sure topic already exists'
           ELSE
                      BEGIN
                                 BEGIN TRY
                                            EXECUTE [PRIVATE].insertQuestion @top_id, 'MCQ', @q_text, @corr_answer, @q_id
output
                                            INSERT INTO MCQ (q_id, ch_a, ch_b, ch_c, ch_d)
                                                       VALUES(@q_id, @ch_a, @ch_b, @ch_c, @ch_d)
                                 END TRY
                                 BEGIN CATCH
                                            select 'Make sure you entered the data correctly'
                                 END CATCH
                      END
END
```

5.1.41. Procedure: dbo.insertTFQ

Input/Output

	Name	Data type	Description
→@	top_id	int	
→@	q_text	varchar(300)	
→@	corr_answer	varchar(1)	
→@→	q_id	int	

Script

```
/* ------------------------------------------------------------------------------ */
/*                      True or False Question                                   */
/* ------------------------------------------------------------------------------ */

CREATE   PROC insertTFQ
                      @top_id int,
                      @q_text varchar(300),
                      @corr_answer varchar(1),
                      @q_id int output
AS
BEGIN
           IF NOT EXISTS( SELECT top_id FROM Topic WHERE top_id = @top_id)
                      SELECT 'Make sure topic already exists'
           ELSE
                      BEGIN
                                 BEGIN TRY
                                            EXECUTE [PRIVATE].insertQuestion @top_id, 'TF', @q_text, @corr_answer, @q_id
output
                                 END TRY
                                 BEGIN CATCH
                                            SELECT 'Make sure data is correct'
                                 END CATCH
                      END
END
```

5.1.42. Procedure: dbo.returnGrades

Input/Output

	Name	Data type	Description
→@	std_id	int	

Script

```
CREATE   PROCEDURE dbo.returnGrades
@std_id INT
AS
BEGIN
           DECLARE @t TABLE
           (
                      crs_id INT,
                      crs_name VARCHAR(100),
                      std_grade INT
           )
    IF EXISTS (SELECT std_id FROM Student WHERE std_id = @std_id)
                      BEGIN
                                 INSERT INTO @t (crs_id, crs_name, std_grade)
                                 SELECT CA.crs_id, C.crs_name, CA.grade
                                 FROM Course_Attendance CA, Course C
                                 WHERE CA.crs_id = C.crs_id AND CA.std_id = @std_id
                                 SELECT * FROM @t
                      END
    ELSE
        SELECT 'Student ID does not exist' AS [Error Message]
END
```

5.1.43. Procedure: dbo.setCourseName

Input/Output

	Name	Data type	Description
→@	crs_id	int	
→@	crs_name	varchar(50)	

Script

```
/* ------------------------------------------------------------------------------- */
/*                         Update Course Name                                     */
/* ------------------------------------------------------------------------------- */

CREATE   PROCEDURE setCourseName @crs_id INT, @crs_name VARCHAR(50)
AS
BEGIN
    IF EXISTS(SELECT crs_id FROM Course WHERE crs_id = @crs_id)
        BEGIN
            UPDATE [Course]
            SET crs_name = @crs_name
            WHERE crs_id = @crs_id
        END

    ELSE
        SELECT 'Course ID not found' AS [Error Message]
END
```

5.1.44. Procedure: dbo.setTopicName

Input/Output

	Name	Data type	Description
→@	top_id	int	
→@	top_name	varchar(50)	

Script

```
/* ------------------------------------------------------------------------------ */
/*                                Update Topic Name                              */
/* ------------------------------------------------------------------------------ */


CREATE   PROCEDURE setTopicName @top_id INT, @top_name VARCHAR(50)
AS
BEGIN
    IF EXISTS(SELECT top_id FROM Topic WHERE top_id = @top_id)
        BEGIN
            UPDATE [Topic]
            SET top_name = @top_name
            WHERE top_id = @top_id
        END

    ELSE
        SELECT 'Topic ID not found' AS [Error Message]
END
```

5.1.45. Procedure: dbo.sp_returngrades

Input/Output

	Name	Data type	Description
→@	std_id	int	

Script

```
CREATE   PROCEDURE dbo.sp_returngrades
@std_id INT

AS
BEGIN
    IF EXISTS (SELECT std_id FROM Student WHERE std_id = @std_id)
                      BEGIN
                                 SELECT CA.crs_id, C.crs_name, CA.grade
                                 FROM Course_Attendance CA, Course C
                                 WHERE CA.crs_id = C.crs_id AND CA.std_id = @std_id
                      END
    ELSE
        SELECT 'Student ID does not exist' AS [Error Message]
END
```

5.1.46. Procedure: dbo.Student_Take_course_with_Instructor

Input/Output

	Name	Data type	Description
⇢@	std_id	int	
⇢@	crs_id	int	
⇢@	ins_id	int	

Script

```
/* ------------------------------------------------------------------------------- */
/*           Student, Course, Instructor CRUDs (Course_Attendance table)          */
/* ------------------------------------------------------------------------------- */

/* ------------------------------------------------------------------------------- */
/*                     Student Take Course with Instructor                         */
/* ------------------------------------------------------------------------------- */

create   procedure Student_Take_course_with_Instructor @std_id int, @crs_id int, @ins_id int
as
BEGIN TRY
if exists (select ins_id from [Instructor] where ins_id = @ins_id)
and exists (select std_id from [Student] where std_id = @std_id)
           begin
                       if exists (select crs_id from [Course] where crs_id = @crs_id)
                                  begin
                                             if exists (select crs_id, ins_id from [Ins_Course]
                                             where (crs_id = @crs_id and ins_id = @ins_id))
                                             insert into Course_Attendance (crs_id, std_id, ins_id)
                                             values(@crs_id, @std_id, @ins_id)

                                             else
                                                        RETURN 0;
                                  end
                       else
                                  RETURN 0;
           end

else
           RETURN 0;
END TRY
BEGIN CATCH
           RETURN 0;
END CATCH
RETURN 1;
```

5.1.47. Procedure: dbo.Topics_of_Course

Input/Output

	Name	Data type	Description
→@	crs_name	varchar(20)	

Script

```
/* ------------------------------------------------------------------------------- */
/*                              Report that takes course ID and returns its topics                */
/* ------------------------------------------------------------------------------- */

create   procedure Topics_of_Course @crs_name varchar(20)
as
if exists(select crs_name from Course where crs_name = @crs_name)
begin
           select t.top_name
           from Course c
           inner join Topic t
           on c.crs_id = t.crs_id
           where c.crs_name = @crs_name
end
else
           select 'There is no course named ' + @crs_name
```

5.1.48. Procedure: dbo.Update_Department_Manager

Input/Output

	Name	Data type	Description
→@	dept_name	varchar(20)	
→@	mgr_id	int	

Script

```
/* ------------------------------------------------------------------------ */
/*                    Update Department Manager                             */
/* ------------------------------------------------------------------------ */

create   procedure Update_Department_Manager @dept_name varchar(20), @mgr_id int
as
if exists (select dept_name from [Department] where dept_name = @dept_name)
begin
           begin try
                      update [Department] set mgr_id = @mgr_id where dept_name = @dept_name
           end try
           begin catch
                      select 'Error: There is no an instructor with ID ' + @mgr_id
           end catch
end
else
           select 'No department with name ' + @dept_name
```

5.1.49. Procedure: dbo.updateInstructorData

Input/Output

	Name	Data type	Description
→@	f_name	varchar(50)	
→@	l_name	varchar(50)	
→@	address	varchar(150)	
→@	email	varchar(90)	
→@	salary	money	
→@	degree	varchar(50)	
→@	dept_id	int	
→@	ins_id	int	

Script

```
/* -------------------------------------------------------------------------- */
/*                       Update Instructor Data                             */
/* -------------------------------------------------------------------------- */

CREATE   PROCEDURE updateInstructorData
    @f_name varChar(50),
    @l_name varChar(50),
    @address varChar(150),
    @email varChar(90),
    @salary MONEY,
    @degree varChar(50),
    @dept_id INTEGER,
    @ins_id INTEGER
AS
BEGIN
    BEGIN TRY
    -- update the userInfo
    EXEC [dbo].[updateUserData]
    @usr_id = @ins_id,
    @f_name = @f_name,
    @l_name = @l_name,
    @address = @address,
    @email = @email;
    -- update instructor specificInfo
    UPDATE [Instructor]
    SET salary = @salary,
        degree = @degree,
        dept_id = @dept_id
    WHERE ins_id = @ins_id;
    END TRY
    BEGIN CATCH
        -- TODO send specific error message when department id is not in the database
        SELECT 'failed to update instructor' as [Error Message];
    END CATCH
END
```

5.1.50. Procedure: dbo.updateMCQ

Input/Output

	Name	Data type	Description
→@	q_id	int	
→@	top_id	int	
→@	q_text	varchar(300)	
→@	ch_a	varchar(300)	
→@	ch_b	varchar(300)	
→@	ch_c	varchar(300)	
→@	ch_d	varchar(300)	
→@	corr_answer	varchar(1)	

Script

```
/* ------------------------------------------------------------------------------ */
/*                             Update Question                                  */
/* ------------------------------------------------------------------------------ */

/* ------------------------------------------------------------------------------ */
/*                                Update MCQ                                    */
/* ------------------------------------------------------------------------------ */

CREATE   PROC updateMCQ
                      @q_id int,
                      @top_id int,
                      @q_text varchar(300),
                      @ch_a varchar(300),
                      @ch_b varchar(300),
                      @ch_c varchar(300),
                      @ch_d varchar(300),
                      @corr_answer varchar(1)
AS
BEGIN
-- Check for question existence
           IF NOT EXISTS( SELECT q_id FROM Question where q_id = @q_id)
                      SELECT 'Question does not exist'
           ELSE
                      BEGIN
                                 IF NOT EXISTS( SELECT top_id FROM Topic WHERE top_id = @top_id)
                                            SELECT 'Make sure topic already exists'
                                 ELSE
                                            BEGIN
                                                       BEGIN TRY
                                                       BEGIN TRANSACTION
                                                                  UPDATE Question
                                                                  SET
                                                                             top_id = @top_id,
                                                                             q_text = @q_text,
                                                                             corr_answer = @corr_answer
                                                                  WHERE q_id = @q_id;
                                                                  -------------------
                                                                  UPDATE MCQ
                                                                  SET
                                                                             ch_a = @ch_a,
                                                                             ch_b = @ch_b,
                                                                             ch_c = @ch_c,
                                                                             ch_d = @ch_d
                                                                  WHERE q_id = @q_id
                                                       COMMIT
                                                       END TRY
                                                       BEGIN CATCH
                                                                  select 'Make sure you entered the data correctly'
                                                                  ROLLBACK;
                                                       END CATCH
                                            END
                      END
END
```

5.1.51. Procedure: dbo.updateStudentData

Input/Output

	Name	Data type	Description
→@	f_name	varchar(50)	
→@	l_name	varchar(50)	
→@	address	varchar(150)	
→@	email	varchar(90)	
→@	dept_id	int	
→@	std_id	int	

Script

```sql
/* -------------------------------------------------------------------------- */
/*                          Update Student Data                              */
/* -------------------------------------------------------------------------- */

CREATE   PROCEDURE updateStudentData
    @f_name varChar(50),
    @l_name varChar(50),
    @address varChar(150),
    @email varChar(90),
    @dept_id INTEGER,
    @std_id INTEGER
AS
BEGIN
    BEGIN TRY
    -- update the userInfo
    EXEC [dbo].[updateUserData]
    @usr_id = @std_id,
    @f_name = @f_name,
    @l_name = @l_name,
    @address = @address,
    @email = @email;
    -- update student specificInfo
    UPDATE [Student]
    SET dept_id = @dept_id
    WHERE std_id = @std_id;
    END TRY
    BEGIN CATCH
        -- TODO send specific error message when department id is not in the database
        SELECT 'failed to update student' as [Error Message];
    END CATCH
END
```

5.1.52. Procedure: dbo.updateTFQ

Input/Output

	Name	Data type	Description
→@	q_id	int	
→@	top_id	int	
→@	q_text	varchar(300)	
→@	corr_answer	varchar(1)	

Script

```
/* ------------------------------------------------------------------------------- */
/*                           Update True/False                                     */
/* ------------------------------------------------------------------------------- */

CREATE   PROC updateTFQ
                      @q_id int,
                      @top_id int,
                      @q_text varchar(300),
                      @corr_answer varchar(1)
AS
BEGIN
IF NOT EXISTS(SELECT q_id FROM Question where q_id = @q_id)
           SELECT 'Question does not exist'
ELSE
BEGIN
                      IF NOT EXISTS( SELECT top_id FROM Topic WHERE top_id = @top_id)
                      SELECT 'Make sure topic already exists'
           ELSE
                      BEGIN
                                 BEGIN TRY
                                            UPDATE Question
                                            SET
                                                       top_id = @top_id,
                                                       q_text = @q_text,
                                                       corr_answer = @corr_answer
                                            WHERE q_id = @q_id;
                                 END TRY
                                 BEGIN CATCH
                                            select 'Make sure you entered the data correctly'
                                 END CATCH
                      END
END
END
```

5.1.53. Procedure: dbo.updateUserData

Input/Output

	Name	Data type	Description
→@	usr_id	int	
→@	f_name	varchar(50)	
→@	l_name	varchar(50)	
→@	address	varchar(150)	
→@	email	varchar(90)	
→@	password	varchar(255)	

Script

```
/* ------------------------------------------------------------------------ */
/*                            update user data                               */
/* ------------------------------------------------------------------------ */

-- Fathy Comment Needed to add functionality to update password for desktop application

           CREATE   PROCEDURE updateUserData
    @usr_id INTEGER,
    @f_name varChar(50),
    @l_name varChar(50),
    @address varChar(150),
    @email varChar(90),
    @password VARCHAR(255)
AS
BEGIN

    DECLARE @hashed_password varChar(255);
    SELECT @hashed_password = HASHBYTES('SHA2_256', @password+'seed');
    BEGIN TRY
    UPDATE [User]
    SET
        f_name = @f_name,
        l_name = @l_name,
        [address] = @address,
        hashed_password = @hashed_password
    WHERE usr_id = @usr_id;
                      IF NOT EXISTS (SELECT *  FROM [User] U WHERE U.usr_id = @usr_id AND U.email = @email)
                      BEGIN
                                 UPDATE [USER]
                                 SET
                                 email = @email
                                 WHERE usr_id = @usr_id
                      END
                      RETURN 1;
    END TRY
    BEGIN CATCH
        -- TODO send specific error message when email is already in database
        RETURN 0;
    END CATCH
END
```

5.1.54. Procedure: dbo.viewCourseMCQ

Input/Output

	Name	Data type	Description
➔@	crs_name	varchar(100)	

Script

```
/* ------------------------------------------------------------------------------- */
/*                Display MCQ Question for a certain Course                        */
/* ------------------------------------------------------------------------------- */

CREATE   PROC viewCourseMCQ @crs_name varchar(100)
AS
BEGIN
           IF NOT EXISTS(select crs_id from Course where crs_name = @crs_name)
                      SELECT 'Course not found'
           ELSE
           BEGIN
                      Select q.q_id AS QID,
                      c.crs_name AS [Course],
                      T.top_name AS [Topic],
                      q.q_text AS [Question],
                      m.ch_a AS [Choice a],
                      m.ch_b AS [Choice b],
                      m.ch_c AS [Choice c],
                      m.ch_d AS [Choice d],
                      q.corr_answer AS [Correct Answer]
                      from Question q, MCQ m, Topic t, Course c
                      where q.q_id = m.q_id and t.top_id = q.top_id and c.crs_id = t.crs_id and c.crs_name = @crs_name;
           END
END
```

5.1.55. Procedure: dbo.viewCourseTFQ

Input/Output

	Name	Data type	Description
→@	crs_name	varchar(100)	

Script

```
/* ------------------------------------------------------------------------------- */
/*                 Display True/False Question for a certain Course                */
/* ------------------------------------------------------------------------------- */

CREATE   PROC viewCourseTFQ @crs_name varchar(100)
AS
BEGIN
           IF NOT EXISTS(select crs_id from Course where crs_name = @crs_name)
                      SELECT 'Course not found'
           ELSE
           BEGIN
                      Select q.q_id AS QID,
                      c.crs_name AS [Course],
                      T.top_name AS [Topic],
                      q.q_text AS [Question],
                      q.corr_answer AS [Correct Answer]
                      from Question q, Topic t, Course c
                      where t.top_id = q.top_id and c.crs_id = t.crs_id and c.crs_name = @crs_name and q.q_type = 'TF';
           END
END
```

5.1.56. Procedure: dbo.viewExamQuestions

Input/Output

	Name	Data type	Description
→@	ex_id	int	

Script

```
/* ------------------------------------------------------------------------------- */
/*                          Display Exam without Answers                           */
/* ------------------------------------------------------------------------------- */

CREATE   PROC viewExamQuestions @ex_id int
AS
BEGIN
           IF NOT EXISTS(select ex_id from Exam where ex_id = @ex_id)
                      SELECT 'Exam not found'
           ELSE
                      BEGIN
                                 SELECT e.ex_id, q.q_id, q.q_text, q.q_type
                                 FROM Exam e, Question q, Exam_Question eq
                                 WHERE e.ex_id = eq.ex_id
                                            AND q.q_id = eq.q_id
                                            AND q.q_type='TF'
                                            AND e.ex_id = @ex_id

                                 SELECT e.ex_id, q.q_id, q.q_text, q.q_type, M.ch_a, M.ch_b, M.ch_c, M.ch_d
                                 FROM Exam e, Question q, Exam_Question eq, MCQ M
                                 WHERE e.ex_id = eq.ex_id
                                            AND q.q_id = eq.q_id
                                            AND M.q_id = q.q_id
                                            AND q.q_type='MCQ'
                                            AND e.ex_id = @ex_id
                      END
END
```

5.1.57. Procedure: dbo.viewMCQ

Script

```
/* ------------------------------------------------------------------------------- */
/*                Display MCQ with choices and correct answer                     */
/* ------------------------------------------------------------------------------- */

CREATE   PROC viewMCQ
AS
BEGIN
           Select q.q_id AS QID,
                      c.crs_name AS [Course],
                      T.top_name AS [Topic],
                      q.q_text AS [Question],
                      m.ch_a AS [Choice a],
                      m.ch_b AS [Choice b],
                      m.ch_c AS [Choice c],
                      m.ch_d AS [Choice d],
                      q.corr_answer AS [Correct Answer]
           from Question q, MCQ m, Topic t, Course c
           where q.q_id = m.q_id and t.top_id = q.top_id and c.crs_id = t.crs_id
END
```

5.1.58. Procedure: dbo.viewTFQ

Script

```
/* ------------------------------------------------------------------------------ */
/*                 Display True/False with choices and correct answer             */
/* ------------------------------------------------------------------------------ */

CREATE   PROC viewTFQ
AS
BEGIN
           Select q.q_id AS QID,
                      c.crs_name AS [Course],
                      T.top_name AS [Topic],
                      q.q_text AS [Question],
                      q.corr_answer AS [Correct Answer]
           From Question q, Topic t, Course c
           Where q_type = 'TF'
END
```

5.1.59. Procedure: dbo.viewTopicMCQ

Input/Output

	Name	Data type	Description
⇢@	top_name	varchar(200)	

Script

```
/* ------------------------------------------------------------------------------- */
/*                                Read Question                                   */
/* ------------------------------------------------------------------------------- */

/* ------------------------------------------------------------------------------- */
/*                    Display MCQ Question for a certain topic                     */
/* ------------------------------------------------------------------------------- */

-- Fathy Comment : Is this procedure a report? Should it instead be reading question data using question id?

CREATE   PROC viewTopicMCQ @top_name varchar(200)
AS
BEGIN
           IF NOT EXISTS(select top_id from Topic where top_name = @top_name)
                      RETURN 0;
           ELSE
           BEGIN
                      Select q.q_id AS QID,
                      c.crs_name AS [Course],
                      T.top_name AS [Topic],
                      q.q_text AS [Question],
                      m.ch_a AS [Choice a],
                      m.ch_b AS [Choice b],
                      m.ch_c AS [Choice c],
                      m.ch_d AS [Choice d],
                      q.corr_answer AS [Correct Answer]
                      from Question q, MCQ m, Topic t, Course c
                      where q.q_id = m.q_id and t.top_id = q.top_id and c.crs_id = t.crs_id and t.top_name = @top_name
                      RETURN 1;
           END
END
```

5.1.60. Procedure: dbo.viewTopicMCQV2

Input/Output

	Name	Data type	Description
→@	top_name	varchar(200)	

Script

```
CREATE   PROC viewTopicMCQV2 @top_name varchar(200)
AS
BEGIN
           IF NOT EXISTS(select top_id from Topic where top_name = @top_name)
                      SELECT 'Topic not found'
           ELSE
           BEGIN
                      Select q.q_id AS QID,
                      q.q_text AS [Question],
                      m.ch_a AS [Choice_a],
                      m.ch_b AS [Choice_b],
                      m.ch_c AS [Choice_c],
                      m.ch_d AS [Choice_d],
                      q.corr_answer AS [Correct_Answer]
                      from Question q, MCQ m, Topic t, Course c
                      where q.q_id = m.q_id and t.top_id = q.top_id and c.crs_id = t.crs_id and t.top_name = @top_name
           END
END
```

5.1.61. Procedure: dbo.viewTopicTFQ

Input/Output

	Name	Data type	Description
→@	top_name	varchar(200)	

Script

```
/* ------------------------------------------------------------------------------- */
/*                 Display True/False Question for a certain topic                */
/* ------------------------------------------------------------------------------- */

CREATE   PROC viewTopicTFQ @top_name varchar(200)
AS
BEGIN
           IF NOT EXISTS(select top_id from Topic where top_name = @top_name)
                      RETURN 0;
           ELSE
           BEGIN
                      Select q.q_id AS QID,
                      c.crs_name AS [Course],
                      T.top_name AS [Topic],
                      q.q_text AS [Question],
                      q.corr_answer AS [Correct Answer]
                      from Question q, Topic t, Course c
                      where t.top_id = q.top_id and c.crs_id = t.crs_id and t.top_name = @top_name and q.q_type = 'TF';
                      RETURN 1;
           END
END
```

5.1.62. Procedure: dbo.viewTopicTFQV2

Input/Output

	Name	Data type	Description
→@	top_name	varchar(200)	

Script

```
CREATE   PROC viewTopicTFQV2 @top_name varchar(200)
AS
BEGIN
          IF NOT EXISTS(select top_id from Topic where top_name = @top_name)
                    SELECT 'Topic not found'
          ELSE
          BEGIN
                    Select q.q_id AS QID,
                    c.crs_name AS [Course],
                    T.top_name AS [Topic],
                    q.q_text AS [Question],
                    q.corr_answer AS [Correct_Answer]
                    from Question q, Topic t, Course c
                    where t.top_id = q.top_id and c.crs_id = t.crs_id and t.top_name = @top_name and q.q_type = 'TF';
          END
END
```

5.1.63. Procedure: PRIVATE.Insert_User

Input/Output

	Name	Data type	Description
→@	user_type	varchar(1)	
→@	f_name	varchar(50)	
→@	l_name	varchar(50)	
→@	address	varchar(150)	
→@	email	varchar(90)	
→@	password	varchar(255)	
→@→	usr_id	int	

Script

```
/* -------------------------------------------------------------------------- */
/*                               Create User                                  */
/* -------------------------------------------------------------------------- */

-- User [usr_id, user_type, f_name, l_name, address, email, password]

CREATE   PROCEDURE [PRIVATE].[Insert_User]
    @user_type varChar(1),
    @f_name varChar(50),
    @l_name varChar(50),
    @address varChar(150),
    @email varChar(90),
    @password varChar(255),
    @usr_id INTEGER OUTPUT
AS
BEGIN
    BEGIN TRY



    DECLARE @hashed_password varChar(255);
    -- TODO define the seed globally
    SELECT @hashed_password = HASHBYTES('SHA2_256', @password+'seed');
    INSERT INTO [User]
        (user_type, f_name, l_name, address, email, [hashed_password])
    VALUES
        (
            @user_type,
            @f_name,
            @l_name,
            @address,
            @email,
            @hashed_password
    );

    SELECT @usr_id = scope_identity();
           RETURN 1;
    /* NOTE scope_identity() may give wrong result when queries run in parrallel
    ref:[1]:https://blog.sqlauthority.com/2009/03/24/sql-server-2008-scope_identity-bug-with-multi-processor-parallel-plan-
and-solution/
    [2]:https://stackoverflow.com/questions/42648/sql-server-best-way-to-get-identity-of-inserted-row
    */
    END TRY
    BEGIN CATCH
    RETURN 0;
    -- select ERROR_MESSAGE() 'Error Message'
           -- , ERROR_NUMBER() 'Error Number'
           -- , ERROR_LINE () 'Error Line Number'
           -- , ERROR_SEVERITY () 'Error Severity Level'
           -- , ERROR_PROCEDURE() 'Error Procedure'
           -- , ERROR_STATE () 'Error State';
    -- IF (ERROR_NUMBER() = 2627)
        -- SELECT 'User already exists' as [Error Message];
   --  ELSE
       -- SELECT ERROR_NUMBER() 'Error Number', ERROR_MESSAGE() 'Error Message';
    END CATCH
END
```

5.1.64. Procedure: PRIVATE.insertQuestion

Input/Output

	Name	Data type	Description
→@	top_id	int	
→@	q_type	varchar(3)	
→@	q_text	varchar(300)	
→@	corr_answer	varchar(1)	
@→	q_id	int	

Script

```
/* ------------------------------------------------------------------------------- */
/*                        Question Table CRUDs                                    */
/* ------------------------------------------------------------------------------- */

/* ------------------------------------------------------------------------------- */
/*                             Insert Question                                    */
/* ------------------------------------------------------------------------------- */

CREATE   PROC [PRIVATE].insertQuestion
                      @top_id int,
                      @q_type varchar(3),
                      @q_text varchar(300),
                      @corr_answer varchar(1),
                      @q_id int output
AS
BEGIN
           IF NOT EXISTS( SELECT top_id FROM Topic WHERE top_id = @top_id)
                      SELECT 'Make sure topic already exists'
           ELSE
                      BEGIN
                                 BEGIN TRY
                                            INSERT INTO Question(q_type, q_text, corr_answer, top_id)
                                                       VALUES(@q_type, @q_text, @corr_answer, @top_id)
                                            SELECT @q_id = SCOPE_IDENTITY();
                                 END TRY
                                 BEGIN CATCH
                                            SELECT 'Make sure you entered the data correctly'
                                 END CATCH
                      END
END
```