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# EXAMINATION SYSTEM

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Using SQL Server & Windows Forms-C#



## Team 5

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Team 5

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## Introduction

The examination system is a vital tool for assessing the knowledge and understanding of students in various educational settings.

It provides a standardized way of testing and evaluating students' performance and progress, allowing teachers and institutions to identify areas for improvement and develop tailored learning programs.

In recent years, the use of computer-based examination systems has become increasingly popular, offering numerous advantages over traditional paper-based tests. These systems are designed to automate the examination process, allowing for faster grading and more efficient management of test data.

One popular tool for developing computer-based examination systems is C#, a programming language developed by Microsoft. C# offers a powerful, object-oriented programming environment that allows developers to build robust and scalable applications.

To store and manage data generated by the examination system, developers often use a SQL Server database. SQL Server is a reliable and efficient database management system that can handle large volumes of data and provide quick access to information. Combining C# and SQL Server, developers can create an examination system that provides a user-friendly interface for students and teachers, automated grading and reporting, and secure storage and management of test data.

C# is a versatile and powerful programming language used to build a wide range of applications, including desktop applications, web applications, and games. C# is also used extensively in developing database applications, as it supports Object-Relational Mapping (ORM) frameworks, which allow developers to interact with databases in an object-oriented way.

When developing an examination system using C#, developers can use a variety of frameworks and libraries to streamline the development process. For example, the .NET framework provides a set of pre-built classes and functions that developers can use to handle common tasks, such as file I/O, network communication, and database access.

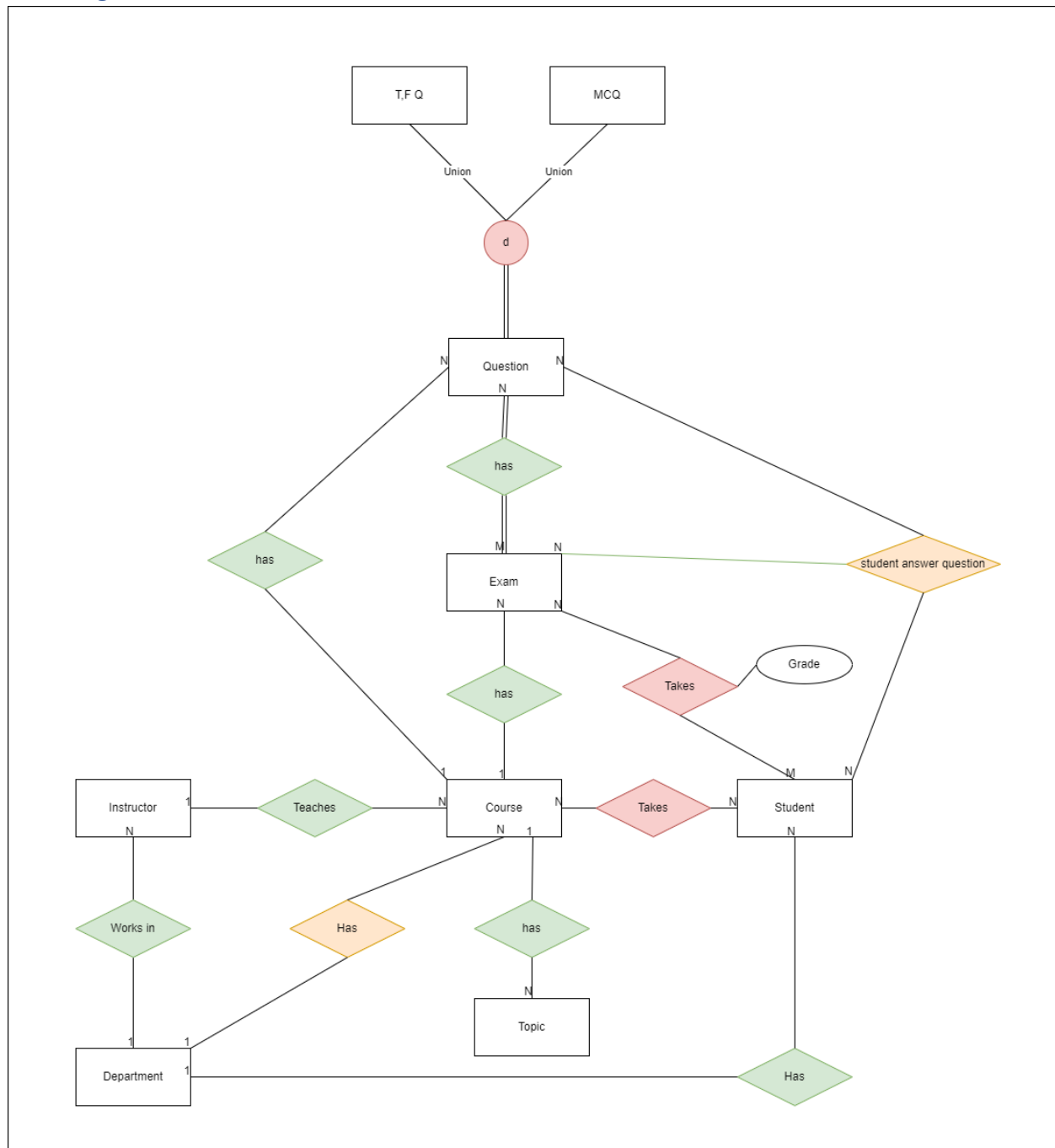
SQL Server, on the other hand, is a relational database management system (RDBMS) that provides a powerful and scalable platform for storing and managing data. Developers can use SQL Server to create and manage databases, tables, and stored procedures, and to perform queries and other operations on the data.

In an examination system, developers can use SQL Server to store and manage various types of data, such as student information, test questions and answers, grading criteria, and test results. SQL Server provides built-in security features, such as user authentication and access control, to ensure that only authorized users can access the data.

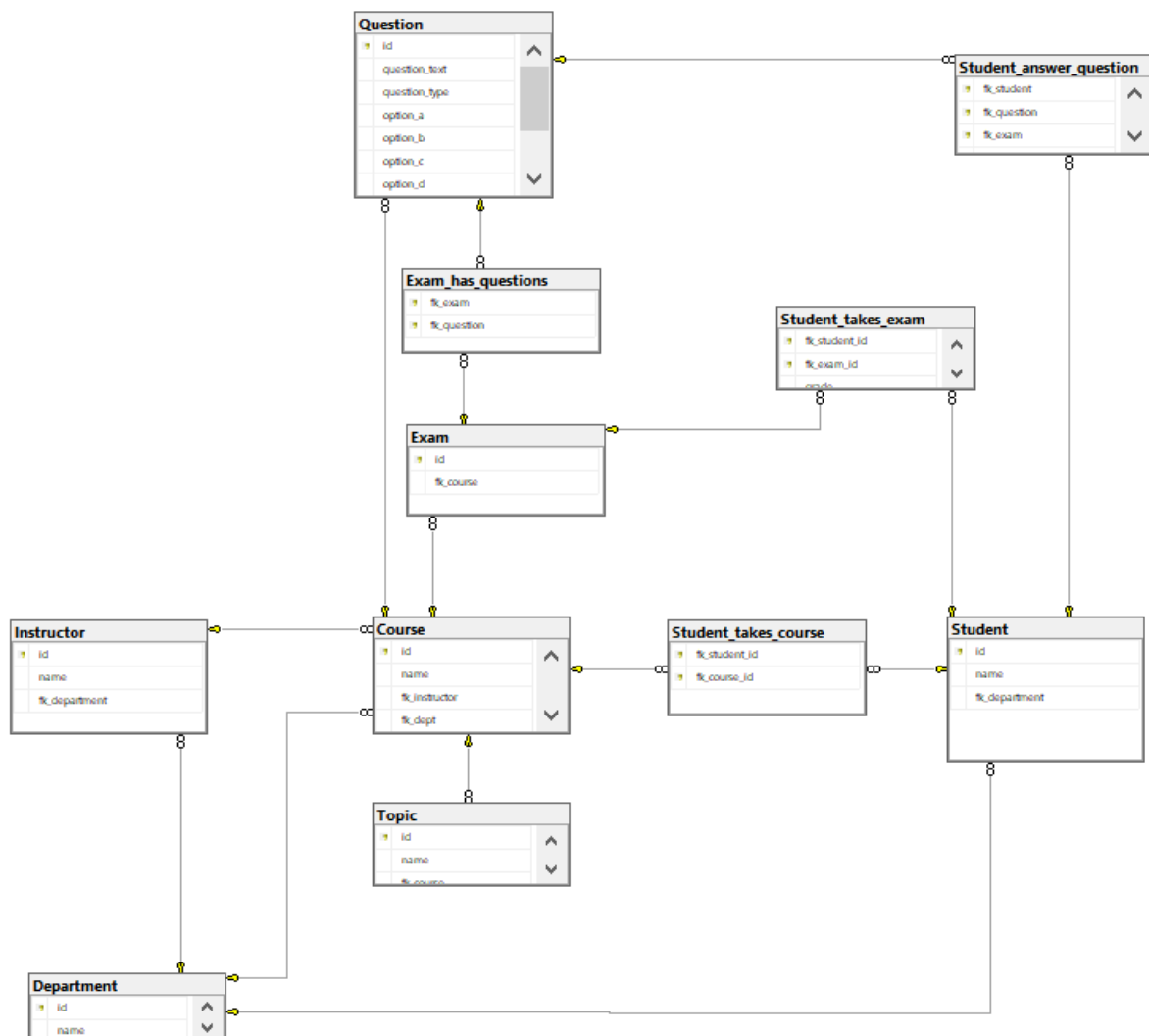
By combining the power of C# and SQL Server, developers can create a robust and efficient examination system that can handle large volumes of data, provide fast and accurate grading, and generate detailed reports on student performance.

## DB Design

### EER Diagram



## Tables Diagram (Mapping)



## Desktop Application

We used windows forms with C# to build Examination System Application that enables instructors and students to generate and perform exams

Also we used entity framework database first to deal with the database we created

## System Features

### Instructor

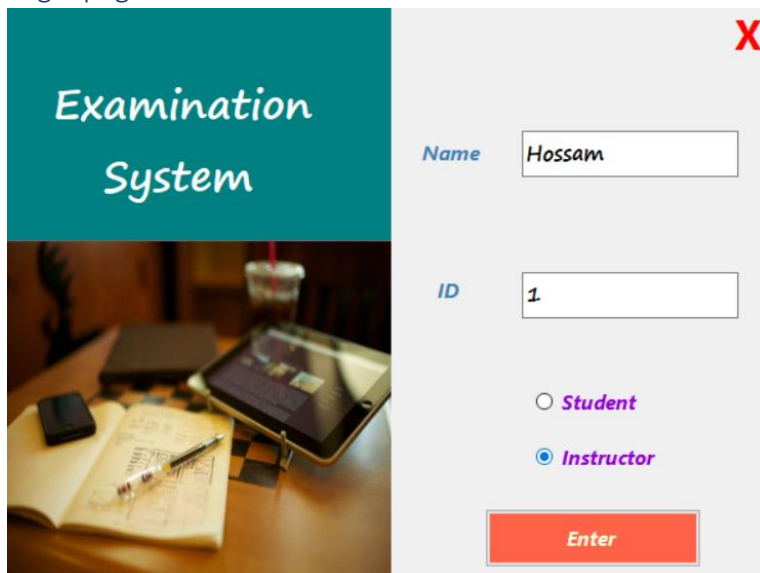
- Can generate exam.
- Can specify number of T/F questions, and number of MCQs in exam
- Can see courses he is teaching.
- Can see exams questions.
- Can preview students registered in each course.
- Can preview student answer of specific exam.

### Student

- Can preview courses it takes.
- Can preview course exams.
- Can solve exam and submit answers.
- Exam will be corrected automatically.
- Student can preview his grade in each exam.

## Application Screenshots

Login page



**Examination System**

**Name**

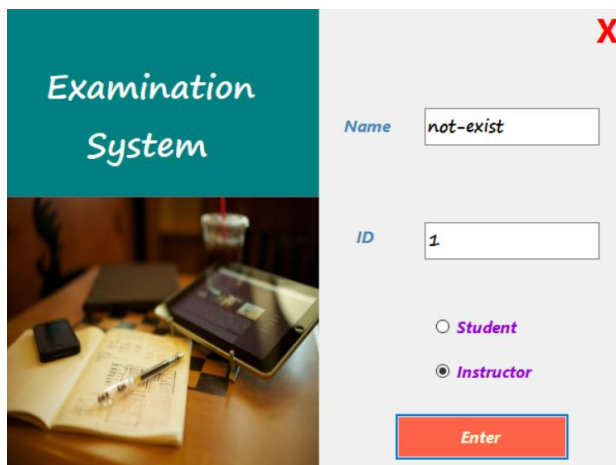
**ID**

☐ Student

☒ Instructor

**Enter**

Wrong inputs



Examination System

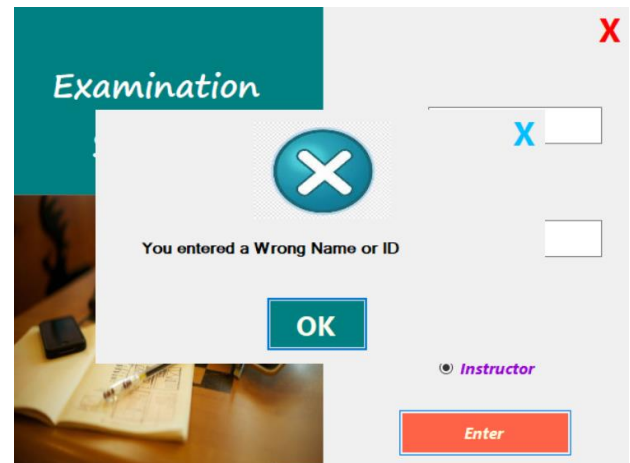
Name

ID

☐ Student

☒ Instructor

A red 'X' icon is in the top right corner.



Examination

You entered a Wrong Name or ID

☒ Instructor

A red 'X' icon is in the top right corner. A blue 'X' icon is in the top right of the error message box.

## Instructor Dashboard

After login as instructor it will show instructor dashboard where instructor can choose a course it teaches and it's students, exams and Topics

InstructorDashboard

Welcome Hossam

ID 1

Name Hossam

Department Web Development



Course

Students

	id	name
▶	1	Ahmed
	2	Mohamed
	25	Nadia
	32	Youssef
	33	Maha
	35	Sara
	42	Razan
	48	Maha

Exam ID

0

Show Student Answers

Exams

	id
▶	1
	2
	3
	4
	5

Open Exam Wizard

Topics

	id	name
▶	1	Keywords
	2	Variables
	3	Constants
	4	Data types
	5	Input/Output
	6	Operators
	7	Functions
	8	Arrays

Student Answer

Instructor can select student and specify exam to show student answers on that exam

InstructorDashboard



## Welcome Hossam

ID **1**  
Name **Hossam**  
Department **Web Development**



Course

### Students

	id	name
▶	1	Ahmed
	2	Mohamed
	25	Nadia
	32	Youssef
	33	Maha
	35	Sara
	42	Razan
	48	Maha

Exam ID

1

Show Student  
Answers

### Exams

	id
▶	1
	2
	3
	4
	5

Open Exam  
Wizard

### Topics

	id	name
▶	1	Keywords
	2	Variables
	3	Constants
	4	Data types
	5	Input/Output
	6	Operators
	7	Functions
	8	Arrays

### Student Answer

	question_type	question_text	option_a	option_b	option_c	option_d	model_answer	answer
▶	MCQ	Which of the ...	It is an enviro...	It is an enviro...	It is an enviro...	It is an enviro...	A	T
	MCQ	Which of the ...	It is an enviro...	It is an enviro...	It is an enviro...	It is an enviro...	A	A
	MCQ	Which of the ...	ToDecimal	ToDouble	ToInt16	ToInt32	C	T
	MCQ	Which of the ...	ToDecimal	ToDouble	ToInt16	ToInt32	C	A
	T/F	Multiple inheri...	T	F			T	T
	T/F	Multiple inheri...	T	F			T	T

also when instructor clicks (open exam wizard) button it will open form for instructor that enables him to show and generate exams

## Exam Wizard

Generate\_ShowExam

**Name :** Hossam  
**Department :** Web Development

Course   
   
\*the sum of the question should be 10

**Generate Exam**

**Show Exam**  
Exam List



Instructor can specify course and Number of MCQs and T/F questions then click Generate Exam

Generate\_ShowExam

Name : Hossam  
Department : Web Development

Course C

MCQ 3 T/F 4  
\*The sum of the question should be 10

Generate Exam

Show Exam

Exam List

An Exam has been generated for Course : C

OK

After clicking ok the exam will be added to exam list

And when instructor chooses exam from exam list, (show exam) button will be enabled and when clicking it, it will show that exam questions

Generate\_ShowExam

Name : Hossam  
Department : Web Development

Course C

MCQ 3 T/F 4  
\*The sum of the question should be 10

Generate Exam

Show Exam

Exam List

ID : 9, Course : C

	id	question_type	question_text	option_a	option_b	option_c	option_d
▶	2	MCQ	Which of the following utilities can be used to compile managed assemblies into processor-specific native code?	gacutil	ngen	sn	dumpbin
	11	T/F	Multiple inheritance is different from multiple levels of inheritance.	T	F		
	36	T/F	The rows of the result relation produced by a SELECT statement can be sorted, but only by one column.	T	F		
	59	MCQ	What is the keyword used to declare a class in C#?	Class	Object	Struct	Interface
	63	MCQ	What is the purpose of the "async" keyword in C#?	To indicate that a method can be executed asynchro	To indicate that a method must be executed synchro	To declare a variable with explicit typing	To create a loop
	69	T/F	C# does not support multiple interface inheritance.	T	F		
	106	T/F	The LIKE operator is used to search for a specified pattern in a column in SQL.	T	F		

Student dashboard

Student dashboard has courses student registered in , also it shows student grades in exams

The screenshot shows a student dashboard for 'Mohamed Web Development'. It features a blue sidebar on the left. The main content area has a dark background with a pencil sharpener and a pencil. There are two dropdown menus: 'Choose the Course' and 'Choose the Exam'. Below these is a text box displaying 'Course : C, Exam ID: 2, Grade : 5'. At the bottom is a blue button labeled 'Start Exam'. A red 'X' icon is in the top right corner.

Student can specify the course and exam of this course that he wants to perform

This screenshot shows the same student dashboard as the previous one, but with the 'Choose the Exam' dropdown menu open. The dropdown menu displays a list of exam options: 1, 2, 3, 4, and 5. Option 3 is highlighted in blue. The 'Start Exam' button remains at the bottom.

When student clicks start exam it will show exam form with exam questions

## Exam form

Exam form has student exams and student can select his answer

ExamForm

**Mohamed**  
C

Submit

There is an equivalent join expression that can be substituted for all subquery expressions. <input type="radio"/> T <input type="radio"/> F	A view is which of the following? <input type="radio"/> A virtual table that can be accessed via SQL commands <input type="radio"/> A virtual table that cannot be accessed via SQL commands <input type="radio"/> A base table that can be accessed via SQL commands <input type="radio"/> A base table that cannot be accessed via SQL commands
Which of the following is the original purpose of SQL? <input type="radio"/> To specify the syntax and semantics of SQL data definition language <input type="radio"/> To specify the syntax and semantics of SQL manipulation language <input type="radio"/> To define the data structures <input type="radio"/> All of the above	The SQL WHERE clause: <input type="radio"/> limits the column data that are returned. <input type="radio"/> limits the row data are returned. <input type="radio"/> Both A and B are correct. <input type="radio"/> Neither A nor B are correct.
You can add a row using SQL in a database with which of the following? <input type="radio"/> Add <input type="radio"/> Create <input type="radio"/> Insert <input type="radio"/> Make	It is illegal to make objects of one class as members of another class. <input type="radio"/> T <input type="radio"/> F
There is no private or protected inheritance in C#.NET. <input type="radio"/> T <input type="radio"/> F	The way a derived class member function can access base class public members/ the base class member functions can access public member functions of derived class. <input type="radio"/> T <input type="radio"/> F
An object of a derived class cannot access private members of base class. <input type="radio"/> T <input type="radio"/> F	Which of the following converts a type to a 16-bit integer in C#? <input type="radio"/> ToDecimal <input type="radio"/> ToDouble <input type="radio"/> ToInt16 <input type="radio"/> ToInt32

After student finishes and click submit button, it will close exam form and return to student dashboard that will have the exam performed added to exams list with his grade on it

Mohamed  
Web Development

Choose the Course  
Choose the Exam

Course : C, Exam ID: 2, Grade : 5  
Course : C, Exam ID: 3, Grade : 4

Start Exam

## How to run the application

- 1- import data-tier backup of data base locally  
attached "ADBP\_Ver4.0.bacpac" backup fil
- 2- run the application and make sure connection string is right (it maps for ' To map to local database)
  - connection string  
`data source=.;initial catalog=ADBP_Ver4.0;integrated security=True;`
- 3- there is some accounts inserted for testing
  - instructor: id:1 name:Hossam
  - student: id:1 name:Ahmed