

## **Design a Simple Program of the Electronic Exam Depending on the Time by Vb.Net**

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### **Abstract:**

This study aims to identify the possibility of interaction and the quality of the electronic test that was programmed in the Visual Basic language and the SQL Server database under the Visual Studio environment and a temporary exam setting and compare it with the traditional exam, that is, the paper exam during the current time period that the world is going through (COVID-19), where 80 trainees were brought from the Secondary Directorate of Education in Baghdad, Rusafa, from the specialty of computer science, and tested with random questions from the information technology subject. The questions consisted of choices consisting of 10 questions within ten minutes, The results were very good in terms of the time taken to answer the electronic exam, which is less than the traditional exam, which allows the examination of the most prepared for the test, as well as the indicators of the questionnaire distributed to the trainees after the completion of the two exams, where the percentage of voters on the evaluation of the electronic exam reached 20% with a rating of excellence and 30% very good, while the traditional exam was 5% with a rating of excellence and 10% very good. Thus, efforts must be made to develop this type of test and to disseminate it to all educational and training fields.

**Key words:** electronic exam, Visual Basic, SQL Server, traditional exam, time.

## تصميم برنامجًا بسيطًا للاختبار الإلكتروني اعتمادًا على الوقت بواسطة vb.net

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الخلاصة:

تهدف هذه الدراسة إلى التعرف على إمكانية التفاعل ونوعية الامتحان الإلكتروني الذي تمت برمجته بلغة Visual Basic وقاعدة بيانات SQL Server ضمن بيئة Visual Studio وإعداد اختبار مؤقت ومقارنته بالامتحان التقليدي وهو الامتحان الورقي خلال الفترة الزمنية الحالية التي يمر بها العالم (كوفيد - ١٩) ، حيث تم إحصار ٨٠ متدربا من الثانويات في مديرية تربية بغداد الرصافة الثانية ، من تخصص علوم الحاسوب ، واختبارهم بأسئلة عشوائية من موضوع تكنولوجيا المعلومات. تكونت الأسئلة من اختيارات مكونة من ١٠ أسئلة خلال عشر دقائق ، وكانت النتائج جيدة جداً من حيث الوقت المستغرق للإجابة على الاختبار الإلكتروني ، وهو أقل من الامتحان التقليدي الذي يسمح باختبار الأكثر استعداداً للامتحان ، فضلا عن مؤشرات الاستبيان الموزع على المتدربين بعد الانتهاء من الاختبارين ، حيث بلغت نسبة المتدربين على تقييم الامتحان الإلكتروني ٢٠٪ بتقدير امتياز و ٣٠٪ جيد جدا ، بينما الامتحان التقليدي كان ٥٪ بتقدير امتياز و ١٠٪ جيد جداً. وعليه لابد من بذل الجهود لتطوير هذا النوع من الامتحانات ونشره في كافة المجالات التعليمية والتدريبية.

## **Introduction:**

After the emergence of the Covid-19 epidemic and the declaration of a state of emergency in the world by the World Health Organization and what caused a temporary suspension in all areas, including education [1], it was necessary to go to an alternative, which is to rely on remote teaching and examination. There were fears about the exam via the Internet and was there a fear about interaction on the part of the undergraduate and postgraduate students, so tests were conducted for the students and the interaction was large, so it was approved in these circumstances, temporarily or as a precaution [2]. It was necessary to conduct several types of these tests in terms of method and test their efficiency in order to develop their style and form in order to suit the requirements of the student in terms of providing all the atmospheres that enter the student in this type of examination [3]. The Visual Basic language is one of the oldest programming languages that were derived from the Basic Language, which was one of the foundations for learning programming in the computer, as this language contains all the codes we need, in addition to creating a suitable and smooth environment for the work of all applications. Visual Basic is supported because of its flexibility and updates [4,5]. SQL Server is one of the most secure databases as well as being flexible in the amount of data entered and the speed of data return if requested [5]. That is why in this study we

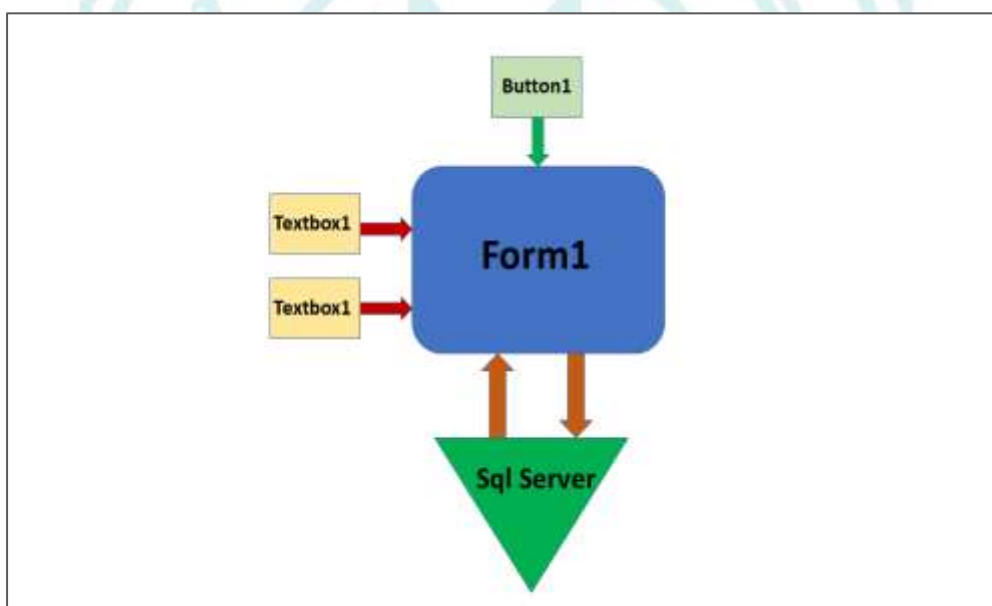
used the Visual Basic language with SQL Server database as an application. In this field, many studies have been conducted to prevent problems during the study and remote tests, and these studies include: Presented a practical study based on a sample of students and professors to search for a way to follow lessons at home during the Corona pandemic [6]. A sample of 400 professors and 600 students was selected for an exploratory descriptive approach. Results showed the existence of technical, educational, subjective, and organizational obstacles faced by students and professors. Evaluated a study on defining an exam system and how it is implemented when it is not connected to the Internet [7]. Thus, teachers will have more insight into the students in terms of the quality of their answers in the exam, and the student will immediately commit to returning the questions. The teachers found that in this case, the student's answers were 63.26%, and this a little, and when the students adhere to the deadline set for returning the questions and answers which arrived at 48.97%, this is an indication that the quality of the students' answers must be improved, so the students must attend on time. A study was presented on the impact and performance between the traditional and electronic tests and the extent of students' response to them [8]. The number of students was 60 students and they were divided into two parts between the two tests, and after a questionnaire was conducted at the end of the test, And it turns out

that the electronic tests have less time than the traditional one and an increase in the desire of students to participate in this type of test . A study was evaluated on the obstacles that will occur through online study in Arab countries, and the opinions of both students and professors in universities were taken [9]. And it was found that there are 27 obstacles in the study and testing via the Internet, so questionnaires will be provided to know these obstacles to solve them and the possibility of developing them for the universities that use them. A study was conducted to check exams in schools and universities for exams and student results electronically in several different countries periodically to reveal the reasons for cheating by students and to know the percentage [10]. It turned out that the free resources that were used as well as the quality of the Internet and the extent of recognition in examination centers in a group of countries, and the percentage was 99%, 82%, and 68%.has been submitted a questionnaire to students at a university about the exam remotely via the Internet, and their number was 242, and the questionnaire consisted of 22 questions divided into 5 specializations [11]. And It was approved by 55.9% of the students and found it good and includes all topics. have been Interviews and questionnaires were held with students and teachers from a university to study how to cheat in the electronic exam. The number of students was 212 and the number of teachers was 162 [12]. And it turns out that if the student brings

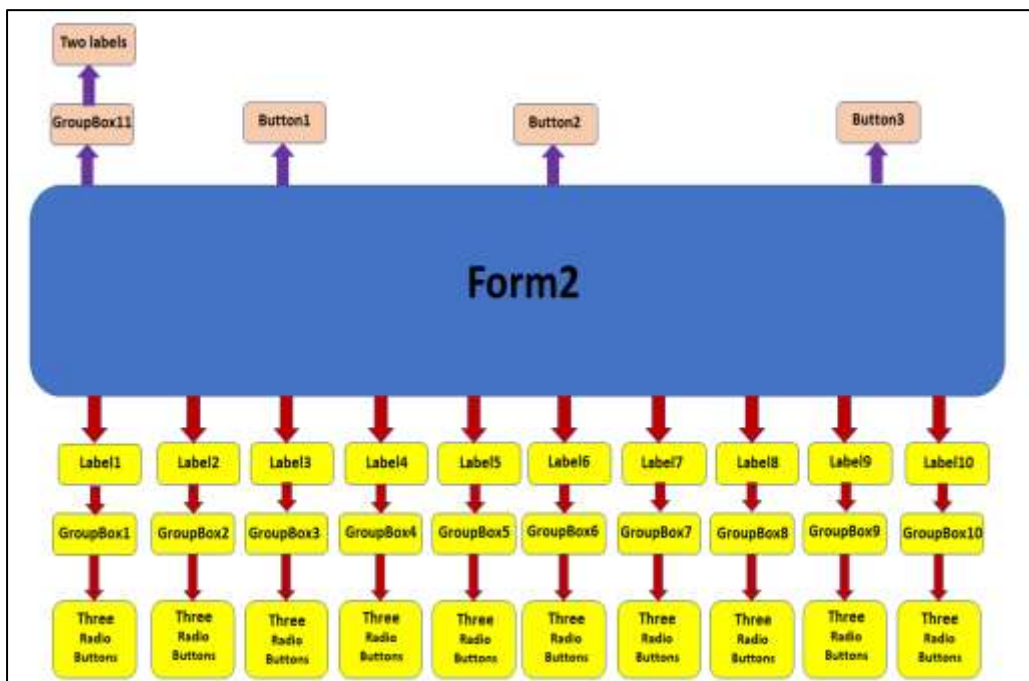
the student's device with him in the electronic exam, cheating will be easy. A study was prepared to examine a template for learning through the Basic and Excel program in terms of design, reviews, and experiments on primary schools to see the extent to which students interact with it [13]. And it turned out to be highly effective through positive interaction by students and teachers, and the development of students' abilities more than traditional education. A study was created to conduct a test within a local network of computers and manage the entry and processing of information automatically, i.e., without a server, using the Packet tracer program [14]. It turned out that the implementation was excellent and the presence of minor errors. A study was conducted by Visual Basic to make an application as a experimental research and development of educational curricula and to find out their effectiveness for accounting and analysis, as well as other steps [15]. The experts expressed their opinion on the application that it can be used and that it enhances the abilities of students. presented a study of data security and encryption in Microsoft SQL Server in terms of loading a lot of data and how to perform it [16]. And there were many positives in terms of performance and encryption in a transparent manner.

### **Method:**

The system is designed from two forms, the first form as shown in Figure 1 consists of two text boxes and a button to move to the second form by connects the first form with the SQL Server database that contains student information previously entered, and the second form as shown in Figure 2 contains 10 Label for questions , 10 GroupBoxes inside each one there are 3 RadioButtons for the answer, either the eleventh GroupBox there are 2 labels for timing ,There are also 3 buttons for starting the exam, showing the result and exiting the exam



**Figure. 1. Block diagram for the First Form.**



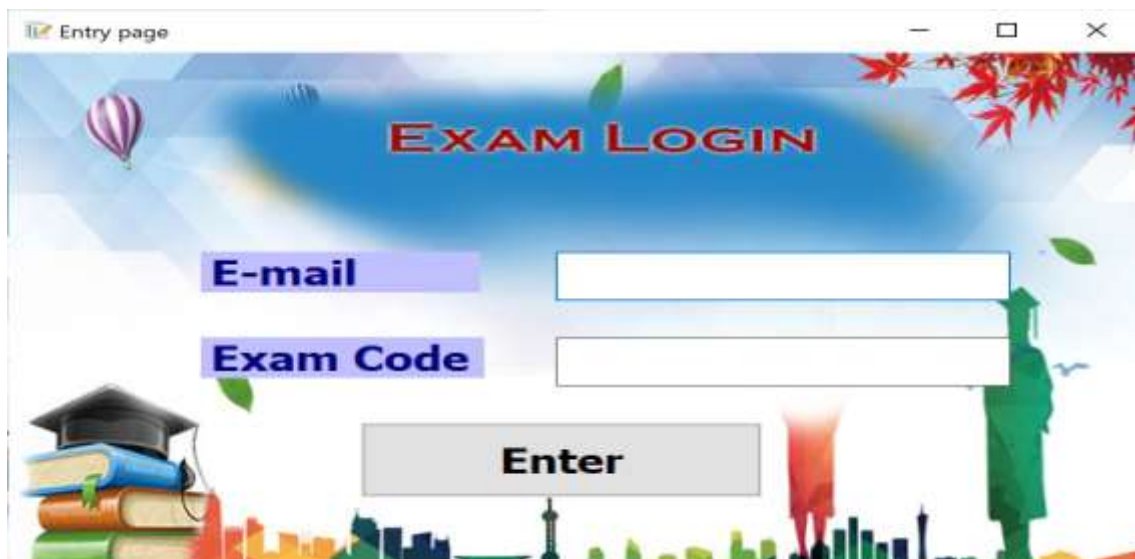
**Figure. 2. Block diagram for the Second Form.**

### The Theoretical Analysis

The system was designed in vb.net language and using the SQL server express database, and the display is via windows form. Here we used two forms:

In the first form shown in Figure (3)

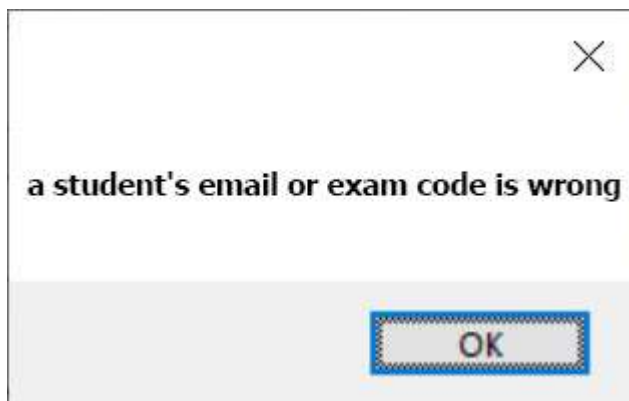




**Figure. Figure. 3. First form (Entry page)**

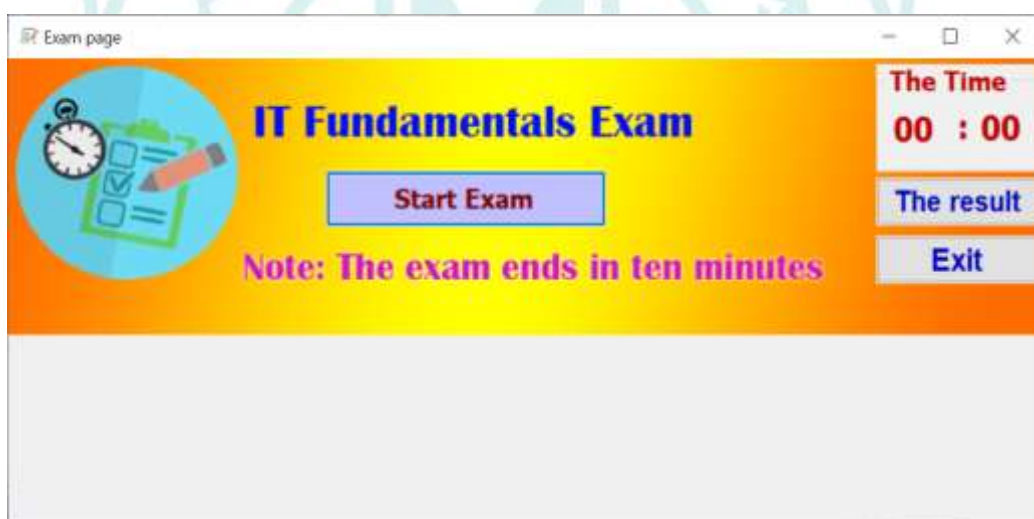
It is the login interface to the system, it contains two text boxes, the first to enter the student's e-mail, and the second to enter the student's exam number, as well as there is a button to enter the exam's form. The button contains a code linking the form with the SQL server express database that searches the database for the student's e-mail and the exam number. In the event of a match, he would close the entry form and open the exam form, and in case one or both textboxes were left empty or the information entered was wrong, he would show us a message box, alerts that there was an error in the entry

As shown in Figure (٤)



**Figure. 4. wrong message**

As for the second form shown in Figure (5)

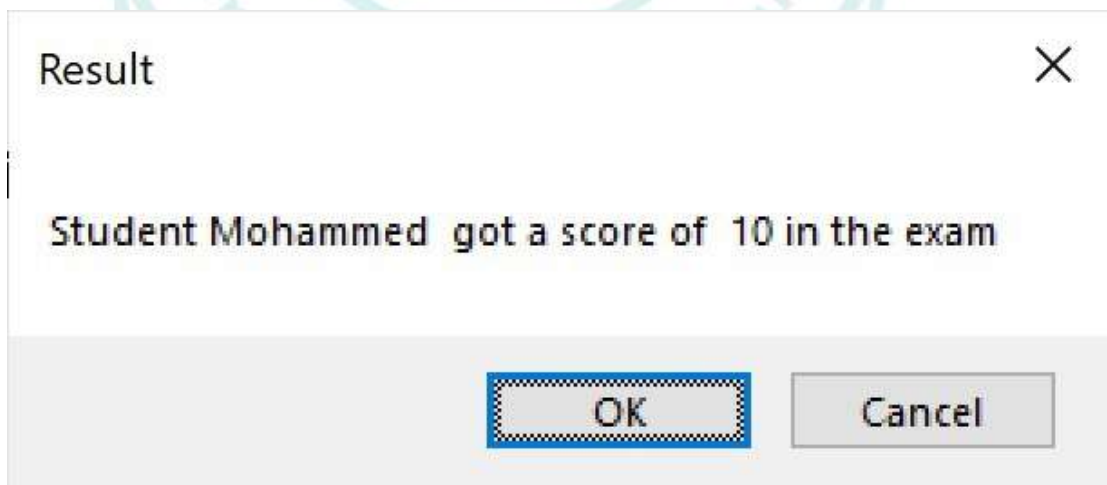


**Figure. 5. second form(Exam page)**

Here, on the exam page, we have chosen the information technology exam as an electronic exam and it consists of ten questions on each one found three radio buttons, so we choose one answer from each question.

At the top left of the form there is a timer that is two labels, one for seconds and the second for minutes and the counter reaches 10 minutes, and below it, there is a button to show the result, which is the last stage, and under it, there is a button to exit the exam and in the middle, there is a button to start the exam, either at the bottom of the form is placed (panel) It is the container for all questions and every question. Beneath it are three radio buttons, and they are placed inside a group box.

Exam mechanism When opening the form, we will find (panel) invisible, and when you press the button to start the exam, the (panel) that contains the questions will be visible and the timer will run, and we can answer by choosing (radio button) When completing the solutions, we can press the result button and it will disable the questions And a message box that shows us the name of the student who entered the exam and the result obtained, and in the event that it is 10 minutes late, the questions will be suspended, as well as the display of the (message box) that shows us the name of the student who entered the exam and obtained the result as well as shown in the figure (6).



**Figure. 6. Result message**

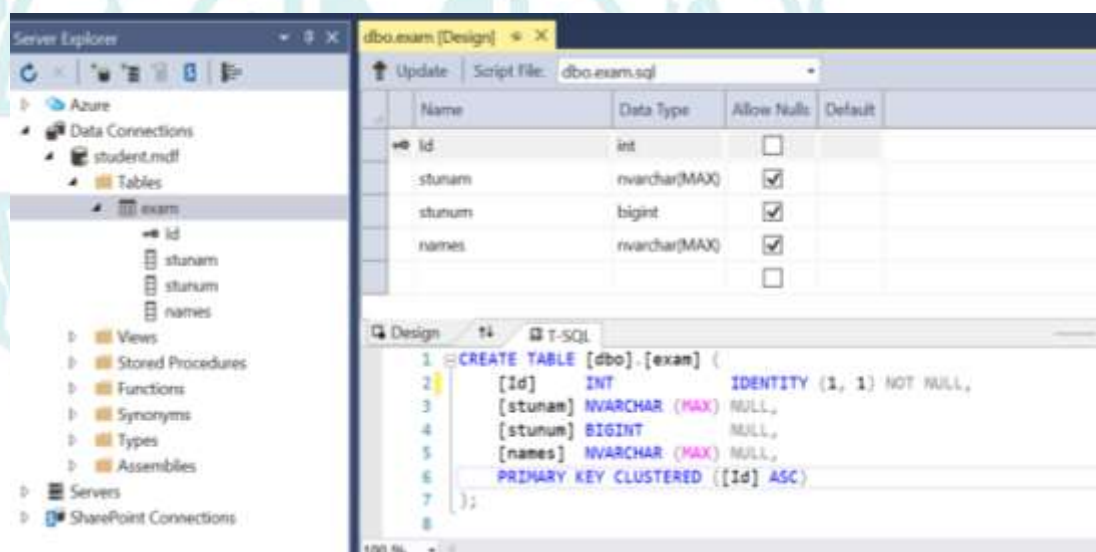
Note: When you press (ok) from (message box), it will exit the system in order not to allow the student to answer again.

## Experimental Work

At the beginning of the work, we create a database (sql server express) named (student.mdf) and we create a table inside it named (exam) consisting of four fields (Id) representing the student's number, a field (stunam) representing the student's email and a field (stunum) representing exam code or the password and the (names) field that represents the name of the student. Figure

(7)

the



following represents the names and types of fields.

**Figure. 7. The Names and Types of Fields.**

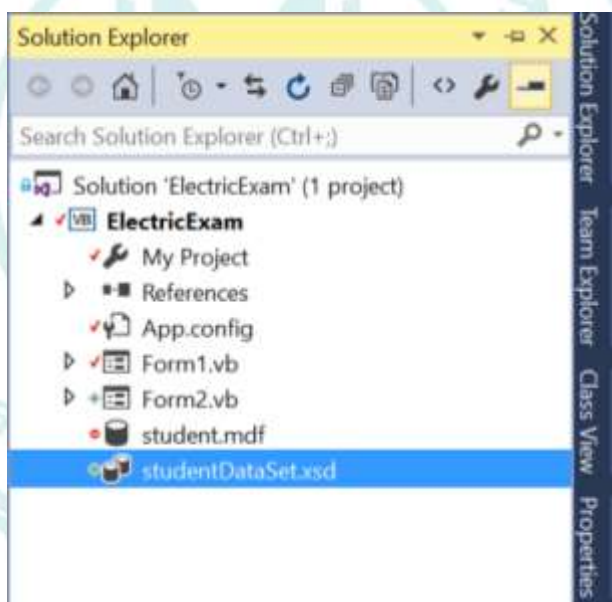
And we enter some data as shown in Figure (8).



Id	stunam	stunum	names
1	moh@gmail.com	8484	mohammed
2	sami@yahoo.com	9090	sami
3	noor@hotmail.com	8989	noor

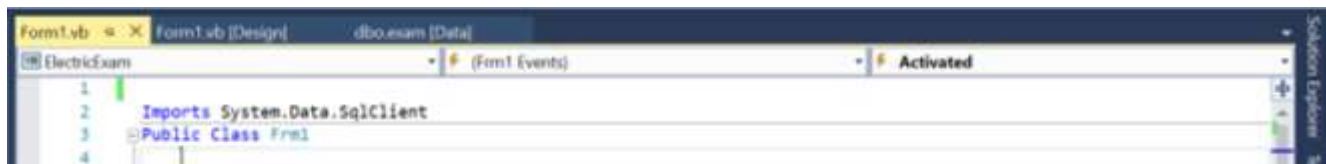
**Figure. 8 Enter Some Data**

We will now explain the codes and the mechanism in this project, and Figure (9) shows us the entire project



**Figure. 9. The Entire Project**

We start with the first form shown in Figure (1):



**Figure. 10 Import (System.Data.SqlClient)**

At the beginning of writing the code, we must import (System.Data.SqlClient). The System.Data.SqlClient namespace contains the provider's ADO.NET objects used to connect to the database, execute a command, and transfer information to and from Dataset. as shown in Figure (10).

In the form, we have also added (2 labels) (2 textbox) (button)(labels) present names of text boxes.

As for the (button), the code is written inside it, and we will explain the code line by line.

in this code

**Dim ob As New Form2**

We have defined a variable that represents the second form, and the purpose of which is that we will need data and be defined in the second form, which is the name of the student from the database .

**Dim conn As SqlConnection = New SqlConnection("Data Source=(LocalDB)\MSSQLLocalDB;AttachDbFilename =|DataDirectory|\student.mdf;Integrated Security=True;Connect Timeout=30")**

The purpose of creating a SqlConnection object is to enable other ADO.NET Help to work with other ADO.NET database objects, such as SqlCommand and SqlDataAdapter that take a Connection object as a parameter. The sequence of life processes that occur in a SqlConnection,

And here we attributed it to the variable (conn).

```
Dim cmand As SqlCommand = New  
SqlCommand("select * from exam where stunam=" +  
txtname.Text + " and stunum=" + txtnumber.Text + """,  
conn)
```

SqlCommand: used to deal with SQL statements and calling procedures, here we fetched all the data in the exam table and set a condition to compare this data if it is similar to the entries with text boxes and (conn) which is the tool to link the database with vb.net We used a variable as sqlcommand and as (cmand).

```
Dim ad As SqlDataAdapter = New  
SqlDataAdapter(cmand)
```

SqlDataAdapter is a part of the ADO.NET Data Provider and it resides in the System.Data.SqlClient namespace. SqlDataAdapter provides the communication between the Dataset and the SQL database. We can use SqlDataAdapter Object in combination with Dataset Object.

Here we used the (ad) As SqlDataAdapter object

**Dim dat As DataTable = New DataTable()**

A datatable is a temporary object used to interact with a single table and treat the table as row-row or column-column to search for data.

Here we used the temporary object as (dat).

**ad.Fill(dat)**

Here we put the data from the table (exam) and fill it in the datatable (ad) .

We'll use if condition and it has two halves.

```
If (dat.Rows.Count > 0) Then  
    ob.n = dat.Rows(0)(3).ToString  
    Me.Hide()  
    ob.Show()
```

He will, according to the condition, search for the data in the temporary object (dat), and the search will be row by row and compare it with the entries in the text boxes, and if they are similar, he will do the following:

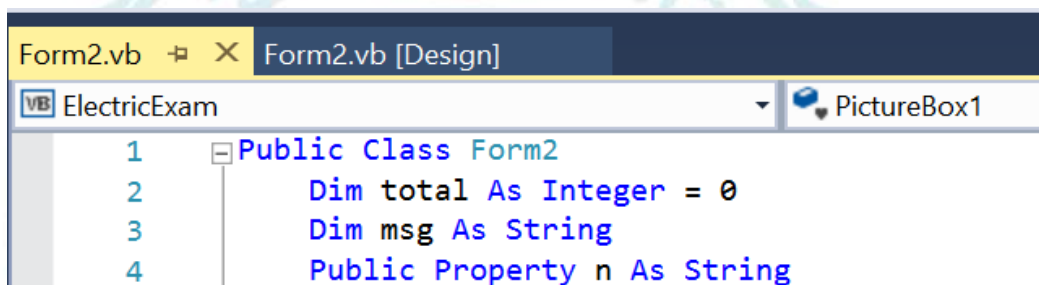
1. Save the name of the student present in the row similar to the data in the text boxes in the variable (n).
2. Hide the first form.
3. Show the second form.



But if the condition does not match, it will output a message box for us that will inform us after matching the data entered in the text boxes with the data in the (exam) table.

As for the second form as figure (3)

On the code page, we will find three in public variables, as shown in Figure (10).



```
Form2.vb [Design]
ElectricExam PictureBox1
1 Public Class Form2
2     Dim total As Integer = 0
3     Dim msg As String
4     Public Property n As String
```

**Figure. 11 Define Three Variables**

(total) is a variable with an integer value and the initial value is zero which represents the final score of the student's examination.

As for (msg) it is a variable such as a string value as a message box showing the result.

As for (n) is a variable such as a string value and a definition, it must be (Public Property) in order to preserve and bring us the name of the student participating in the examination from the first form to the second form .

**Note:** These variables are defined in the public so that identifiers remain in the form in general if they are called anywhere

**The following code works when the event of form activation:**

```
RadioButton1.Checked = RadioButton2.Checked =  
RadioButton3.Checked = False  
Panel1.Visible = False
```

At first, we deactivated all the "Radio Button" for the questions, but the mechanism of work is to activate one of them. Here we needed to write the code in the first line to deactivation of the first three RadioButtons .

As well as invisible the Panel, which contains the questions

**The following code when pressing the (button) to start the exam:**

```
Timer1.Enabled = True  
Panel1.Visible= True
```

The first will activate the timer and start the counting and the second will appear is the board that contains questions and answers and allows us to answer.





It represents. When we press the results button, it will stop the timer and collect the correct results, as we have mentioned. and it will show a message box in the name of the student and the result. When we press OK, the project will be closed.

**And the last code in the system is pressing the Exit button:**

```
Dim f As String
```

```
f = MsgBox("Are You Sure To Exit", vbOK,  
"Exit")
```

```
If (f = vbOK) Then End
```

We have defined a variable called (f) of the type of string, and we have written a code for exiting the program if the (ok) button is pressed .

## Result

Two electronic and traditional exams were conducted for the trainees of the teachers of the Directorate of Education in Baghdad, Al-Rusafa 2, and their number was 80 trainees. The test consisted of ten questions. Within 10 minutes the exam ended. Each trainee also took an assessment of the two tests, and the table (1) shows us the results.

Questionnaire					Last OT	First OT	num OT	Type of exam
excellent	very good	Good	Acceptable	weak				
20%	30%	10%	20%	20%	6.30 min	2 min	80 OT	Electronic exam
5%	10%	35%	20%	30%	8.20 min	4 min	80 OT	Traditional exam

**Table. 1**

As an explanation of the table, the trainees took from two minutes to six minutes and thirty seconds in the electronic exam, while the time in the traditional exam took four minutes to eight minutes and twenty seconds, and the Questionnaire from weak to excellent as the quality of the exam is shown as percentages.

### Conclusions

From Table (1), we concluded that the answers in the electronic exam are faster than the traditional exam, because the timer is exist that makes the trainee care about time, as well as the questionnaire indicator for the electronic exam is better than the traditional exam, and from it we have a vision of positive interaction with regard to the electronic exam, which is useful to use currently with The presence of covid-9, which contributes to the distance between the trainees and reduces the incidence of this epidemic and the transfer of this experience to different specializations and all groups.

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