School System Project

A school system software based on a SQL database called “marks” that deals with data of students , teachers , department and their timetable.

For students, it takes their (name , year , gender , marks) and the department that they study in then stores it.

The program calculate student’s total marks and grade.

You can search for a student using his id number or name.

In the database the primary key is (student_id) and it is connected to department using foreign key (department_id).

For teachers, the project takes their personal data (name , salary , phone number , hiring date) and the department that they works for.

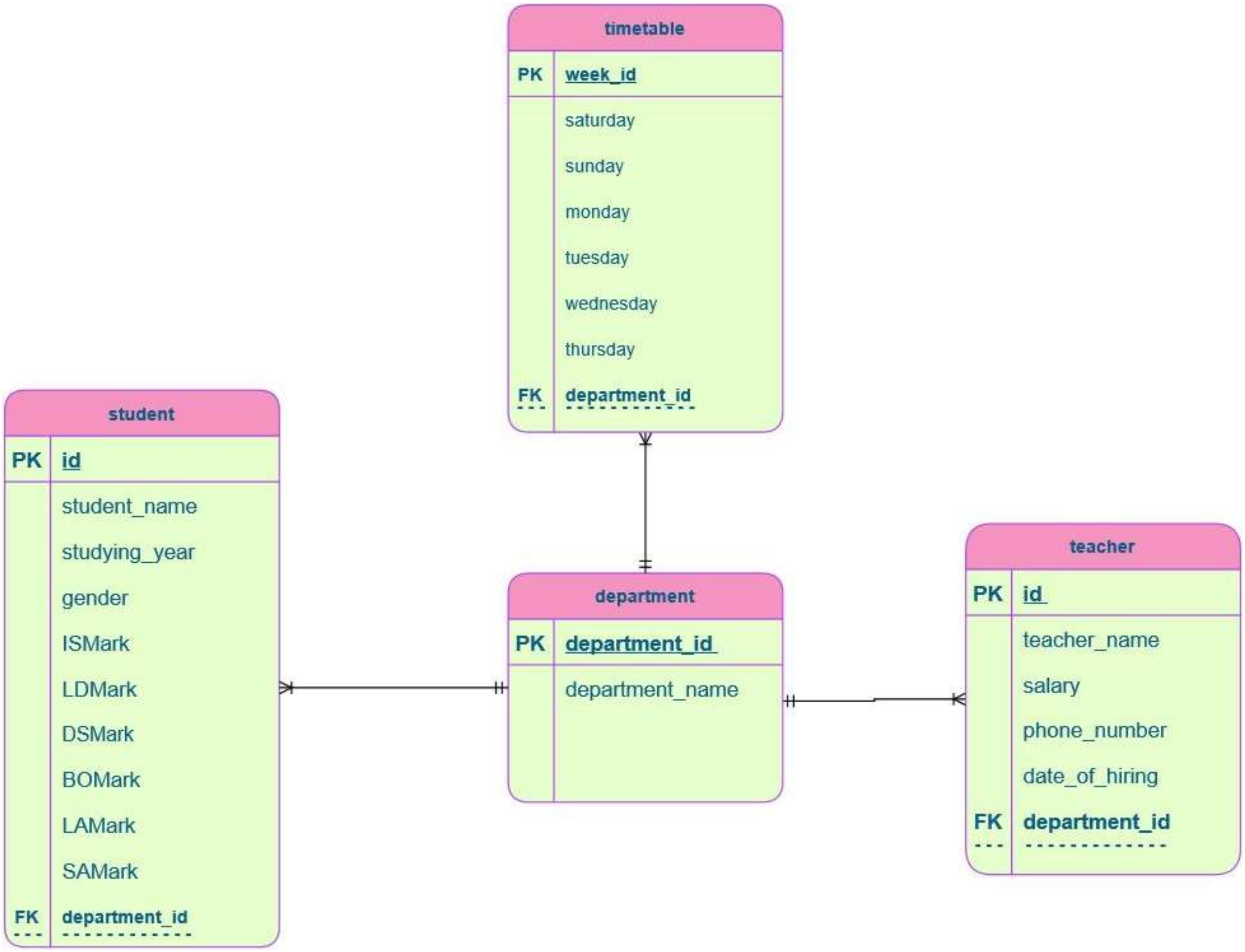
You can search for a teacher using his id number or name.

The primary key is (teacher_id) and it is connected to department using foreign key (department_id).

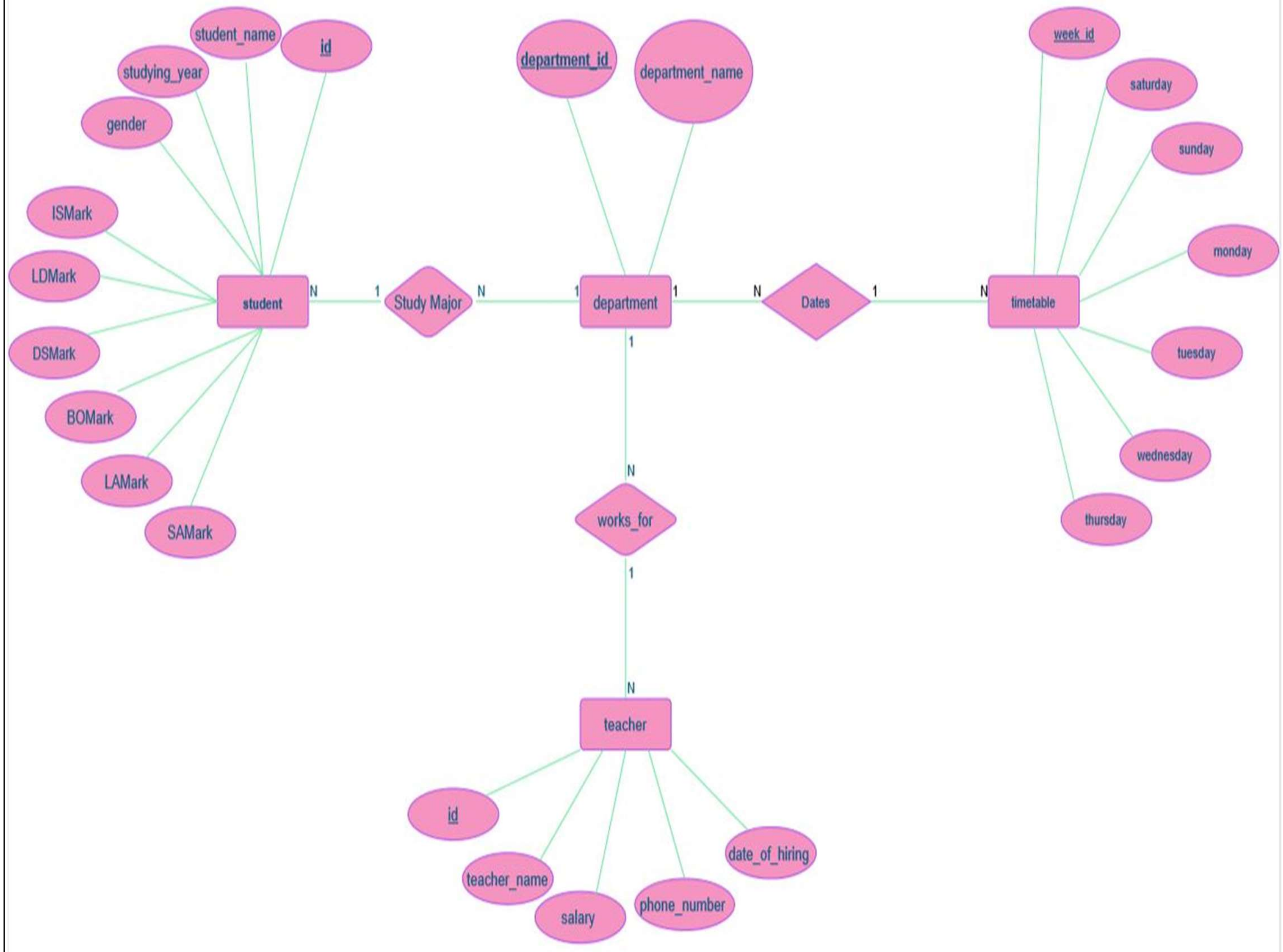
In timetable, it stores everyday’s subjects and the department concerned with this week.

The primary key (week_id) and it is connected to department using foreign key (department_id).

System ERD

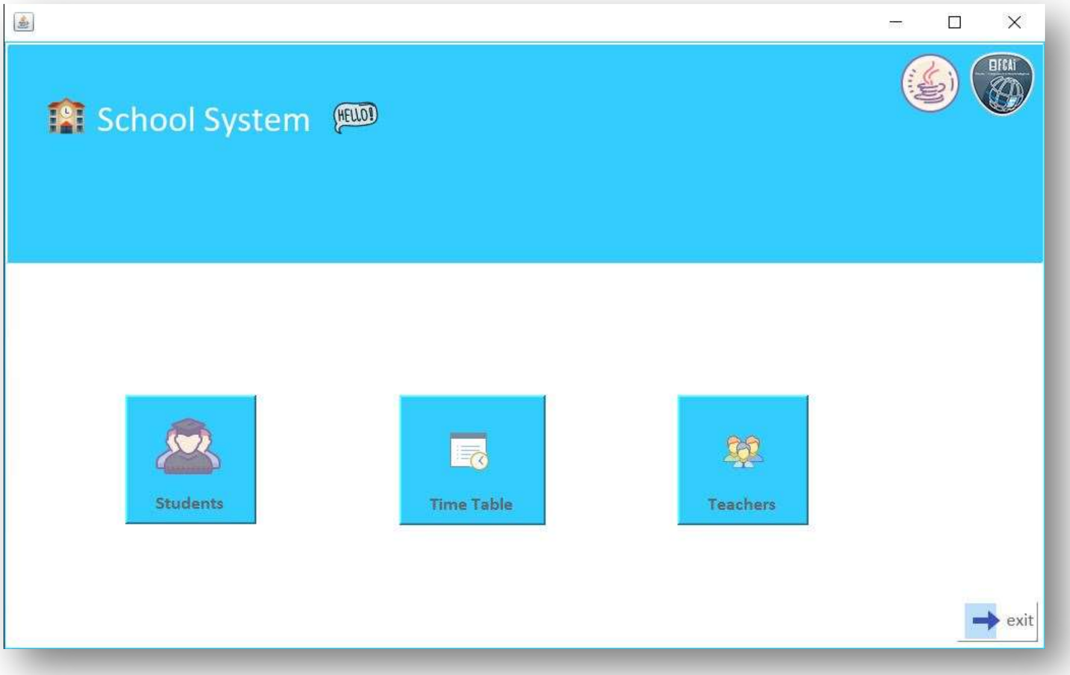

timetable
PK week_id
saturday
sunday
monday
tuesday
wednesday
thursday
FK department_id
student
PK id
student_name
studying_year
gender
ISMark
LDMark
DSMark
BOMark
LAMark
SAMark
FK department_id
department
PK department_id
department_name
teacher
PK id
teacher_name
salary
phone_number
date_of_hiring
FK department_id

System Mapping



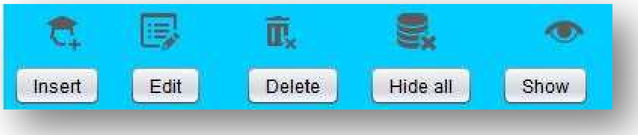
Home Frame

here you can choose whether if you want to enter student’s frame , timetable’s frame , teacher’s frame or exit the program.



In every data frame

there are 5 fixed buttons (insert , edit , delete , hide all , show).



- ➔ **Insert button** allows the user to list a row to the table.
- ➔ **Edit button** allows the user to update the data.
- ➔ **Delete button** allows the user to delete a row from the table.
- ➔ **Hide all button** is a button to hide the data without deleting it.
- ➔ **Show button** is a button to show the data inserted into the table.

Using (try – catch) to test for errors … To access the database there is a connection statement typed first in try block.

```
Connection con =
DriverManager.getConnection("jdbc:mysql://localhost:3306/marks", "root", "root");
```

To detect the error we use a statement in catch block like :

```
Logger.getLogger(Teachers.class.getName()).log(Level.SEVERE, null, e);
```

Insert **(EX from students)**

Programmed button to access the database getting data from the text fields then sending it to the table to be stored .

After connection statement here comes the prepared (insert) statement from the database.

```
PreparedStatement ins = con.prepareStatement("insert into
student(student_name,studying_year,gender,ISMark,LDMark,DSMark,BOMark,LAM
ark,SAMark,department_id) values(?,?,?,?,?,?,?,?,?,?)");
```

Now we get data from the text fields through (getText) function accessed through text field name then stored into variables like:

```
        String id = sid.getText();            String name = sname.getText();
```

Then we set culomn’s data into the table using their variables through (setString) function like:

```
        ins.setString(1, name);            ins.setString(2, year);
```

To set the department_name as the department_id is the foreign key :

```
if (dep == "science")
 {       ins.setInt(10, 1);       }
else
{       ins.setInt(10, 2);       }
```

The statement means that if the department that have been got from the department text field is science then set the value to culomn number 10 after that set the department_id in the database to 1

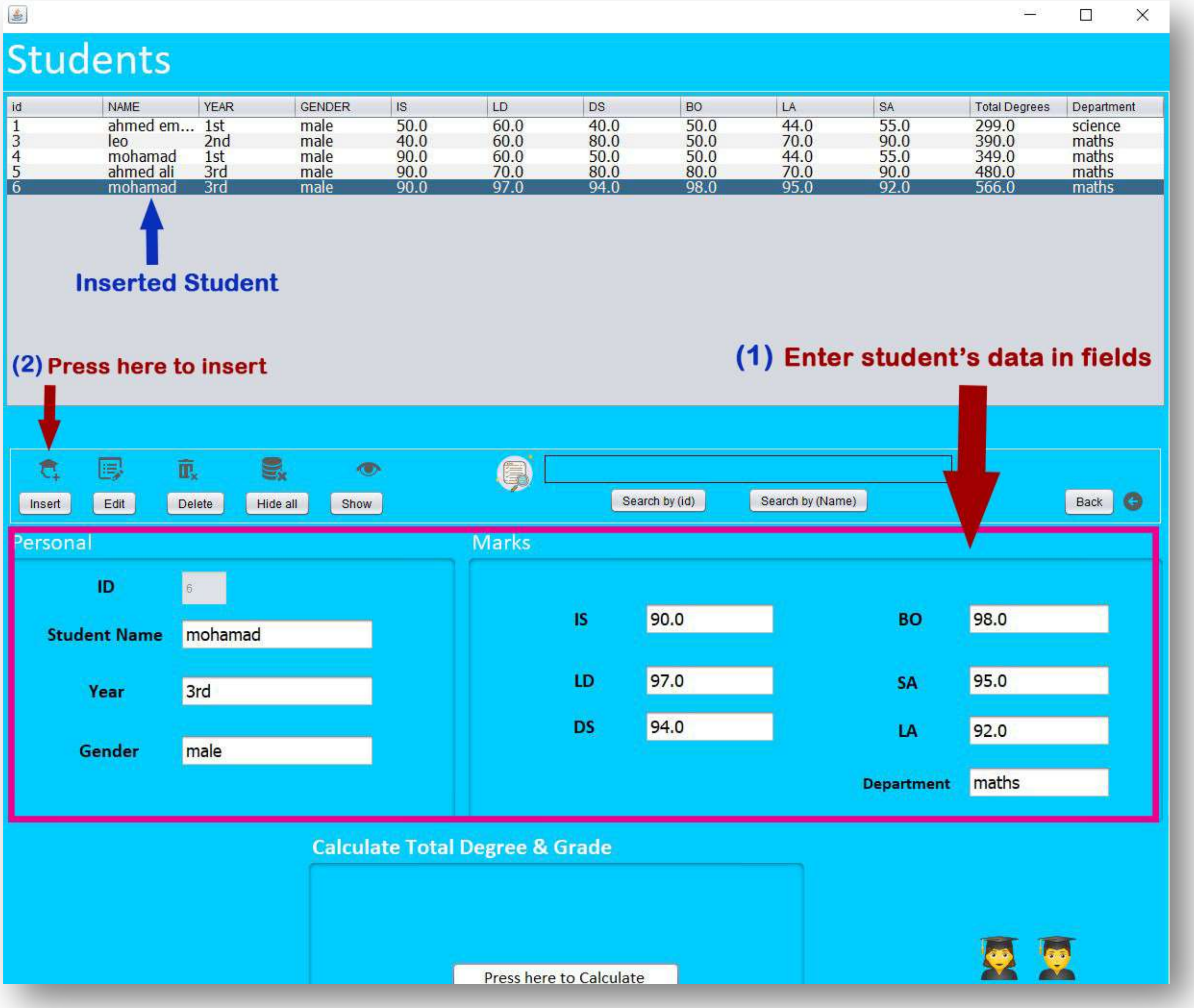
And if he entered maths then set the value to culomn number 10 after that set the department_id in the database to 2.

Now execute the selected statement

```
ins.executeUpdate();
```

Finally, empty the text fields after the execution by giving it empty values like:

```
        sname.setText("");                    syear.setText("");
```



Students

id	NAME	YEAR	GENDER	IS	LD	DS	BO	LA	SA	Total Degrees	Department
1	ahmed em...	1st	male	50.0	60.0	40.0	50.0	44.0	55.0	299.0	science
3	leo	2nd	male	40.0	60.0	80.0	50.0	70.0	90.0	390.0	maths
4	mohamad	1st	male	90.0	60.0	50.0	50.0	44.0	55.0	349.0	maths
5	ahmed ali	3rd	male	90.0	70.0	80.0	80.0	70.0	90.0	480.0	maths
6	mohamad	3rd	male	90.0	97.0	94.0	98.0	95.0	92.0	566.0	maths

Inserted Student

(2) Press here to insert

(1) Enter student's data in fields

Personal

ID: 6

Student Name: mohamad

Year: 3rd

Gender: male

Marks

IS: 90.0

LD: 97.0

DS: 94.0

BO: 98.0

SA: 95.0

LA: 92.0

Department: maths

Calculate Total Degree & Grade

Show

(EX from teachers)

Programmed button to show the data stored into the database in the table.

Calling the prepared (select) statement from the database that is responsible for showing the data :

```
 PreparedStatement stm = con.prepareStatement("select * from teacher");
```

Execute the selected statement using (executeQuery) function called by the object (stm) :

```
ResultSet result = stm.executeQuery();
```

After that, we created a table model from our table to access it:

```
 DefaultTableModel dt = new DefaultTableModel();
```

To Add the database columns to the table , we used the tableModel Object to call (addColumn) function giving it column name as a parameter:

```
dt.addColumn("id");                    dt.addColumn("name");
```

The while loop makes a cursor to display the data and in displaying the (department_name) using the foreign key (department_id).

When the culomn is the department to execute the statement using integer variable (dep) to store (department_id).

The department_id given by the user will be set to the selected statement .

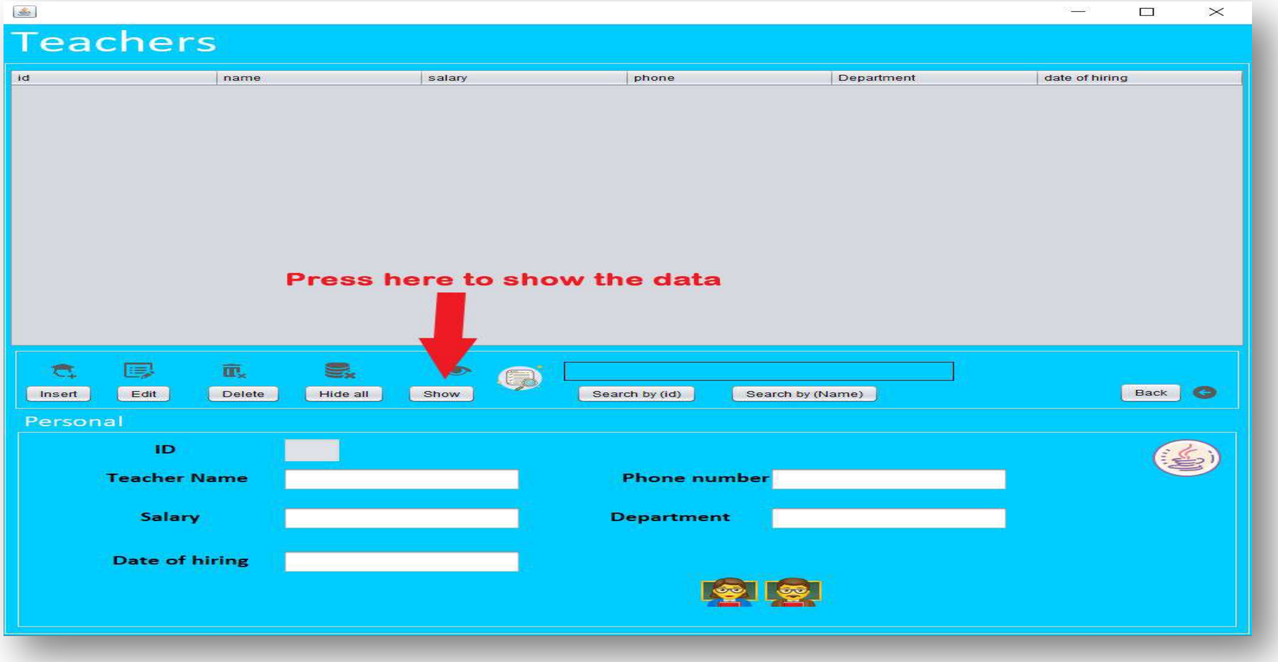
To give it the variable dep we use a single quote then a double quotes.

In the department table we need to get the (department_name) from the column number (2) , so we used (getString) function.

Then we set the (department_name) to a String variable to store the data in column number (2).

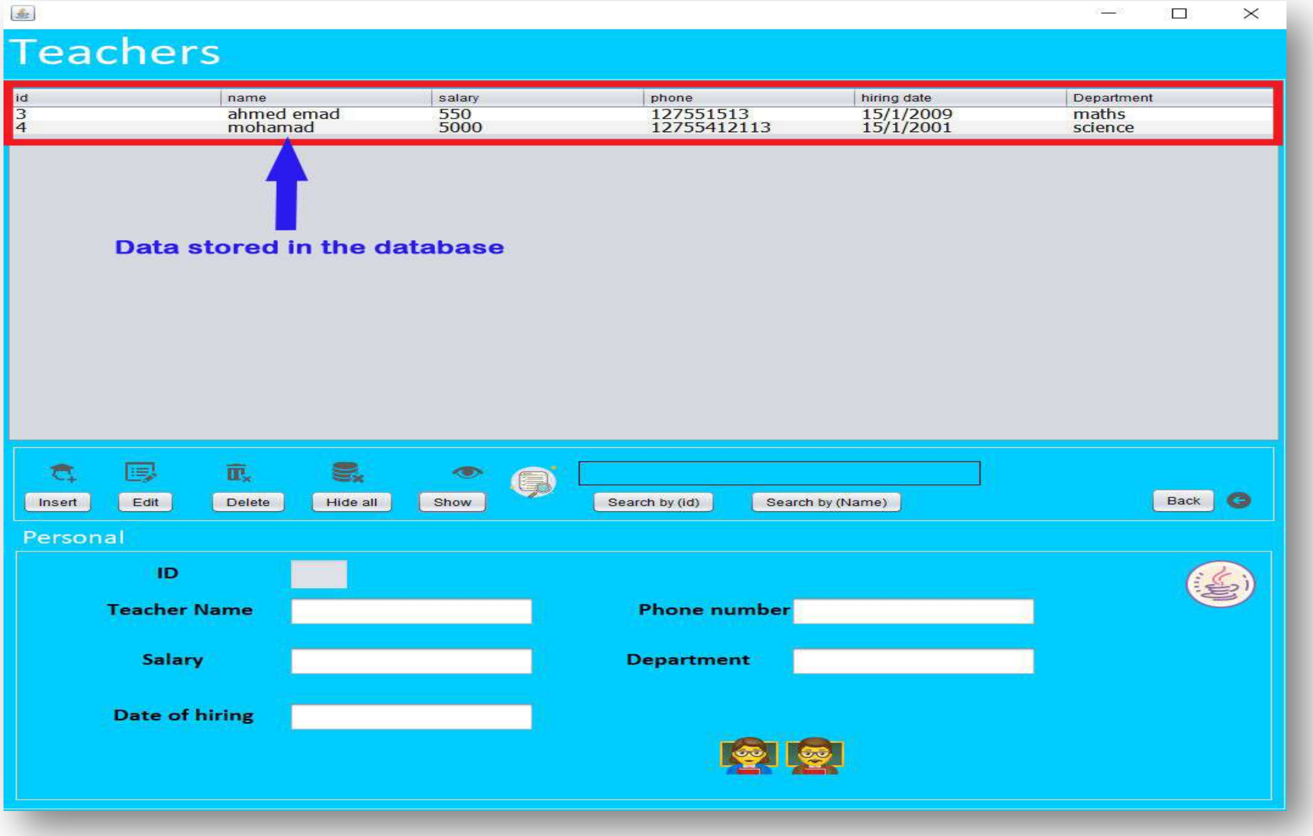
Now we get the rest data using array of string variables by (getString) function to put it in the row.

```
while (result.next()) {
        int dep=result.getInt(6);
        PreparedStatement depa = con.prepareStatement("select * from
department where department_id='" + dep + "'");
        ResultSet depa_result = depa.executeQuery();
        depa_result.next();


        String department_name=depa_result.getString(2);
        String r[] = {result.getString(1),
          result.getString(2),
          result.getString(3),
          result.getString(4),
          result.getString(5),
          department_name
       };
          dt.addRow(r);
```



Press here to show the data

After pressing the show button the data stored will be shown in the table after executing the code



id	name	salary	phone	hiring date	Department
3	ahmed emad	550	127551513	15/1/2009	maths
4	mohamad	5000	12755412113	15/1/2001	science

Data stored in the database

In Every data table

There is a mouse clicked event that allows us to select a row from the table and send its data back to appear in the text fields , so we can edit and delete a row if we needed.

First we have to know the row selected , so we have to make an integer value that stores it and get it from the table using (getSelectedRow) function.

Like: `int row_num = teacher_table.getSelectedRow();`

Here the integer variable called row_num stores the number of the row , as we called the function using table name (teacher_table) .

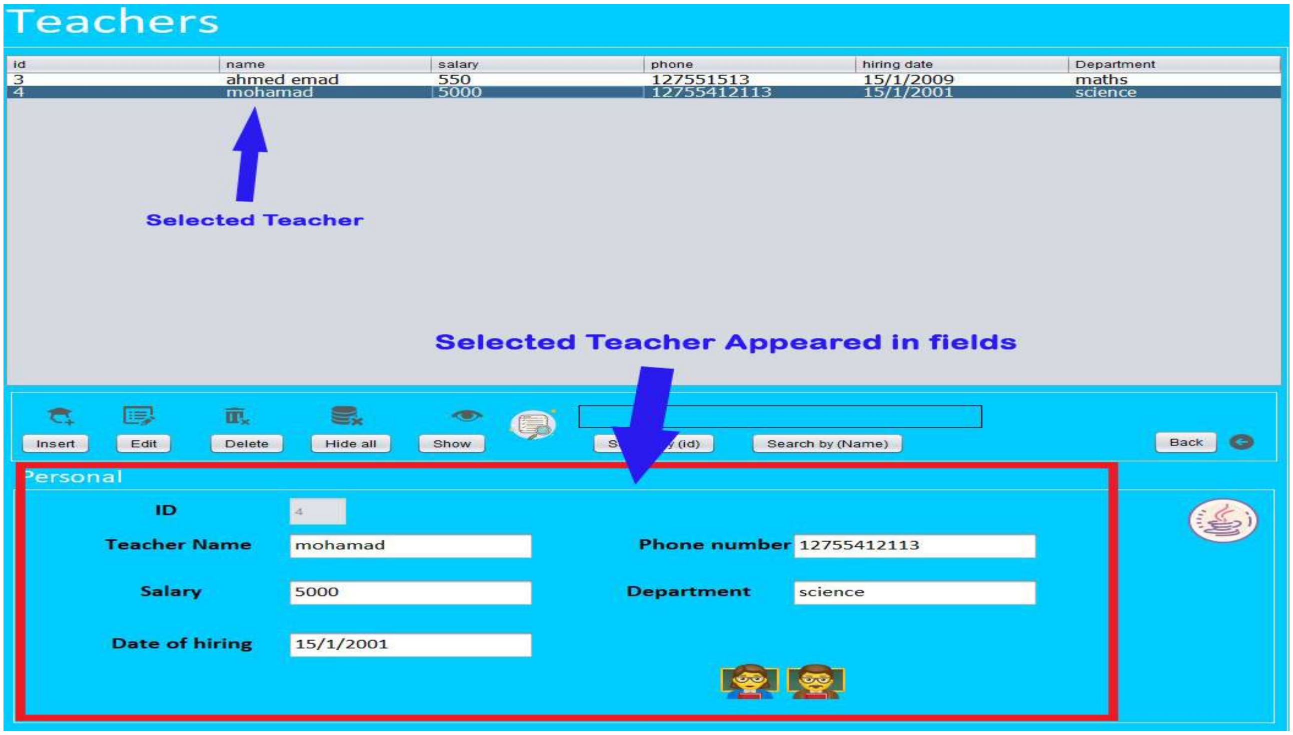
Now we have to get the row data stored in String variable from every column , so we use getValueAt giving it (row_num, number of the culomn).

We used (toString) function to convert every data to a String datatype so we can give it to the text fields.

```
String id = teacher_table.getValueAt(row_num, 0).toString();
```

putting variables in their text fields like:

```
      jID.setText(id);                    jNAME.setText(name);
```



Teachers

id	name	salary	phone	hiring date	Department
3	ahmed emad	550	127551513	15/1/2009	maths
4	mohamad	5000	12755412113	15/1/2001	science

Selected Teacher

Selected Teacher Appeared in fields

Personal

ID	4		
Teacher Name	mohamad	Phone number	12755412113
Salary	5000	Department	science
Date of hiring	15/1/2001		

Edit

(EX from timetable)

Programmed button to get the selected data from the table row to let us update it.

The selected (update) statement will be called from the database

```
PreparedStatement update = con.prepareStatement("update timetable set saturday=?,sunday=?,monday=?,tuesday=?,wednesday=?,thursday=?,department_id=? where week_id=?");
```

After selecting the row that we want to update from the table , the data will appear in the text fields to update it.

So we have to get the data from the text fields , as we used field name to get the data then store it into a variable like:

```
String sa = sat.getText();                    String su = sun.getText();
```

After editing the data we have to insert it into the table putting the column number and data variable.

```
update.setString(1, sa);                      update.setString(2, su);
```

(if) statement to update the department that means if the department name is (maths) set the department id to 2 ,else if it is science set it to 1.

```
if (de == "maths") {    update.setInt(7, 2);    }

else {    update.setInt(7, 1);    }
```

Execute the selected statement

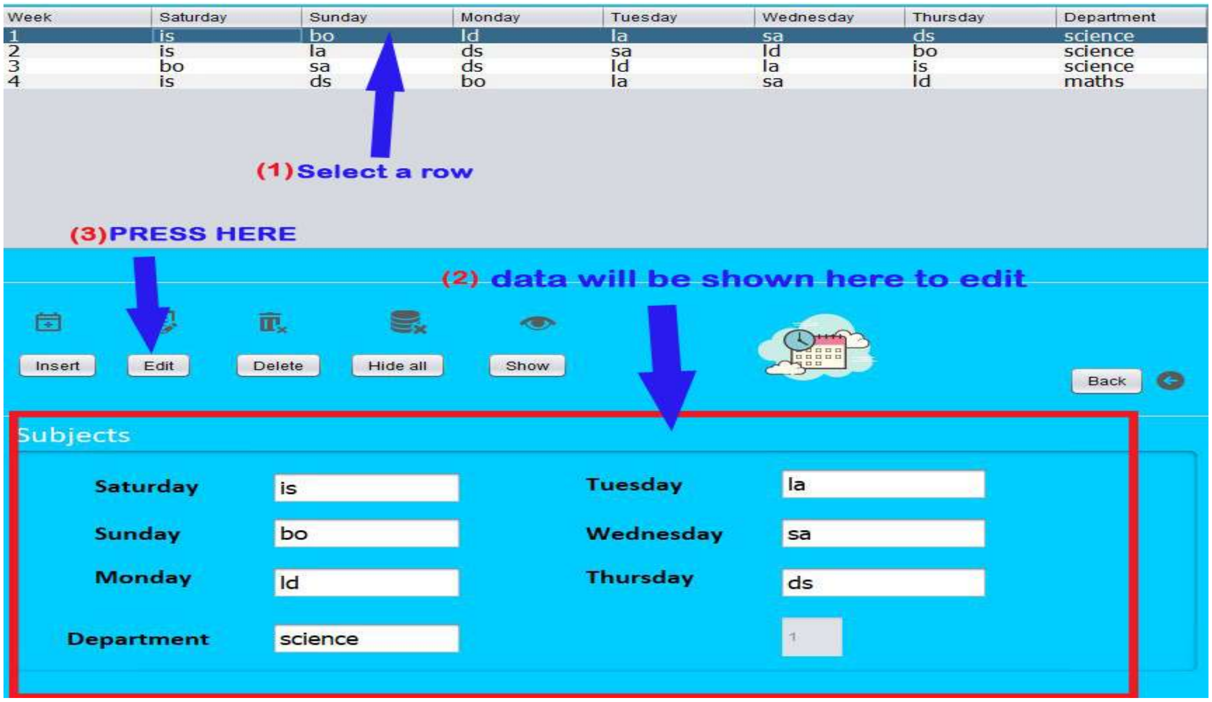
```
update.executeUpdate();

JOptionPane.showMessageDialog(this, "edit done!");   //message showed after execution
```

Now we have to empty text fields by setting to it an empty value

```
        sat.setText("");                      sun.setText("");
```

Finally calling the show button function

```
jButton18ActionPerformed(evt);
```



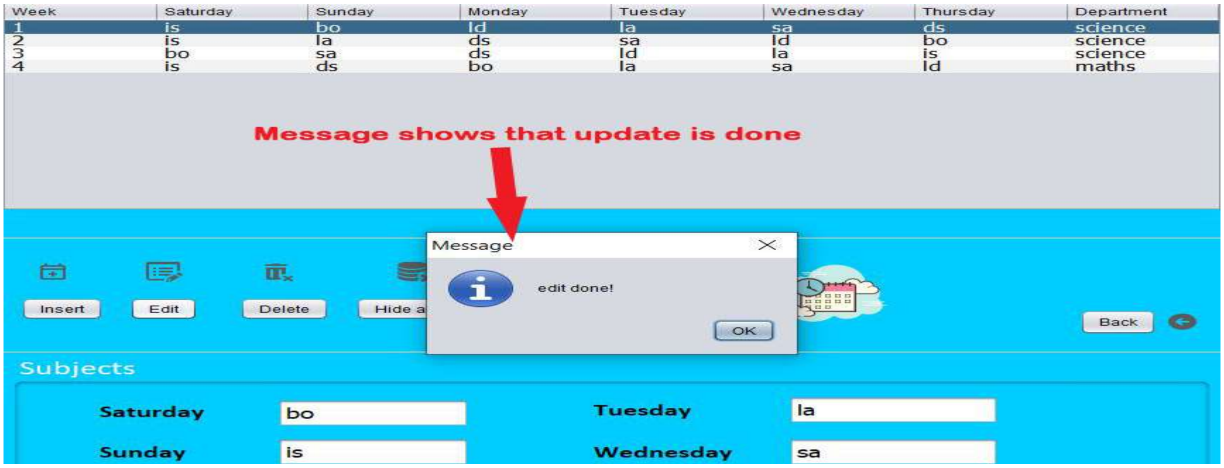
Week	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Department
1	is	bo	ld	la	sa	ds	science
2	is	la	ds	sa	ld	bo	science
3	bo	sa	ds	ld	la	is	science
4	is	ds	bo	la	sa	ld	maths

(1)Select a row

(3)PRESS HERE

(2) data will be shown here to edit

Saturday	is	Tuesday	la
Sunday	bo	Wednesday	sa
Monday	ld	Thursday	ds
Department	science		1



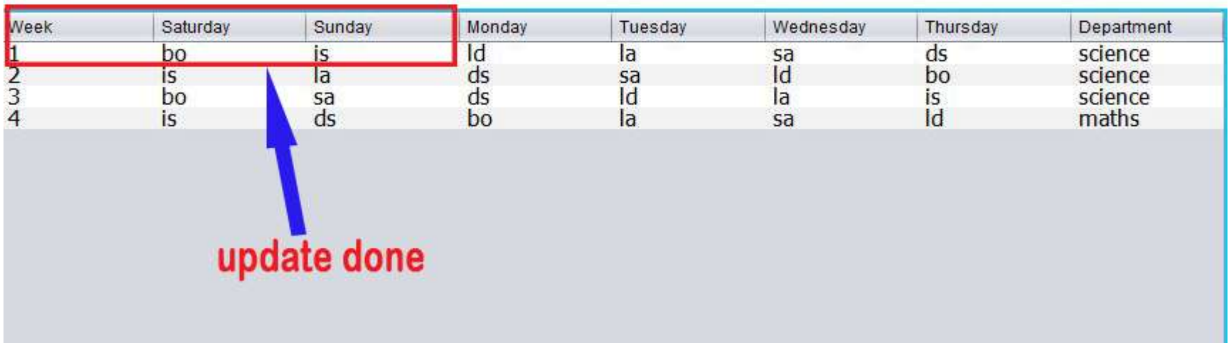
Week	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Department
1	is	bo	ld	la	sa	ds	science
2	is	la	ds	sa	ld	bo	science
3	bo	sa	ds	ld	la	is	science
4	is	ds	bo	la	sa	ld	maths

Message shows that update is done

Message

edit done!

Saturday	bo	Tuesday	la
Sunday	is	Wednesday	sa



Week	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Department
1	bo	is	ld	la	sa	ds	science
2	is	la	ds	sa	ld	bo	science
3	bo	sa	ds	ld	la	is	science
4	is	ds	bo	la	sa	ld	maths

update done

Delete

(EX from teacher)

Programmed button to remove the selected row from the table.

The selected (drop) statement will be called from the database

```
PreparedStatement stm = con.prepareStatement("delete from teacher where
teacher_id=?");
```

After selecting a teacher his data will be shown in the fields.

Get the teacher id from its text field and set it to the prepared drop statement to be executed.

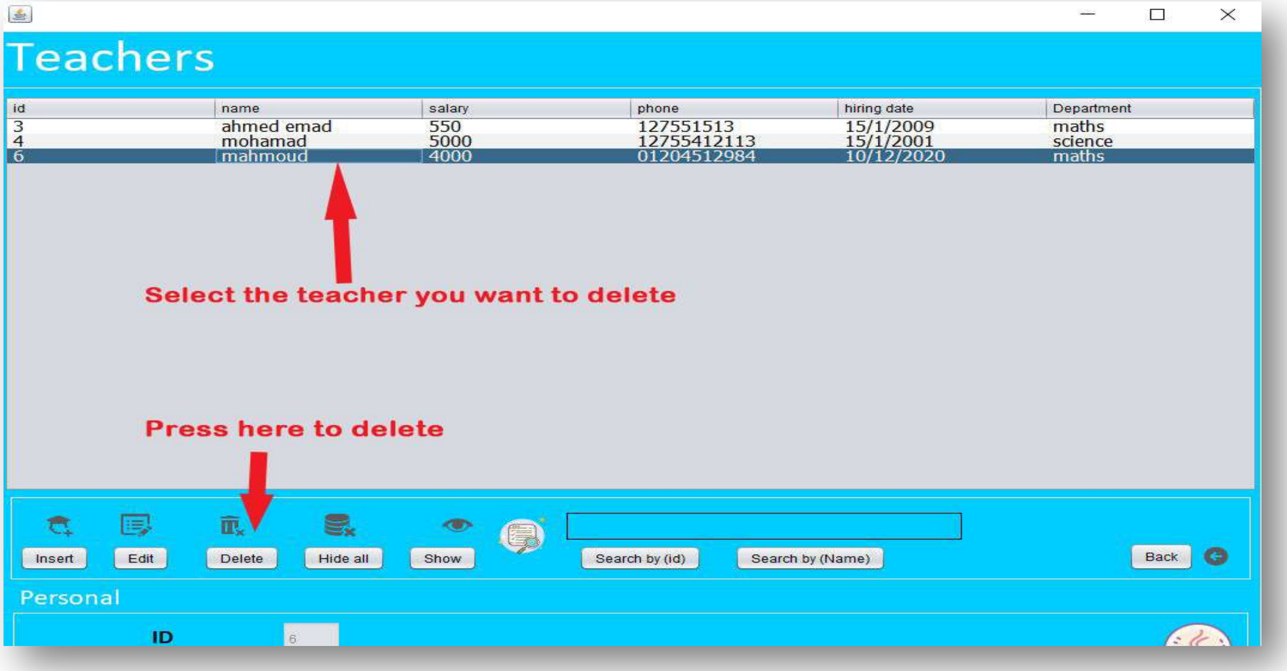
```
String id =jID.getText();

stm.setString(1, id);

stm.executeUpdate();
```

Calling the show function to make the difference in the table

```
showActionPerformed(evt);
```

Now we get to empty the text fields from the deleted data by setting an empty values to them.

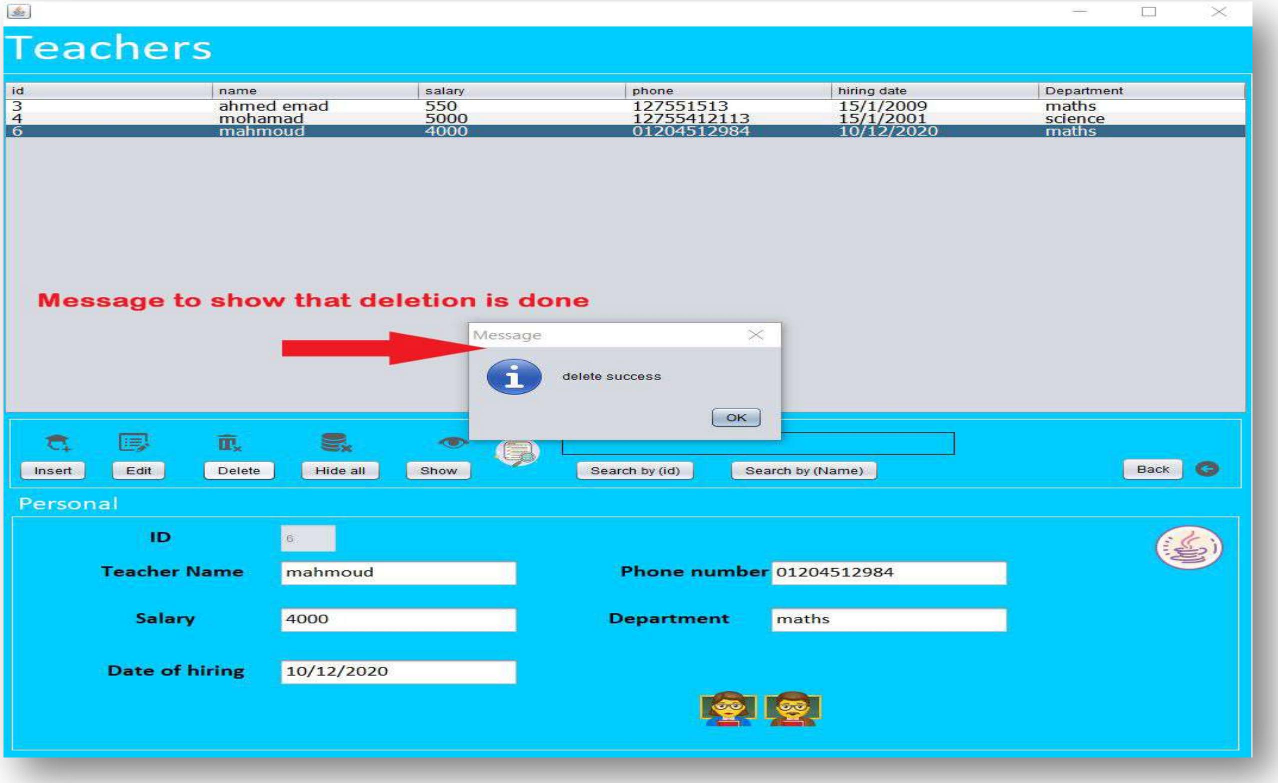
```
jID.setText("");                                    jNAME.setText("");
```



id	name	salary	phone	hiring date	Department
3	ahmed emad	550	127551513	15/1/2009	maths
4	mohamad	5000	12755412113	15/1/2001	science
6	mahmoud	4000	01204512984	10/12/2020	maths

Select the teacher you want to delete

Press here to delete



Teachers

id	name	salary	phone	hiring date	Department
3	ahmed emad	550	127551513	15/1/2009	maths
4	mohamad	5000	12755412113	15/1/2001	science
6	mahmoud	4000	01204512984	10/12/2020	maths

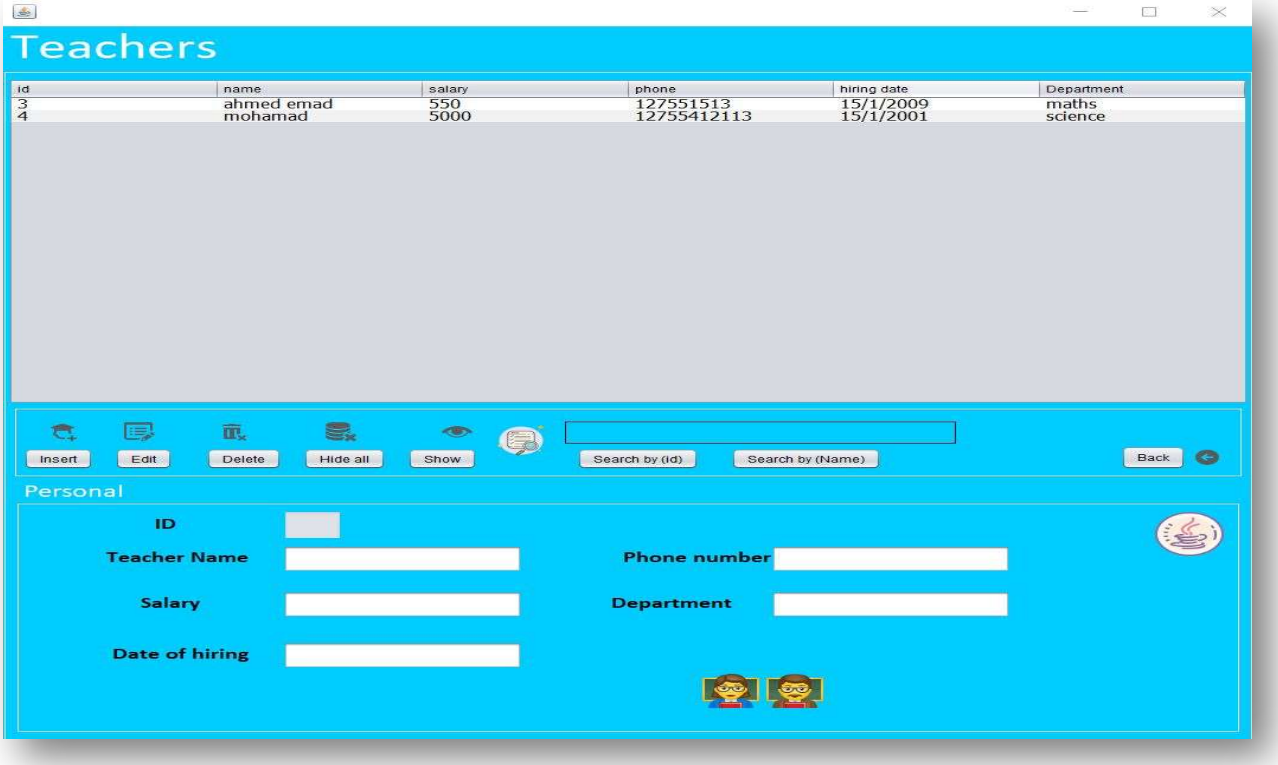
Message to show that deletion is done

delete success

Personal

ID	6		
Teacher Name	mahmoud	Phone number	01204512984
Salary	4000	Department	maths
Date of hiring	10/12/2020		

Know the deletion is done and the row is deleted from the table



Teachers

id	name	salary	phone	hiring date	Department
3	ahmed emad	550	127551513	15/1/2009	maths
4	mohamad	5000	12755412113	15/1/2001	science

Personal

Hide all

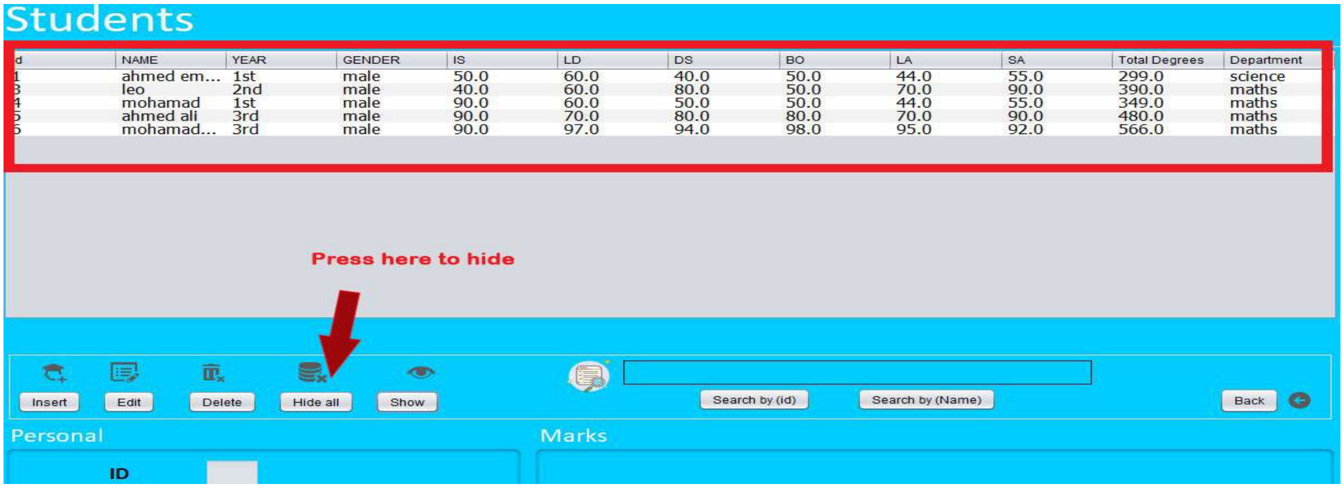
Programmed button to hide all table data without deleting them.

By creating an object from the table to use it to get the number of rows using (getRowCount).

Then using a for loop , we can remove the rows one by one .

The loop removes them from the last row to the first one.

```
DefaultTableModel dm = (DefaultTableModel) teacher_table.getModel();

int rowCount = dm.getRowCount();

for (int i = rowCount - 1; i >= 0; i--) {   dm.removeRow(i);   }
```

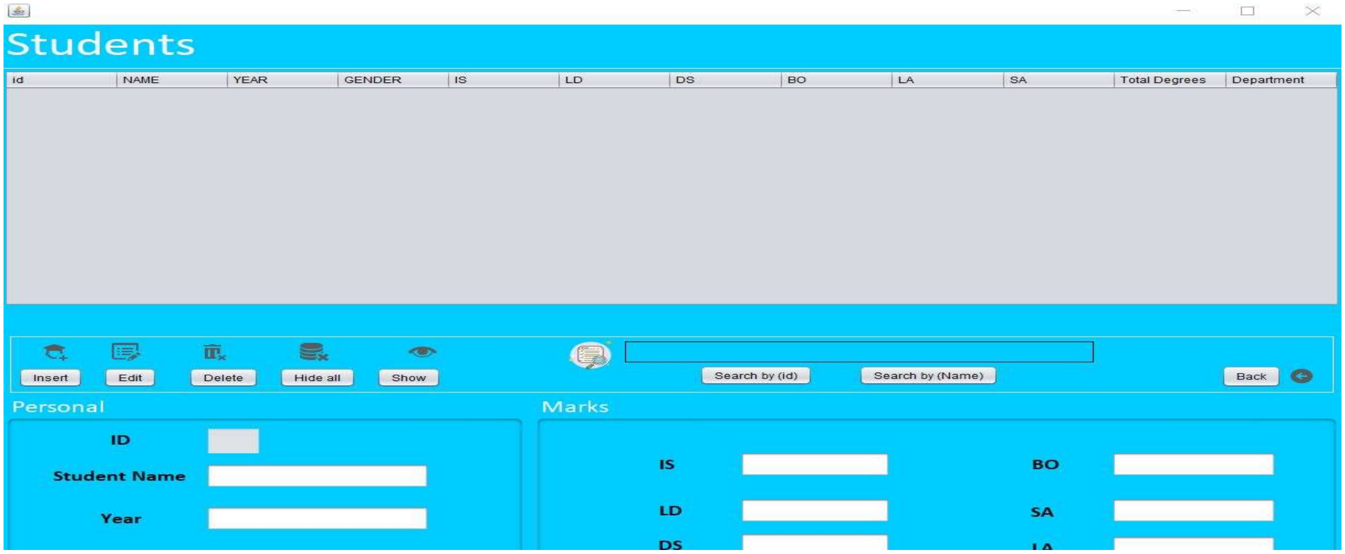


Students

d	NAME	YEAR	GENDER	IS	LD	DS	BO	LA	SA	Total Degrees	Department
1	ahmed em...	1st	male	50.0	60.0	40.0	50.0	44.0	55.0	299.0	science
3	leo	2nd	male	40.0	60.0	80.0	50.0	70.0	90.0	390.0	maths
4	mohamad	1st	male	90.0	60.0	50.0	50.0	44.0	55.0	349.0	maths
5	ahmed ali	3rd	male	90.0	70.0	80.0	80.0	70.0	90.0	480.0	maths
5	mohamad...	3rd	male	90.0	97.0	94.0	98.0	95.0	92.0	566.0	maths

Press here to hide

Now the table is empty

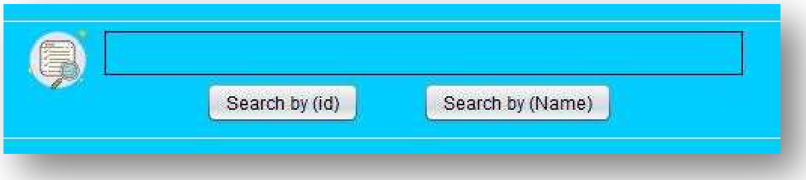


Students

id	NAME	YEAR	GENDER	IS	LD	DS	BO	LA	SA	Total Degrees	Department

In teacher and student frames

There are 2 buttons to search in the table , the first one is search by name and the second to search using id .



Search by (Name)

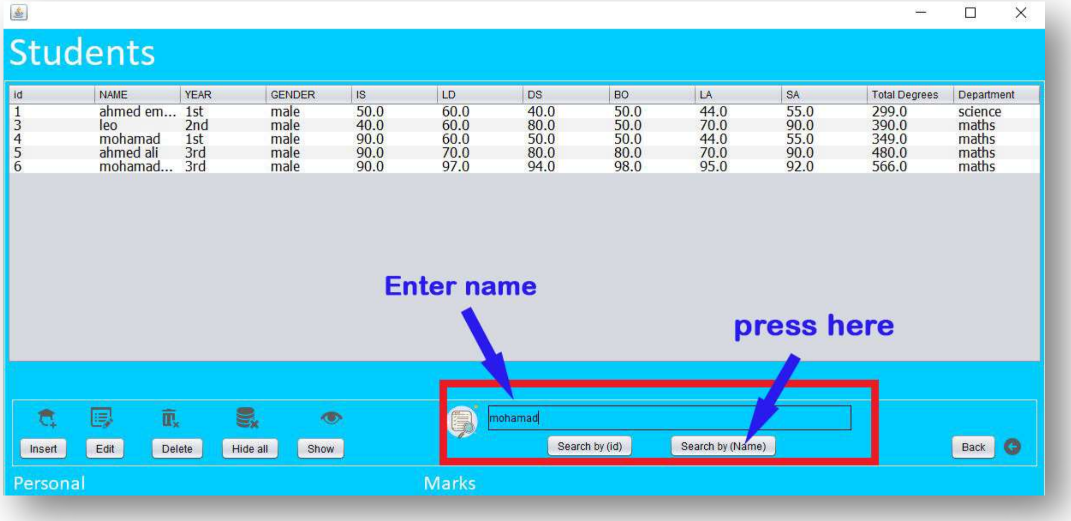
To do this we first have to get the text typed in the text field in a variable

```
String searchKeyword=jTextField4.getText();
```

Then writing the show button code with a little difference .

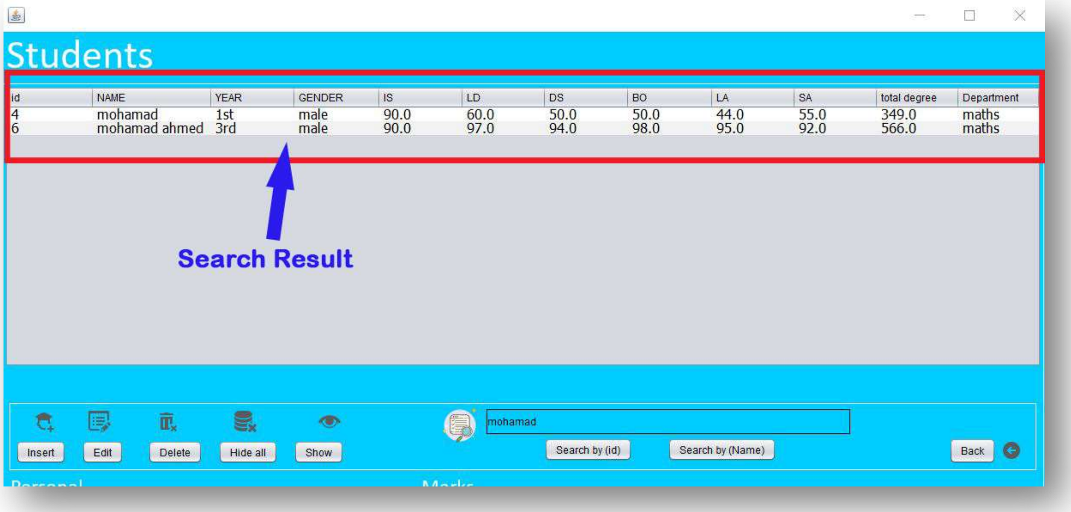
In the while loop we have to put an if statement to check whether the string typed is the same as any string (name) in culomn 2 in the table then give it to the table row to appear.

```
while (result.next()) {

            if ( result.getString(2).contains(searchKeyword) )

            {       int dep=result.getInt(6);

                 PreparedStatement depa = con.prepareStatement("select * from department
where department_id='" + dep + "'");

        ResultSet depa_result = depa.executeQuery();

        depa_result.next();

         String department_name=depa_result.getString(2);

            String r[] = {result.getString(1),

               result.getString(2),

               result.getString(3),

               result.getString(4),

               result.getString(5),

               department_name

            };

             table.addRow(r);

            }   }
```



id	NAME	YEAR	GENDER	IS	LD	DS	BO	LA	SA	Total Degrees	Department
1	ahmed em...	1st	male	50.0	60.0	40.0	50.0	44.0	55.0	299.0	science
3	leo	2nd	male	40.0	60.0	80.0	50.0	70.0	90.0	390.0	maths
4	mohamad	1st	male	90.0	60.0	50.0	50.0	44.0	55.0	349.0	maths
5	ahmed ali	3rd	male	90.0	70.0	80.0	80.0	70.0	90.0	480.0	maths
6	mohamad...	3rd	male	90.0	97.0	94.0	98.0	95.0	92.0	566.0	maths

After entering student name the result will appear in the table



id	NAME	YEAR	GENDER	IS	LD	DS	BO	LA	SA	total degree	Department
4	mohamad	1st	male	90.0	60.0	50.0	50.0	44.0	55.0	349.0	maths
6	mohamad ahmed	3rd	male	90.0	97.0	94.0	98.0	95.0	92.0	566.0	maths

<u>Search by (id)</u>

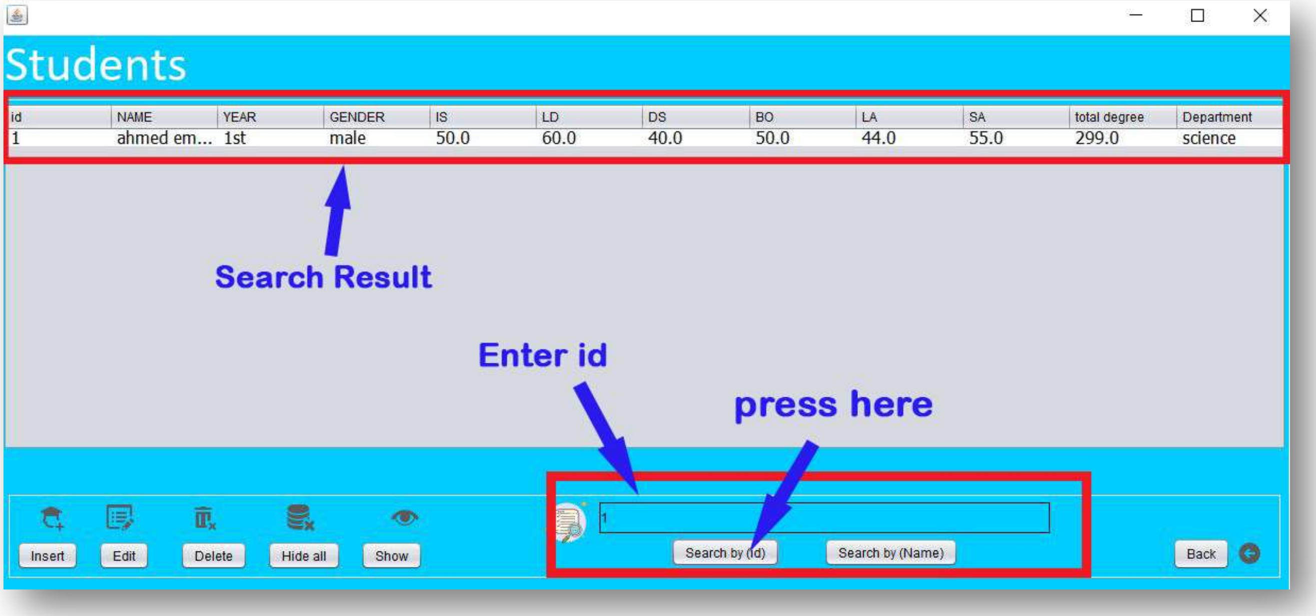
To do this we first have to get the text typed in the text field in a variable

```
String searchKeyword=jTextField4.getText();
```

Then writing the show button code with a little difference .

In the while loop we have to put an if statement to check whether the string typed is the same as any string (id) in culomn 1 in the table then give it to the table row to appear.

```
while (result.next()) {
            if(result.getString(1).equals(searchKeyword))
            {       int dep=result.getInt(6);
                PreparedStatement depa = con.prepareStatement("select * from
department where department_id='" + dep + "'");
         ResultSet depa_result = depa.executeQuery();
         depa_result.next();
          String department_name=depa_result.getString(2);
            String r[] = {result.getString(1),
               result.getString(2),
               result.getString(3),
               result.getString(4),
               result.getString(5),
               department_name
            };
             table.addRow(r);
            }
```



id	NAME	YEAR	GENDER	IS	LD	DS	BO	LA	SA	total degree	Department
1	ahmed em...	1st	male	50.0	60.0	40.0	50.0	44.0	55.0	299.0	science

1

Search Result

Enter id

press here

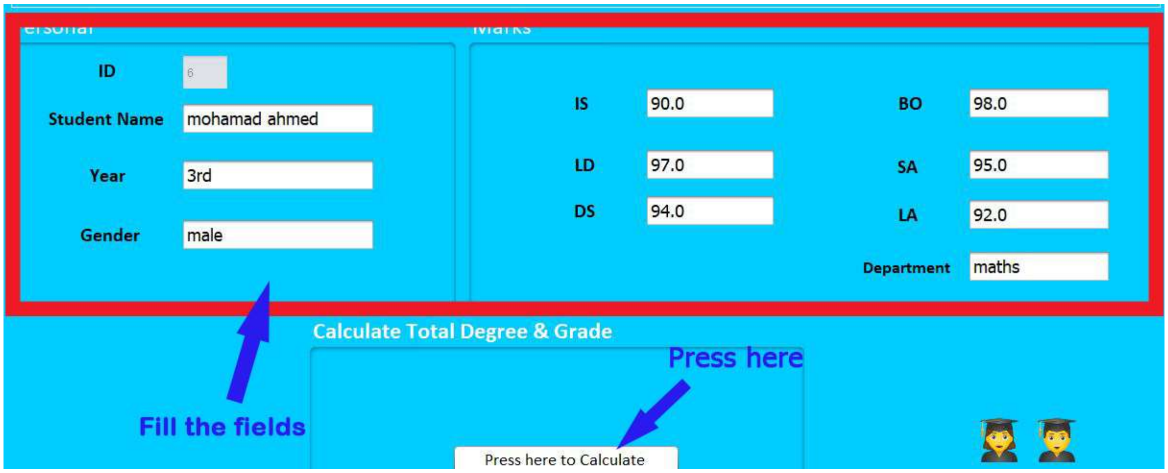
In Students you can calculate the total degree and the grade for the student.

After filling the text field press on calculate button to show the result.

If the student grade is more than 90% it will be (A) , more than 80% it will be(B) , more than 70% it will be(C) , more than 60% it will be(D) , more than 50% it will be(E) and any thing else it will be (F).

Here we have to take the degrees from its text fields and convert it into double values then calculate its summation.

```
String iss = is.getText();

        String ldd = ld.getText();

        String dss = ds.getText();

        String boo = bo.getText();

        String saa = sa.getText();

        String laa = la.getText();

        double num1 = Double.parseDouble(iss);

        double num2 = Double.parseDouble(ldd);

        double num3 = Double.parseDouble(dss);

        double num4 = Double.parseDouble(boo);

        double num5 = Double.parseDouble(saa);

        double num6 = Double.parseDouble(laa);

        String calc_g;

        double calc_tot = num1+num2+num3+num4+num5+num6;

        {

          if(calc_tot >=540)         {   calc_g="A";   }

          else if (calc_tot >=480)  {  calc_g="B";  }

          else if(calc_tot>=420)    {   calc_g="C"; }

          else if(calc_tot>=360)    {   calc_g="D"; }

          else if(calc_tot>=300)    {   calc_g="E";  }

          else                       { calc_g="F";    }         }

        calc_grade.setText(calc_g+"");

        calc_total.setText(calc_tot+"");
```



ID 6

Student Name mohamad ahmed

Year 3rd

Gender male

IS 90.0

LD 97.0

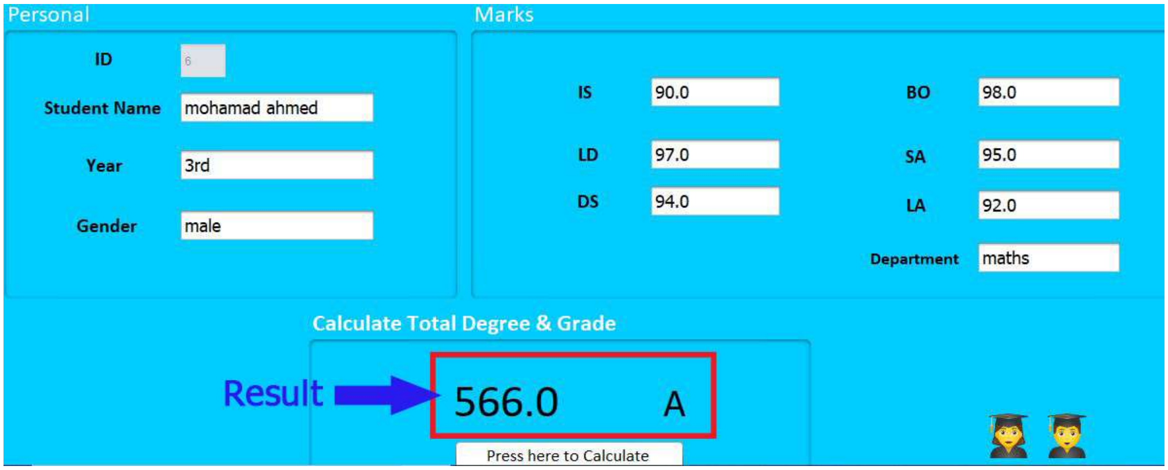
DS 94.0

BO 98.0

SA 95.0

LA 92.0

Department maths



ID 6

Student Name mohamad ahmed

Year 3rd

Gender male

IS 90.0

LD 97.0

DS 94.0

BO 98.0

SA 95.0

LA 92.0

Department maths

566.0 A