Now that I have proposed and decided what I will be doing so as to improve the database management of EMIRATES NATIONAL SCHOOL I will now decide how I will be using MS Access. All the data for EMIRATES NATIONAL SCHOOL will be stored in tables although the data will be entered through the use of forms. Each table has different fields depending on the type of data it is going to store. The design layout for the tables, which I will be creating for the new EMIRATES NATIONAL SCHOOL database, has been shown below. Along with the data entered there is always a chance of an error occurring. To reduce the risk of error occurring I have used validation rules and input masks with the fields for each table. Therefore along with the design layout for the table I have also shown the validation rules and input masks I have used. The validation rule in Access is used to detect errors made during data entry and immediately prompts the user to correct the error. The input masks on the other hand are used to restrict data entry to only one form.

**Table Name: Student Records**

| Field Name | Datatype | Width | Example |
|---|---|---|---|
| Roll Number | Text | 4 | N001 |
| First Name | Text | Variable | Nantie |
| Last Name | Text | Variable | Hayward |
| Gender | Text | 6 | Male |
| Date Of Birth | Date/Time | 9 | 12-Mar-84 |
| Residence Telephone | Text | 12 | (DXB)3276878 |
| Address | Number | 5 | 3564 |
| Emirate | Text | Variable | Dubai |
| Current Class | Text | Variable | Senior 5B |
| Percentage For Year | Number (Percent) | 5 | 65.6% |
| Grade | Text | 2 | B |
| Picture | OLE Object | - | Bitmap Image |

**Validation Rules:**

| Field Name | Validation Rule | Validation Text |
|---|---|---|
| Gender | ="Female" Or "Male" | "Only 'Female' and 'Male' can be entered into this field. Please re enter your data." |
| Date Of Birth | <=#01-Jan-95# And >#30-Dec-82# | "Only a date between 30-Dec-90 and 01-Jan-95 can be entered. Please re enter" |
| Grade | ="A*" Or "A" or "B" or "C" or "D" or "F" | "Only A*, A, B, C, D or F can be entered. Please re enter" |

**Input Masks:**

| Field Name | Input Mask |
|---|---|
| Roll Number | >L000 |
| Residence Telephone | \(AAA") "0000000 |

For this table too the key filed is the “Roll Number” field. This completes all the tables that will be storing student information.
The design layout for the next table is shown below.

**Table Name: Teacher Records**

| Field Name | Datatype | Width | Example |
|---|---|---|---|
| Teacher ID | Text | 5 | TA001 |
| First Name | Text | Variable | Asif |
| Last Name | Text | Variable | Paul |
| Gender | Text | 6 | Male |
| Date Of Birth | Date/Time | 9 | 16-Aug-65 |
| Residence Telephone | Text | 12 | (DXB)3349801 |
| Rate Of Pay | Currency | 6 | $12.00 |
| Classes Lectured | Text | Variable | Senior 5F |
| Classes Lectured (2) | Text | Variable | A Level |
| Subjects Taught | Text | Variable | Physics |
| Subjects Taught (2) | Text | Variable | Maths |
| Picture | OLE Object | Bitmap Image | - |

**Validation Rules:**

| Field Name | Validation Rule | Validation Text |
|---|---|---|
| Rate Of Pay | <50 | “Only a value less than 50 can be entered. Please re enter” |
| Gender | =“Female” Or “Male” | "Only 'Female' and ‘Male’ can be entered into this field. Please re enter your data." |

**Input Masks:**

| Field Name | Input Mask |
|---|---|
| Teacher ID | >\TL000 |
| Residence Telephone | \(AAA") "0000000 |
| Rate Of Pay | 00.00 |

The keyfield for the teacher records table is the “Teacher ID” field. The design layout for the next table is shown in the next page.

**Table Name: Staff Records**

| Field Name | Datatype | Width | Example |
|---|---|---|---|
| Staff ID | Text | 5 | SJ001 |
| First Name | Text | Variable | Joseph |
| Last Name | Text | Variable | Crasto |
| Gender | Text | 6 | Male |
| Date Of Birth | Date/Time | 9 | 12-Dec-56 |
| Position Of Work | Text | Variable | Librarian |
| Rate Of Pay | Currency | 6 | $10.00 |
| Picture | OLE Object | Bitmap Image | - |

**Validation Rules:**

| Field Name | Validation Rule | Validation Text |
|---|---|---|
| Rate Of Pay | <20 | “Only a value less than 20 can be entered. Please re enter” |
| Gender | =“Female” Or “Male” | "Only 'Female' and ‘Male’ can be entered into this field. Please re enter your data." |

**Input Masks:**

| Field Name | Input Mask |
|---|---|
| Staff ID | >\TL000 |
| Rate Of Pay | 00.00 |

The keyfield for the staff records table is the “Staff ID” field. The next table and its design layout is shown below.

**Table Name: Medical Records**

| Field Name | Datatype | Width | Example |
|---|---|---|---|
| Roll Number | Lookup Wizard (Text) | 4 | A005 |
| First Name | Text | Variable | Alan |
| Last Name | Text | Variable | Iverson |
| Gender | Text | 6 | Male |
| Date Of Birth | Date/Time | 9 | 06-Jun-85 |
| Current Class | Lookup Wizard (Text) | Variable | Senior 5C |
| Height (cm) | Number | 3 | 180 |
| Weight (kg) | Number | 3 | 80 |
| Polio Vacine | Yes/No | - | Yes |
| HIV Vacine | Yes/No | - | Yes |
| Mantoux Vacine | Yes/No | - | Yes |
| BCG Vacine | Yes/No | - | Yes |
| Small Pox Vacine | Yes/No | - | No |
| Measles Vacine | Yes/No | - | No |
| Mumps Vacine | Yes/No | - | Yes |

**Validation Rules:**

| Field Name | Validation Rule | Validation Text |
|---|---|---|
| Gender | =“Female” Or “Male” | "Only 'F' and ‘M’ can be entered into this field. Please re enter your data." |
| Date Of Birth | <=#01-Jan-95# And >#30-Dec-82# | "Only a date between 30-Dec-90 and 01-Jan-95 can be entered. Please re enter" |

**Input Masks:**

| Field Name | Input Mask |
|---|---|
| Roll Number | >L000 |
| Height (cm) | ###cm |
| Weight (kg) | ##kg |

The keyfield for the medical record list is the “Roll Number” field. The design layout for the next table can be seen below.

**Table Name: Library Book List**

| Field Name | Datatype | Width | Example |
|---|---|---|---|
| Book ID | Text | 5 | BP001 |
| Name | Text | Variable | A Level Physics |
| Author | Text | Variable | Tom Duncan |
| Available | Yes/No | - | No |
| Date Borrowed | Date/Time | 9 | 16-Oct-01 |
| Current Date | Date/Time | 9 | 18-Oct-01 |
| Return Date | Date/Time | 9 | 23-Oct-01 |
| Roll Number | Lookup Wizard (Text) | 4 | A006 |

**Input Masks:**

| Field Name | Input Mask |
|---|---|
| Book ID | \BL000 |
| Roll Number | >L000 |

The keyfield for this library book list is the “Book ID” field. The design layout for the next table is shown in the next page.

**Table Name: Senior Students Mark Register**

| Field Name | Datatype | Width | Example |
|---|---|---|---|
| Roll Number | Text | 4 | J006 |
| First Name | Text | Variable | James |
| Last Name | Text | Variable | Avery |
| Gender | Text | 6 | Male |
| Current Class | Lookup Wizard (Text) | Variable | Senior 5C |
| English Language | Number | 3 | 75 |
| English Literature | Number | 3 | 76 |
| Maths | Number | 3 | 99 |
| Physics | Number | 3 | 95 |
| Chemistry | Number | 3 | 86 |
| Accounts | Number | 3 | 92 |
| Business Studies | Number | 3 | 80 |
| Information Technology | Number | 3 | 85 |
| History | Number | 3 | 95 |
| Percentage | Number (Percent) | 7 | 87.00% |
| Grade | Text | 2 | A |

**Validation Rules:**

| Field Name | Validation Rule | Validation Text |
|---|---|---|
| Gender | ="Female" Or "Male" | "Only 'Female' and 'Male' can be entered into this field. Please re enter your data." |
| English Language | <=100 | "Only a mark less than or equal to 100 can be entered." |
| English Literature | <=100 | "Only a mark less than or equal to 100 can be entered." |
| Maths | <=100 | "Only a mark less than or equal to 100 can be entered." |
| Physics | <=100 | "Only a mark less than or equal to 100 can be entered." |
| Chemistry | <=100 | "Only a mark less than or equal to 100 can be entered." |
| Accounts | <=100 | "Only a mark less than or equal to 100 can be entered." |
| Business Studies | <=100 | "Only a mark less than or equal to 100 can be entered." |
| Information Technology | <=100 | "Only a mark less than or equal to 100 can be entered." |
| History | <=100 | "Only a mark less than or equal to 100 can be entered." |
| Percentage | <=100 | "Only a percentage less than or equal to 100 can be entered." |

| | | |
|---|---|---|
| Grade | ="A*" or "A" or "B" or "C" or "D" or "Fail" | "Only A*, A, B, C, D or Fail can be entered for the grade." |

## Input Masks:

| Field Name | Input Mask |
|---|---|
| Roll Number | >L000 |

The keyfield for this mark register is the "Roll Number" field. Just as I have designed a mark register for the senior students I will also be designing a mark register for the junior students as well. The only changes that will taking place will be the fields therefore I will be showing the record structure for this junior students mark register. The validation rules and input masks for the table for each type of field remains the same.
The record structure for the junior mark register is shown below.

## Table Name: Junior Students Mark Register.

| Field Name | Datatype | Width | Example |
|---|---|---|---|
| Roll Number | Text | 4 | J006 |
| First Name | Text | Variable | Jonathan |
| Last Name | Text | Variable | Perera |
| Gender | Text | 6 | Male |
| Current Class | Lookup Wizard (Text) | Variable | Junior 5C |
| English Language | Number | 3 | 90 |
| English Literature | Number | 3 | 86 |
| Maths | Number | 3 | 65 |
| Science | Number | 3 | 75 |
| Geography | Number | 3 | 96 |
| History | Number | 3 | 100 |
| Arabic | Number | 3 | 55 |
| Art | Number | 3 | 85 |
| Percentage | Number (Percent) | 7 | 81.50% |
| Grade | Text | 2 | A |

The validation rules and input masks that are applied to the following fields remain the same as the validation rules and input masks applied to the senior mark register.

- Roll Number
- Gender
- Subject Fields
- Percentage
- Grade

The record structure for the next table is shown in the next page.

**Table Name: Teacher's Payroll**

| Field Name | Datatype | Width | Example |
|---|---|---|---|
| Teacher ID | Lookup Wizard (Text) | 5 | TT001 |
| First Name | Text | Variable | Tom |
| Last Name | Text | Variable | Hanks |
| Gender | Text | 6 | Male |
| Rate Of Pay | Lookup Wizard (Currency) | 6 | $30.00 |
| Hours Lectured | Number | 2 | 65 |
| Miscellaneous Expenses | Currency | 7 | $150.00 |
| Net Pay | Currency | 8 | $1800.00 |

**Validation Rules:**

| Field Name | Validation Rule | Validation Text |
|---|---|---|
| Gender | ="Male" Or "Female" | "Only 'Male' or 'Female' can be entered into this field. Please re enter." |
| Rate Of Pay | <50 | "Only a value less than 50 can be entered." |
| Hours Lectured | <100 | "Only a value less than 100 can be entered. Please re enter." |

**Input Masks:**

| Field Name | Input Mask |
|---|---|
| Teacher ID | >\TL000 |

The keyfield for this teacher's payroll is the "Teacher ID" field. Just as I have designed a table to calculate the wages for the teachers I will also calculate the payroll for the staff as well. The design layout for this table is shown below.

**Table Name: Staff Payroll**

| Field Name | Datatype | Width | Example |
|---|---|---|---|
| Staff ID | Lookup Wizard (Text) | 5 | SJ001 |
| First Name | Text | Variable | Joseph |
| Last Name | Text | Variable | Crasto |
| Gender | Text | 6 | Male |
| Position | Lookup Wizard (Text) | Variable | Librarian |
| Rate Of Pay | Lookup Wizard (Currency) | 6 | $15.00 |
| Hours Worked | Number | 2 | 120 |
| Miscellaneous Expenses | Currency | 7 | $350.00 |
| Net Pay | Currency | 8 | $1450.00 |

The validation rules and input masks, which I will be applying, have been shown in the next page.

## Validation Rules:

| Field Name | Validation Rule | Validation Text |
|---|---|---|
| Gender | ="Male" Or "Female" | "Only 'Male' or 'Female' can be entered into this field. Please re enter." |
| Rate Of Pay | <20 | "Only a value less than 20 can be entered." |
| Hours Worked | <150 | "Only a value less than 150 can be entered. Please re enter." |

## Input Masks:

| Field Name | Input Mask |
|---|---|
| Staff ID | >\SL000 |

This completes all the tables I will be creating for EMIRATES NATIONAL SCHOOL's database. However to complete these tables, that is to fill this data there has to be a source for this data. To achieve this collection of data I have to carry this out the old fashioned way by issuing data collection. These forms will vary in design based on the data I wish to obtain. The data collection I will be handing out are listed below.

- Student Admission Form
  This form is handed to parents when they come to admit their child into the school. Therefore this form will contain all the basic information about the child such as his name, date of birth, gender, etc.

- Teacher Application Form
  When someone wishes to apply for a post as a teacher in the school, the school administration hands this form to the applicant who fills in his or her information, which will be considered for the post.

- Staff Application Form
  Just as there is an application form for teachers there is also an application form for applicants who wish to work for the school. Here again this form is handed to the applicant when they apply for the job and the form will contain information about the applicant.

- Teacher/Staff Activity Log
  The teacher activity log records the time all teachers come in and leave the school and is signed by the teachers as an approval. This form is then used at the end of the month to calculate the payroll for the teachers. There is a similar activity log sheet for the staff, which serves the same purpose and records the same information.

Using this data obtained in these data collection forms and also other data such as the marks for each student from he teacher's mark register I will be creating the new database for EMIRATES NATIONAL SCHOOL. The data for this database will be entered using MS Access' forms function and the data will be stored in the tables I have designed above. I will also have to design each of these forms including the layout of the form header as well as the layout of the fields as well as the controls, which I will be using for data entry.
Shown below are the steps, which I will be carrying out to design each of the forms. Each of these forms will be created using the Form Wizard as it offers easy and simple steps to designing and using a form.

## Student Records Form

- After opening the Design View of the form I will first create the form header, which will contain the title of the school and also the name of the form. The title of the school will be created using Ulead Photoimpact and I would save the image as a GIF image which will be pasted onto the form header.

- I will also be using the different controls provided by MS Access for data entry. The only control I will be using for this form is the Combo Box. This feature lists all the data items similar to a drop down menu when I click on a radio button. This combo box control will be applied to the following fields:
  - Emirate; which will list all the emirates.
  - Current Class; to list all the classes in the school.

- The next control, which I will be using, is the toggle button. This control will be used to select between "Male" and "Female" and only one selection can be applied. I will add the toggle button using the Option group feature. Since the toggle button works by storing a value a little coding is involved as well. In the Code Builder, under the Got Focus event of each button the coding will be as shown below:

```
Private Sub Toggle64_GotFocus()
Me.Gender = "Male"
End Sub
```

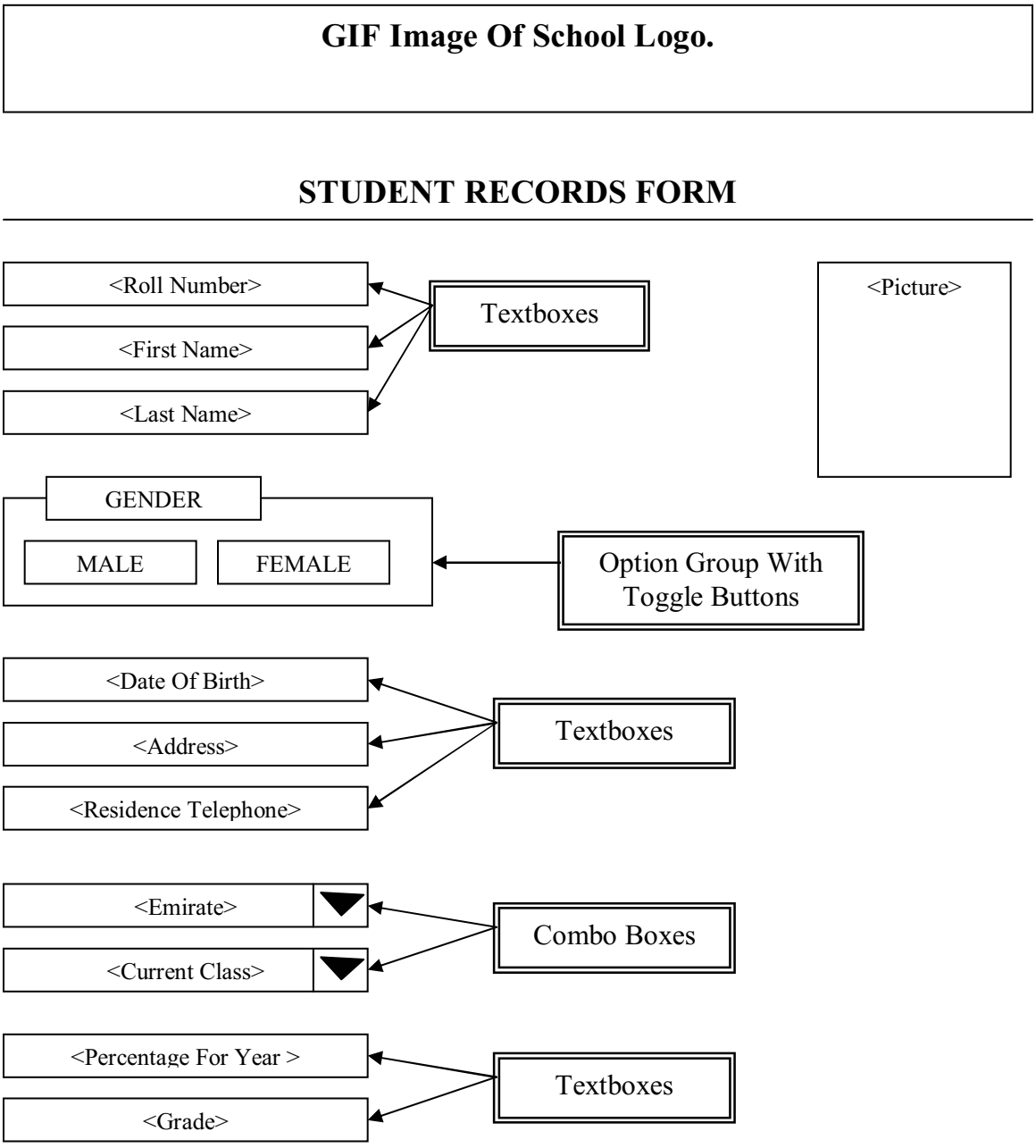
  This is the coding applied to the 'Male' toggle button, which also applies to the 'Female' toggle button where the only change is that the Gender field displays "Female".

- To improve the use of the form I will also include a number of command buttons to control navigation within the form. The command button is found in the control toolbar itself and adding a command button results in an easy to use command button wizard being displayed. I have added command buttons to:
  - Go to the next record
  - Go to the previous record
  - Delete a record

- Add a new record
- Print the active record

- All the validation rules and input masks which I have applied to each field in the record structure of the table for Student Records, these validation rules and input masks also apply to the fields in the form.

This completes the design of the form to store the records for the students of EMIRATES NATIONAL SCHOOL. When I type in data into each field this data item is also stored in the respective table as well. The design layout for this Student Records form is shown below.



# Student Medical Records Form

- After opening the Design View of the form I will first proceed to designing the header of the form. I will first add the GIF image of the logo of the school, which I have created using Ulead Photoimpact.

- The first control I will be using is the combo box, which will be used to select a data item from a field. This combo box will be applied to the following fields.
  - Roll Number; to select the roll number of a student from the student records table.
  - Current Class; will be used to select the class of the student

- The next control which I am using is the toggle button which will be used to select the gender of the student. Again this control will be applied using the Option Group and again the same form of coding as I have used above will gain be used in the Code Builder.

- The next control I will be using is the check box. This check box will be applied to the following fields:
  - Polio Vacine
  - HIV Vacine
  - Mantoux Vacine
  - BCG Vacine
  - Small Pox Vacine
  - Measles Vacine
  - Mumps Vacine

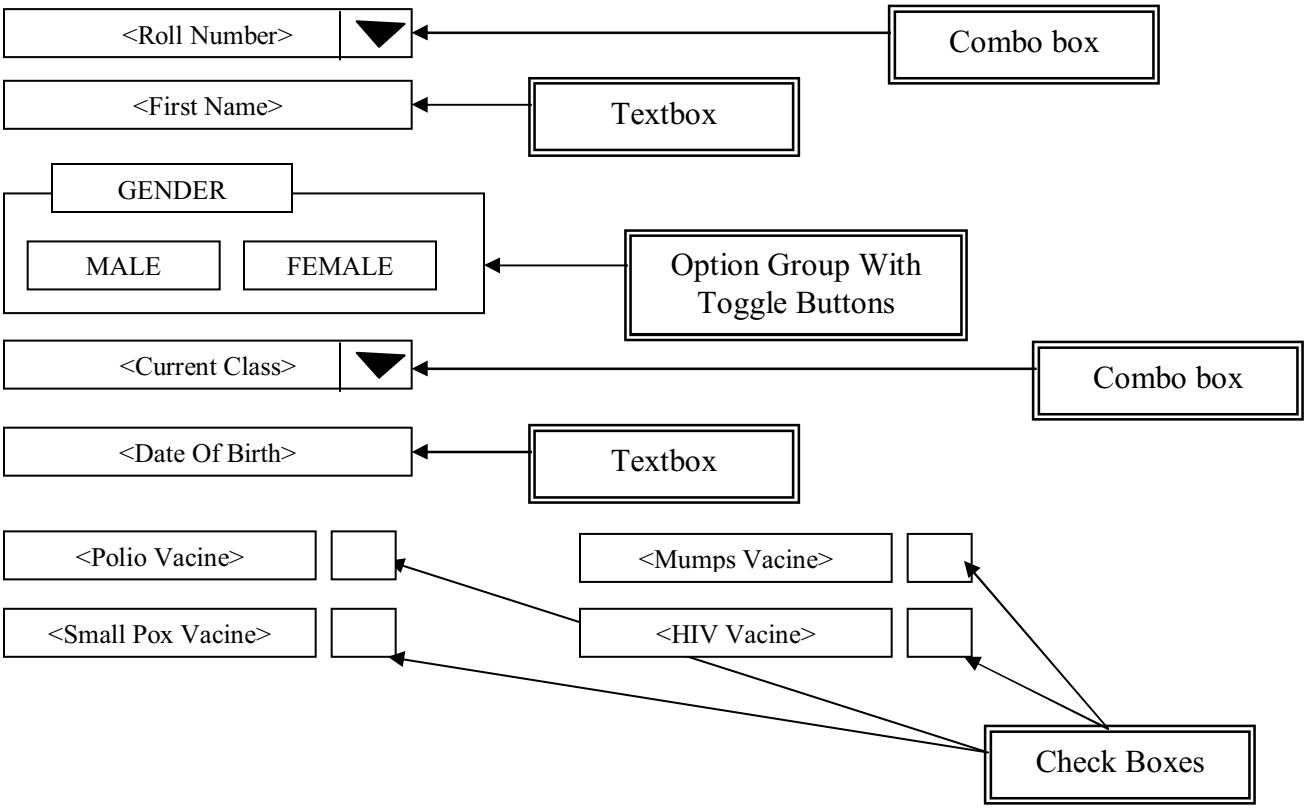
  The datatype for each of these fields is Yes/No or otherwise known as Boolean datatype. Therefore the most practical and easiest control, which can be used, is the check box whereby the nurse can just select whether a student has received a vacine or not.

- Again to improve the navigation within the form I will include a number of command buttons which can be added from the Controls Toolbar. This different buttons which I will add will perform the following functions:
  - Go to the next record
  - Go to the previous record
  - Delete a record
  - Add a new record
  - Print the active record

- Again for this form the data validation rules and the input masks, which have been used in the Student Medical records table, also apply to the form as well. Also any changes or entries made in this form also results in a change in the respective tables as well.

**GIF Image Of School Logo.**

## STUDENT MEDICAL RECORDS




## Library Book List Form

- I would first proceed to designing the header of the form, which would include inserting the header of the form. This would include the logo of the form which has been created using Ulead Photoimpact.

- The first control I will be using is the check box, which will be used for the "Available" field. This field is a Boolean field and is used to indicate whether the indicated book is available in the library or not. Therefore it is suitable to use a check box.

- The next control, which I will be using, is the combo box, which will be used for the "Roll Number" field. The library book list looks up all the roll numbers of the school from the Student records table and this Roll number is displayed to indicate which students has borrowed the book.

- A new feature in MS Access is used in this Library Book List. This feature is the Code Builder, which allows the user to add formulae as well as commands to his

database. This coding is typed in through a Visual Basic interface. For this Library Book list I will be using two different forms of coding.

- The first coding is to display the current date in the "Current Date" field without any user intervention. This date will be updated everyday by just moving the mouse. This is achieved using some simple coding. To first enter the coding screen in Visual basic I would first go to the Design View of the form, next I would right click on the "Current Date" field and after selecting the "Properties" option I would select the "Event" tab and I would select the "Mouse Move" event. This would open up the Code Builder screen. Then under the mouse move event of the current date field I would type in the coding. In the end the coding would be seen as shown below:

```
Private Sub Current_Date_MouseMove(Button As Integer, Shift As Integer, X
As Single, Y As Single)
Current_Date = Date
End Sub
```

This same coding will also be applied to the "Got Focus" event of the current date field. Therefore everytime I move my mouse or the cursor moves to the current date field the date displayed in the current field will be the current date.

- The next coding, which I am using, is more longer. The purpose of this code is to change the layout of the form based on the fact whether a book is available or not. If a book is indicated as available this means that no one has borrowed it so there's no need to display the borrowed date and return date and other similar fields. Only if the book has been borrowed will these fields be displayed. The fact whether a book has been borrowed or not is indicated by a check box in the Available field. Since the field is Boolean this means it has two values, either true or false. If the value is true that mean the check box has been checked and the book is available. If the value is false this means that the book has been borrowed. Using these facts I can program this Library Book List to display certain fields only when required. So after opening the Code Builder as mentioned previously, under the "Mouse Move" event of the Available field the coding will appear as shown below:

```
Private Sub Available_MouseMove(Button As Integer, Shift As Integer, X As
Single, Y As Single)
If Available = True Then
Date_Borrowed.Visible = False
Current_Date.Visible = False
Return_Date.Visible = False
Roll_Number.Visible = False
Else
If Available = False Then
Date_Borrowed.Visible = True
Current_Date.Visible = True
```

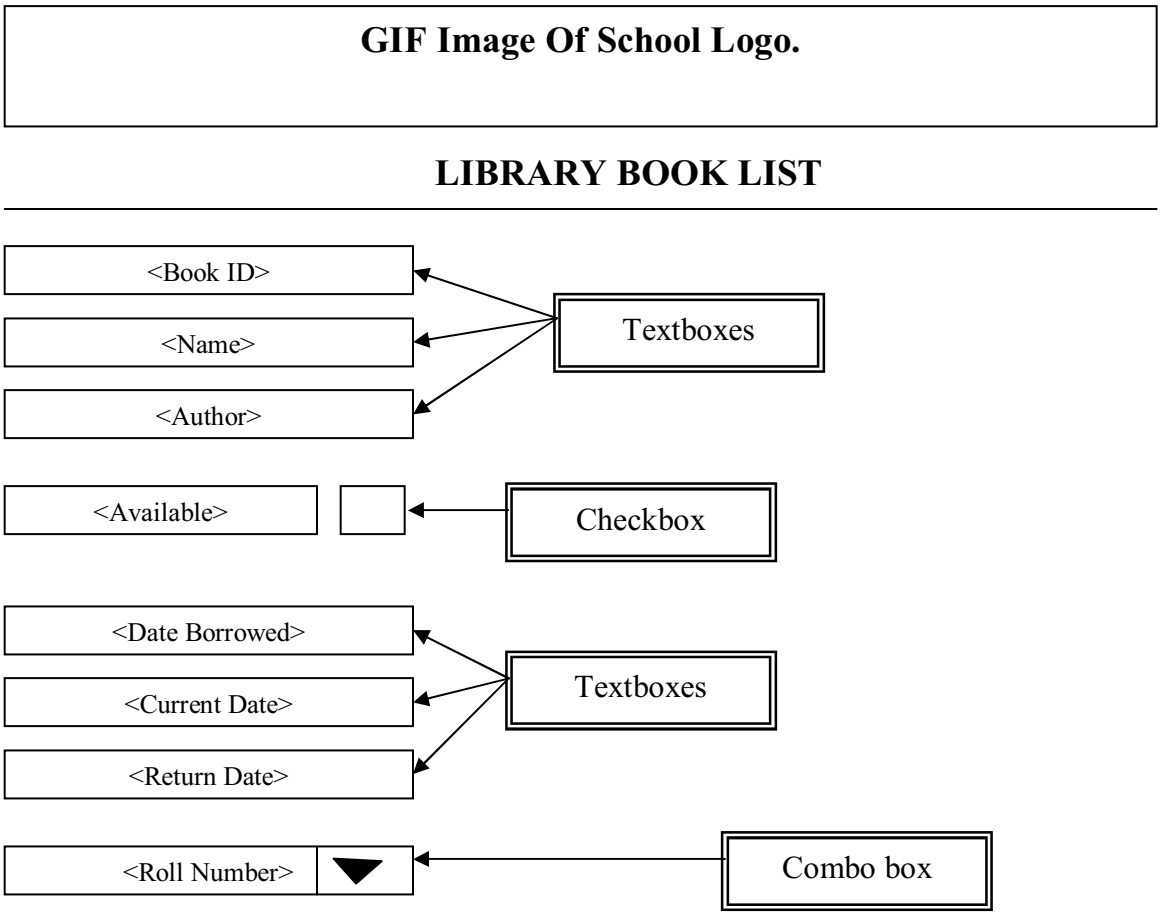
```
Return_Date.Visible = True
Roll_Number.Visible = True
End If
End If
End Sub
```

In general what this coding does is that if the value of the checkbox is true then the fields showing the date borrowed, current date, return date and roll number will not be visible. However if the value of the checkbox is false then the form will be displayed in its entirety.
This completes the coding I will be using for this form.

- Here too I will be adding command buttons to improve the navigation within the form. The same buttons and the purpose of the buttons remains the same as used in the previous forms.

- Any changes that are made in this form will also result in a change in the respective. Also all the validation rules and the input masks that have been used for the Library Book List table are also applied to the form as well.

The design layout for this Library Book List form can be seen below.



## Teacher Records Form

- First I would design the header of the form and firstly I would add the logo of the school, which is a GIF created using Photo Impact.

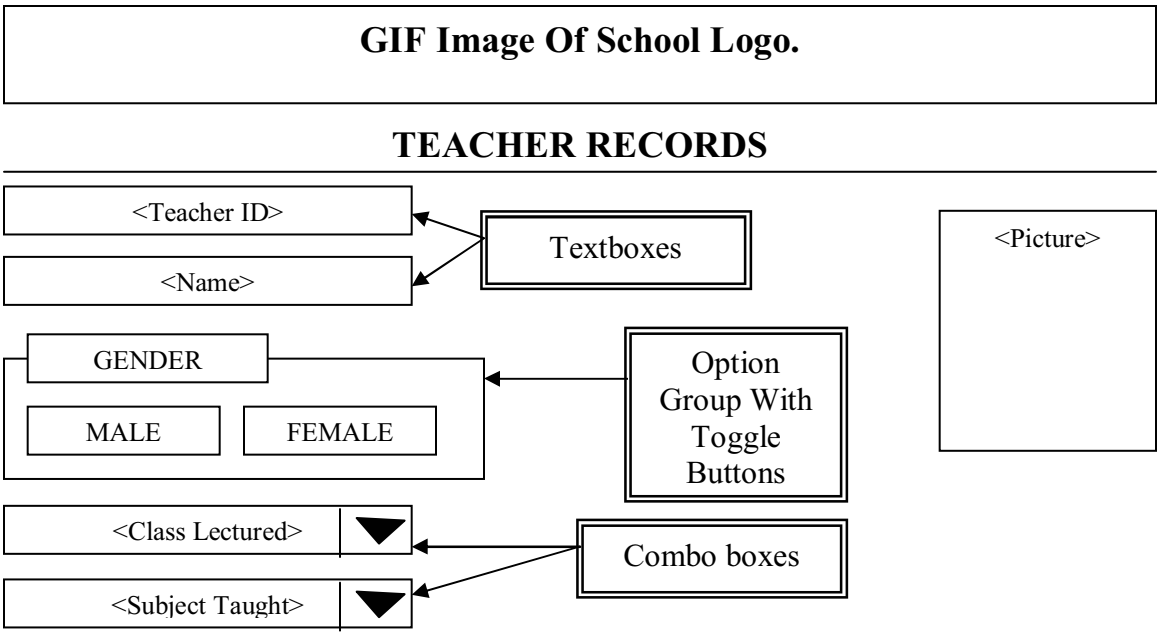
- In this form I will be using the combo box. This combo box will be applied to the following fields:
  - Classes Lectured; to select from the list all the classes of the school
  - Subjects Taught; to select a subject from the list of subjects offered by the school

- The next control, which I will be using, is the toggle button, which will be used to select the gender. Here again I would the two toggle buttons using the Option Group and the same coding will be applied in the Code Builder so as to select and store, either "Male" or "Female"

- Here too for this form I will be using a number of command buttons so to increase the ease of use for the form. The same buttons are also used in this form as have been used in the previous forms and the events which these buttons perform remain the same.

- This would complete the designing of the form, which is to be used to store teacher's records. Again the validation rules and input masks, which have been used for the table of teacher's records, also apply to the form as well. Also any changes or entries of data that are made in this form will also result in a similar change in the respective table as well.

The design layout for this form can be seen below.




- I would open the Design View of the form and I would proceed to designing the form. The first step would be to design the header of the form. I would first enter the logo of the school which is a GIF image which has been created using Ulead Photoimpact.

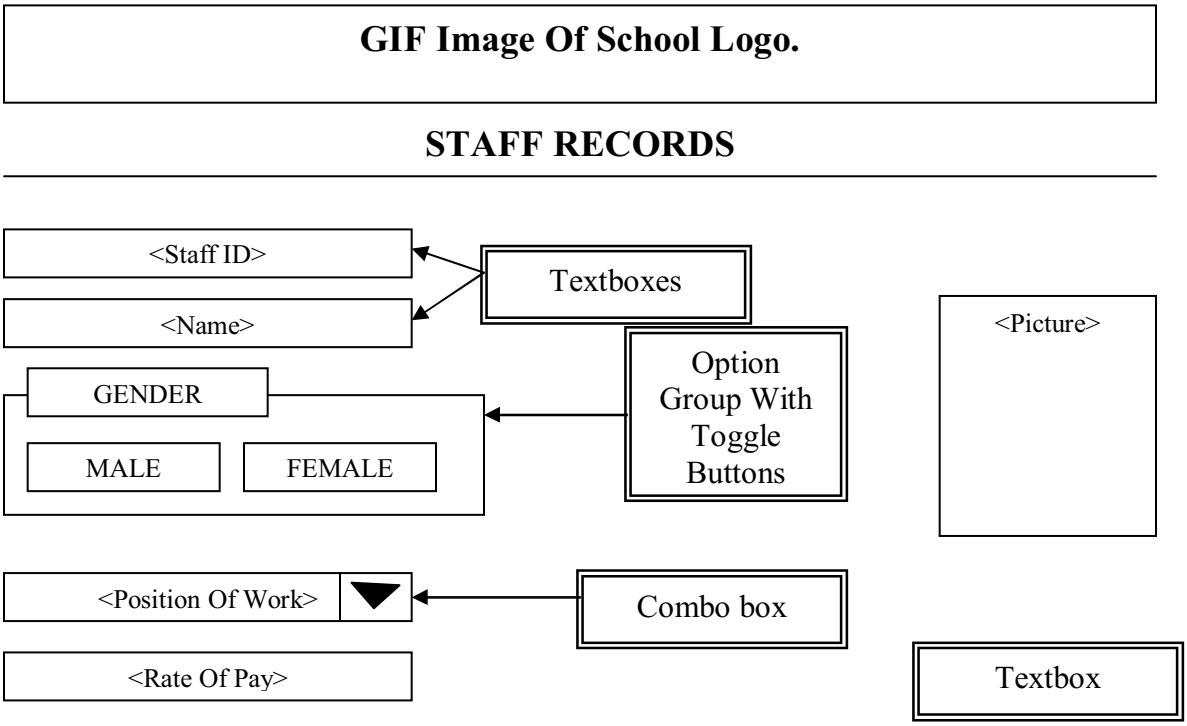
- For this staff records form I will be using the combo box which will be applied to the "Position Of Work" field where the user will have to select from a fixed list of data items.

- The next control, which I will be using, is the toggle button, which will be used to select the gender. Here again I would the two toggle buttons using the Option Group and the same coding will be applied in the Code Builder so as to select and store, either "Male" or "Female"

- For this form I will be using the same command buttons as in previous forms so to improve the ease of use for this form.

- This completes the designing of the form for Staff Records. Again the validation rules and input masks, which were applied to the Staff Records table, also apply to this form.

The design layout for this Staff Records form is shown below.



## Staff Payroll Form

- I would open the Design View of the form and here I would begin designing the form. Firstly I would design the form header by adding the school logo which would be a GIF file created using Ulead Photoimpact and then I would enter the name of the form which in this case is "Staff Payroll".

- The next step would be to use the different data controls to improve data entry. I will be using the check box for this from. The fields which I am applying this check box contain a list of data items so it would be appropriate to use the check box. The fields for which the check box will be used are listed below:
  - Staff ID; the form will obtain the list of Staff ID from the Staff Records table.
  - Position Of Work; to select from a fixed list of positions in the school
  - Rate Of Pay; to select from a list of fixed rates of pay

- Besides the combo box I will also be using the toggle button control, which will be added from the option group. Here too I will have to apply coding under the click event for each toggle button so that either "Male" or "Female" is stored in the Gender field.

- This form also involves coding which will be used to calculate the net pay. Therefore to apply this coding I would open the Properties Window of the Miscellaneous Window and I type in the following coding under the Lost Focus event of this field:

```
Private Sub Miscellaneous_Expenses_LostFocus()
Net_Pay = (Rate_Of_Pay * Hours_Worked) - Miscellaneous_Expenses
End Sub
```

  What this coding is that it calculates the net pay by multiplying the rate of pay with the hours worked and then deducts the miscellaneous expenses and then displays the net pay in the respective field.
  This same coding will also be applied to the Lost Focus event of the Hours Worked and Rate Of Pay fields.

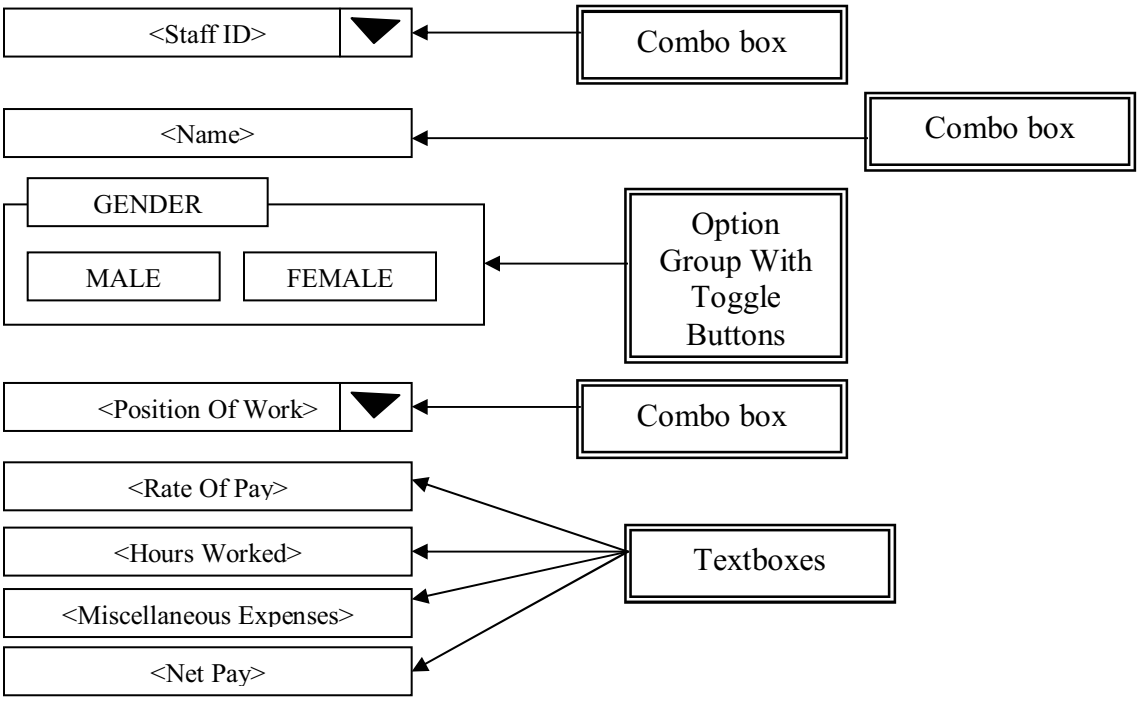
- For this form as well I will be applying the command buttons as in previous forms, which will improve the ease of use within the form itself.

- This completes the design of the staff payroll. Again any validation rules and input masks that were applied to the staff payroll table also apply to this form. Also changes or updates that take place in this form also result in a change in the staff payroll table.

The design layout for this staff payroll form can be seen on the next page.

**GIF Image Of School Logo.**

## STAFF PAYROLL




## Teachers Payroll Form

- Just as I have created a payroll form for the school staff I will also be designing a payroll form for the teachers. The design of this form is similar to the staff payroll. The only change is that I will select the Teachers Payroll table in the Form Wizard. The remaining procedure remains the same.

- Even the data controls, which I will be using, and also the fields to which I will be applying is similar to that of the staff payroll form. Even the coding, which I will be using to calculate the net pay, remains the same. Again I will be applying this coding under the Lost Focus event of the Hours Worked and Rate Of Pay fields.

## Senior Students Mark Register Form

- After opening the Design View of the form I will first design the Form Header by placing the school logo, which is a GIF image, which has been created on Ulead Photoimpact. Next I will type in the name of the form.

- The next step would be to use the different data controls to improve data entry. The first control I will be using is the Combo Box which would be applied to the Roll Number field. It would be to select from the roll numbers of all the senior students. This is achieved by first designing a query to display the roll numbers of all the students in the student records form who are in the senior classes. Therefore the source for this Roll Number field is the Senior Students Query.

- The next control, which I will be using, is the Toggle Button, which will be applied to the Gender field. The toggle button will be inserted using the Option Group button. Here too I will have to apply coding so as to store either "Male" or "Female" in the Gender field on the click event of a button.

- However for this form I will be using the Code Builder extensively since I will have to calculate the percentage and grade for the certain. Therefore under the lost focus event for each subject field and under the lost focus event of the percentage field shown below is how the coding would appear to calculate the percentage and based on the percentage a grade is assigned.

```
Private Sub English_Language_LostFocus()
Percentage = ((English_Language + English_Literature + Maths + Physics + Chemistry + Information_Technology + Business_Studies + Accounts + History) / 900) * 100
If Percentage >= 90 Then
Grade = "A*"
Else
If Percentage > 80 Then
Grade = "A"
Else
If Percentage > 70 Then
Grade = "B"
Else
If Percentage > 60 Then
Grade = "C"
Else
If Percentage >= 50 Then
Grade = "D"
Else
```

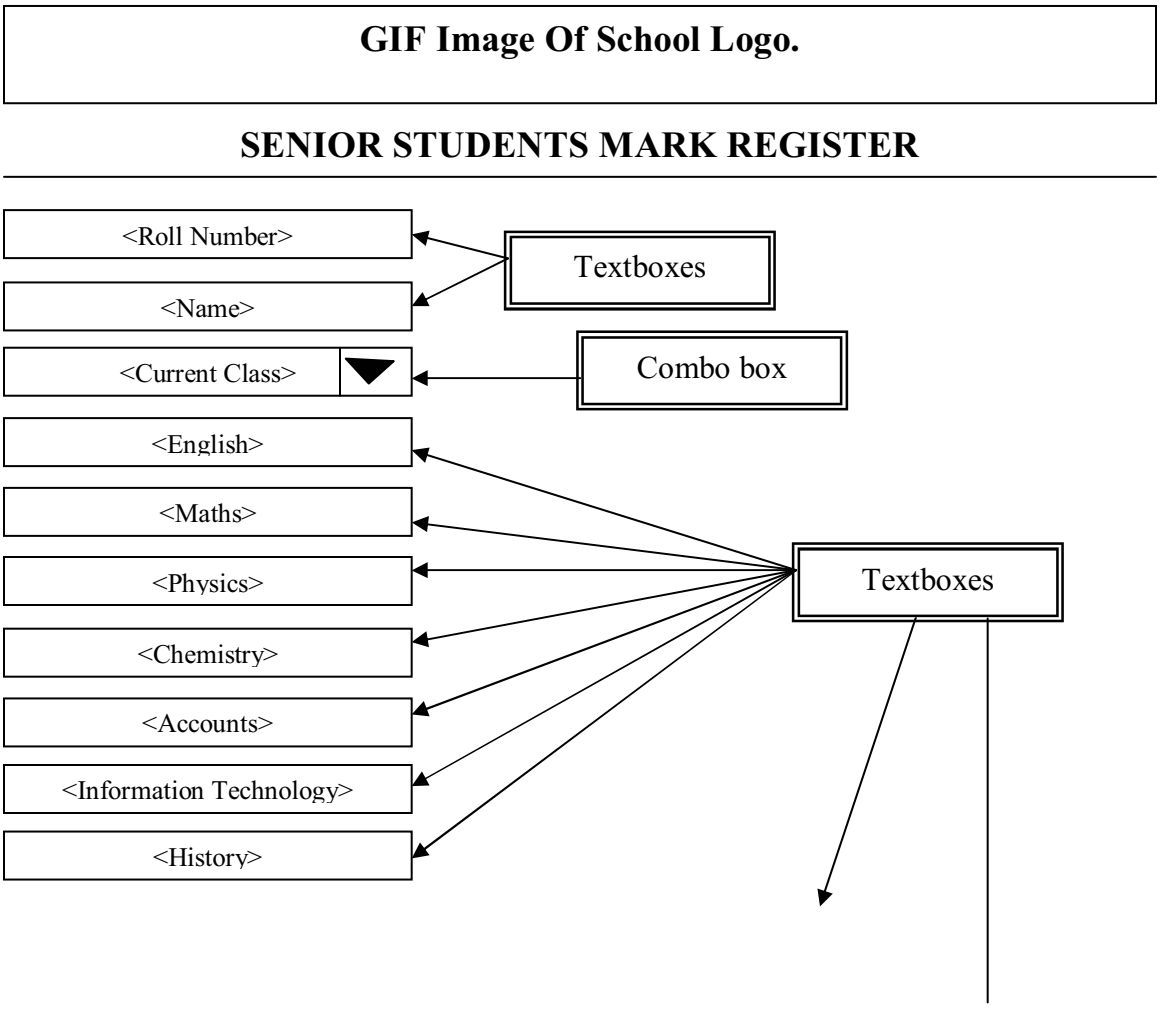
```
If Percentage < 50 Then
Grade = "Fail"
End If
End If
End If
End If
End If
End If
End Sub
```

- This same coding will be applied to the Lost Focus event for each subject field and also the percentage field.

- For this form too I will apply the command buttons which will be used to navigate within the forms. The command buttons I will be using are the same as in previous forms.

- This completes the designing of this form. Here too any validation rules and input masks which were applied to the table also apply to the form.

Shown below is the design layout for the Senior Students Mark Register Form.



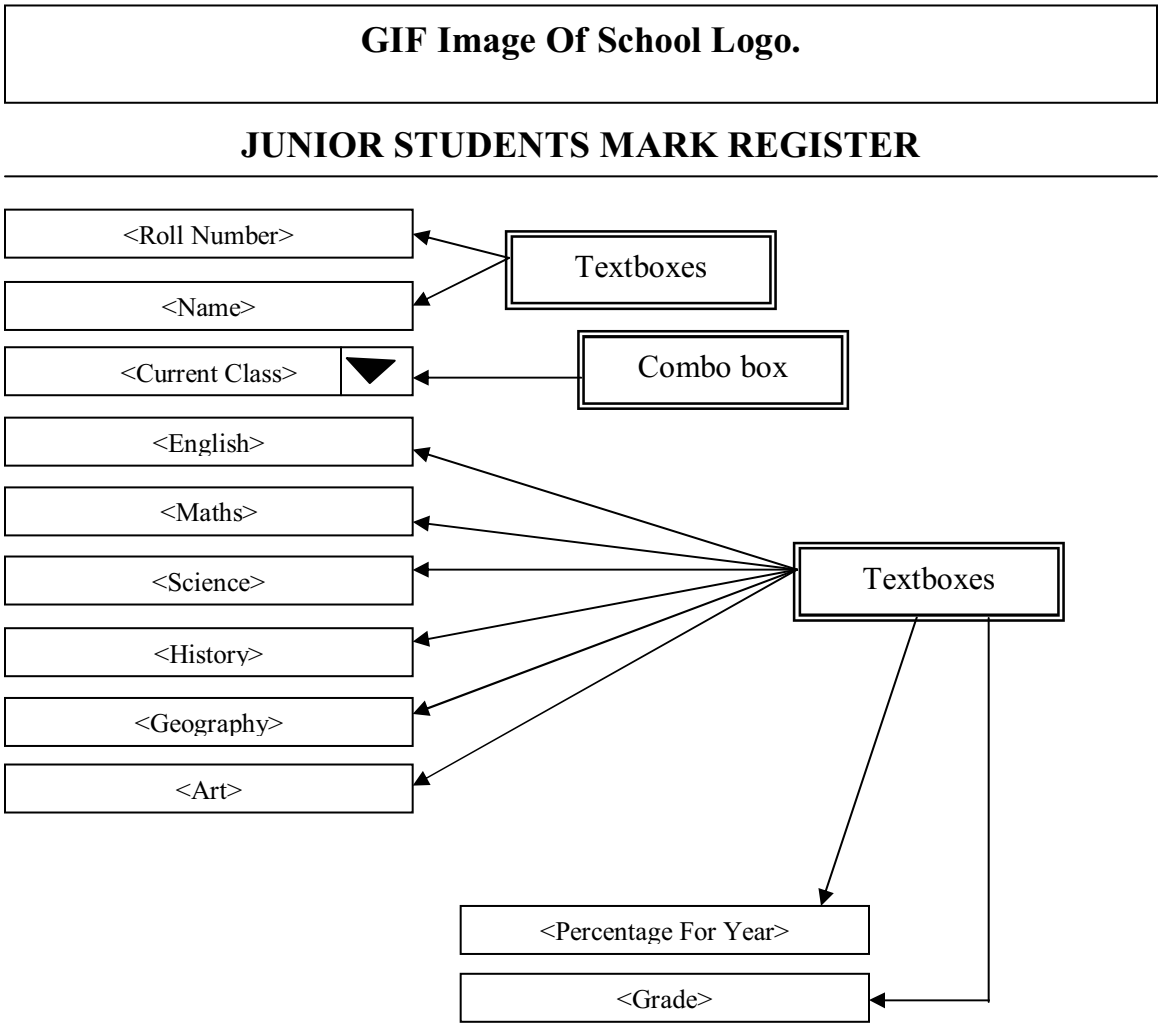
<Percentage For Year>

**Junior Students Mark Register Form**

<Grade>

- The mark register for the junior students has the same design as the senior students mark register. The only difference in the junior mark register is that the subject headings change. I will also have to design a query to display the roll numbers for all the junior students from the student's records table. The same coding is used to calculate the percentage and grade. Even the controls used remains the same. Even the command buttons used to navigate within the form remains the same.

Shown below is the design layout for the junior students mark register.



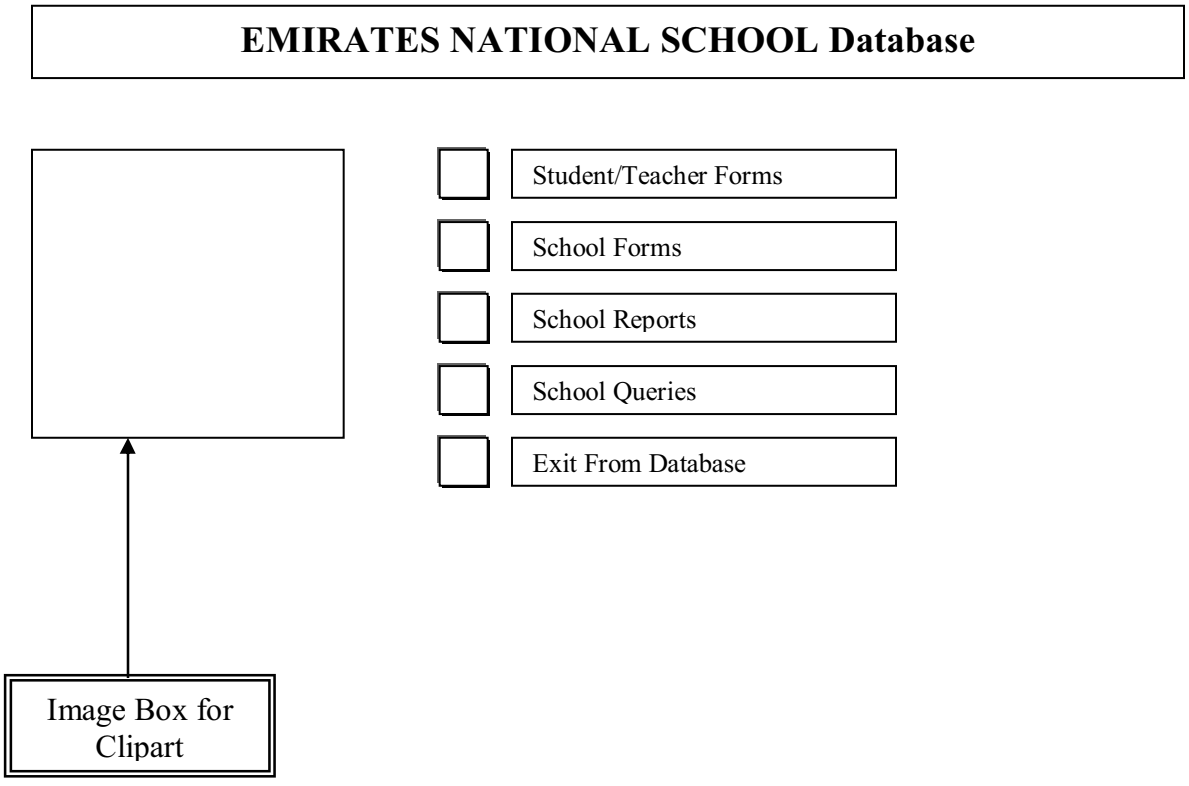
## Switchboard Form

- This form is specifically designed by a special feature in Access called Switchboard Manager. The switchboard can be designed by clicking on the "**Tools**" menu I would select "**Database Utilities**" and from the drop down menu I would select "**Switchboard Manager**". This switchboard manager acts as a main menu for the database for the school.

- The user can click on a number of buttons from the main menu to navigate within the school database. I have categorised the school database into four main sections. They are;
  - Student/Teacher Forms
  - School Forms
  - School Reports
  - School Queries

  Clicking on either button will open a list of other options, which can be opened. Besides these buttons I have included buttons to 'Exit Database' and also to go 'Back To Main Menu'.

Shown below is the design layout for the main menu for the school database. In the latter stages of this section I will present the menu structure of this switchboard where I will illustrate the different features provided by each category.



This completes all the forms, which I will be designing for EMIRATES NATIONAL SCHOOL. Besides these forms and tables I will also be creating a number of queries on MS Access so that specific records can be accessed and printed in quick time. The queries feature in MS Access is a vital feature because during days of extensive work at the school, the principle would require certain records of students quickly, for example the names of boys who have failed the year so that a letter can be sent to the parents. With the current system, the secretary would have to search through each students files or the mark registry, but now with MS Access, all the secretary has to do is to type in the criteria for the query and the records are shown in a table view which can be printed and presented immediately. Therefore I have decided to design a number f queries which I feel will be of use to the school where a lot of information is required immediately. Therefore shown below are the design layouts for the queries, which I am designing along with the necessary criteria.

## Query Name: Borrowed Library Books List

| Field Name | Criteria |
|---|---|
| Book ID | |
| Name | |
| Author | |
| Available (Hidden) | No |

This query will be used to list all the books, which have been borrowed from the library. This is achieved using simple criteria, which involves the "Available" field, which is a Yes/No. If the selection is 'No' this signifies that the book has been borrowed from the library and vice versa. Therefore the query searches through the entire Library Book List and displays all those book records, which have been borrowed from the library where the "Available" field is equal to 'No'. Similarly if I wished all those books available in the library so that a student or teacher could conveniently locate and select a book, the only change would be the criteria for the "Available" field which would be changed to "Yes".

## Query Name: Library Books Return Date Today

| Field Name | Criteria |
|---|---|
| Book ID | |
| Name | |
| Author | |
| Available (Hidden) | No |
| Return Date (Hidden) | "Current Date" |

The purpose of this query is to display the list of books, which are borrowed and have to be retuned the current day. Therefore what this query does is to search through the list of library books and locate those books, which have been borrowed since I have included the criteria for the "Available" field to be No. Next after locating the borrowed books the query has to locate those books where the data item for the "Return Date" field is equal to

that of the current date. This means it looks up the "Current Date" field which displays the current date and automatically changes each day and compares the current date with the return date value and accordingly displays the list of books.

## Query Name: Senior 4 Girls Performance

| Field Name | Criteria |
|---|---|
| Roll Number | |
| First Name | |
| Last Name | |
| Current Class | ="Senior 4A" Or "Senior 4D" |
| Percentage | |
| Grade | "A" |

The purpose of this query is to display the percentages for all girl students in Senior 4 who have obtained an A grade. Therefore the query first looks through the Student Records table for all those students in Senior 4A or Senior 4D and then lookups from this list of girls in Senior 4A and Senior 4D those who have obtained an 'A' grade and displays the student information along with the percentage in the form of a table.

## Query Name: English Teacher Working Hours

| Field Name | Criteria |
|---|---|
| Teacher ID | |
| First Name | |
| Last Name | |
| Class Lectured | "English Language/Literature" |
| Class Lectured (2) | "English Language/Literature" |
| Hours Lectured | <120 |

The purpose of this query is to locate those English teachers who have lectured for less then 60 hours in the month. Therefore the query looks up all teachers from the Teacher's records table and it searches through the "Class Lectured" and "Class Lectured (2)" fields for those teachers who teach English Language/Literature and then locates all those teacher records where the "Hours Lectured" field is less than 120 and then displays all the records which match this criteria.

This completes all the basic queries, which I will be designing for EMIRATES NATIONAL SCHOOL. However if there are any immediate needs for records of any student or teacher I can easily design a query using the Wizard provided by MS Access. All I have to do is to select the fields I wish to display and I would type in the criteria for the records to be displayed. Note that even the criteria for any of the existing queries can be changed in the Design View of the query.

The next step to improving EMIRATES NATIONAL SCHOOL's database management would be to use the records in the database to create reports. These reports are the actual outputs, which will be based on the data, which has been entered in the forms I have

designed. These reports can easily be created using the simple Report Wizard where I only have to select the fields I wish to include in my report and I have to align the fields accordingly.

## Report Name: Students Performance Report

This report is used to display the results for all the students of each class. The report is a grouped report, which displays records according to class and is a summary of the performance of each student as it displays only the grade and percentage of each student. Shown below is the design for this report.

**STUDENTS PERFORMANCE REPORT 2001**

**Current Class:**

**Grade:**

| Roll Number | Name | Percentage |
|---|---|---|

*RECORDS OF STUDENTS*

## Report Name: Teacher's Payroll Summary Report

This report displays a summary of the wages of each teacher. The report will be used to display the rate of pay, the hours lectured, miscellaneous expenses and the net pay for each teacher. Just as I will be creating a summary of the payroll for the teachers, I will also be creating a report for the summary of wages for the school staff. This report is a simple report and has not been grouped.

Shown in the next page is the design layout for the Teacher's Payroll Summary Report.

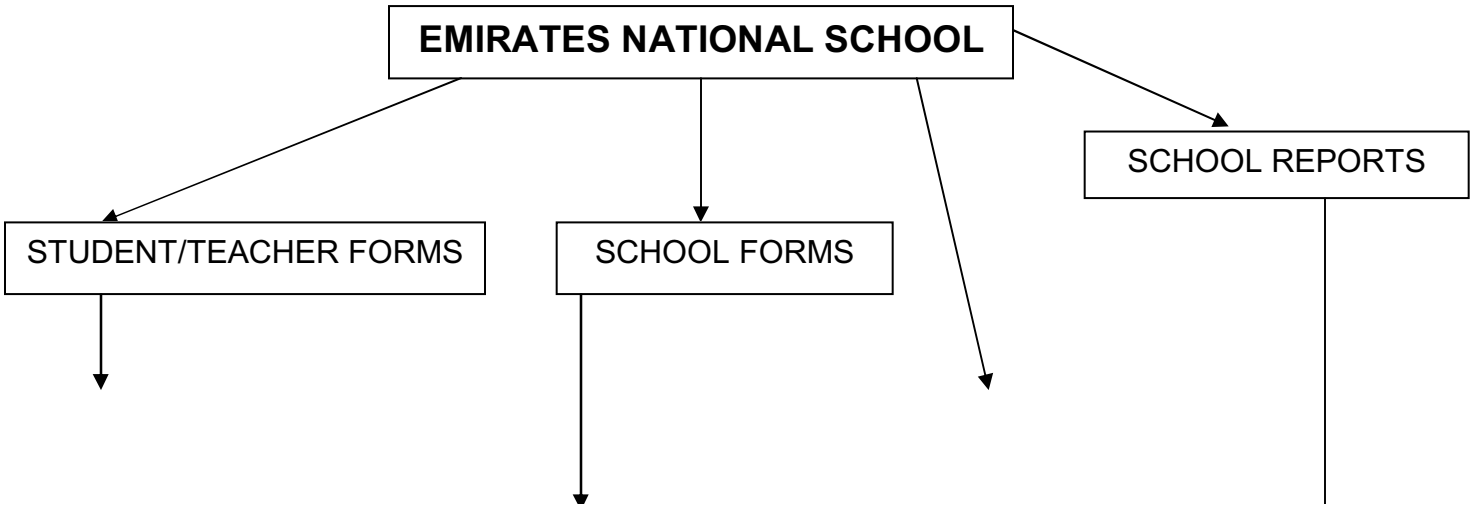
| TEACHERS PAYROLL REPORT FOR THE MONTH OF… | | | | |
|---|---|---|---|---|
| **Teacher ID** | **Name** | **Rate Of Pay** | **Hours Wkd.** | **Net Pay** |
| *RECORDS OF TEACHERS* | | | | |

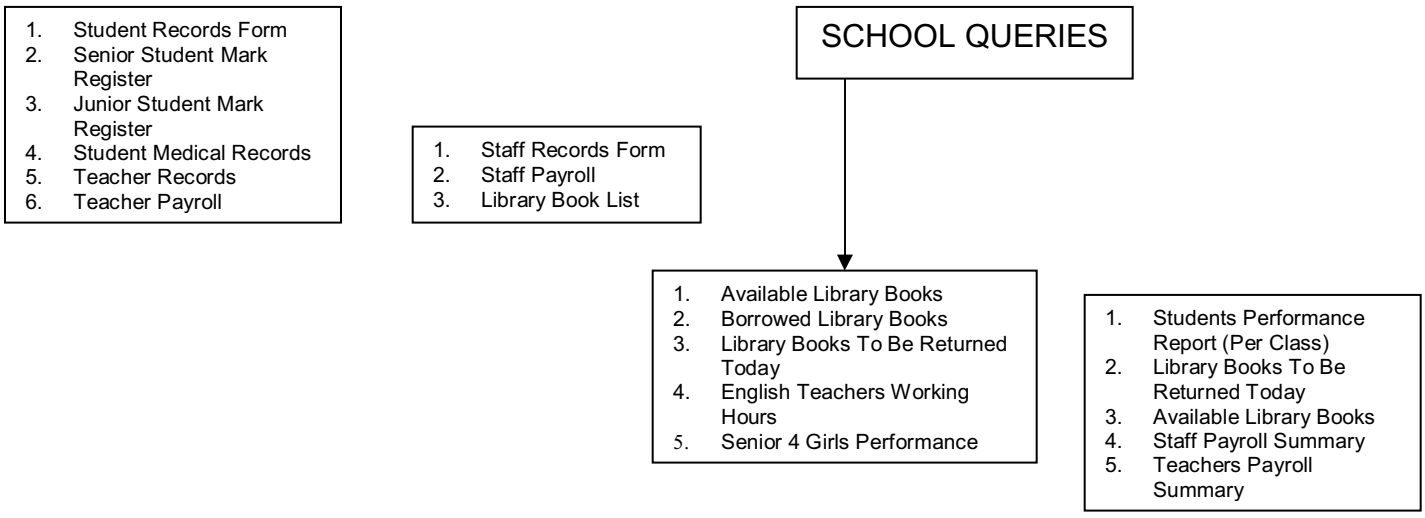
**Report Name: Library Books To Be Returned Today**

This report is created from a query. The query will be used to list all the books where the Return Date field is equal to the Current Date field. Then using this list a report can be drawn up easily which will contain all the details of the book, which has been borrowed. This report will change everyday as the Current Date field also changes. Shown below is the design layout for this report.

| LIBRARY BOOKS TO BE RETURNED TODAY | | | |
|---|---|---|---|
| **Book ID** | **Name** | **Author** | **To Be Returned By** |
| *RECORDS OF LIBRARY BOOKS* | | | |

This completes all the reports, which I will be creating for EMIRATES NATIONAL SCHOOL. I have now completed the designing for each form, query and report, which I will be designing. In general I have used the data, which will be entered into the respective forms, and they will be stored in tables, which I have also designed. I have will then manipulate this data to retrieve specific records and also print out regular reports. All of these features of this newly designed database will be stored under one file. Therefore to improve the access of each file I also designed a switchboard form using the Switchboard Manager feature provided in MS Access. Using the switchboard I have categorised all the forms and records into different sections so that clicking on respective buttons can access all the reports and forms, which I have designed. This switchboard has a specific structure and this can be represented through a simple diagram. In general this menu structure represents the different features and sections in the Switchboard form. Shown below is the menu structure for EMIRATES NATIONAL SCHOOL.






Besides sticking within the boundaries of MS Access, I can also integrate the word processing capabilities of MS Word with MS Access. Both of these applications software come from the same software package of Microsoft Office 200 so it is more convenient to import or export data within the same software. I can create general school letters using MS Word and the Mail Merge feature where the merge fields can be obtained from the fields within a table or query. For example for the school, if a letter stating the date of a parent teacher meeting for those students who have done poorly, that is obtained an F grade, a letter can be created using the merge fields from a query which would display all those students who have failed. To use the fields in MS Access as merge fields in MS Word, I would first click on the table or query which would be the source for these fields, next I would click on the "**Tools**" menu and then I would point on "**Office Links**" where I would select "**Merge It With MS Word**". By doing so a window would appear asking me whether to apply the fields to an existing document or new document. Next I would save the Word document depending on the letter I am typing and then I would proceed to typing out the letter using the Merge Fields.

This completes the designing for all the forms and reports, which I will be creating to overhaul EMIRATES NATIONAL SCHOOL's database management system. For some of the forms I plan to link the fields between two different recordsets. For example when preparing the Senior Students Mark Register I plan to use a combo box to select from the list of all the roll numbers for senior students. This list of roll numbers will be obtained by using a simple query. The same will be done for the junior students mark register. Therefore I will have to link the Roll Number field in the mark register with the roll number field in the query. Therefore all the roll numbers in the query will also be the

source of data for the respective mark register. This can be called a one is one relationship where there is one item of data in the query which will be used in the mark register.
Besides this one is to one query I can also create a one is to many relationship, which is a relationship between two tables where the primary field in the primary table corresponds to the value in the matching field in the related table. An example of where a one to many relationship was used in the EMIRATES NATIONAL SCHOOL Database was when I designed the Senior Students Performance Form which displays the records of students based on the grade I enter. For example if I enter 'A' and click on the "Display Students By grade Form" it will then display the records of those students who have obtained an 'A' grade.
These are a few examples of the forms of relationships, which I have used for the designing of the school's database. To create and design these relationships MS Access has provided a specific Relationships window where these different relationships can be defined. To access this Relationships feature I would click on the "Tools" menu and from the drop down menu I would select the "Relationships" option. I would then add the tables, which I wish to relate and I would then drag and drop the fields, which I wish to relate. The type of relationship is automatically set based on the data contained within the table. For tables with a one to many relationship I would have to also "Enforce Referential Integrity". Referential integrity is a system of rules that Microsoft Access uses to ensure that relationships between records in related tables are valid, and that you don't accidentally delete or change related data.
Shown previously is the layout of the Relationships which were created for the EMIRATES NATIONAL SCHOOL Database.

# DATA TESTING AND VALIDATION

Once I have completed designing the outputs for EMIRATES NATIONAL SCHOOL following the steps for the design stages, I will begin the actual data entry where data will be stored in the database. However to limit the errors which are prone to be caused during data entry I have included a number of validation rules and input masks to restrict data entry and improve the accuracy of the data entered. To get an idea of how effective the use of these validation rules are, I drew up a test data entry table where actual data was entered into the fields of the newly designed outputs. The results of this test data operation is shown below along with any customized messages or prompts that were displayed.

| Test No. | Form Name | Field Name | Input | Result |
|---|---|---|---|---|
| 1. | Student Records | Date Of Birth | 30/2/88 | Error Message: "The value you entered isn't valid for this field" |
| 2. | Senior Student Mark Register | Maths | 101.65 | Validation Text: "Only a value less than or equal to 100 can be entered. Please re |

| | | | | |
|---|---|---|---|---|
| | | | | enter" |
| 3. | Junior Student Mark Register | Science | 95.75 | ACCEPTED |
| 4. | Staff Records | Gender | M | Validation Text: Only 'Male' or 'Female' can be entered into this field. Please re enter" |
| 5. | Library Book List | Book ID | 001BP | Not Possible. Protected by Input Mask |
| 6. | Student Records | Gender | MALE | ACCEPTED. Auto Corrected to 'Male'. |
| 7. | Library Book List | Book ID | BP020 | ACCEPTED |
| 8. | Staff Records | Rate Of Pay | 55 | Validation Text: "Only a value less than 20 can be entered. Please re enter" |
| 9. | Student Records | Date Of Birth | 31/12/94 | Validation Text: "Only a date between 30-Dec-84 and 01-Jan-95 can be entered. Please re enter" |
| 10. | Teacher Records | Gender | FEMALE | ACCEPTED. Auto Corrected to 'Female'. |
| 11. | Senior Student Mark Register | Grade | A** | Validation Text: "Only A*, A, B, C, D or Fail can be entered for the grade." |
| 12. | Junior Student Mark Register | History | 100.9 | Validation Text: "Only a value less than or equal to 100 can be entered" |

Therefore from these entries of test data one can see that the validation rules and input masks which I have applied work as I have defined. This will be an asset when entering the actual data for the school since there is less risk of errors occurring during the entry of data. This will improve the accuracy of the entire database which means data does not have to be checked regularly.

Along with these data validation rules and input masks which I have applied to improve the accuracy of data I have also set a database password so that the database can be selected only by those employees who know the password. This can greatly reduce the risk of fraud and malicious manipulation of data. Also some of the data contained within the database is sensitive and so the database password feature is an advantage. To set a password for the database I would click on the "**Tools**" menu and from the drop down menu I would click on the "**Security**" and I would select the "**Set Database Password**" feature. A window would open allowing me to enter the password, which would be required to access the database. So now whenever the school database file is opened the user will have to enter the password to access the database.

The next step would to the actual design of the database that is the tables, forms and reports using MS Access' numerous features. This is shown in the next section.