

Criterion E: Product development

Complex techniques used

Three or more related tables

Use of graphics fields

Complex queries

Subforms

Proficient use of techniques to enable easy navigation such as menus or buttons

Proficient design of reports and/or forms

Basic techniques used

Data validation

Three data types

Use of graphics

Organisation of the Database

Three or more related tables (complex technique)

The required data was split into 7 tables, according to the design document. This normalized database prevents problems caused by redundant data. The diagram below shows the database layout, with the primary keys clearly indicated.

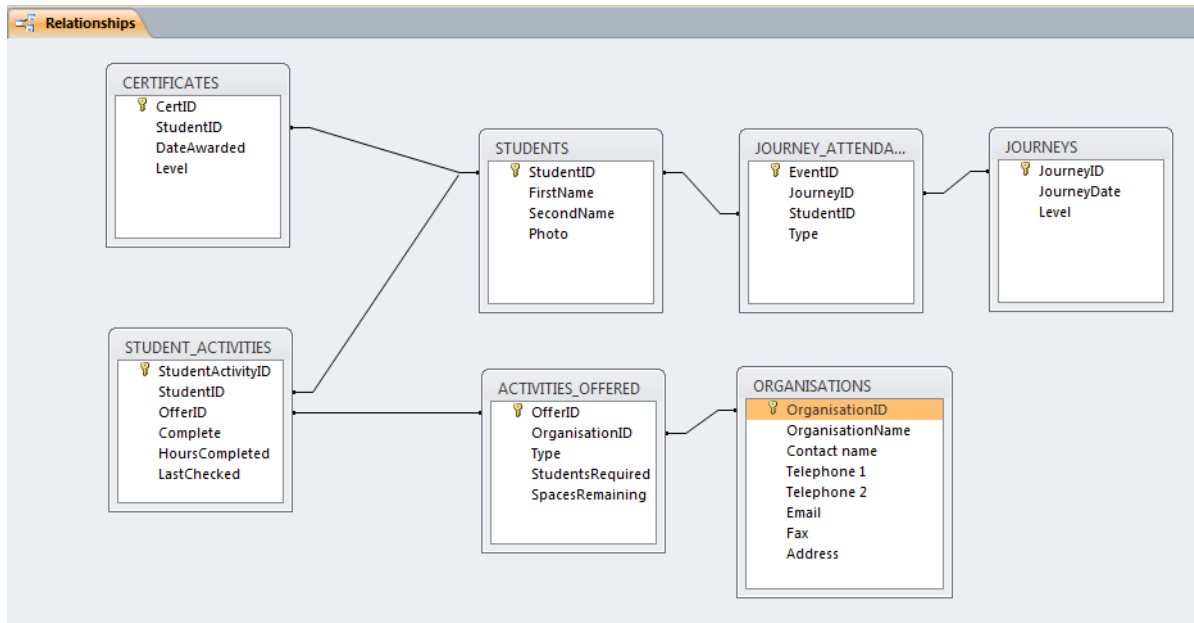


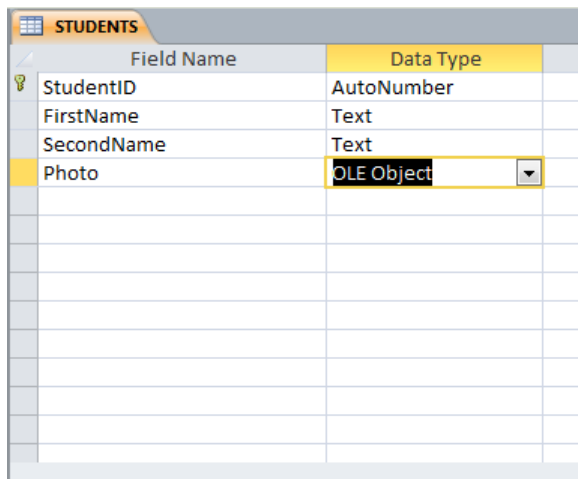
Figure 1 Three or more related tables (complex technique)

Organisation of database fields

Technique: Three data types (basic)

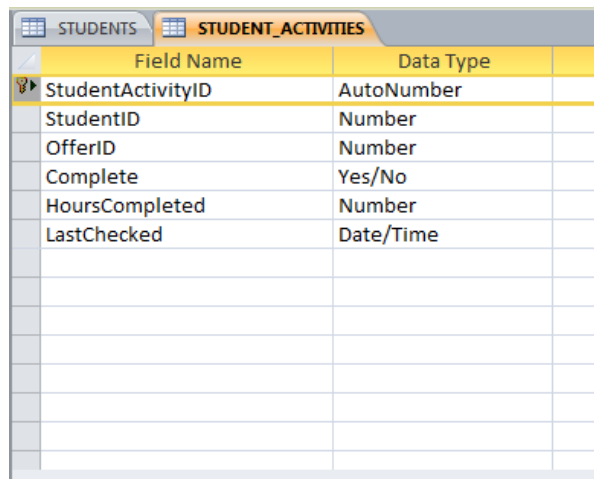
Technique: Use of graphics fields (advanced)

Graphics fields have been used to store the photo of students in the database. This was done because Mr Cole (according to the interview) required a photo of each student to help him remember them. Other field types used include: AutoNumber, Text, OLE Object, Date/Time, and Yes/No (Boolean).



Field Name	Data Type
StudentID	AutoNumber
FirstName	Text
SecondName	Text
Photo	OLE Object

Figure 2 Use of graphics fields (advanced technique)



Field Name	Data Type
StudentActivityID	AutoNumber
StudentID	Number
OfferID	Number
Complete	Yes/No
HoursCompleted	Number
LastChecked	Date/Time

Figure 3 Three data types (basic technique)

Queries

Technique: Complex queries (advanced technique)

To meet Mr. Cole's needs, the following queries were created:

- Find an activity of the required type with the specified number of spaces
- List of students on a given trip
- List students needing a certificate
- List students whose diaries have not been checked for some time

The precise criteria for these queries varies each time it is run – for example, Mr Cole might want to list all “Skill” activities one time, but all “Service” activities another. Therefore, instead of entering the criteria into the query design, the queries were created as **parameter queries**. This involves enter a user-friendly message in square brackets, prompting the user to enter the criteria at run time. This avoids creating many separate queries for each possible criteria which may be entered.

The screenshot displays the Microsoft Access interface for a query named "Activities_by_spaces". At the top, two tables are shown: "ACTIVITIES_OFFERED" and "ORGANISATIONS". The "ACTIVITIES_OFFERED" table has fields: OfferID (primary key), OrganisationID, Type, Description, StudentsRequired, and SpacesRemaining. The "ORGANISATIONS" table has fields: OrganisationID (primary key), OrganisationName, Contact name, Telephone 1, Telephone 2, Email, Fax, and Address. Below the tables is a design grid with the following structure:

Field:	OrganisationName	Description	Type	SpacesRemaining
Table:	ORGANISATIONS	ACTIVITIES_OFFERED	ACTIVITIES_OFFERED	ACTIVITIES_OFFERED
Sort:				
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:			[Enter activity type (Skill, Service, or F	>=[Enter the number of sp
or:				

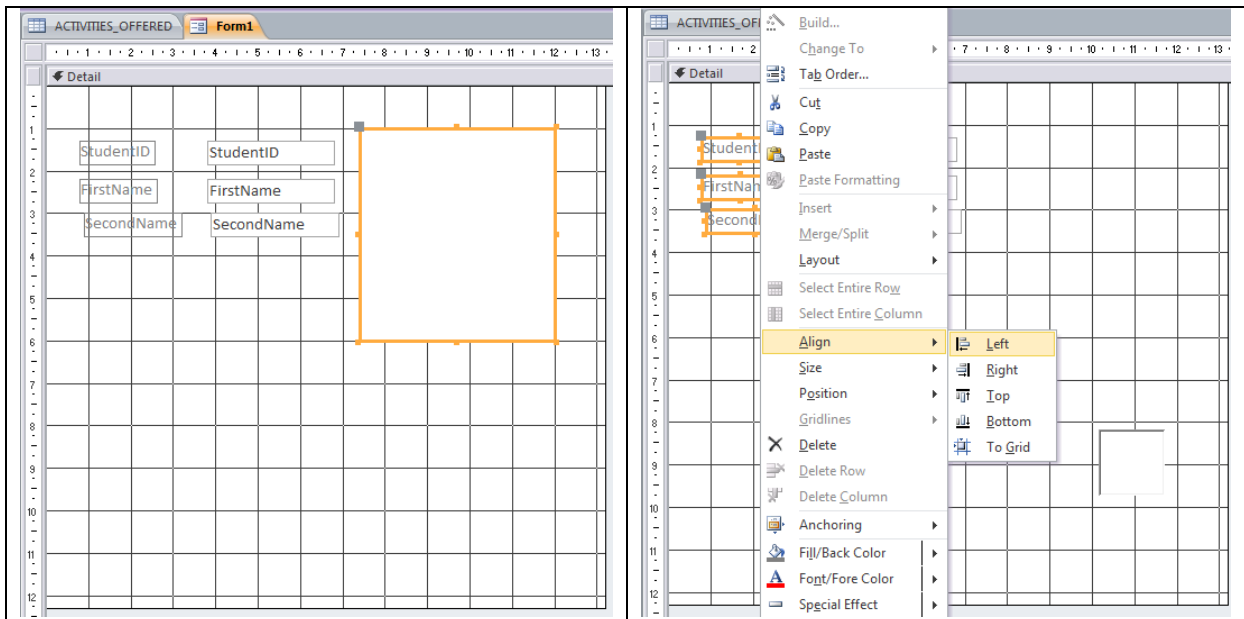
Two callout boxes are present below the design grid. The first box, containing "[Enter activity type (Skill, Service, or Physical Recreation))", has an arrow pointing to the criteria cell for the "Type" field. The second box, containing ">=[Enter the number of spaces required]", has an arrow pointing to the criteria cell for the "SpacesRemaining" field.

For the “Activities by spaces” query, the user will enter a type of activity at run time. They will also enter a number and the query will find records with at least (greater than or equal to) that many spaces.

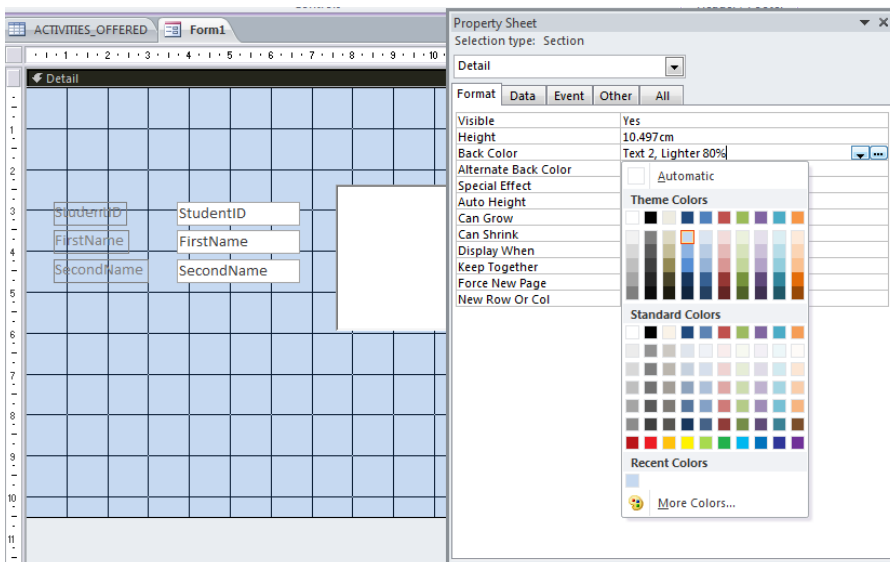
Form Creation

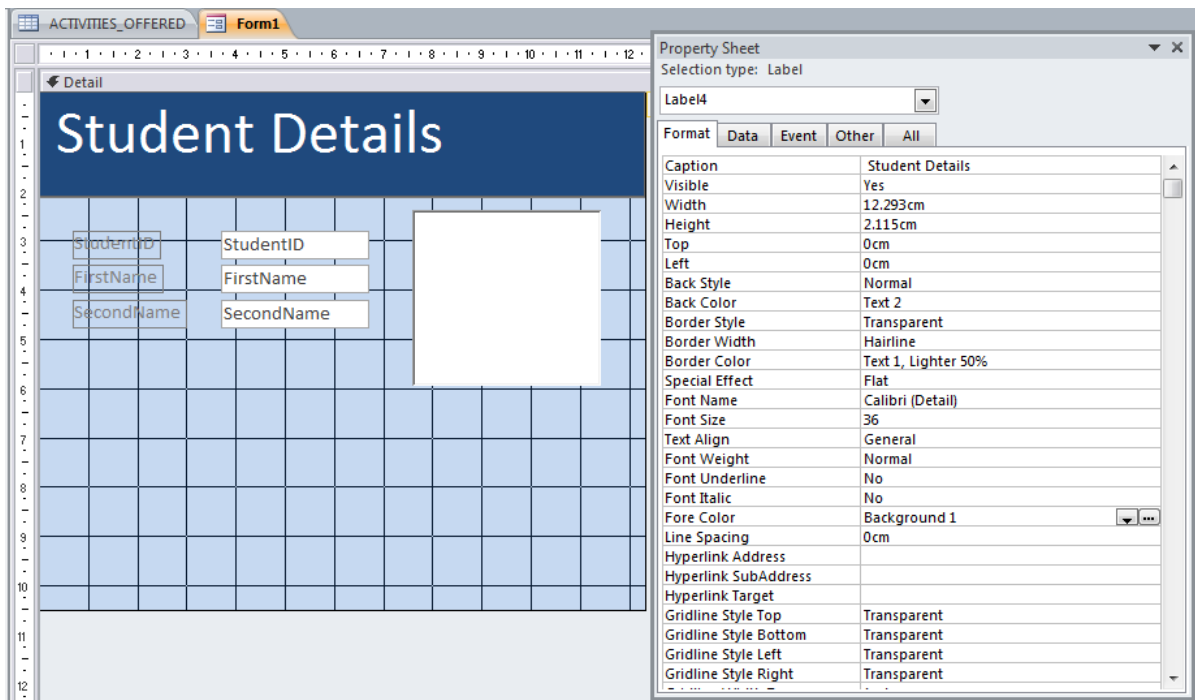
Technique: Proficient design of reports and/or forms (advanced technique)

The basic forms were created to allow an easier to use interface compared to the default datasheet view that Access offers. Although Mr Cole has some experience with Access he specifically requested an easy to use interface. The forms were created in the **Design View**, with the fields being initially added to the form. The **align tool** was used to improve the presentation by ensuring the labels and text fields were correctly aligned at the edges and improve appearance.

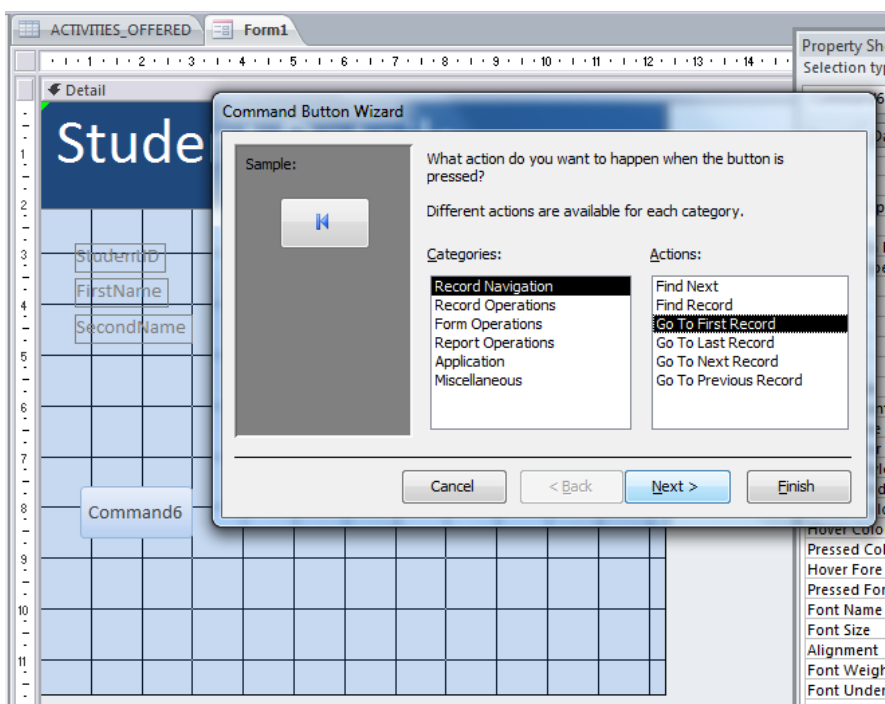


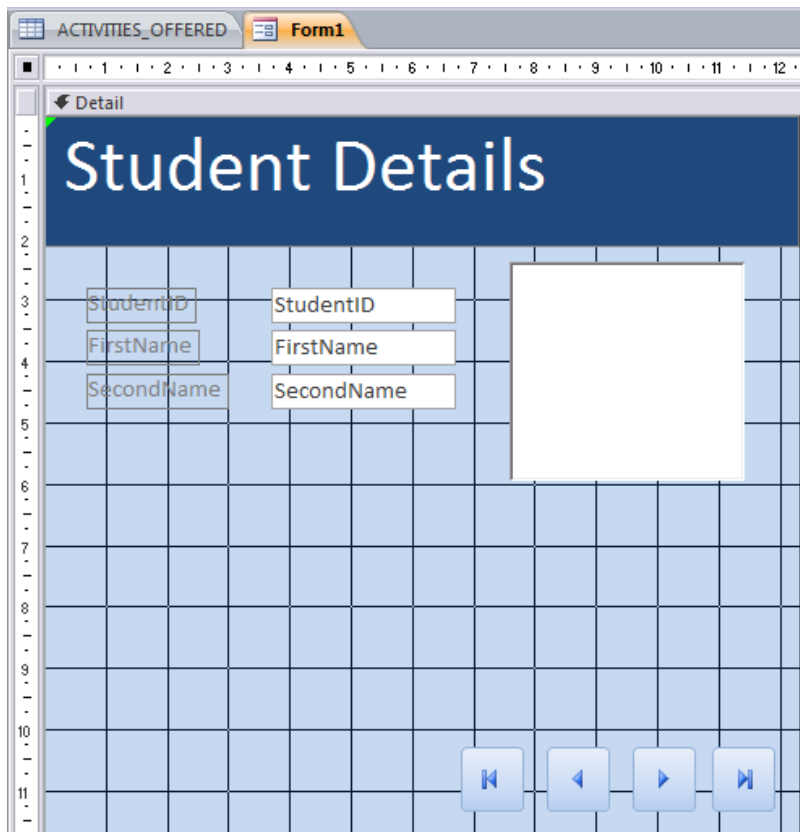
The colour of the Form background was changed to match the school's colours (as requested by Mr Cole), and a clear heading was added (again, using the school colours).



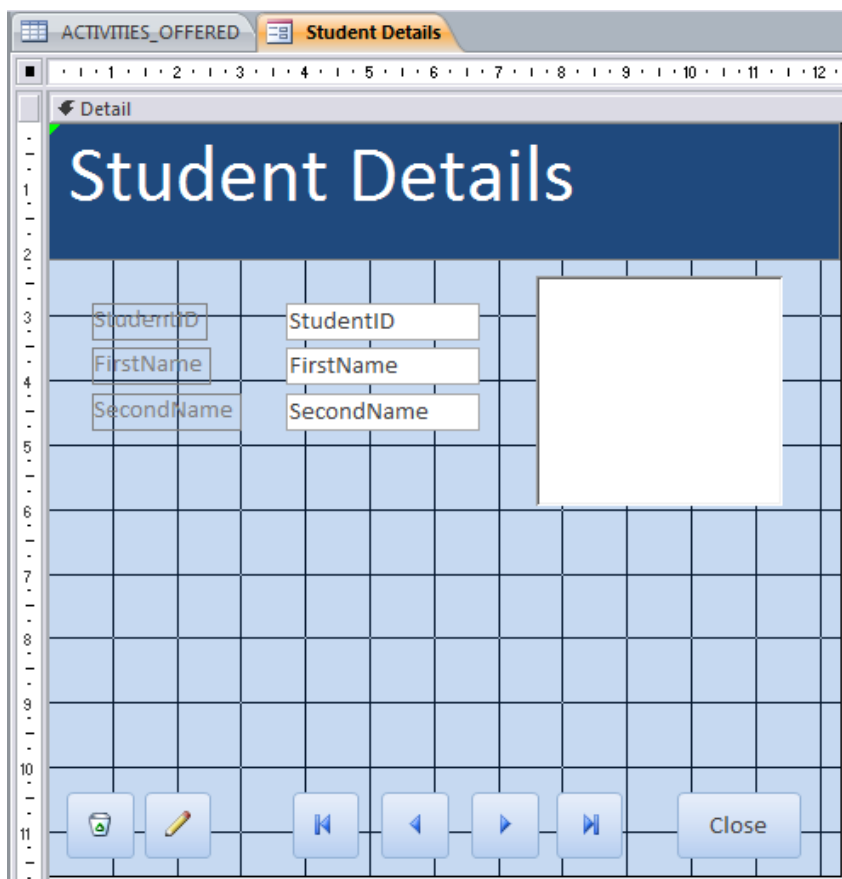


To improve navigation, custom buttons were used. The default Access navigation buttons were turned off by setting the **Navigation Buttons** option in the **Form Properties** to “No”. Then, a series of buttons were added from the toolbar. The buttons were assigned operations for moving to the First, Previous, Next, and Last records, using pictures to represent their actions. Again, this helps improve the user interface.





Buttons were also added for the Add New Record and Delete Record, plus one for Close Form. Again, they were positioned and neatened using the Align tool to improve the appearance.

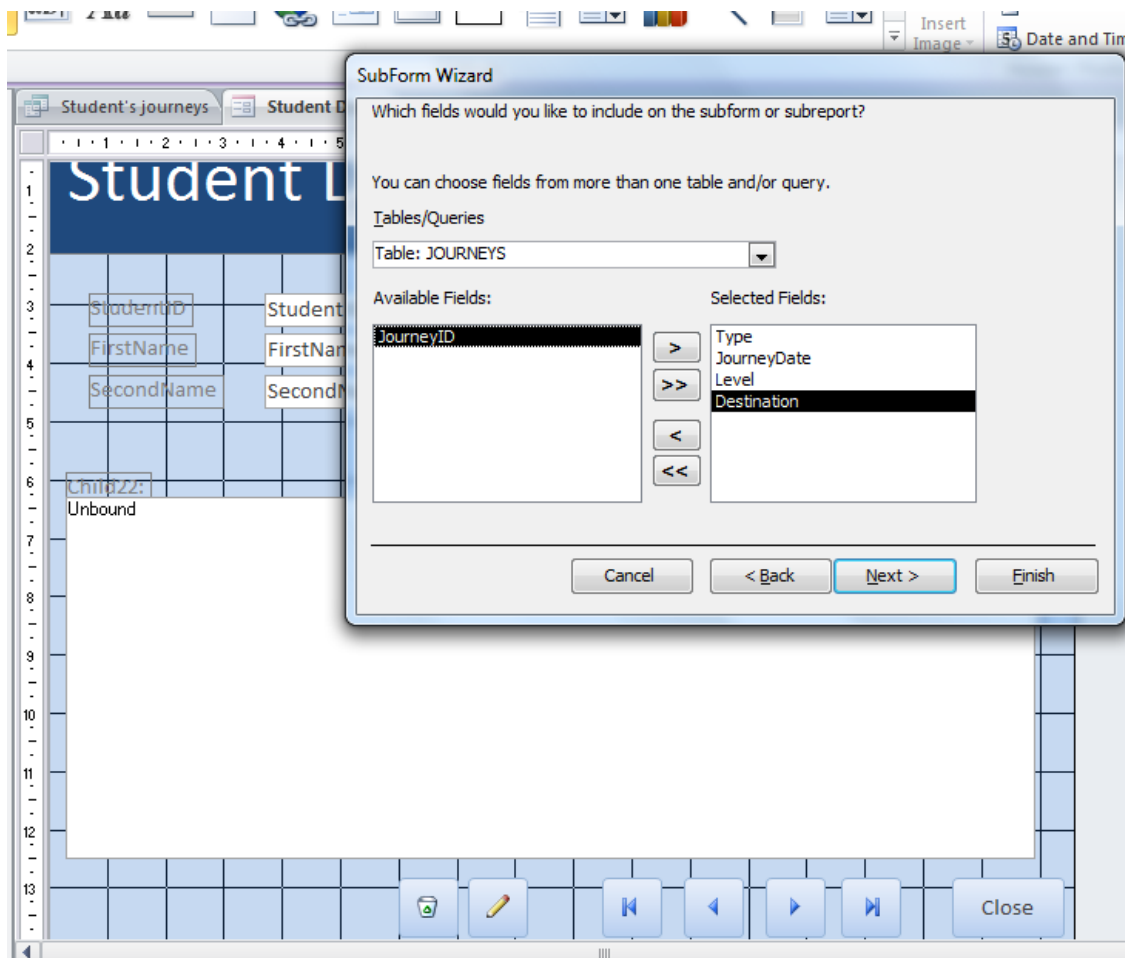


Overall, this use of the form layout, colours, and navigation buttons allows for a much friendlier user interface for Mr Cole, compared to the datasheet grid view which Access uses by default for tables.

Technique: Subforms (advanced technique)

When viewing student details, Mr Cole needs to see the trips and activities involving that student. This involved adding subforms to the Students form, because Journey and Activities data is stored in separate tables.

A subform to show a student's Journeys was added using the Subform button from the Design View toolbar. The appropriate fields from the JOURNEYS and JOURNEY_ATTENDANCE tables were added.



The screenshot shows a 'Student Details' form with the following fields:

- StudentID: 2
- FirstName: Michelle
- SecondName: Norway

The subform 'JOURNEY_ATTENDANCE subform1' contains the following table:

Type	JourneyDate	Level	Destina
Practice	09/11/2011	Bronze	El Imposible
Final	27/11/2011	Silver	El Pital
*			

At the bottom of the subform, it shows 'Record: 1 of 2' and 'No Filter'. The main form has a 'Close' button and navigation icons.

Adding the second subform, for activities:

The 'SubForm Wizard' dialog box is open, asking 'Which fields would you like to include on the subform or subreport?'. It lists the following tables/queries:

- Table: STUDENT_ACTIVITIES (selected)
- Table: ACTIVITIES_OFFERED
- Table: CERTIFICATES
- Table: JOURNEY_ATTENDANCE
- Table: JOURNEYS
- Table: ORGANISATIONS
- Table: STUDENT_ACTIVITIES
- Table: STUDENTS
- Query: Student's journeys

The 'Fields' list on the right is empty. The dialog has 'Cancel', '< Back', 'Next >', and 'Finish' buttons.

The size and layout of the form were changed slightly to accommodate the new subform. The **popup** attribute of the Form was also changed to "Yes" to make it appear as a separate window, and the X and Y positions were changed in the properties window to ensure that the form appeared with no parts hanging off the bottom of the screen.

Student Details

StudentID: 2

FirstName: Michelle

SecondName: Norway

Student's Adventurous Journeys:

Type	JourneyDate	Level	Destina
Practice	09/11/2011	Bronze	El Imposible
Final	27/11/2011	Silver	El Pital

Record: 1 of 2, No Filter, Search

Student's Activities:

Complete	HoursComple	LastChecked	Type	Descrip
<input checked="" type="checkbox"/>	15		Physical Recreation	Tennis
<input type="checkbox"/>	2		Physical Recreation	Swimming

Record: 1 of 2, No Filter, Search

Close

Using similar techniques, Forms were created for all items that Mr Cole needs to interact with directly. These needed to be created before a navigation menu system (switchboard) could be created. The forms created were:

- Add / Edit a student (shown above)
- Assign a student to an activity
- Add / Edit an activity
- Find an activity
- Students needing a certificate
- Students on a given trip
- Students needing checking

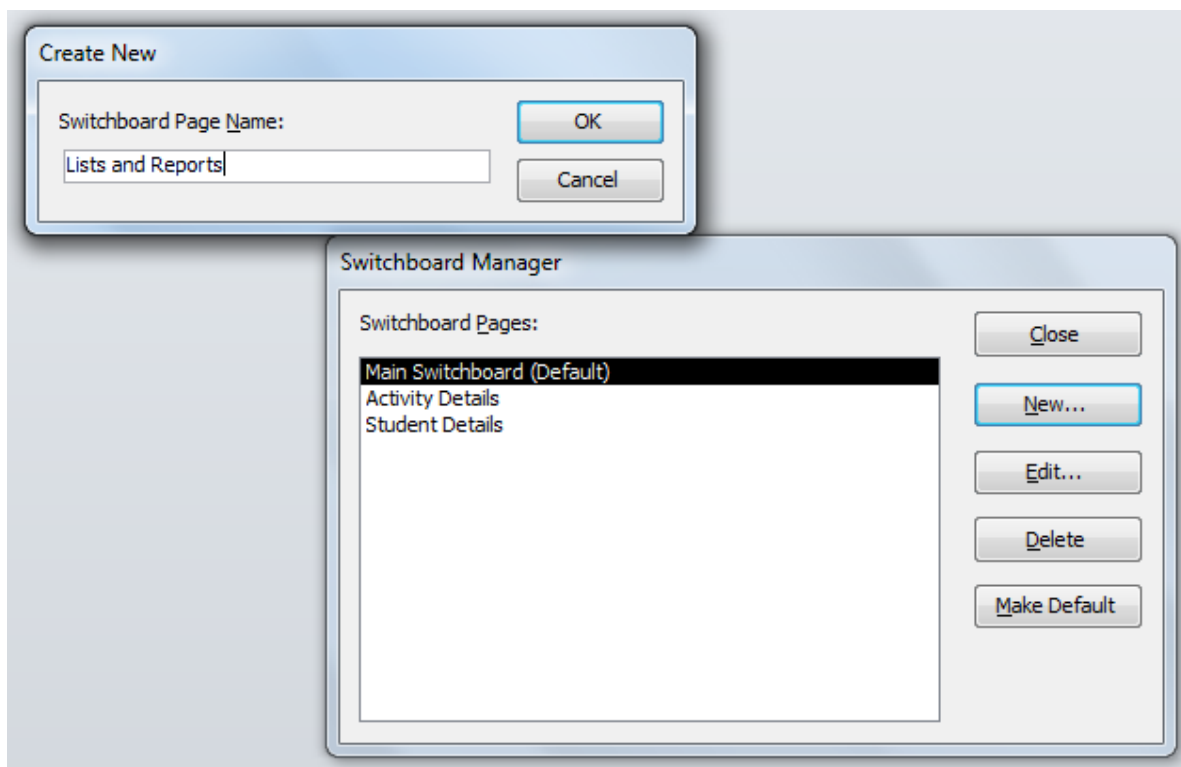
The last four forms were bound to the queries described in the relevant parts of this document. This provides a consistent graphical interface to all parts of the database, as all forms are designed with the same colour and layout.

Technique: Proficient use of techniques to enable easy navigation such as menus or buttons (advanced technique)

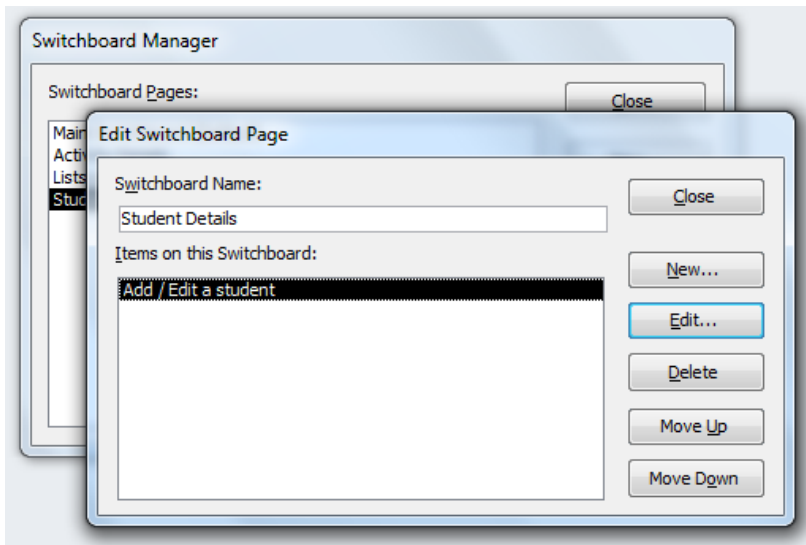
The Switchboard manager was used to create four switchboards: a main one to be displayed when the database is opened, and three more that represents the submenus as shown in the diagram on page 2 of the design:

- Student details menu
- Activity details menu
- Lists and Reports menu

This was an essential part of the user interface as it allows access to each of the database's main functions. By making the switchboard appear by default when the database is run, it also hides the list of tables, forms, and queries, which could confuse the user (and some of which do not need to be accessed directly).



Each of these switchboards then had separate items added to them to open the appropriate forms and reports.



Word count: 991 words