**Criterion E: Product Development**

**Techniques used**

- 6 related tables (pg 1)
- Main menu (pg 12)
- Macros (pg 9)
- Sub-form (pg 10)
- Complex queries / calculated fields (pg 5)
- Graphics field (pg 8)

**Database structure – explanation and justification**

The relational database below consists of 6 linked tables shown below.

| Table | Keyfield | A record contains... | Links |
|---|---|---|---|
| STUDENTS | Student_ID | Student details | STUDENTS:LOANS is 1:many |
| COPIES | Copy_ID | Copy ID & associated DVD ID | COPIES:LOANS is 1: many |
| DVDs | DVD_ID | DVD details | DVDs: COPIES is 1:many |
| RATINGS | Rating | Description of rating code | RATINGS:DVDs is 1: many |
| POSTCODES | Town | Town name & its postcode | POSTCODES:STUDENTS is 1: man |
| LOANS | - | ID of copy & student plus time out and time returned (if applicable) | Transaction table linking COPIES and STUDENTS |
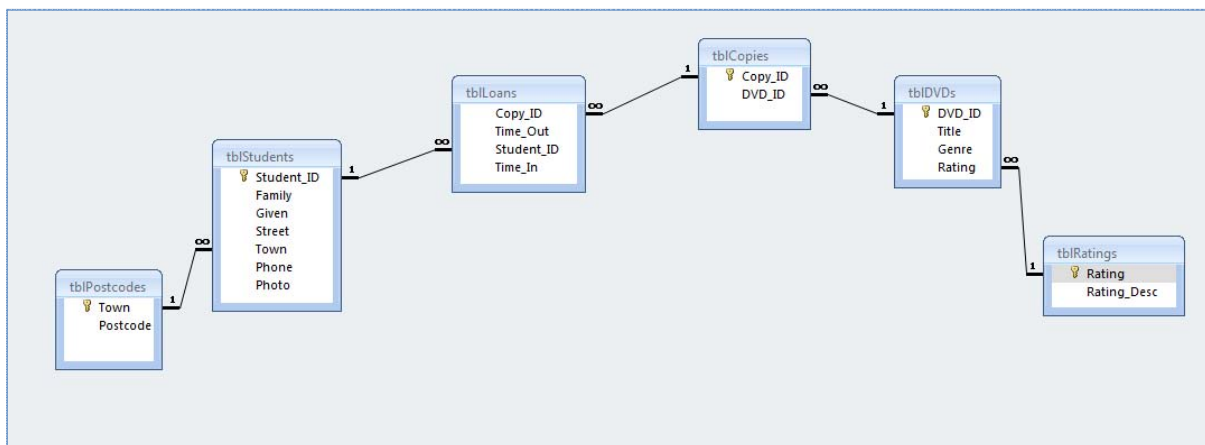


The LOANS table is a transaction table linking STUDENTS and COPIES

The COPIES table is necessary as Mme Martin has more than one copy of some DVDs.

Copy_ID identifies the actual copy that is borrowed.

The RATINGS table has been incorporated to eliminate repetition of data which would occur if each DVD record included a rating description.

POSTCODES is a look-up table which will save Mme Martin time looking up the postcode each time she enters a new student's address.

Key fields identify one record in a table and are used for linking tables.

## Techniques used to minimise errors during data entry

1.  Default values make data entry more efficient and minimise errors eg Time_Out in LOANS defaults to Now() which automatically enters today's date from the computer clock. Rating in DVDs defaults to "G" as most of Mme Martin's DVDs are G rated.

2.  Appropriate data types minimise errors eg Time_Out in LOANS is date/time,

3.  Input masks limit the field type and number of characters eg Postcode in POSTCODES is 0000 limiting the data entry to 4 numbers.

4.  Validation rules limit data entry eg Rating in DVDs (diagram below) is limited to "G" Or "PG" Or "M" Or "MA" Or "R" and if the user enters an unaccepted code the validation text "Invalid rating" provides feedback. Similarly Rating_Desc has a validation rule "General" Or "Parental Guidance" Or "15+over" Or "Mature Audiences" Or "Restricted".
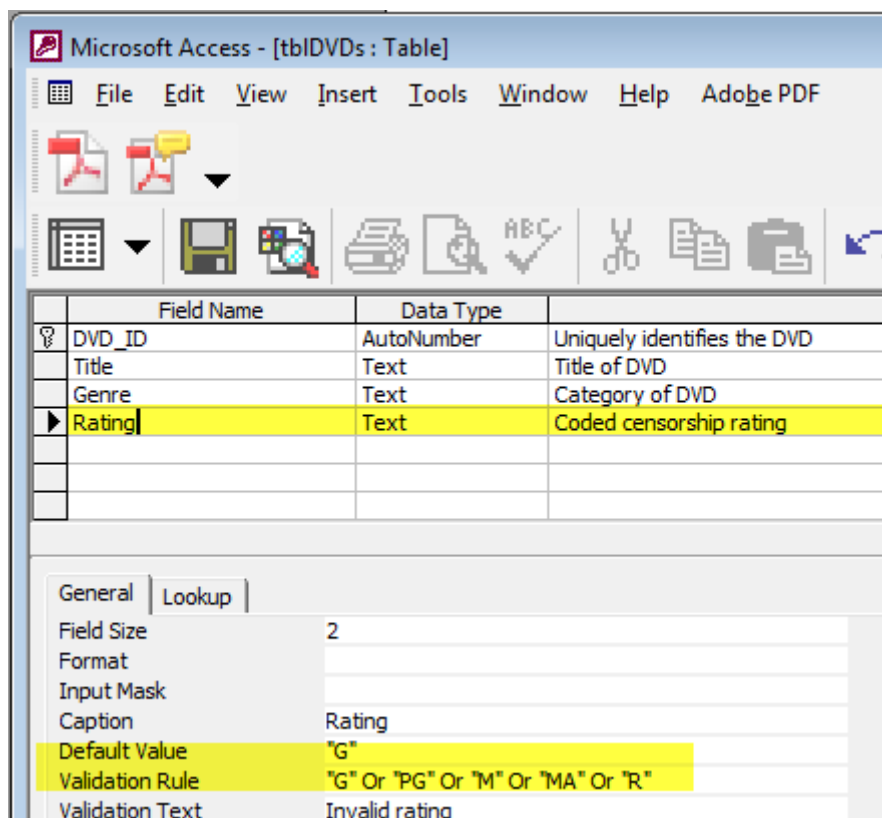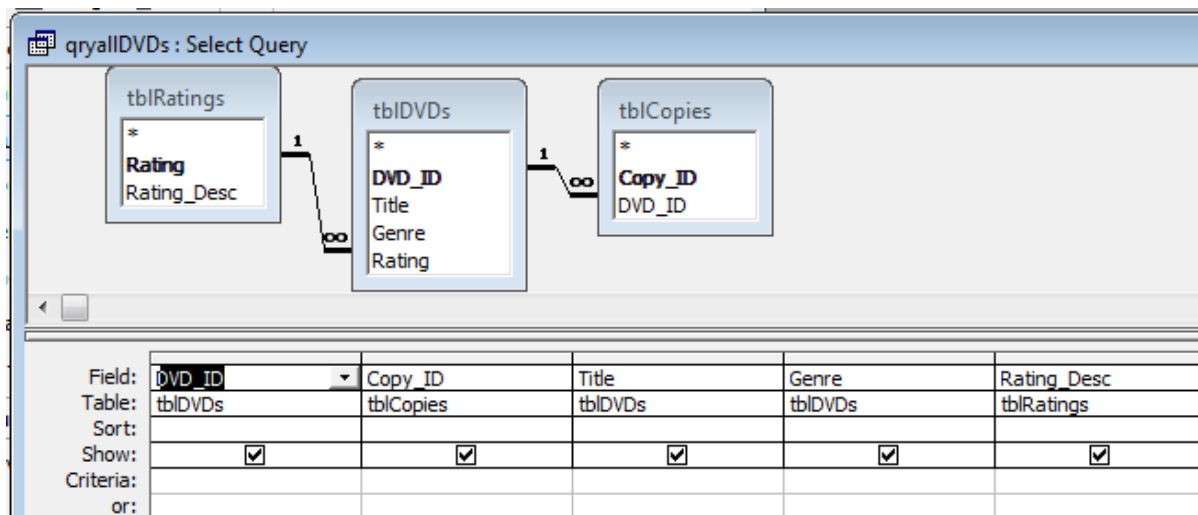
## Development of the product based on the requirements specification

### 1. List of all DVDs

Mme Martin requires a list of all her DVDs. A report has been generated which includes the Copy_ID and totals the number of copies of each video.

**DVD Listing**

| Title | DVD ID | Genre | Rating description | Copy ID |
|-------|--------|-------|--------------------|---------|
| A French woman | 3 | Drama | 15+over | |
| 2 copies | | | | 7 |
| | | | | 6 |
| French cuisine | 6 | Food | General | |
| 3 copies | | | | 29 |
| | | | | 14 |
| | | | | 13 |
| French wine | 5 | Food | General | |
| 2 copies | | | | 12 |
| | | | | 11 |
| Hercule Poirot | 4 | Crime | General | |
| 3 copies | | | | 10 |
| | | | | 9 |
| | | | | 8 |

The report is based on the query below.

**qryallDVDs : Select Query**

Tables:
- **tblRatings**: *, **Rating**, Rating_Desc
- **tblDVDs**: *, **DVD_ID**, Title, Genre, Rating
- **tblCopies**: *, **Copy_ID**, DVD_ID

Relationships: tblRatings (1) → tblDVDs (∞); tblDVDs (1) → tblCopies (∞)

| Field: | DVD_ID | Copy_ID | Title | Genre | Rating_Desc |
|--------|--------|---------|-------|-------|-------------|
| Table: | tblDVDs | tblCopies | tblDVDs | tblDVDs | tblRatings |
| Sort: | | | | | |
| Show: | ☑ | ☑ | ☑ | ☑ | ☑ |
| Criteria: | | | | | |
| or: | | | | | |

A formula has been added to count the number of copies. Concatenation links number of copies with the word 'copies' so Mme Martin can immediately see the number of copies of each video.
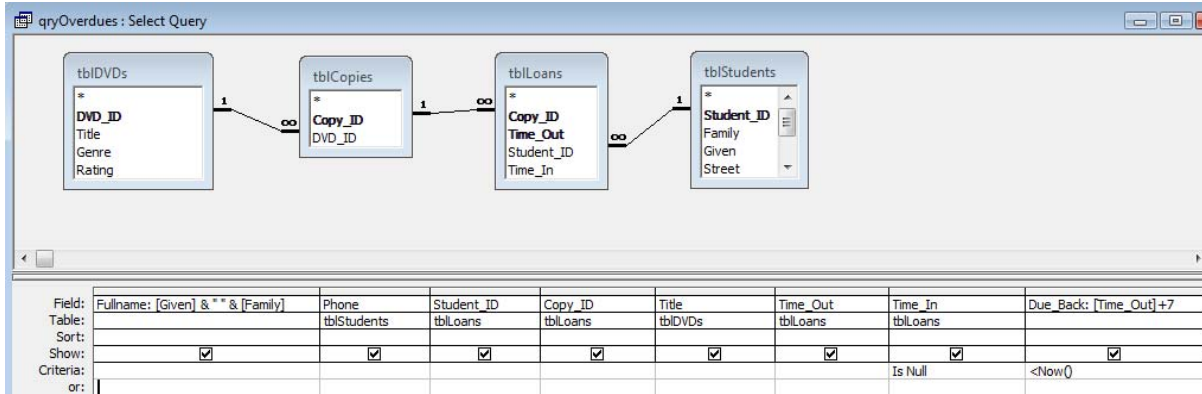
### 2. List of overdue DVDs

Mme Martin wants a list of overdue videos and needs the name and phone number of the borrowers.

By linking tables this query provides details of DVDs and borrowers' names and phone numbers.

The new field Fullname concatenates Given and Family for easy reading.

Since her lessons are weekly she allows a 7 day loan period. The calculated field Due_Back calculates the due date based on 7 days from Time_Out.

The search finds due dates that have passed (ie < today's date) **and** videos not returned ie Time_In is empty.



A report (shown below) has been generated based on this query.

### 3. Search on a particular genre

Another requirement is to find DVDs on a particular subject.

This parameter query allows Mme Martin to search on any genre. It provides a list of titles with their ratings and copy ID.
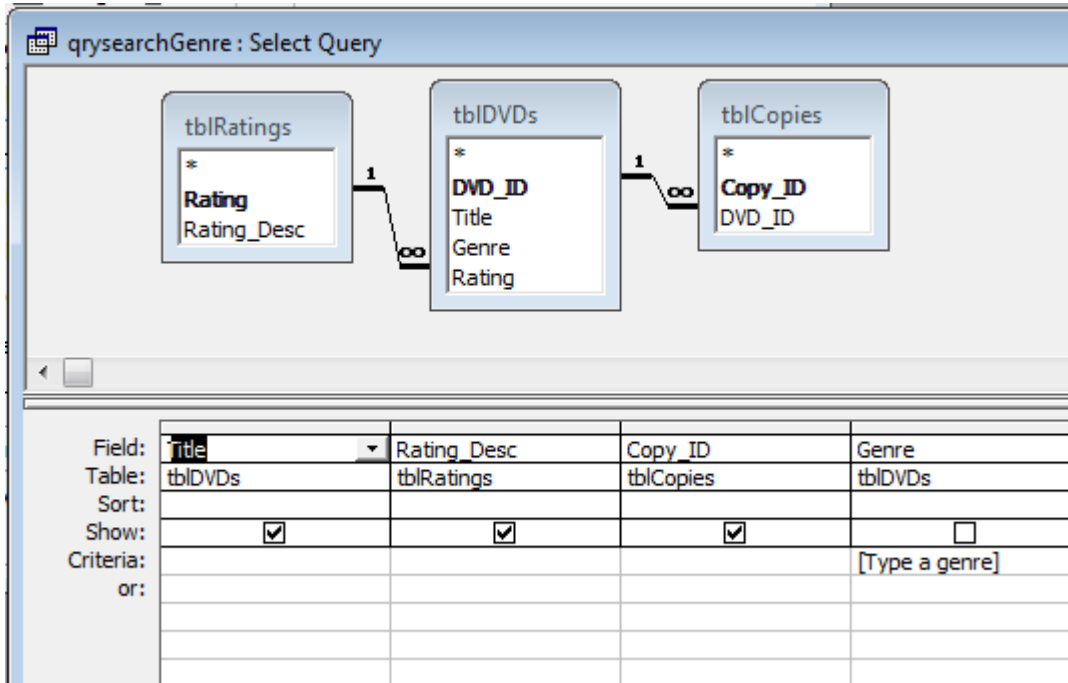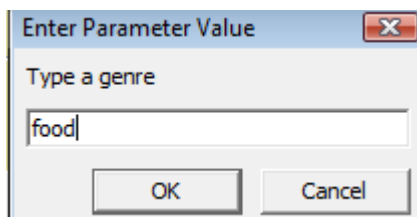


The report below is based on this query.

## *All DVDs about Food*

| *Genre* | *Title* | *Rating description* |
| --- | --- | --- |
| Food | | |
| | French cuisine | |
| | | *General* |
| | French wine | |
| | | *General* |

*Thursday, 26 February 2009*

When the report is run the box below appears and this lets Mme Martin type in her chosen genre.

**Enter Parameter Value** ✕

Type a genre

food

[ OK ] [ Cancel ]

To make the report more user-friendly in the design of the report a text box has been added with input from the control source [genre]. This displays the heading with Mme Martin's input text.

**Report Header**

*All DVDs about =[genre]*

**Page Header**

*Genre*          *Title*          *Rating descript*

**Genre Header**

Genre

**Title Header**

Title

**Rating_Desc Header**

*Rating_Desc*

**Detail**

**Page Footer**

*=Now()*          *="Page " & [Page] &*

**Report Footer**

### 4. A user-friendly interface – Student details

Many features have been added to make the database easy for Mme Martin to use

- The student data entry form includes the student's photo.
- A search button allows Mme Martin to search for a student by typing in last name.
- By clicking the LOANS button she can easily see outstanding loans for this student.
- The HELP button provides assistance on using this screen
- The exit button closes the form

**The photo** has been incorporated into the design of the STUDENTS table (below) as an OLE object. Required is set to NO as not all students may provide a photo.
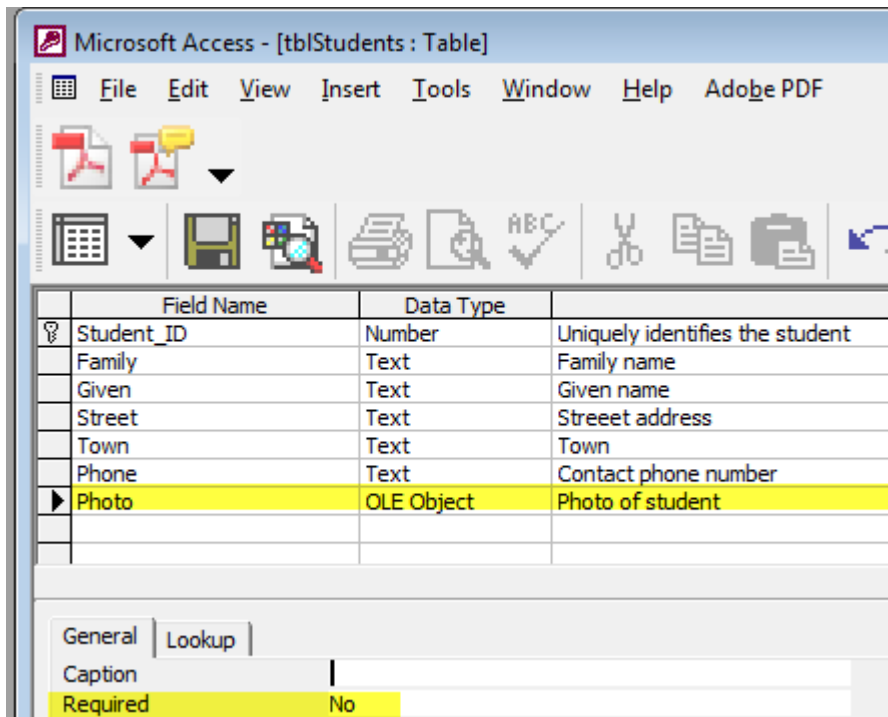


The **search** feature allows easy searching on Last name

The onclick property of the search button will run a macro called mcrFindStudent

| | Action | | Comment |
|---|---|---|---|
| | GoToControl | | Go to the Family text box ie Control Name Family |
| | FindRecord | ▼ | Find the record that matches the search key |
| ⚠ | SetValue | | Blank the serch text boxes Macro Name is mcrClearSearch |

| | Action Arguments |
|---|---|
| Find What | =[txtFamilySearch] |
| Match | Any Part of Field |

The LOANS button runs a macro to open the LOANS form. This enables Mme Martin to quickly see the DVDs the current student has on loan. In order to locate the relevant student this macro has a condition where [Student_ID]=[Forms]![frmStudentEdit]![Student_ID].

The subform is based on a query and the form and subform are linked on Student_ID to ensure that the loans shown relate to the student.

### 5. A user-friendly interface – Loan details



The Loan Information button runs a macro similar to the one above which opens the Loans form and subform.

### 6.  A user-friendly interface – Help facilities
The forms incorporate help buttons which give information about using the forms. Below a macro attached to the Help button has an action to display a message box. The message box incorporates the lines of text.
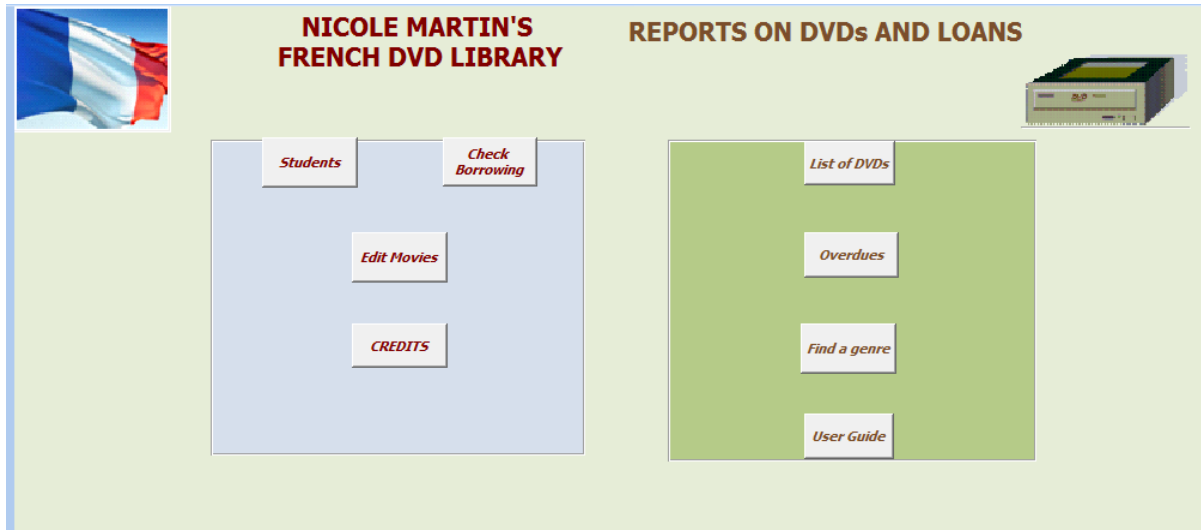
### 7. A user friendly interface – Main Menu

A macro has been created to open the form called Main Menu. By saving this macro as autoexec it automatically launches the Main Menu on startup.

Buttons open forms and reports making the database simple to use.

A user guide is available via a button.



## Security and privacy information

The STUDENTS table contains person information about the students which should not be available to unauthorised users. The database will be loaded onto Mme Martin's home computer. Her computer is not shared with other users and she has a password to log on. A password will also be set on the database for extra security.

Word Count 1012

This database was based on a video store database in *Developing databases with Access* by Graeme Summers.
His Website is http://users.bigpond.net.au/graemebs/

I would highly recommend this book to ITGS teachers who need assistance with MS Access.