

CS 105 - Survey of Computer Science

Spring 2007 - Very Basic MS Access

This handout **very briefly** describes how to create a simple database "application" using Microsoft Access. It assumes the reader is familiar with the example database in Figure 9.5 (p. 399) of the textbook containing EMPLOYEE, JOB, and ASSIGNMENT relations and reproduced here. These relations are used as examples throughout this document.

EMPLOYEE

Empl Id	Name	Address	SSN
25X15	Joe E. Baker	33 Nowhere St.	111223333
34Y70	Cheryl H. Clark	563 Downtown Ave.	999009999
23Y34	G. Jerry Smith	155 Circle Dr.	111005555
:	:	:	:

JOB

Job Id	Job Title	Skill Code	Dept
S25X	Secretary	T5	Personnel
S26Z	Secretary	T6	Accounting
F5	Floor manager	FM3	Sales
:	:	:	:

ASSIGNMENT

Empl Id	Job Id	Start Date	Term Date
23Y34	S25X	3-1-1999	4-30-2001
34Y70	F5	10-1-2002	--
23Y34	S26Z	5-1-2001	--
:	:	:	:

For this class, we will create new blank databases. After launching the MS Access application, if this choice is not available on the start page, use File -> New, then choose Blank Database.

MS Access database applications consist of 4 parts: Tables, Forms, Queries, and Reports. Each is described below. For this course, we will use MS Access itself as the actual application. Normally, after creating a database and its associated forms, queries, and reports, it would be embedded into an actual application. This is beyond the scope of this course.

Tables

In MS Access, relations are called *tables*, tuples are called *records*, and attributes are called *fields*. Tables are maintained under the Tables tab which has items for creating tables in various ways and the actual tables themselves.

For this class, we will create tables using the Design view. Double-clicking on this choice will cause a form to appear for typing in field names and data types. Most of the field data types will be Text, but occasionally there may be number or date data. The form may be navigated using tabs and arrow keys. When a table is saved for the first time, a dialog box pops up to ask for the table name.

Every table should have a *primary key*. A primary key is a field that is unique for each entry in the table and is used as the link between tables. The primary key may be a field that is defined for the data being stored, such as EmplId in the EMPLOYEE table or JobId in the JOB table. These fields are designated as the primary key of their tables by right-clicking on them and choosing Primary Key. Some tables do not have a naturally occurring primary key field, such as the ASSIGNMENT table. None of the fields in the ASSIGNMENT table are intended to be unique. For these tables, MS Access will ask if one should be created when the table is saved. Yes should be clicked and MS Access will add a primary key field (with default name ID) that is an auto-number field. This means that it will be automatically filled with a unique number every time a new record is added to the table.

Most often data will be entered into the database via a form, which is explained below. However, if data is available at the time the database is created, it can be entered directly into a table using the Datasheet view. If the table is not open, double-clicking on the table item under the Tables tab will open it in Datasheet view. If it is open in Design view, right-click on the title bar and choose Datasheet view. A place to enter new record data is automatically created at the bottom of the table whenever a new record is entered. One caveat about data: many symbols have special meaning to MS Access; in particular "*" is one such special symbol, so the textbook example of using it to represent an empty termination date in the ASSIGNMENT table will not work in MS Access. Its use has been replaced with "--" in the reproduction above.

Fields may be added to the table after creation by right-clicking on the field to the right of where the new field is to be inserted and choosing Insert Column. The name of a field can be changed by right-clicking on it and choosing Rename Column.

Once all of the tables of the database have been defined they should be closed. (An open table may cause other actions to fail because MS Access will not overwrite data in an open table.) Then they must be linked together into relationships. These links basically are permanent JOIN operation where clauses that determine which field in one table means the same as a field in another table when more than one table is involved in a query. For example, the EmplId field in the EMPLOYEE table means the same as the EmplId field in the ASSIGNMENT table. Relationships are created by using Tools -> Relationships. A Show Table dialog box will pop up asking which tables to add to the relationship diagram. To link two tables, click on the field that is to be the link in one table, then drag and drop it onto the corresponding field in the second table. A dialog box will pop up to confirm, click OK. Finally, the relationships diagram should be Saved.

Queries

As discussed in lecture, queries are actions that extract information to create new tables that can then be manipulated in the same way as the original tables, including being used in other queries. In MS Access, queries are saved under the Queries tab and can be repeatedly executed to create new tables or as the source for reports (and forms).

For this course we will create queries using the Design view. Double-clicking on this choice will pop up a Show Table dialog box asking which tables or queries to add to the new query. A query is built by specifying which fields are to be considered during the query and whether the field should be shown in the resulting table. (Shown fields essentially are the PROJECT operation arguments.) For example, the textbook query to create a list of employee names and the department they work in would include the EMPLOYEE.Name field, the JOB.Department field, and the ASSIGNMENT.TermDate field. However, the ASSIGNMENT.TermDate field is not to be shown. Instead, it is used to select the records of interest after joining the three tables. (I.e., the unshown fields basically are the fields used in SELECT operations

where clauses.) The selection is done by specifying a match Criteria. Matching one of several criteria can be done by use of the OR boolean operation. Criteria regarding equality can be typed in directly; MS Access will automatically add the enclosing double quote marks if the field is a Text field.

From the Design view, a query may be executed by pressing the exclamation point (!) icon button on the toolbar. This will result in a Datasheet view of the result. To get back to Design view, right-click on the title bar and choose Query Design. When a query is saved for the first time, a dialog box pops up to ask for the query name. A query also may be executed by double-clicking on its entry under the Queries tab.

Forms

MS Access has facilities to create forms for entering data into tables under the Forms tab. For this class, we will create forms using the Form wizard. This wizard allows the programmer to choose which fields should be shown on the form. For this class, we will only create forms for entering data into one table. For most tables, all of the fields should be shown, but sometimes they may not need to be. For example, the auto-generated ID field of the ASSIGNMENT table should not be shown. Then the wizard gives a choice of layouts from several standard layouts and a choice of styling form several standard styles. Finally, the wizard asks for the name of the form. Forms are executed by double-clicking on them under the Forms tab.

The choices made in the wizard determine what the form will look like. If none of the standard choices are suitable, a form can be created using a designer similar to the VB GUI designer. Doing this is beyond the scope of this course, as is creating forms that allow entering data into more than one table.

Reports

The data from a table or resulting from a query may be displayed in a report format using a report generator. Report generators are created under the Reports tab and can be repeatedly used by double-clicking on them. As with forms, we will use the Report wizard. The wizard allows programmers to choose which fields should be shown (thereby being a way of doing a PROJECT operation on the report output), choices for grouping and ordering, and choices from several layouts and styles. Finally, the wizard asks for a title for the report, which is also the name of the report generator for that report. If the standard choices are not suitable, a designer also is available for reports.