

Access and SQL

CS157A

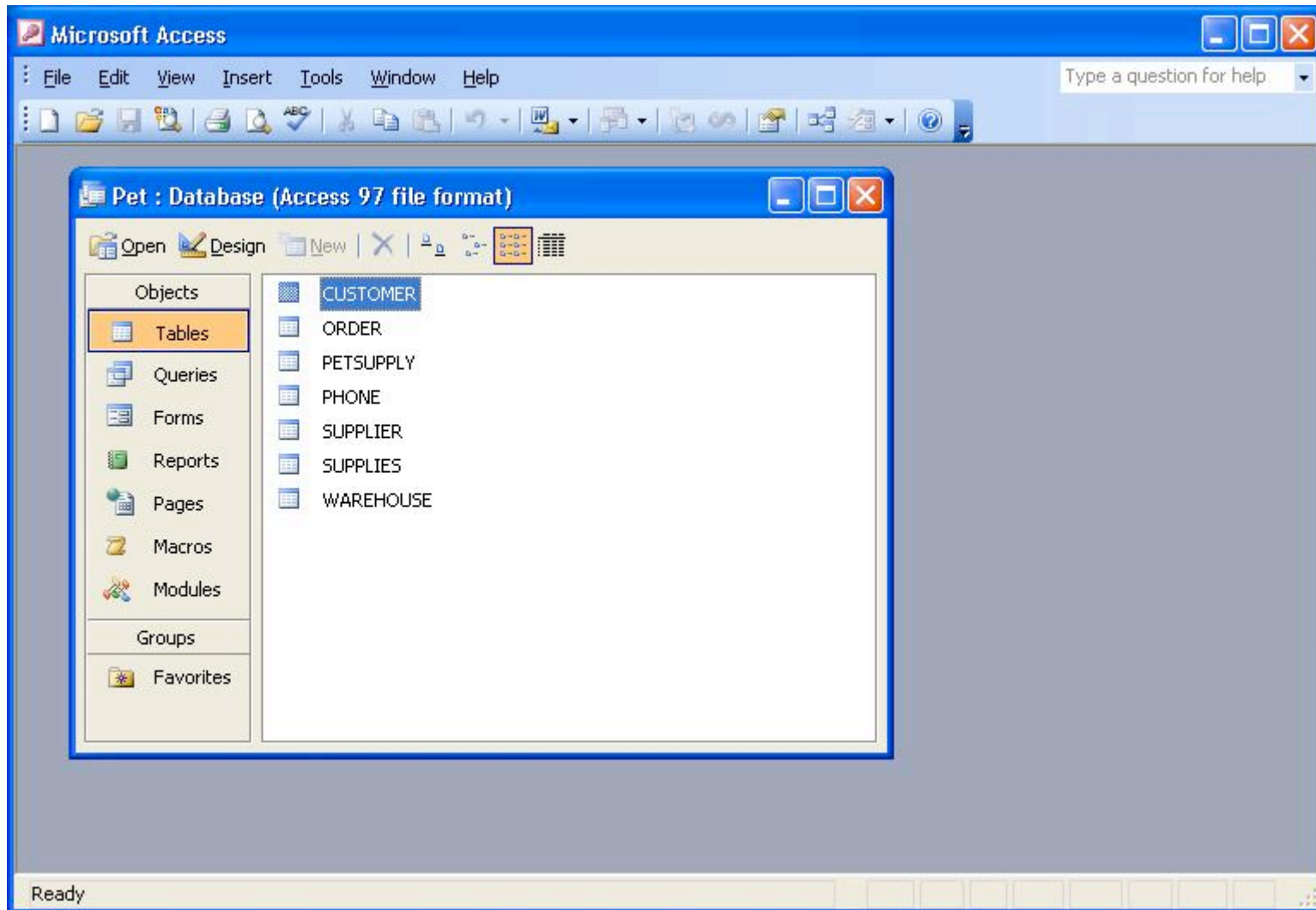
Chris Pollett

Oct. 12, 2005.

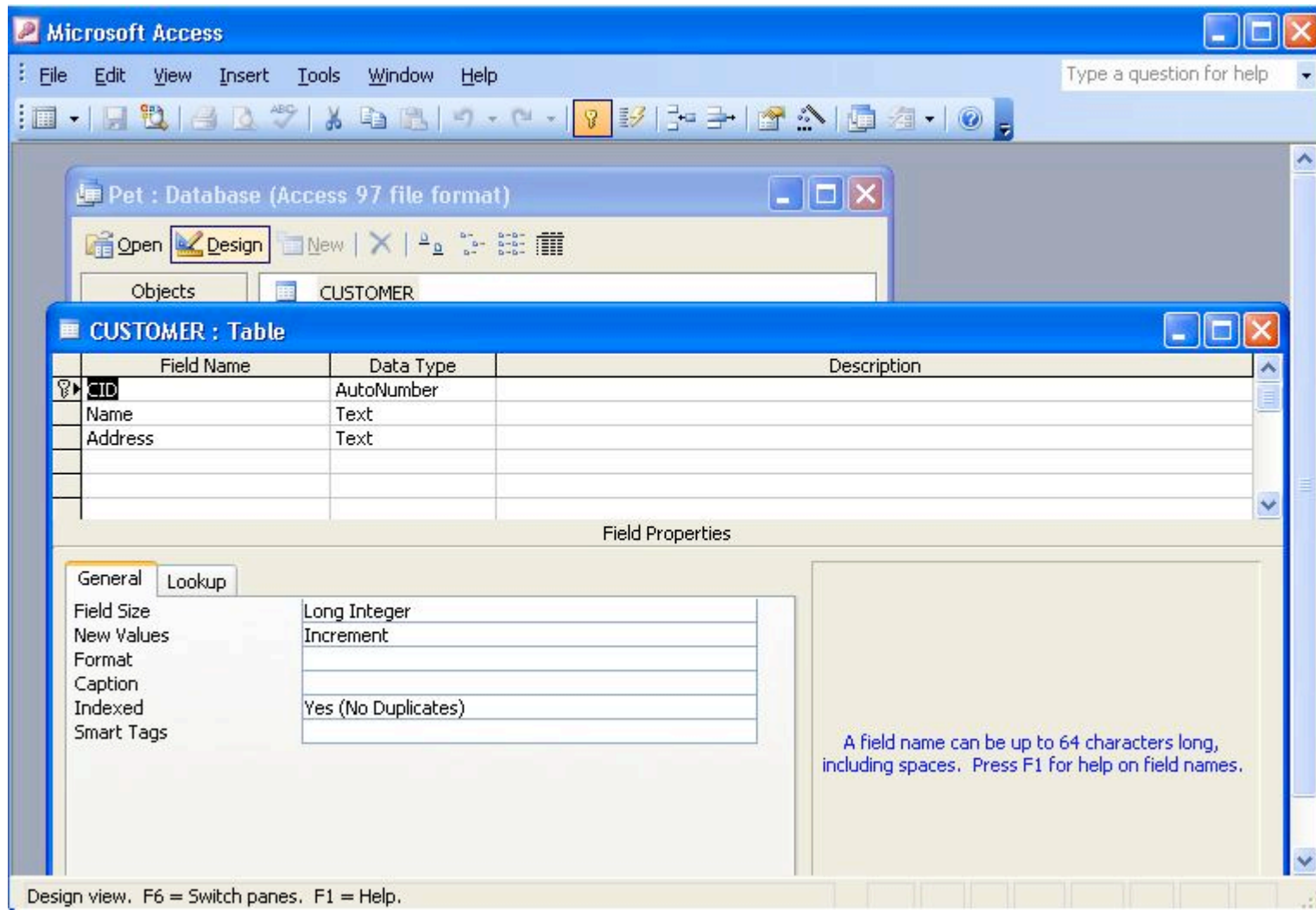
Outline

- Comments on using Access
- SQL-99

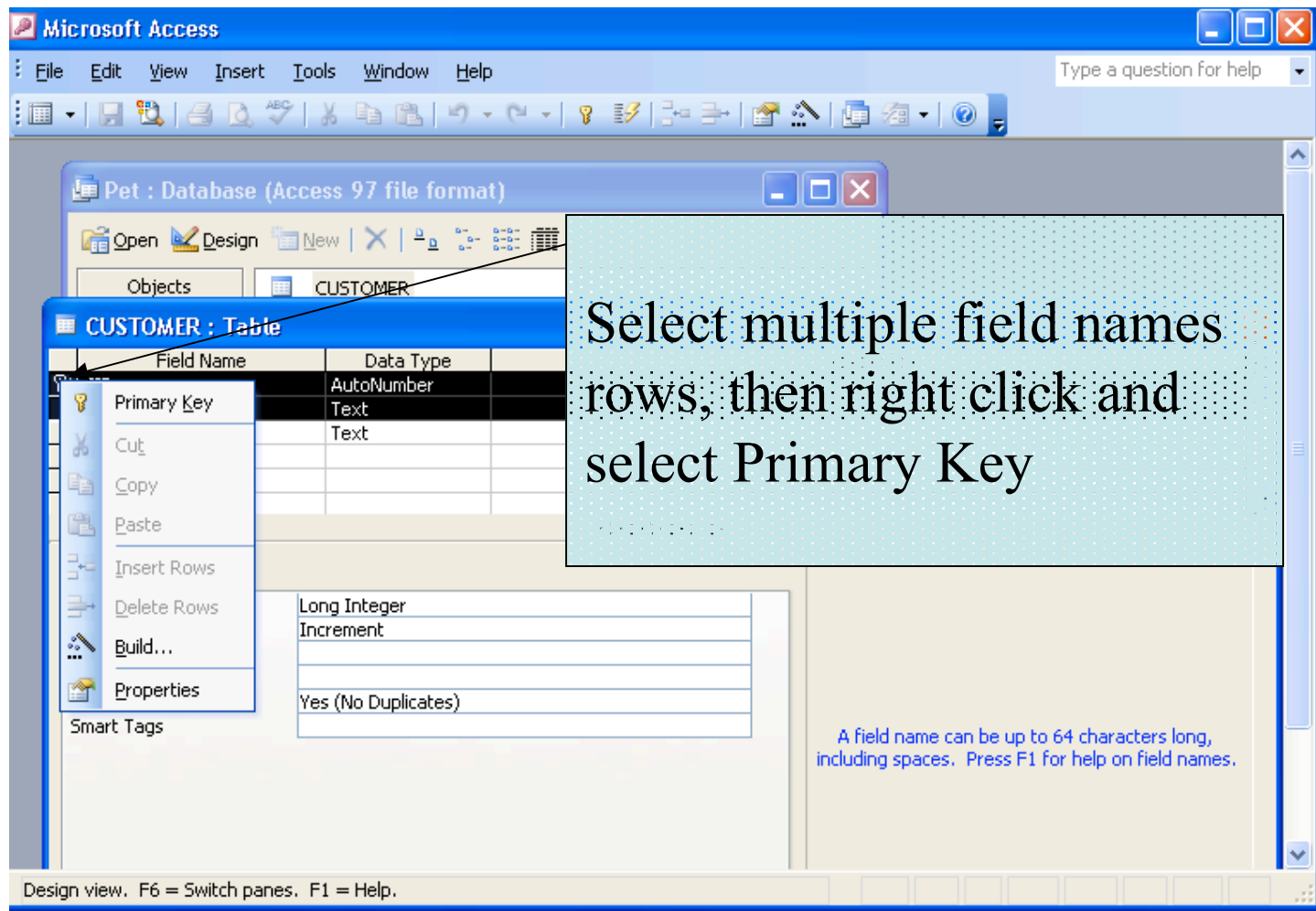
Setting up tables



Editing a table



Creating a key on more than one attribute



Microsoft Access

Pet : Database (Access 97 file format)

Objects CUSTOMER

CUSTOMER : Table

Field Name	Data Type
	AutoNumber
	Text
	Text

Primary Key
Cut
Copy
Paste
Insert Rows
Delete Rows
Build...
Properties

Smart Tags

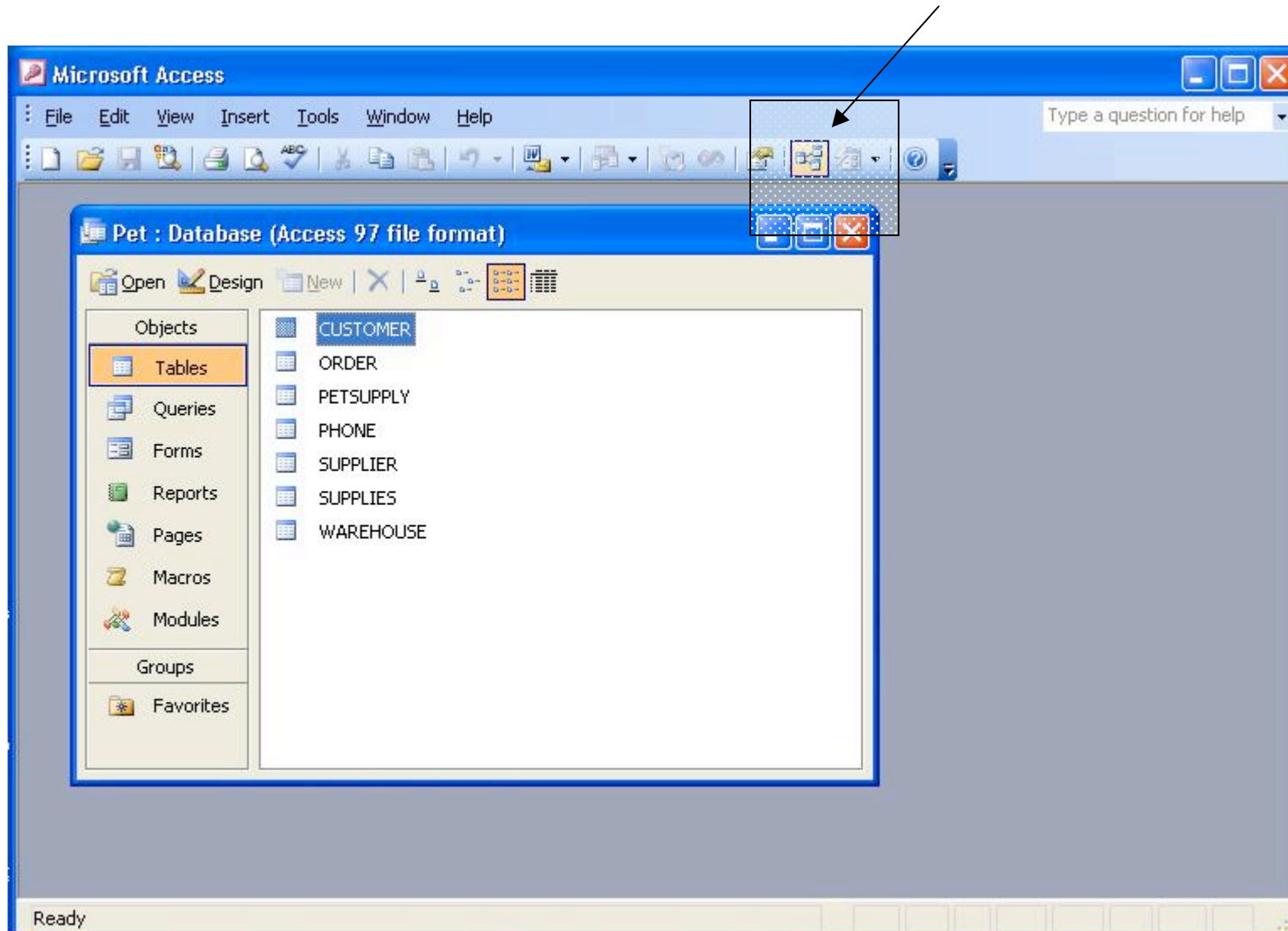
Long Integer
Increment
Yes (No Duplicates)

Select multiple field names rows, then right click and select Primary Key

A field name can be up to 64 characters long, including spaces. Press F1 for help on field names.

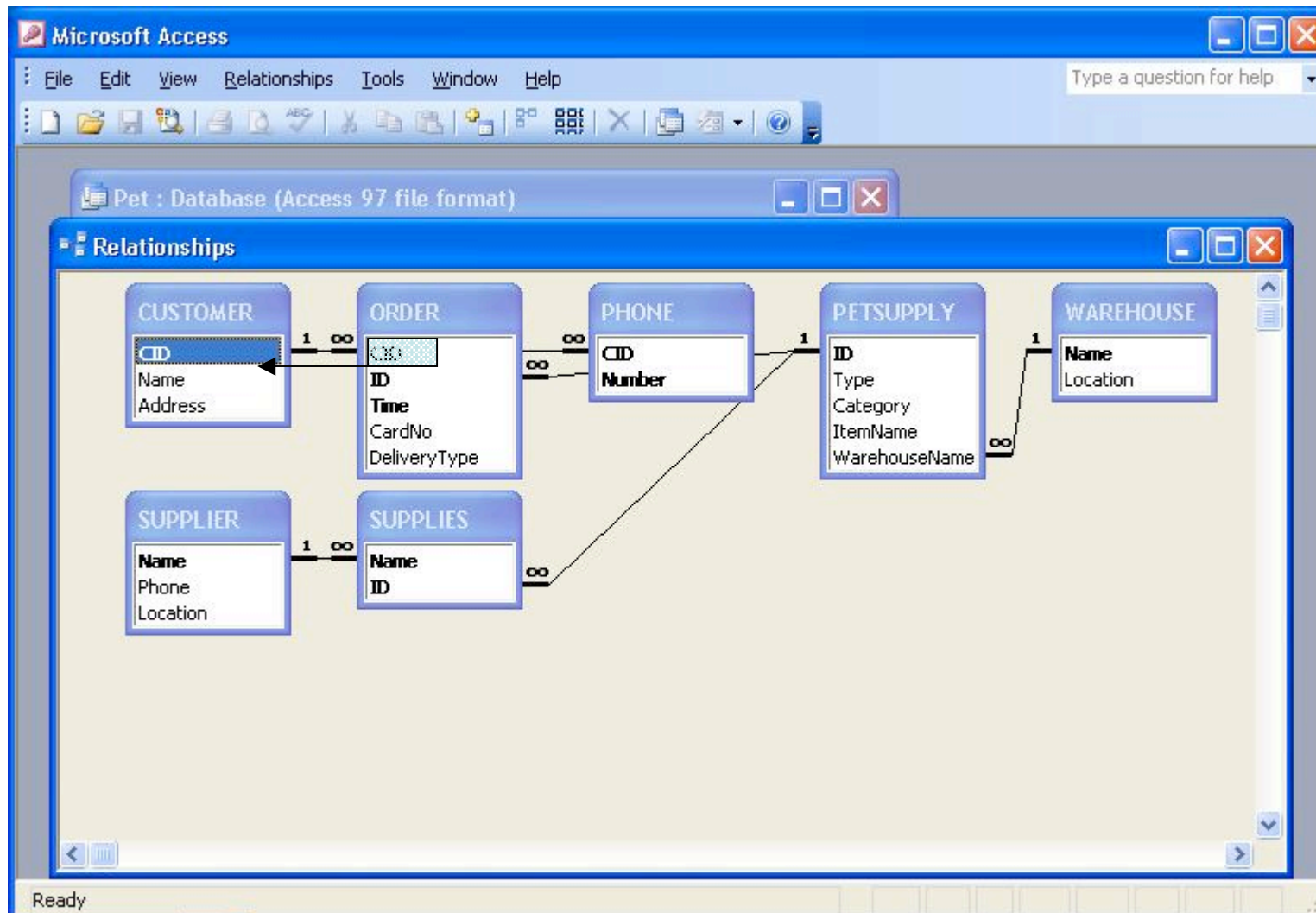
Design view. F6 = Switch panes. F1 = Help.

Switching to edit relationships

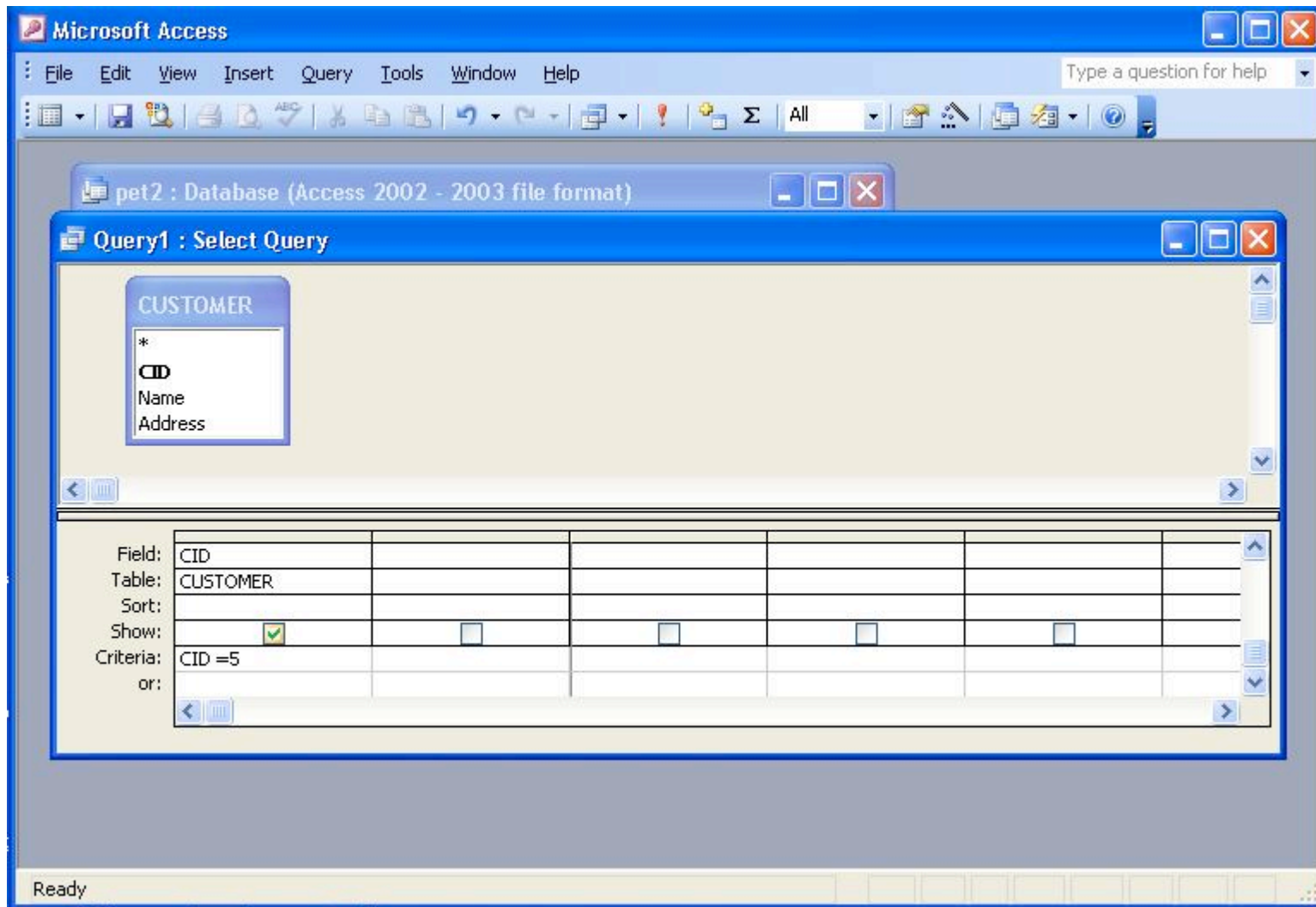


Editing Relationships

(drag fields to create foreign references)



Looking at the Query Editor



SQL Data Definition

- SQL uses the terms *table*, *row*, and *column* for the relational model terms *relation*, *tuple* and *attribute*.
- Originally SQL did not support the concept of relational database schema.
- All tables were considered part of the same schema.
- SQL2 added support for schemas. These consist of:
 - a schema name
 - an authorization identifier
 - descriptors for each element in the schema
- To create a schema, one could do something like:

```
CREATE SCHEMA COMPANY AUTHORIZATION CPOLLETT;
```
- In SQL2 one also has the concept of a *catalog* which is a pre-named collection of schemas in an SQL environment.
- An SQL environment is basically an installation of an SQL-compliant RDBMS.
- In SQL2, the catalog should have a special schema called INFORMATION_SCHEMA which provides information on all the schemas in the catalog.

CREATE TABLE (1)

- CREATE TABLE is the command used to create a new relation in some relational database schema.
- The start of such a statement can look like:
CREATE TABLE COMPANY.EMPLOYEE ...
or
CREATE TABLE EMPLOYEE ...
- SQL distinguish between *base tables* which are created with statements like the above and *virtual tables* (made using CREATE VIEW) .
- All the rows of former are actually physically stored in the database in some file; the latter kind of table is calculated as needed based on other tables.

CREATE TABLE (2)

- A complete create table statement might look like:

```
CREATE TABLE DEPENDENT
( ESSN CHAR(9) NOT NULL,
  DEPENDENT_NAME VARCHAR(15) NOT NULL,
  SEX CHAR,
  BDATE DATE,
  RELATIONSHIP VARCHAR(8),
  PRIMARY KEY(ESSN, DEPENDENT_NAME),
  FOREIGN KEY(ESSN) REFERENCES
  EMPLOYEE(SSN)
);
```

SQL Attribute Data Types

- The basic data types available in SQL are the following:
 - **Numeric data types.** INTEGER (aka INT), SMALLINT, FLOAT (AKA REAL), DOUBLE PRECISION, and DECIMAL(i,j) (aka DEC(i,j) or NUMERIC(i,j)).
 - **Character data types.** CHAR(n) or CHARACTER(n), VARCHAR(n). String literals are single quoted. String concatenation is done using ||
 - **Bit-string data type.** BIT(n). A literal might look like B'1001'
 - **Boolean data type.** BOOLEAN. Can be TRUE, FALSE or UNKNOWN.
 - **Date or Time data type.** DATE, TIME. Literals looks like DATE '2005-06-06' or TIME '13:05:47'.
 - **Timestamp data type.** TIMESTAMP or TIMESTAMP WITH TIME ZONE. A literal might look like TIMESTAMP '2005-09-27 09:12:47 648302'
- One can also create domains with:

```
CREATE DOMAIN SSN_TYPE AS CHAR(9);
```

Specifying Attribute Constraints in SQL

- There are a few additional things we can do to fix the domain of an attribute in our CREATE TABLE statement:

- We can give a default value.

```
DNO INT NOT NULL DEFAULT 1
```

- We can check the value is in some range:

```
DNUMBER INT NOT NULL CHECK (DNUMBER > 0 AND  
DNUMBER < 21)
```

OR

```
DNUMBER D_NUM NOT NULL
```

For the second case, we defined elsewhere the domain D_NUM using:

```
CREATE DOMAIN D_NUM AS INTEGER CHECK  
(D_NUM > 0 AND D_NUM < 21);
```