



University of Delhi

Creating Database with MS Access

by

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Database basics and MS Access structure

What is a Database ?

In its most basic form, a Database is the computer equivalent of an ORGANIZED list of information.

SN	College Name	Location	Connected With
1	Bhagat Singh College (Evening)	Sheikh Sarai	South Campus
2	Bhagat Singh College (Morning)	Sheikh Sarai	South Campus
3	BR Ambedkar College	Wazirabad Road	North Campus
4	College Of Business Studies	Jhilmil Colony	North Campus

Record →

↑
Field



Data vs. Information

Data – a collection of facts made up of text, numbers and dates:

Dr. Singh 1 May 22, 2004

Information - the meaning given to data in the way it is interpreted:

Dr. Manmohan Singh is PM of India whose monthly salary is Rs. 1 and whose hire date is May 22, 2004.



Benefits of using a Database

Because the Database stores information in an electronic format, you can manipulate the information in powerful ways to extend its utility.



- Gives you true command of your data, enabling you to retrieve it, sort it, analyze it, summarize it, and report results in moments.
- Can combine data from various files, so that you never have to enter information twice.
- Can even make data entry more efficient and accurate.



Types of Database

Flat Database

- Stores information in only one table.
- All information has a one-to-one relationship.
- Ex: Table in MS Word, MS Excel

Relational Database

- Can store information in multiple related tables.
- Tables can have one-to-one relationships, one-to-many relationships, many-to-many relationships.
- Ex: MS Access, Oracle



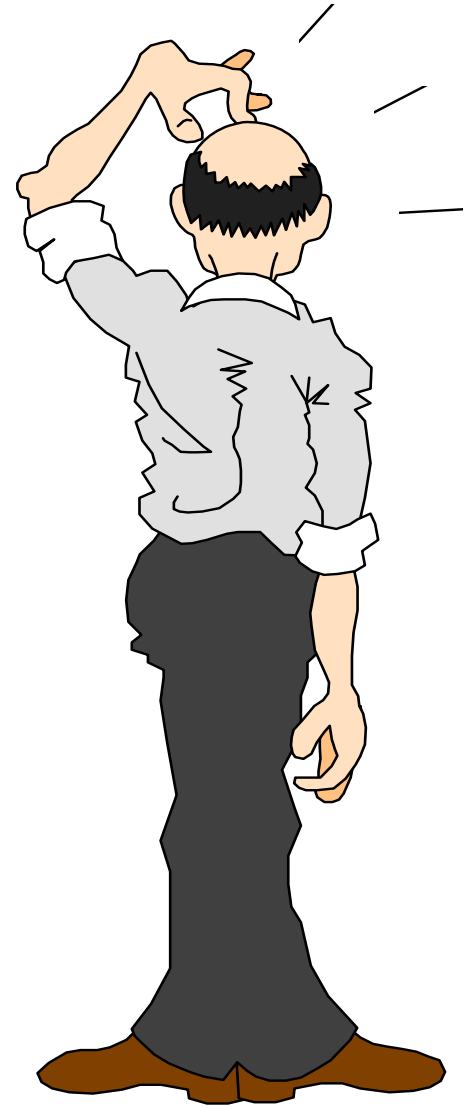
Database Options

- Freeware/Shareware - 1,000's of records
- Microsoft Excel - Limit of 65,536 Rows
- Microsoft Access - 100,000's of records
- Oracle/SQL - 1,000,000,000's of records



Why Use Access?

- Familiar look and feel of Windows
- Easy to start building simple databases
- Can build sophisticated systems
- It's already on your computer
- True relational database

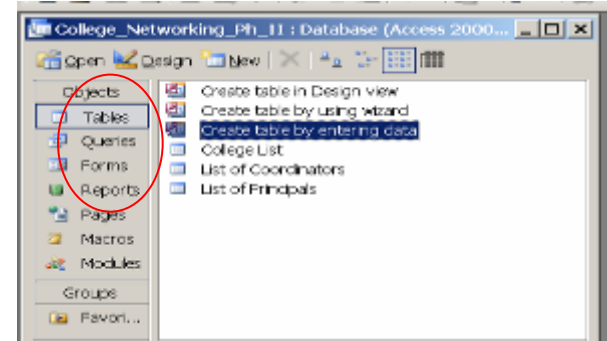
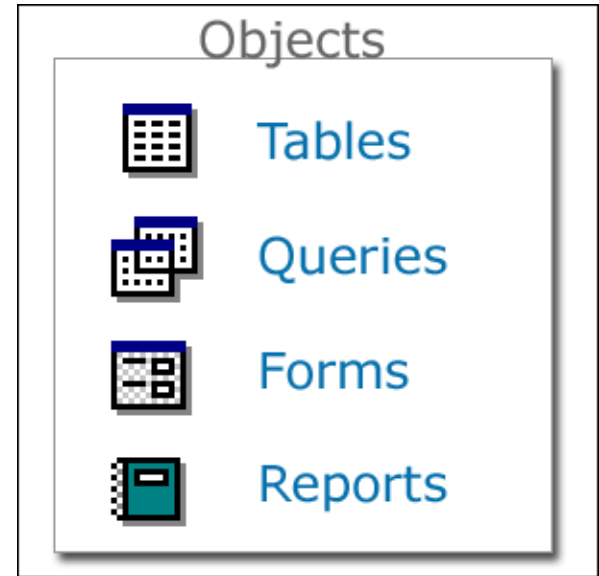




MS Access structure- Objects

Access databases consist of **objects**.

- **Tables** store your data in rows and columns. All databases contain one or more tables.
- **Queries** retrieve and process your data. They can combine data from different tables, update your data, and perform calculations on your data.
- **Forms** control data entry and data views. They provide visual cues that make data easier to work with.
- **Reports** summarize and print your data. They turn the data in your tables and queries into documents for communicating ideas.

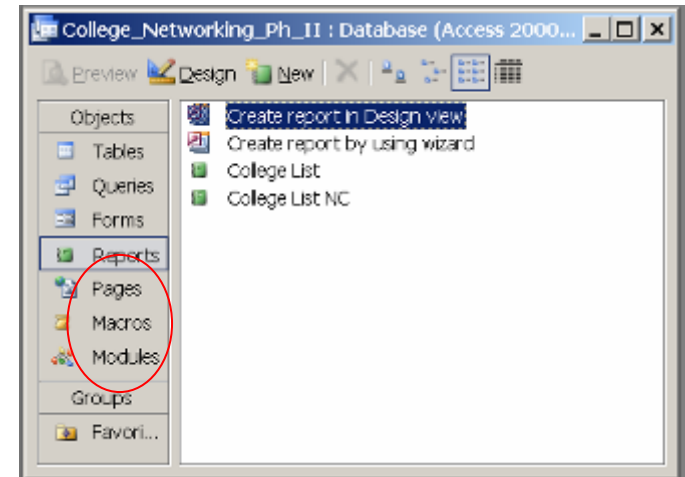




MS Access structure- Other Objects

Pages (Data Access Pages) enable people to view and manipulate your database information over an intranet or Internet.

You can use Macros to have Access respond to an event, such as click of button, the opening of form, or the updating of a record



Modules are Microsoft Visual Basic for Application (VBA) programs and are more powerful than macros.



Steps in creating a Database

1. Clearly define the purpose of the database.
2. Decide what information you want to get out of the database.
3. Decide what information the database will need to store in order to generate the desired output .
4. Plan Tables to store the information in the database and decide what field will be in each table.



Steps in creating a Database (cont....)

5. Create database file in Access and create the tables in the database.
6. Make Relationship between the tables.
7. Create Forms to assist in entering information.
8. Create Queries to generate the required output.
9. Create Reports to present the output neatly, ready for printing.



Tables

- Tables are building blocks of any database. Tables store data.
- A database should have a separate table for every major subject of information, such as college list, principal list, or coordinator list. Data should not be duplicated in multiple tables.
- Each table contains rows called records and columns called fields.

The screenshot shows a database interface with three tables:

- College List : Table**

SN	College Name	Location
1	Bhagat Singh College (Evening)	Sheikh Sara
2	Bhagat Singh College (Morning)	Sheikh Sara
3	BR Ambedkar College	Wazirabad Road
4	College Of Business Studies	Jhilmil Colony
- List of Principals : Table**

SN	Name	Tel	Fax
1	Dr. R. D. Arora	29253430	
2	Dr. Jitender Kaur	29257472	
3	Dr. R. B. Soanki	22130296	
4	Dr. R. M. ...		
5	Dr. Dee ...		
6	Dr. D. ...		
7	Dr. (Ms) ...		
8	Dr. A. P. ...		
9	Dr. (Ms) ...		
- List of Coordinators : Table**

SN	Name	Tel
1	Dr. Kar	921270674
2	Amit K. Singh	981099232
3	Anil Kumar	981004472
4	Dr. Anamika Gupta	981071677

Field

Record →

SN	College Name	Location	Connected With
1	Bhagat Singh College (Evening)	Sheikh Sarai	South Campus
2	Bhagat Singh College (Morning)	Sheikh Sarai	South Campus
3	BR Ambedkar College	Wazirabad Road	North Campus
4	College Of Business Studies	Jhilmil Colony	North Campus



Tables (cont.....)

Primary Key

- To distinguish one record from another, tables can contain a primary key field.
- The primary key is an identifier—such as a serial number, part number, a product code, or an Employee ID—that's unique to each record.
- The primary key should be a piece of information that won't change frequently.

	SN	College Name	Location
+	1	Bhagat Singh College (Evening)	Sheikh Sara
+	2	Bhagat Singh College (Morning)	Sheikh Sara
+	3	BR Ambedkar College	Wazirabad Road
+	4	College Of Business Studies	Jhimil Colony
+	5	Dayal Singh College (Evening)	Lodi Road
+	6	Dayal Singh College (Morning)	Lodi Road
+	7	Deshbandhu College (Evening)	Kalkaji
+	8	Deshbandhu College (Morning)	Kalkaji

College List : Table		
	Field Name	
Key	SN	Aut
	College Name	Tex
	Location	Tex
	Connected With	Tex

General	Lookup
Field Size	255
Format	
Input Mask	

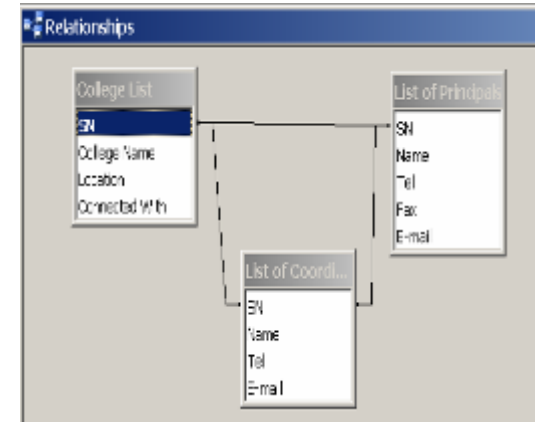


Tables (cont.....)

Relationship

Access creates **relational**

databases, which means that data is stored in various separate tables by subject or task, but the data is related and can be brought together in ways that you specify.



Relationships link data from individual tables to increase its usefulness.



Types of table relationships

One-to-one relationship

In a one-to-one relationship, each record in one table relates directly to a single record in another table.



Types of table relationships

One-to-many relationship

In a one-to-many relationship, a record in one table relates to multiple records in a second table, but the records in the second table relate to only one record in the first table.



Types of table relationships

Many-to-many relationship

In a many-to-many relationship, a record in one table relates to multiple records in a second table, and a record in the second table relates to multiple records in the first table.

This type of relationship requires a third table, called a junction table. The junction table contains the primary keys from the other two tables as its foreign keys.



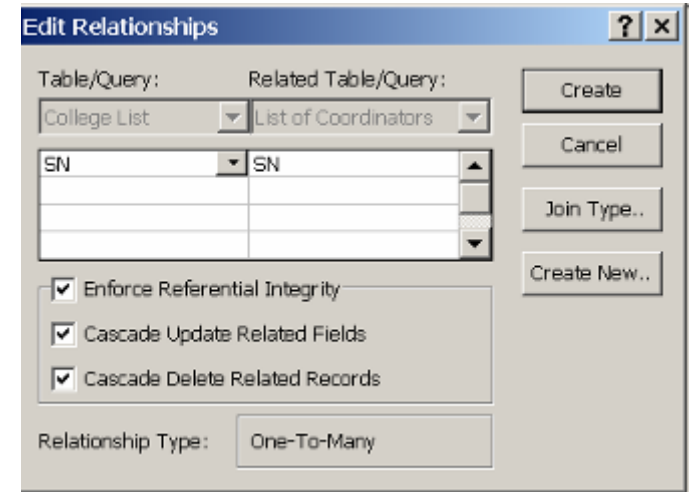
Checklist for structuring tables

- Is each record unique? Or is a record repeated somewhere else?
- Can you easily make changes to one record without changing another record?
- Does each record contain all the details that belong in that record?
- Does each record contain only the details that belong in that record, specifically appropriate to the record's subject?
- Are any details, or any group of details, repeated in more than one record or table?
- Do any fields of details in the record depend on other fields, which might become records in another table?



Referential Integrity

- Access uses a system of rules called referential integrity to ensure that relationship between records in related tables are valid, and that do not accidentally delete or change related data.
- When the Cascade Update Relationship Fields check box is selected, checking a primary key value in primary table automatically updates the matching value in all related tables.



- When the Cascade Delete Related Records check box is selected, deleting a record in primary table deletes any related records in the related table.



Refine how data is displayed

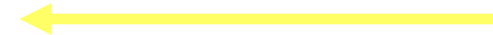
Data View/ Design View

Employees : Table

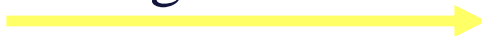
	Employee ID	Last Name	First Name	Title	Title Of	Birt
+	1	Davolio	Nancy	Sales Representative	Ms.	08-D
+	2	Fuller	Andrew	Vice President, Sales	Dr.	19-F
+	3	Leverling	Janet	Sales Representative	Ms.	30-A
+	4	Peacock	Margaret	Sales Representative	Mrs.	19-S
+	5	Buchanan	Steven	Sales Manager	Mr.	04-T
+	6	Suyama	Michael	Sales Representative	Mr.	02-
+	7	King	Robert	Sales Representative	Mr.	29-N
+	8	Callahan	Laura	Inside Sales Coordinator	Ms.	09-
+	9	Dodsworth	Anne	Sales Representative	Ms.	02-
*	(AutoNumber)					

Record: 1 of 9

Datasheet View



Design View



Employees : Table

Field Name	Data Type	Description
EmployeeID	AutoNumber	Number automatically assigned to new employee.
LastName	Text	

Field Properties

General | Lookup

Field Size	Long Integer
New Values	Increment
Format	
Caption	Employee ID
Indexed	Yes (No Duplicates)

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

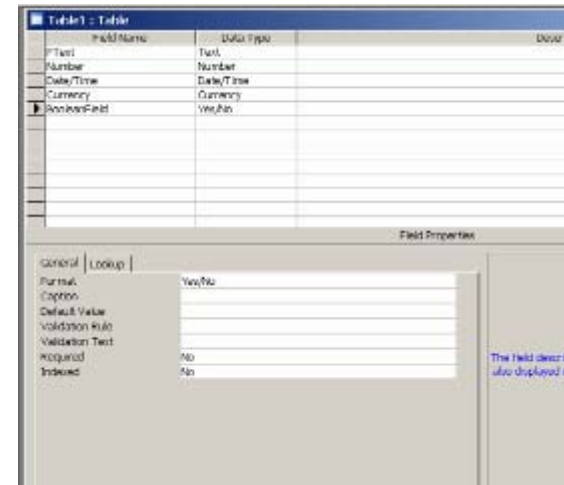


Keeping your Information Accurate.

At the time of creating a Database with MS Access you can set the properties that restrict what can be entered in it, thereby keeping the database organized and useful.

Using Data Type Settings to Restrict Data

1. Create a new Database using Create table in Design view option.
2. Type required field names in Field Name columns and select appropriate data type in corresponding Data Type columns.



Example:

Field	Data type
DateField	Date/Time
CurrencyField	Currency
BooleanField	Yes/No



Refine how data is displayed

Review and edit property setting of a Table.

Primary Key

The screenshot shows the 'Employees' table in Microsoft Access. The 'EmployeeID' field is highlighted with a red arrow, indicating it is the primary key. The 'Field Properties' pane at the bottom shows the 'General' tab with 'Indexed' set to 'Yes (No Duplicates)'.

Field Name	Data Type	Description
EmployeeID	AutoNumber	
FirstName	Text	
LastName	Text	
Region	Text	
EmailName	Text	
City	Text	
Region1	Text	
WorkPhone	Text	
Notes	Memo	
OfficeLocation	Text	

Field Properties

General | Lookup

Field Size: Long Integer
New Values: Increment
Format:
Caption: Employee ID
Indexed: Yes (No Duplicates)
Smart Tags:

A field name can be... Press

Select data type

The screenshot shows the 'Employees' table in Microsoft Access. The 'Region' field is selected, and the 'Data Type' dropdown menu is open, showing options like Text, Memo, Number, Date/Time, Currency, AutoNumber, Yes/No, OLE Object, Hyperlink, and Lookup Wizard. A red arrow points to the dropdown menu.

Field Name	Data Type	Description
EmployeeID	AutoNumber	
FirstName	Text	
LastName	Text	
Region	Text	
EmailName	Text	
City	Memo	
Region1	Number	
WorkPhone	Date/Time	
Notes	Currency	
OfficeLocation	AutoNumber	

Field Properties

General | Lookup

Field Size: 50
Format:
Input Mask:
Caption: Region
Default Value:
Validation Rule:
Validation Text:
Required: No
Allow Zero Length: No
Indexed: No
Unmode Compression: No
OLE Mode: No Control

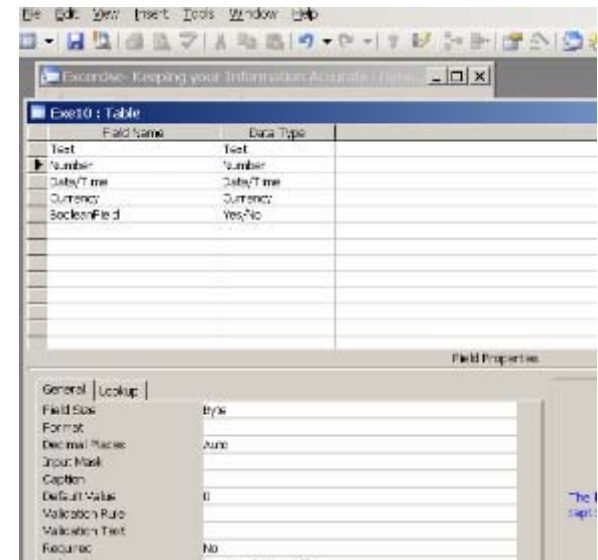
The data type determines the kind of values that users can store in the field. Press F1 for help on data types.



Keeping your Information Accurate.

You can set the Field size property for the Text, Number, and AutoNumber data types.

Using Field Size Properties to Restrict Data.





Manipulating Table Columns and Rows

- You can manipulate the columns and rows of an Access table without in any way affecting the underlying data.
- You can size both rows and columns, and you can also hide, move, and freeze columns.

SN	College Name	Location	Connected With
1	Ehagel Singh College	Sheikh Serai	South Campus
2	Ehagel Singh College	Sheikh Serai	South Campus
3	BR Ambedkar College	Wazirabad Road	North Campus
4	College Of Business	S Jhimil Colony	North Campus
5	Deyal Singh College	Lodi Road	South Campus
6	Deyal Singh College	Lodi Road	South Campus
7	Deshbandhu College	(Kallej)	South Campus
8	Deshbandhu College	(Kallej)	South Campus
9	Institute of Home Econ	Hauz Khas Enclave	South Campus
10	Kamla Nehru College	Khet Ganj Mang	South Campus
11	Laxmibai College	Ashok Vihar	North Campus
12	Mata Sundri College	Mata Sundri Lane	North Campus
13	PGDAV College	(Eve) Nehru Nagar	South Campus
14	PGDAV College	(Mor) Nehru Nagar	South Campus
15	Rajdhani College	Raja Garden	North Campus
16	Raguru College of As	Jhimil Colony	North Campus
17	Satyavati College	(Eve) Ashok Vihar	North Campus
18	Satyavati College	(Mor) Ashok Vihar	North Campus
19	Sharda College	Raja Garden	North Campus



Simplifying Data Entry with Forms



You can make data entry and data viewing easier and safer with well designed and customized forms.



Benefits of using Forms

1. Forms help people to focus on just what they need when they enter or view data.
2. You can design a form so that it is easy to read and understand.
3. You can include labels to describe data, and instructions for entering it, right next to each working area.
4. Forms let you select, from the many fields on a table, just those that you want the users to focus on.
5. This selectivity also means that you don't have to expose all the data to everyone who works with it.



Structure of a form

1

SN	College Name	Location	Connected With
5	Dayal Singh College (Evening)	Lodi Road	South Campus
6	Dayal Singh College (Morning)	Lodi Road	South Campus
7	Deshbandhu College (Evening)	Kalkaji	South Campus
8	Deshbandhu College (Morning)	Kalkaji	South Campus

2

Record: 1 of 34

1 The structure of data in a table...

2 ...is reflected in the structure of a form.

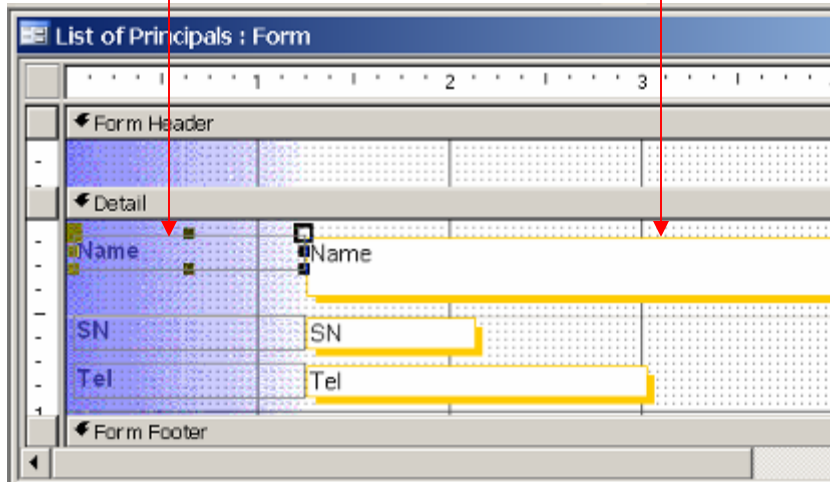


Refining Form Properties

Form in Design View

Label Control

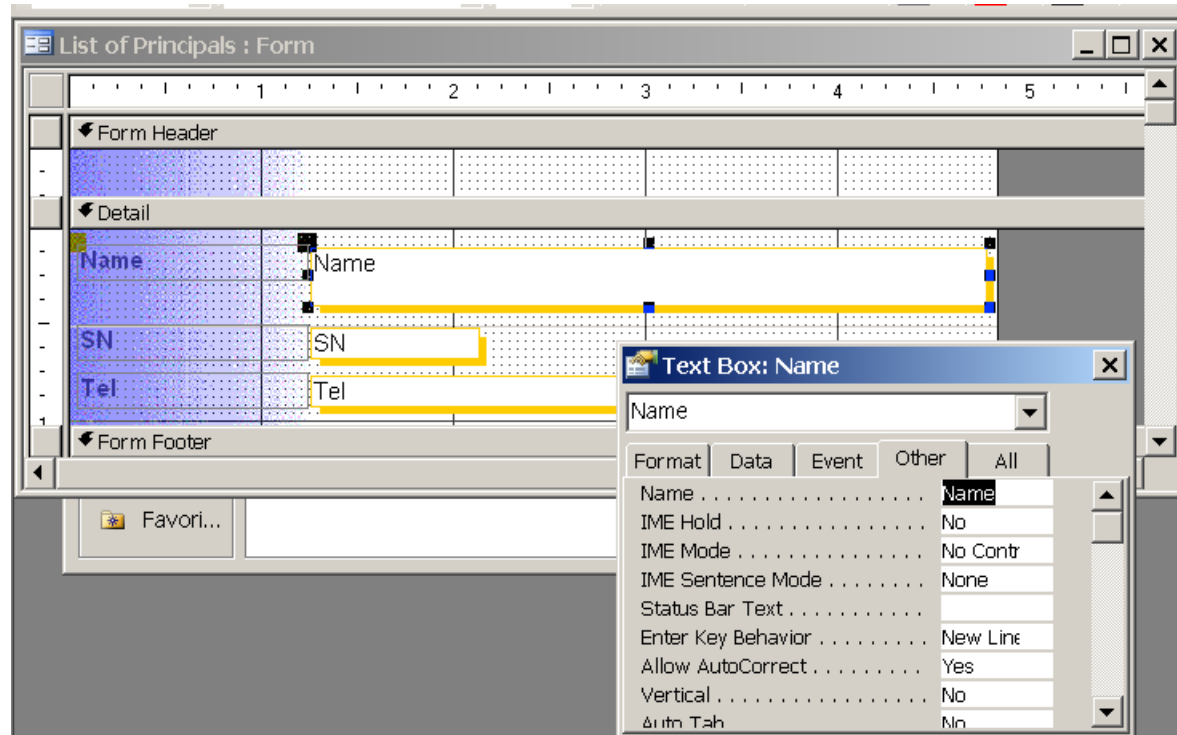
Text Control





Refining Form Properties

Right click on Text Control and click Properties





Locating Specific Information

Once you get your data into your database, how do you get the data out again?



A database becomes really valuable when you use the data it contains as a resource to answer questions or perform tasks.



Locating Specific Information (cont....)



Queries express the questions you want your data to answer.

With queries, you can retrieve, combine, reuse, and analyze your data. You can use queries to retrieve data from multiple tables, or as a source for forms and reports.



Tasks with Query

1. Sorting Information.
2. Filtering Information in a Table.
3. Filter by Form.
4. Refine a Query in Design View.
5. Perform calculation in a Query.
6. Use expressions as criteria to limit your results and perform calculations.



How Query works?

Recordset

1. Whenever you run a query, it checks for the latest data in your database. The data returned by a query is called a **recordset**.
2. You can browse through the recordset, select from it, sort it, and print it.
3. Typically, the recordset you produce with a query isn't saved, but the query structure and criteria you used to get the results are saved. You can check for the most recent data again at any time, simply by rerunning the query.
4. You can create and save multiple queries to retrieve data in different ways. Queries are easy to revise as well, so if you don't set them up right the first time, or if your needs change, you can easily change your criteria. You can even use one or more queries as the source of data for another query, increasing your efficiency as you select more and more precisely to get just the data you want.



Types of Queries

Query type	Description
Select Query	Retrieves data from one or more tables and displays the Recordset in a datasheet.
Parameter Query	Prompts the user to enter values that define the query, such as a specified region for sales results.
Cross- tab Query	Arranges a Recordset to make it more easily visible, using both row headings and column headings.
Action Query	Creates a new table or changes an existing table.
SQL Query	An advanced query that is created by using an SQL statement.



Expressions

The word expressions, as used in Access, is synonymous with formulas. An expression is a combination of operators, constants, functions, and control properties that evaluate to a single value.

To create an expression, you can combine text, numbers, dates, identifiers (such as field names), operators (such as $<$ $>$ $=$ or $+$ $*$ $-$), built-in functions, and constants (a preset value that doesn't change, such as True).



Creating a Calculated Field

A calculated field is a new field that you create in a query to indicate the results of a calculation. By default, a calculated field appears with your other fields in your query results; it can also appear in forms and reports based on the query.

To enter an expression in Design view, you can:

Type the expression directly in the design query grid.

—or—

Type in the **Zoom** box by first right-clicking the cell, and then clicking **Zoom** on the shortcut menu.

—or—

Use Expression Builder by right-clicking the cell, and then clicking **Build** on the shortcut menu.



Reports

- Reports convert data into documents.
- Reports come in various shapes and sizes, but they are all designed to present your data in print.
- Reports provide methods to format the appearance of your data in the ways that are most effective for your purpose.
- Using reports, you can group your data, perform calculations on it, and add headings and other formatting to make it more meaningful and easier to read.

College List

SN	College Name	Coordinator Name	Tel	Principal Name
1	Mauz Singh College (Mauz)	Dr. Kar	91279361	Dr. R.D. Arora
2	Mauz Singh College (Mauz)	Amir K. Singh	98109220	Dr. Anand Kaur
3	DR. Arvind College	AJL Kaur	98109421	Dr. R.S. Solanki
4	College Of Business Studies	Dr. Ananda Gupta	98107070	Dr. R.M. Singh
5	Durgal Singh College (Durgal)	Dr. Manoharan		Dr. Deepak Mahajan
6	Durgal Singh College (Durgal)	Dr. P.K. Sharma	98932794	Dr. D. Jagdishan
7	Deshbandhu College (Durgal)	Dr. Chh. Dhyan Lal	98933020	Dr. (Ms.) Preeti Lal
8	Deshbandhu College (Durgal)	Dr. Jai Prakash	98132458	Dr. A.P. Kaur
9	Institute of Home Economics	Dr. Geeta Tikraner	98102780	Dr. (Ms.) K. Khanna
10	Kautilya College	Dr. Neeta Bhatnagar	98998681	Dr. (Ms.) Meeta Chhabra
11	Laxmibai College	Dr. Nita Goyal	98101385	Dr. (Ms.) Kamini Kaulak
12	Mauz Singh College	Neeta Singh	981090134	Dr. (Ms.) Suresh Kaur
13	NDVY College (Durgal)	Dr. Jagdishan	981320779	Dr. R.M. Bhambhani
14	NDVY College (Durgal)	Shruti Kaur	981330944	Dr. J. Anandkumar
15	Rachna College	Dr. S. S. Bhatnagar	98998806	Dr. Nijal Laxmi Pandey
16	Rajendra College of Appl. Studies	Kamini Kaur	98121383	Dr. S. Lakshmi Devi
17	Satyam College (Durgal)	Prabir Mehta	98911180	Dr. Suresh Kaur
18	Satyam College (Durgal)	Ashu Sharma	98920172	Dr. R.P. Mehta
19	Shree College	Suman Khatwani	98109103	Dr. (Ms.) Shashi Prakash
20	Shree Lal College (Durgal)	Dr. Suresh Datta	98120241	Dr. C.P. Aggarwal
21	Shree Lal College (Durgal)	Dr. V. R. Aggarwal	98103450	Dr. R.K. Sharma
22	Shri Anand College (Durgal)	AJL Kaur	2092515	Dr. (Ms.) Shreshtha Yadav
23	Shri Anand College (Durgal)			Dr. Shree
24	Shri Mata Jyoti	Dr. Nand K. Mehta	98121383	Dr. Karan Arora
25	Shree Swarna College	Vikas Chaudhary	98932790	Dr. (Ms.) Sapna Chahal
26	Shri Anand College of Arts			Dr. Chhavi
27	Shree College			Dr. (Ms.) Mahi
28	Shri Anand College of	Waseem Khan	981142945	Dr. (Ms.) Prabhakar Kaur

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Thank you.

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