INFORMATION TECHNOLOGY

Database Management System

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Class Xb

Index

Introduction to DBMS 2
Project aim: 2
Purpose of Key Elements: 3
Creating a database 3
Advantages of tables 6
Creating relationship 7
Advantages of relationship 8
Building a Query 9
Advantages of query 10
Creating a Form 11
Advantages of form 12
Generating a Report 12
Advantages of report 13

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Introduction to DBMS

A Database Management System (DBMS) is a software tool designed to facilitate the creation, maintenance, and management of databases. It ensures data is stored systematically and provides efficient methods for retrieving, updating, and manipulating information. DBMS is essential for organizing large amounts of data effectively. This project will help us explore and apply the core concepts of DBMS through practical implementation using Microsoft Access.

Project aim:

The goal of this project is to create a simple database in MS Access that includes two related tables, a query, a form, and a report, along with demonstrating relationships between data. This will help us understand how data can be connected and presented efficiently.

Purpose of Key Elements:

Tables: Store structured data in rows and columns.

Relationships: Define connections between tables to avoid data redundancy and maintain consistency.

Query: Retrieve specific information by combining and filtering data from multiple tables.

Form: Provide a user-friendly interface for entering and modifying data.

Report: Present organized data summaries for better understanding and decision-making

Creating a database

1. Open Microsoft Access.
2. We create a new database: Click on "Blank Database," give it a name (e.g., Teachers_Dept_DB.accdb or Students_Clubs_DB.accdb), and click "Create.

3. Then we enter data into **students** and **clubs** fields in design view and save each table.

- Here, Students Table:
  - `ID` (AutoNumber, Primary Key)
  - `SName` (Short Text)
  - `Club_ID` (Number, Foreign Key)
  - Address (short text)
  - Created (date/time)
- Clubs Table:
  - `Club_ID` (AutoNumber, Primary Key)
  - `CName` (Short Text)

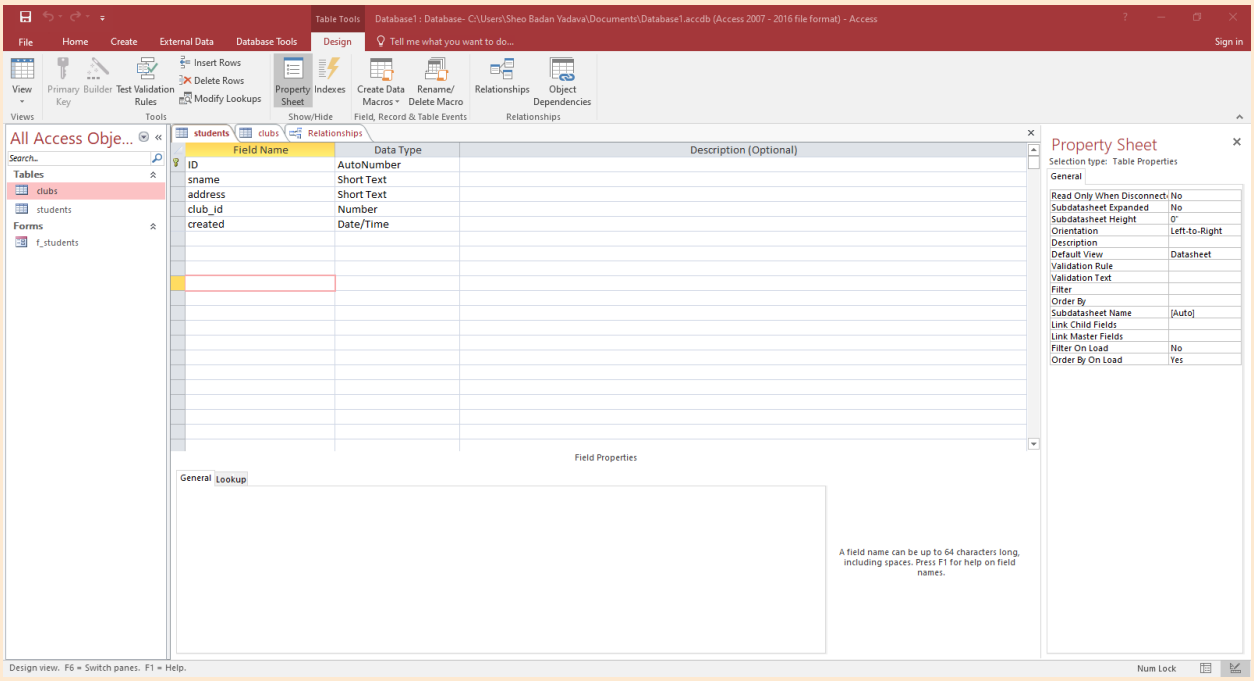
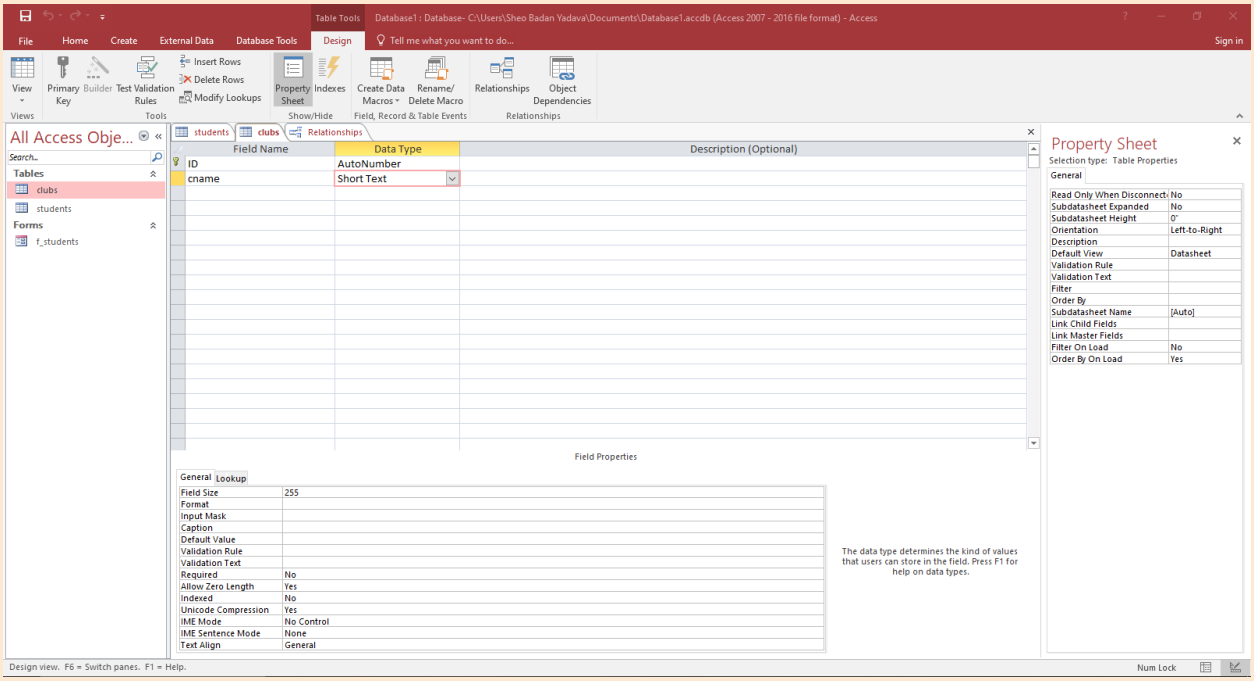


Table Tools
Database1 : Database- C:\Users\Sheo Badan Yadava\Documents\Database1.accdb (Access 2007 - 2016 file format) - Access
File Home Create External Data Database Tools Design
Tell me what you want to do...
Sign in
All Access Obje...
Tables
clubs
students
Forms
f_students
students clubs Relationships
Field Name Data Type Description (Optional)
ID AutoNumber
sname Short Text
address Short Text
club_id Number
created Date/Time
Field Properties
General Lookup
A field name can be up to 64 characters long, including spaces. Press F1 for help on field names.
Property Sheet
Selection type: Table Properties
General
Read Only When Disconnect No
Subdatasheet Expanded No
Subdatasheet Height 0"
Orientation Left-to-Right
Description
Default View Datasheet
Validation Rule
Validation Text
Filter
Order By
Subdatasheet Name [Auto]
Link Child Fields
Link Master Fields
Filter On Load No
Order By On Load Yes
Design view. F6 = Switch panes. F1 = Help.
Num Lock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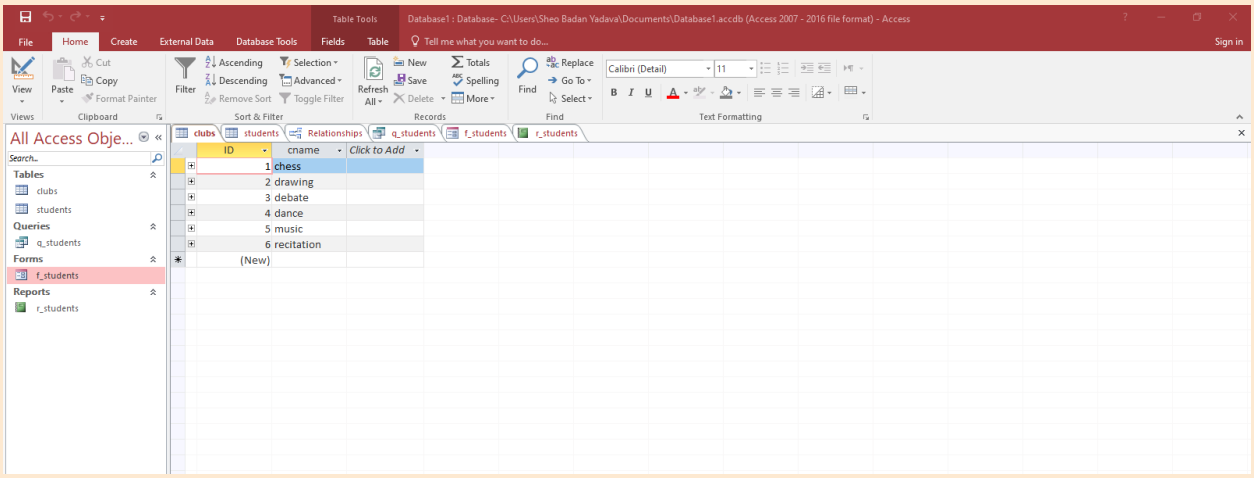
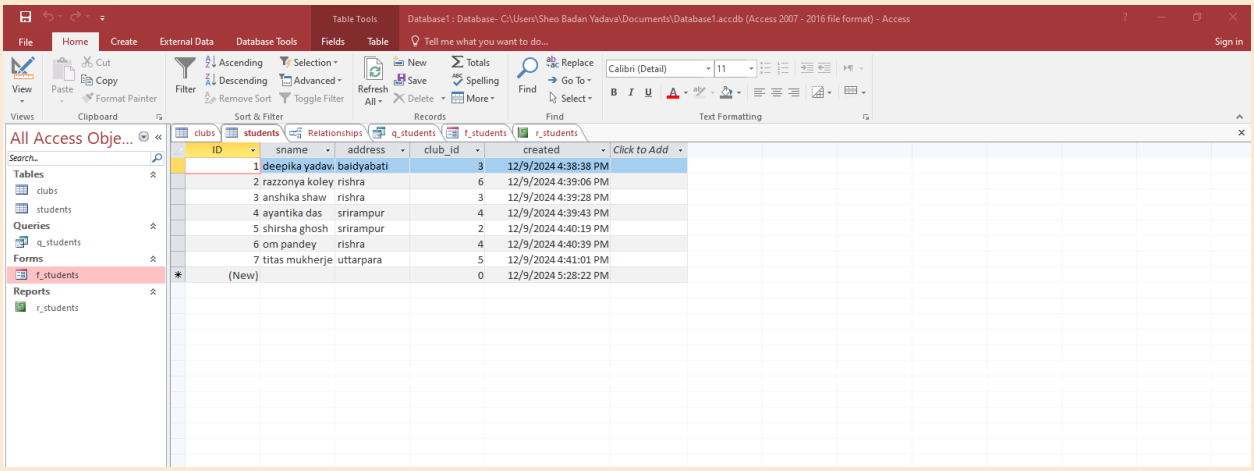
Tell me what you want to do...
Sign in
All Access Obje...
Tables
clubs
students
Forms
f_students
students clubs Relationships
Field Name Data Type Description (Optional)
ID AutoNumber
cname Short Text
Field Properties
General Lookup
Field Size 255
Format
Input Mask
Caption
Default Value
Validation Rule
Validation Text
Required No
Allow Zero Length Yes
Indexed No
Unicode Compression Yes
IME Mode No Control
IME Sentence Mode None
Text Align General
The data type determines the kind of values that users can store in the field. Press F1 for help on data types.
Property Sheet
Selection type: Table Properties
General
Read Only When Disconnect No
Subdatasheet Expanded No
Subdatasheet Height 0"
Orientation Left-to-Right
Description
Default View Datasheet
Validation Rule
Validation Text
Filter
Order By
Subdatasheet Name [Auto]
Link Child Fields
Link Master Fields
Filter On Load No
Order By On Load Yes
Design view. F6 = Switch panes. F1 = Help.
Num Lock

Design view





Datasheet view

Advantages of tables

- Organize data into structured rows and columns for easy management.

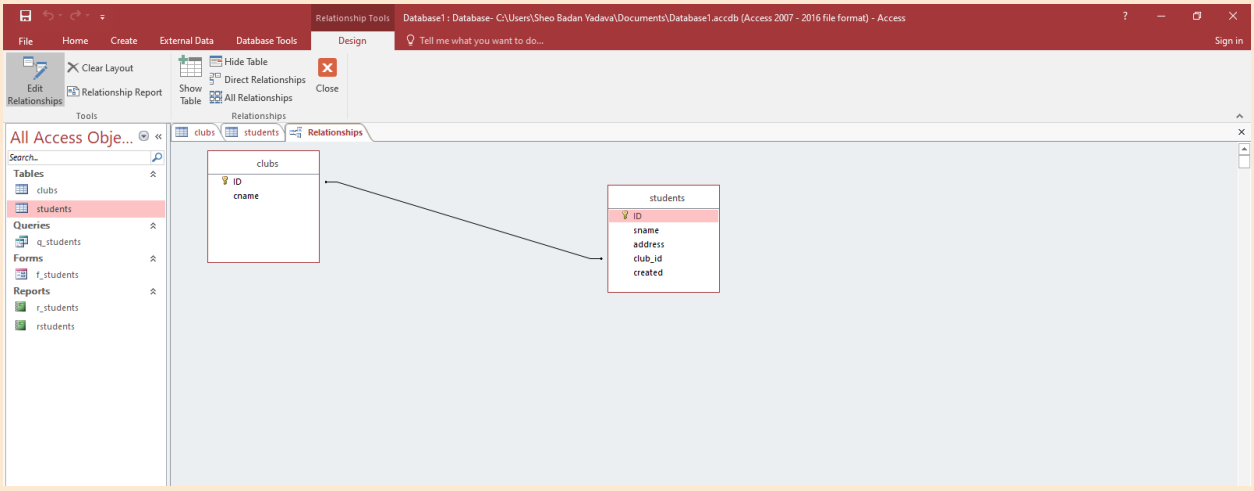
- Support indexing for faster data retrieval.
- Allow handling large datasets with efficient storage methods.

Creating relationship

The Relationships Tool is used to link the tables by dragging the foreign key from one table to the primary key of the related table.

1. We go to the **Database Tools tab** and **click Relationships**.
2. Add both tables to the Relationships window.
3. We drag the foreign key (e.g., club_id) from the first table to the primary key of the second table and save the relationship.

4. Enable **Referential Integrity** to maintain data consistency.



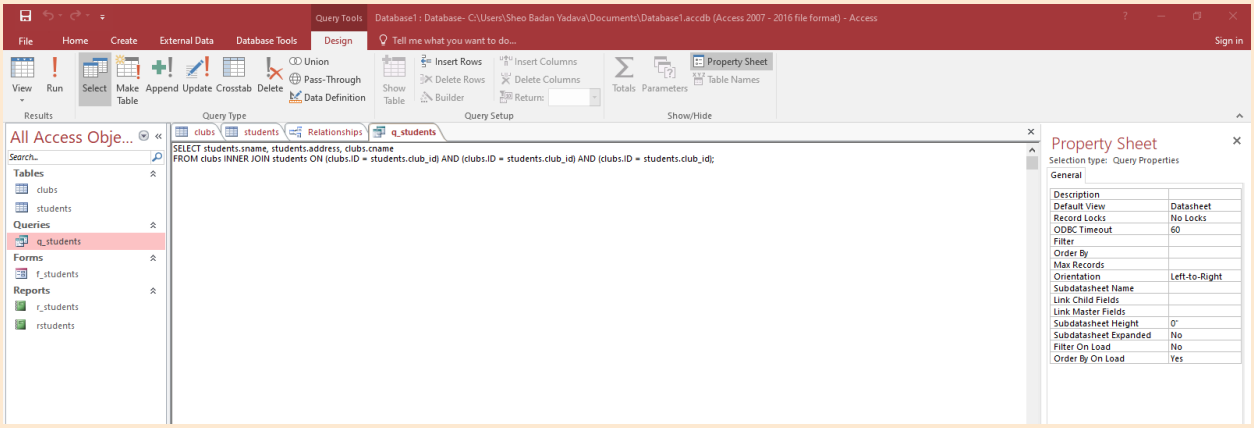
Advantages of relationship

- Reduce data redundancy by linking tables logically.
- Enforce referential integrity to maintain accurate connections.
- Simplify complex data management through relational links

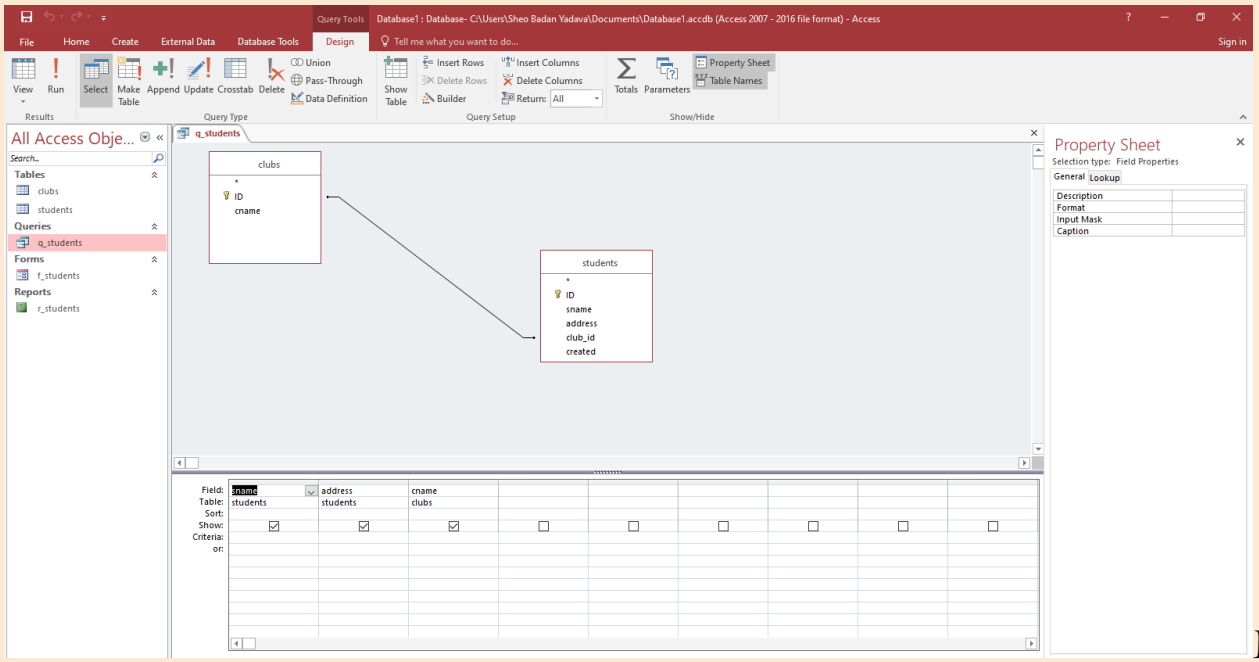
Building a Query

A query is created using Query Design to display or student names and club names.

1. We go to the Create tab and click Query Design.
2. Then add both tables and include :Fields: Students and Clubs
3. Save the query as "q_students"



SQL view of query



Design view of query

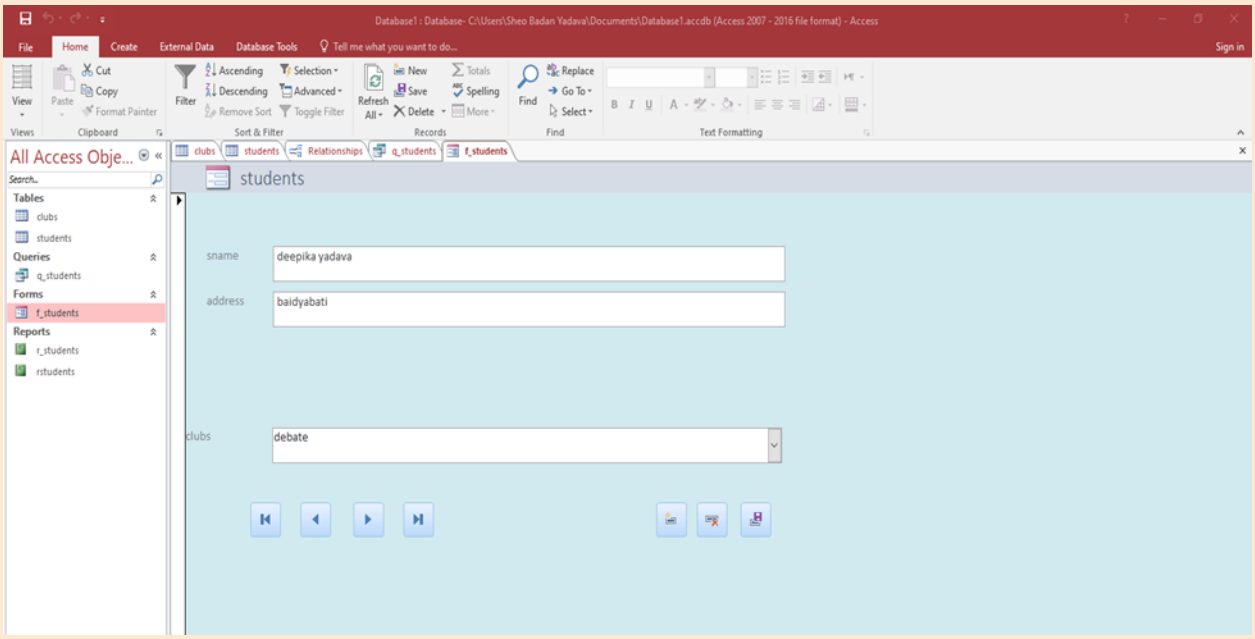
Advantages of query

- Retrieve specific information quickly by setting criteria.
- Combine and filter data from multiple tables for precise results.
- Perform calculations, sorting, and summarization within the database.

Creating a Form

A form is designed with a text box for entering names and a dropdown (combo box) to select departments or clubs. Navigation buttons like First, Previous, Next, Last, New, Save, and Delete are added.

1. We go to the Create tab and click **Form Design.**
2. Then Add a Text Box for StudentName.
3. Add a Combo Box for ClubID with a dropdown showing club names.
4. Add navigation buttons: First, Previous, Next, Last, New, Save, Delete.
5. Save the form as "f_students".



Form view of form

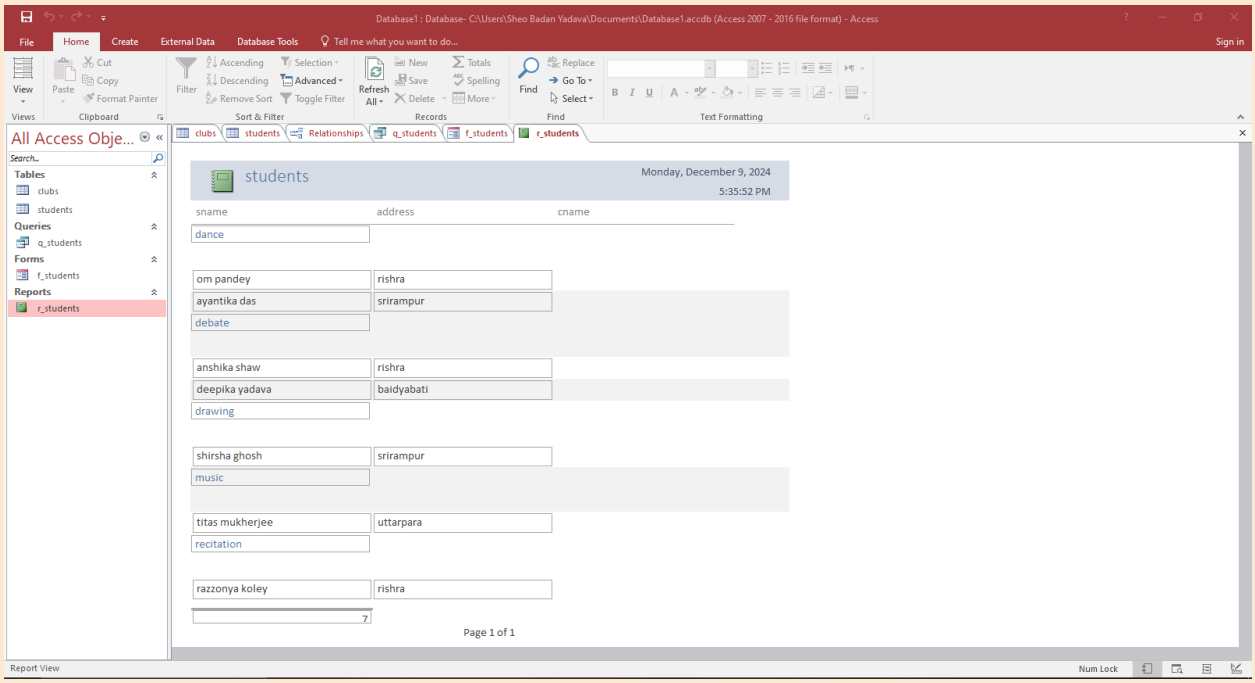
Advantages of form

- Retrieve specific information quickly by setting criteria.
- Combine and filter data from multiple tables for precise results.
- Perform calculations, sorting, and summarization within the database.

Generating a Report

A report is created using Report Wizard, grouping data by club and displaying student names under each group.

1. Go to the Create tab and click Report Wizard.
2. Select fields like Students and Clubs
3. Group the report by cname.
4. Save the report as "r_students”



Report output

Advantages of report

- Present data summaries or detailed records in structured layouts.
- Support exporting to various formats like PDF or Excel for sharing.
- Allow grouping and sorting data for better insights.

ACKNOWLEDGEMENT

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