

GE-161L

Introduction to Information and Communication Technologies

Laboratory 10

Introduction to Microsoft ® Access – II

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Department of Information Technology

University of the Punjab

Lahore, Pakistan

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Learning Objectives:

- Microsoft ® Access Relationships
- Query in Microsoft ® Access
- Multi Table Query in Microsoft ® Access
- Advance Tables in Microsoft ® Access
- Advance Forms in Microsoft ® Access

Resources Required:

- Computer / Laptop
- Microsoft ® Access

General Instructions:

- This is an individual lab, you are **NOT** allowed to discuss your solution with your colleagues, not even allowed to ask how is he/she doing, this may result into negative marking. You can **ONLY** discuss with your TAs or with course instructor.
- Your TAs will be available in the lab for your help. Alternatively, you can send your queries via email.

Teachers:	
Course Instructor	Prof. Dr. Syed Waqar ul Qounain swjaffry@pucit.edu.pk
Teacher Assistants	Usman Ali bitf19m007@pucit.edu.pk
	Saad Rahman bsef19m021@pucit.edu.pk
	Mahreen Asama bsef19m030@pucit.edu.pk

Background and Overview:

What Is a Database?

People often need to retrieve specific data rapidly while on the job. For example, a customer service representative may need to locate a customer's order status quickly while the customer is on the telephone. The registrar at a university may have to look up a student's grade point average or rapidly determine if the student has any outstanding fees before processing his or her class registration. A librarian may need to determine if a particular book is available to check out and, if not, when it is scheduled to be returned. The type of software used for such tasks is a database management system. Computer-based database management systems are rapidly replacing the paper-based filing systems that people used in the past to find information. The most common type of database used with personal computers today is a relational database. The basic features and concepts of this type of database software are discussed next.

A database is a collection of related data that is stored on a computer and organized in a manner that enables information to be retrieved as needed. A database management system (DBMS)—also called database software—is the type of program used to create, maintain, and organize data in a database, as well as to retrieve information from it. Typically data in a database is organized into fields, records, and files. A field (today more commonly called a column) is a single type of data, such as last name or telephone number, to be stored in a database. A record (today more commonly called a row) is a collection of related fields, for example, the ID number, name, and address.

What is Microsoft ® Access?

Microsoft ® Access is a database management system from Microsoft Corporation that combines the relational Access Database Engine with a graphical user interface and software-development tools.

Microsoft ® Access stores data in its own format based on the Access Database Engine (formerly Jet Database Engine). It can also import or link directly to data stored in other applications and databases.

Activities:

Pre-Lab Activities:

Task 01: Prerequisite for In-Lab

[Estimated 15 minutes / 10 marks]

- Create a Table named “**Students**”
- “**Students**” table should have following fields
 - ID
 - First Name
 - Last Name
 - Email
 - Phone Number
- Add Record of minimum “**30**” Students
- Create a Table named “**Student Attendance**”
- “**Student Attendance**” table should have following fields
 - ID
 - Attendance Date
 - Status (Absent, Present)
 - Student ID
 - Subject
- Add attendance details for each student in “**ICT**” & “**ICT Lab**” Subjects respectively
- **Student ID** in “**Student Attendance**” should be equal to the **ID** of student in “**Student**” table
- Save the document named “**Your Roll No**”
- Email the document named with your roll no like “**BSEF19M021**” to the respective TA
- The subject of your email should be “**Your RollNo_Pre-Lab10**”

In-Lab Activities:**Creating a Query:**

- On the “Create” tab, in the “Queries” group, click the “Query Wizard” button

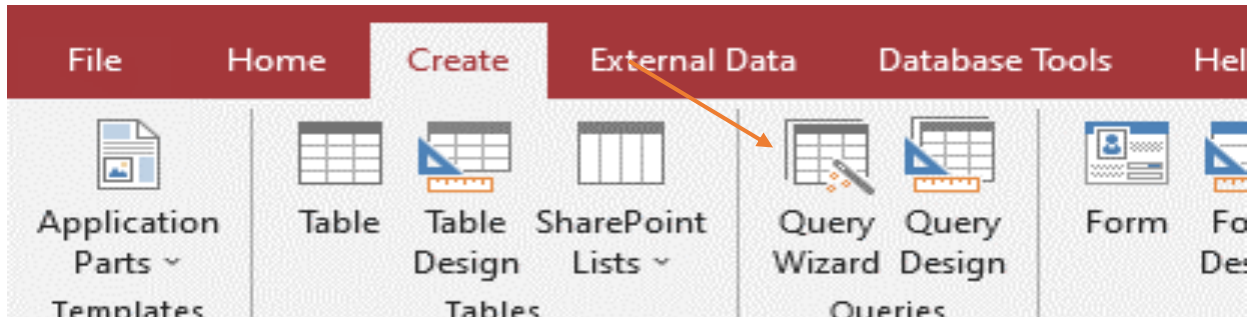


Fig. 1 (Creating Query)

The “New Query” dialog box appears.

- Click “Simple Query Wizard” and then click “OK”

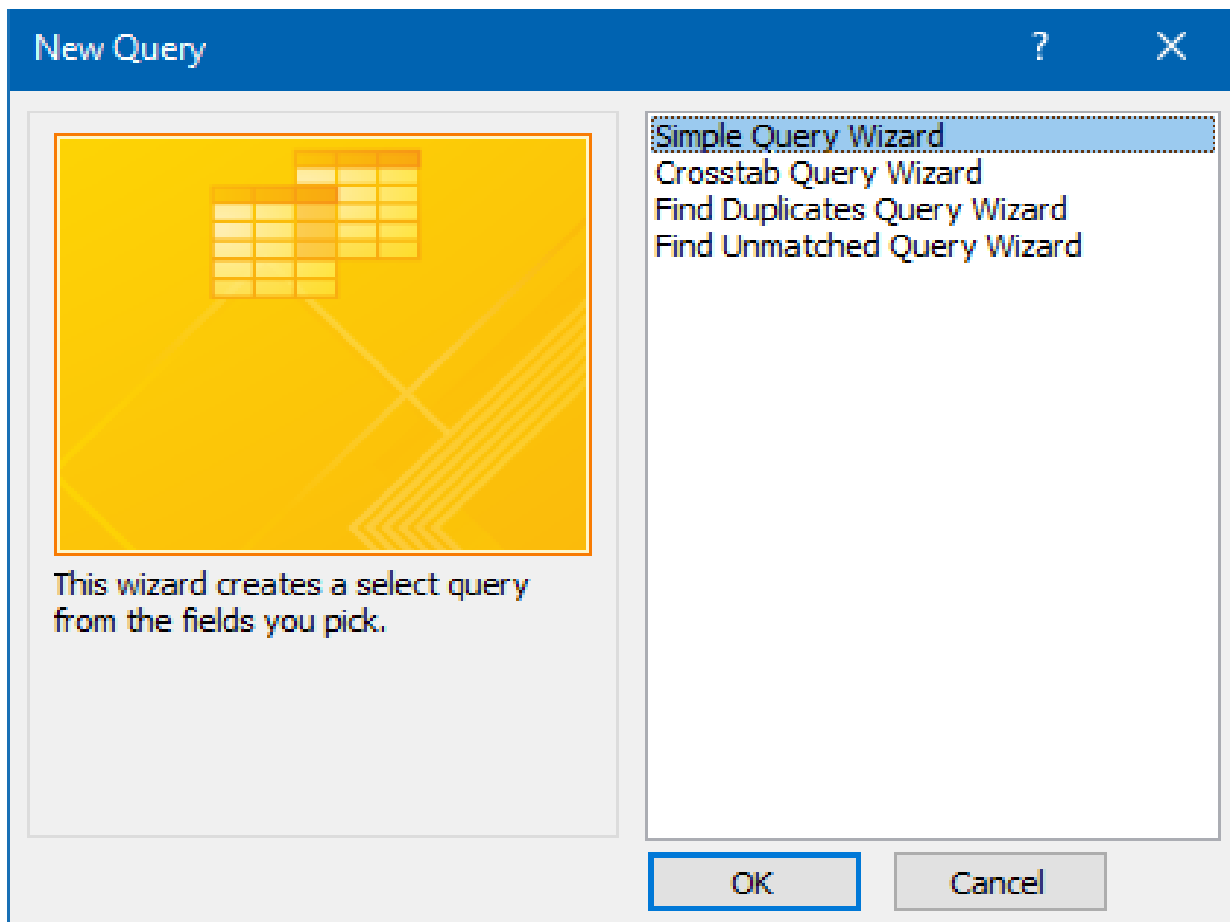


Fig. 2 (New Query dialog)

- Under Available Fields, double-click “ID”, “Last Name”, “First Name”
- Click the “Next” button

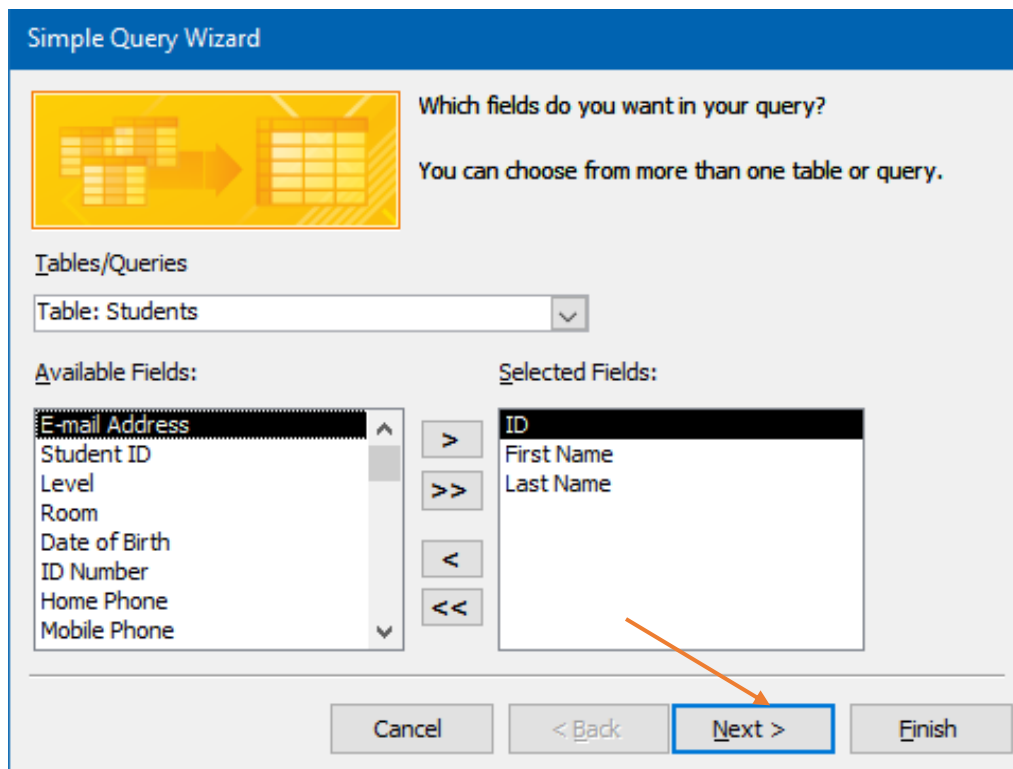


Fig. 3 (Simple Query Wizard dialog)

- Name the query “**Student Query**” and then select “**Open the query to view information**” if it is not already selected
- Click the “**Finish**” button

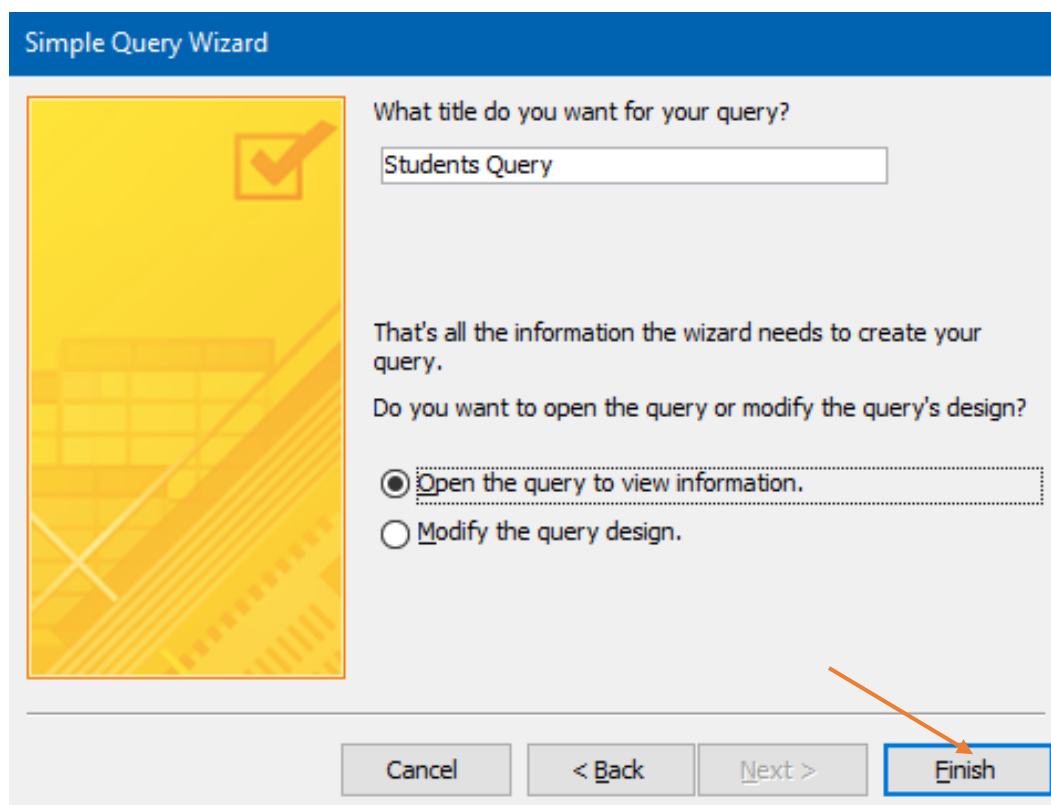


Fig. 4 (Simple Query Wizard dialog)

The results show all of the records, but show only the three fields that you specified in the “**Query Wizard**”

ID	First Name	Last Name	
1	John	Stewart	
3	Saad	Rahman	
(New)			

Fig. 5 (Simple Query)

Find Duplicates Query:

- On the “**Create**” tab, in the “**Queries**” group, click the “**Query Wizard**” button

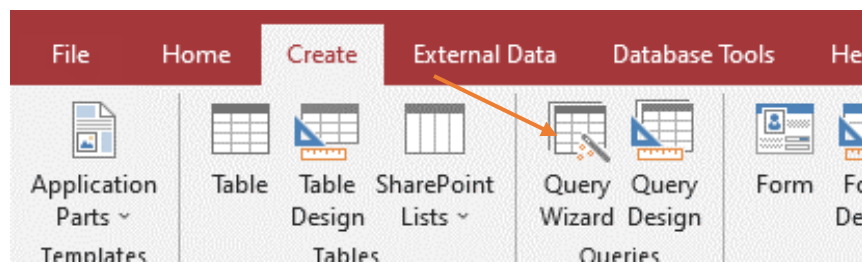


Fig. 6 (New Query)

The “**New Query**” dialog box appears.

- Click “**Find Duplicates Query Wizard**” and then click “**OK**”

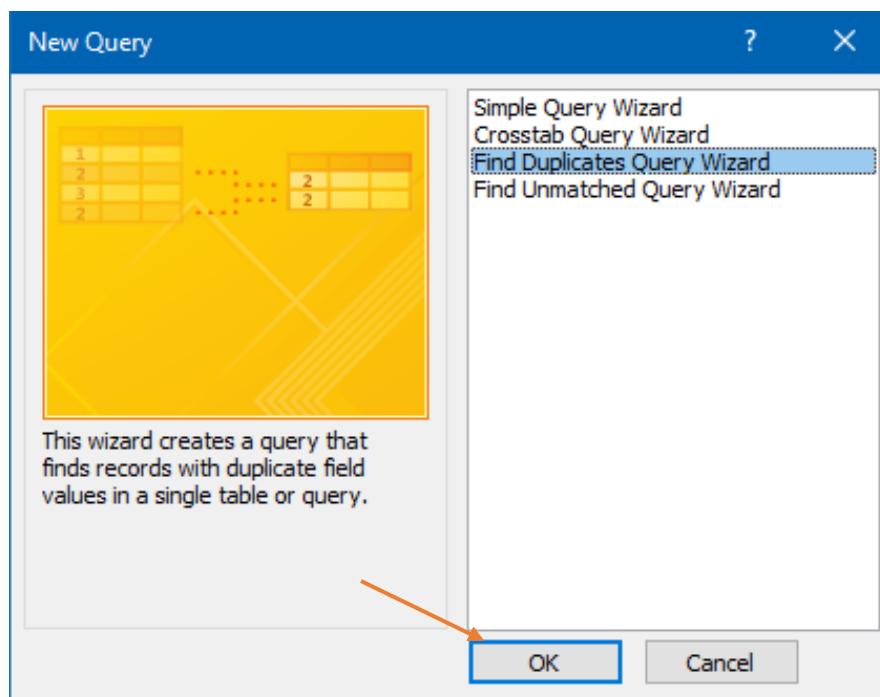


Fig. 7 (New Query Dialog)

- Click “**Table: Students**”
- Click “**Next**”

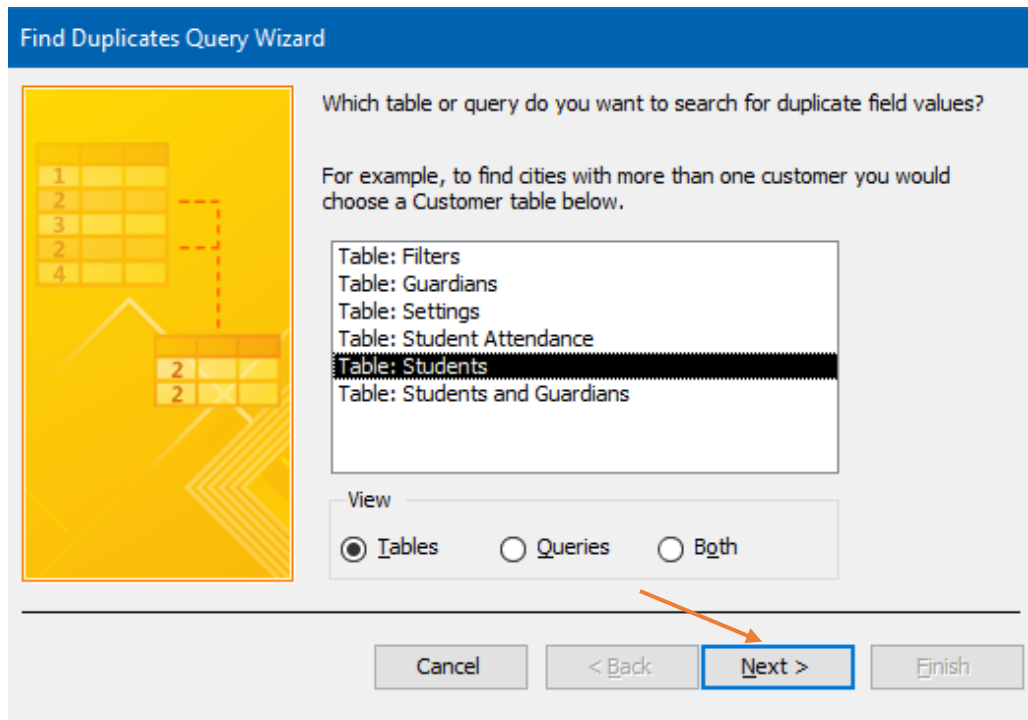


Fig. 8 (Find Duplicates Query Wizard dialog)

- Double-click “**Last Name**”, “**First Name**”, and “**E-mail Address**” to move them to the Duplicate value fields box
- Click “**Next**”

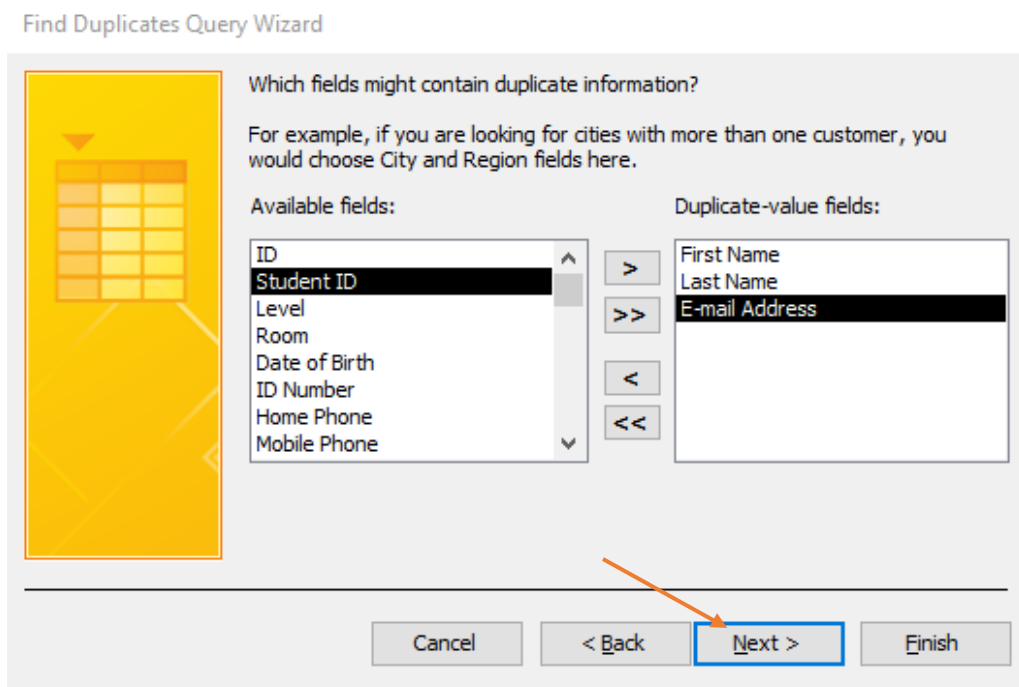


Fig. 9 (Find Duplicates Query Wizard dialog)

- Double-click “**ID**”, “**Student ID**” and “**Room**” to move them to the “**Additional query fields**” box
- Click “**Next**”

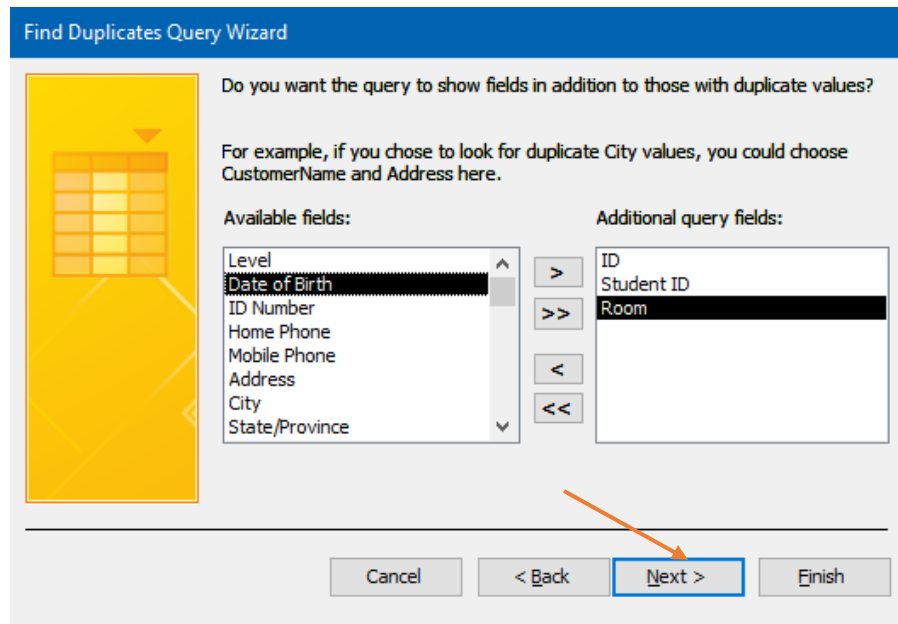


Fig. 10 (Find Duplicates Query Wizard dialog)

- Name the query “**Duplicates**”
- Click “**Finish**”

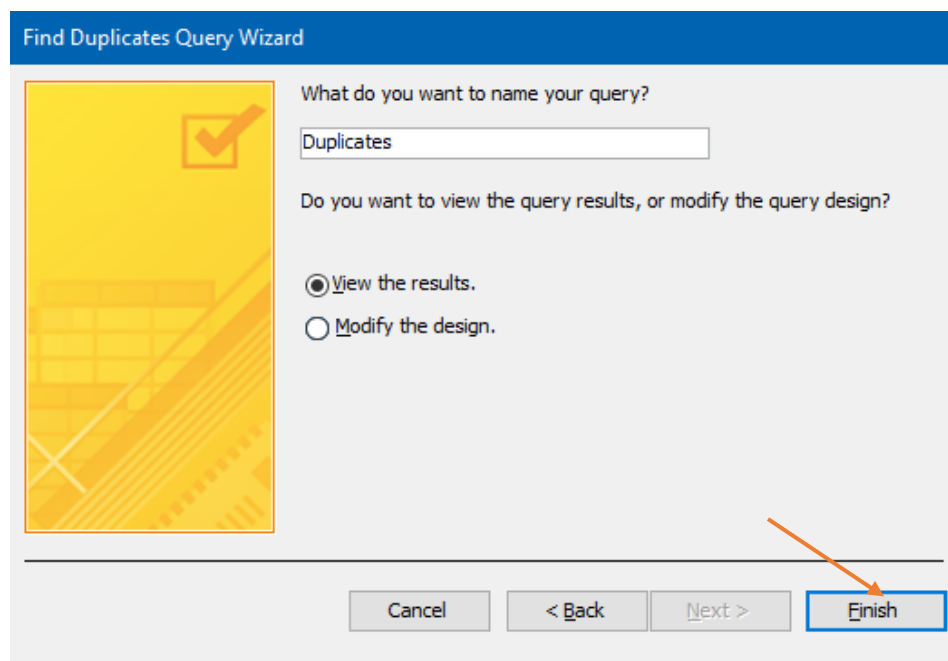


Fig. 11 (Find Duplicates Query Wizard dialog)

The query showing duplicate records in the table is displayed.

First Name	Last Name	E-mail Address	Student ID	ID	Room
Saad	Rahman	bsef19m021@pucit.edu.pk	1892639	5	9
Saad	Rahman	bsef19m021@pucit.edu.pk	28937	3	8
*				(New)	

Fig. 12 (Duplicate Query)

Query from Multiple Tables:

- In the “**Navigation Pane**”, double-click “**Student Attendance**” Table to open the table
- On the “**Database Tools**” tab, in the “**Relationships group**”, click the “**Relationships**” button
- Create Following “**Relationship**”

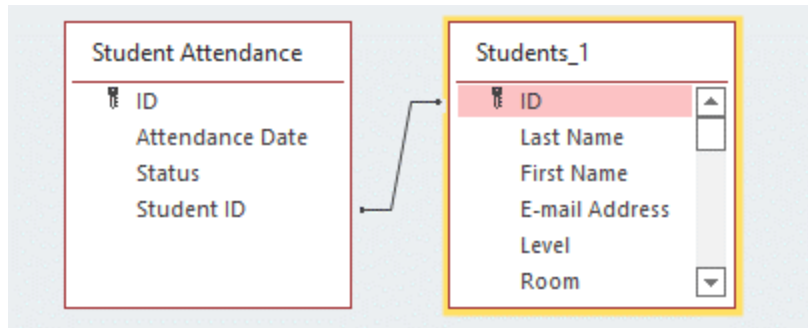


Fig. 13 (Table Relationship)

- On the “**Create**” tab, in the “**Queries**” group, click the “**Query Wizard**” button

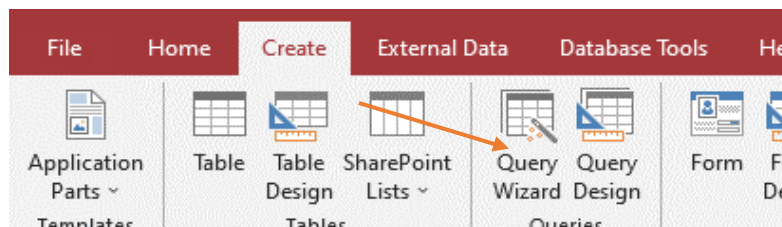


Fig. 14 (New Query)

The “**New Query**” dialog box appears.

- Click “**Simple Query Wizard**” and then click “**OK**”

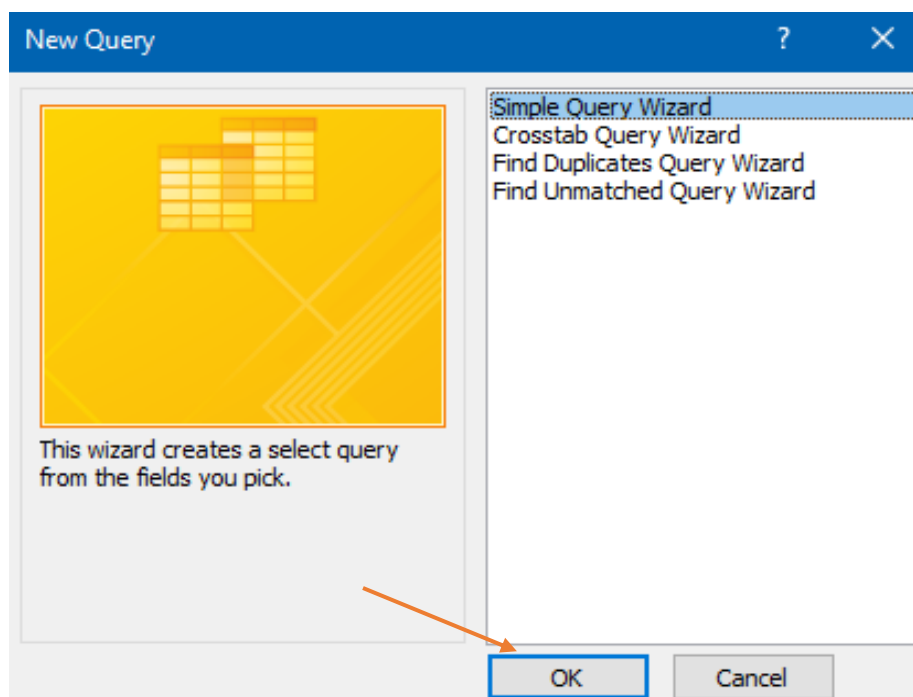


Fig. 15 (New Query dialog)

- In the “**Tables/Queries**” drop-down list, click “**Table: Students**”
- Under “**Available Fields**”, double-click “**First Name**”, and “**Last Name**” to move them to the Selected Fields box
- In the “**Tables/Queries**” drop-down list, click “**Table: Student Attendance**”
- Under “**Available Fields**”, double-click “**Attendance Date**”, and “**Status**” to move them to the Selected Fields box
- Click “**Next**”

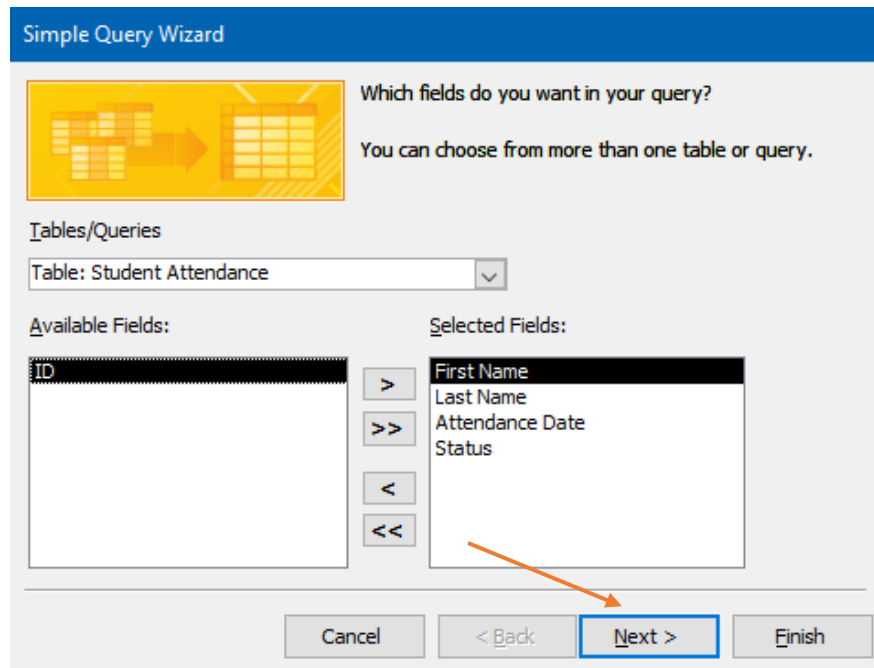


Fig. 16 (Simple Query Wizard dialog)

- Name the query “**Student Attendance Query**”
- Click the “**Finish**” button

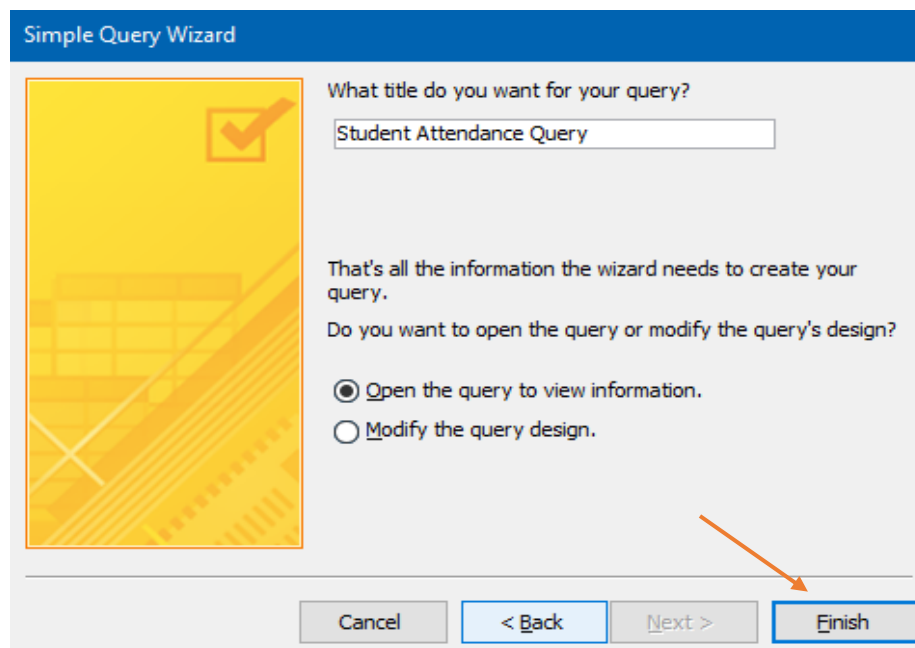


Fig. 17 (Simple Query Wizard dialog)

The query will be displayed.

First Name	Last Name	Attendance Date	Status
John	Stewart	8/25/2015	Absent - Unexcused
John	Stewart	8/26/2015	Present
John	Stewart	8/27/2015	Present
Saad	Rahman	8/24/2015	Absent - Excused
Saad	Rahman	8/23/2015	Present
Saad	Rahman	8/22/2015	Present
Saad	Rahman	8/2/2016	Present

Fig. 18 (Multi Table Query)

Add Criteria to Query:

- Open “Student Attendance Query”
- On the “Home” tab, in the “Views” group, click the lower half of the “View” button and then click “Design View”

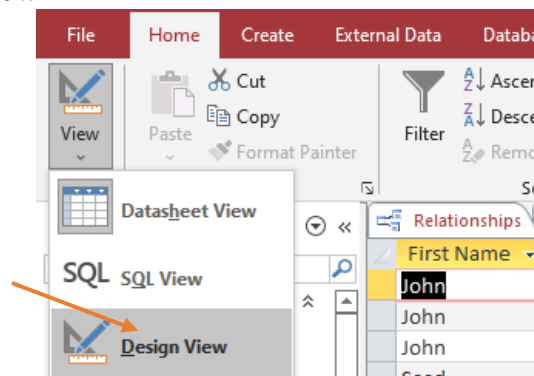


Fig. 19 (Design View)

- In the “Criteria” row of the “First Name” field, type “Like *ad” to display all records ending with string “ad”

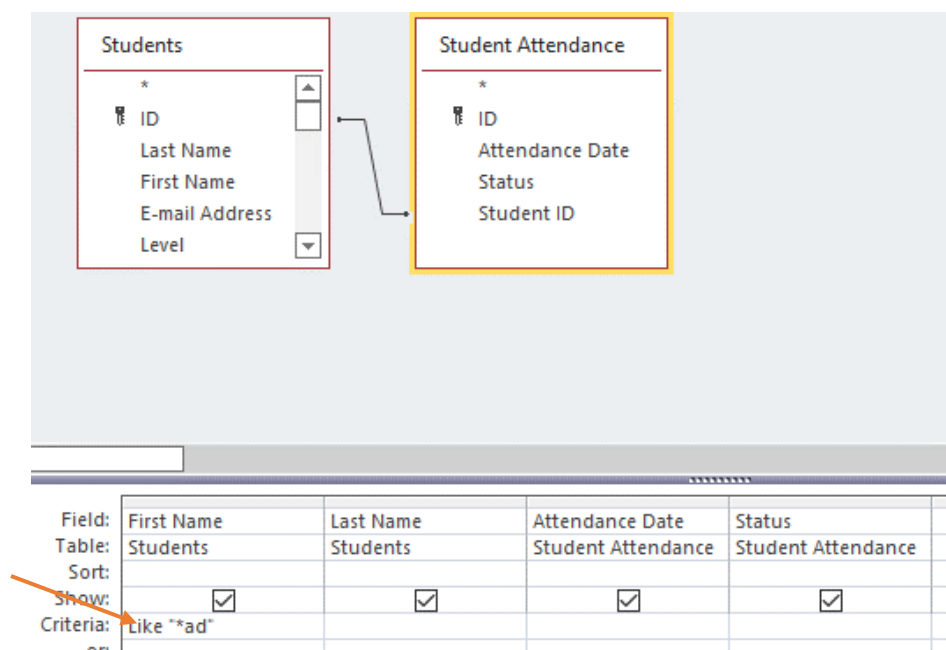


Fig. 20 (Query Criteria)

- Go to the **“Date sheet View”**

Data in which **“First Name”** field ends with **“ad”** will be displayed.

First Name	Last Name	Attendance Date	Status
Saad	Rahman	8/24/2015	Absent - Excused
Saad	Rahman	8/23/2015	Present
Saad	Rahman	8/22/2015	Present
Saad	Rahman	8/2/2016	Present

Fig. 21 (Query Criteria)

- In the **“Criteria”** row of the **“Status”** field, type **“[Status?]”**. This will create the parameter and require you to enter a Status when the query is run

Field:	First Name	Last Name	Attendance Date	Status
Table:	Students	Students	Student Attendance	Student Attendance
Sort:				
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:	Like "*ad"			[Status?]
or:				

Fig. 22 (Query Criteria)

- Return to the **“Date sheet View”**

A dialog will prompt which asks you to input the **Status** to select the results accordingly

- Enter **“Present”** in the **“Status”**
- Click **“OK”**

Fig. 23 (Enter Parameter Value dialog)

Data in which “**First Name**” field ends with “**ad**” and “**Status**” field is “**Present**” will be displayed.

First Name ▾	Last Name ▾	Attendance Date ▾	Status ▾
Saad	Rahman	8/23/2015	Present
Saad	Rahman	8/22/2015	Present
Saad	Rahman	8/2/2016	Present
*			

Fig. 24 (Query Criteria)

Criteria	Description
>25 and < 50	Used for number field. Data greater than 25 and less than 25 will be displayed
IS NULL	Data will be shown where field value is Null
“Manager”	Returns records where the given field is set to Manager
Not “Manager”	Returns records where the given field value is other than Manager.
Like B*	Returns records for the given field where the value starts with “B,” such as Boston, Bakersfield, and so on.
Not Like B*	Returns records for the given field where the value starts with a character other than “B.”
Like “*Sales*”	Returns records for the given field that contain the string “Sales.”
Not Like “*Sales*”	Returns records for the given field that do not contain the string “Sales.”

Create a Custom Table in Design View:

On the “**Create**” tab, in the “**Tables**” group, click the “**Table Design**” button.

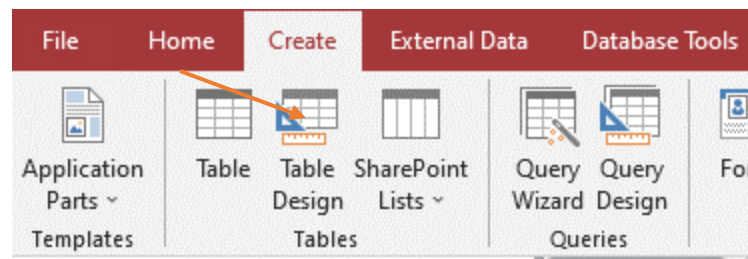


Fig. 25 (Custom Table)

A new blank table is created in Design view

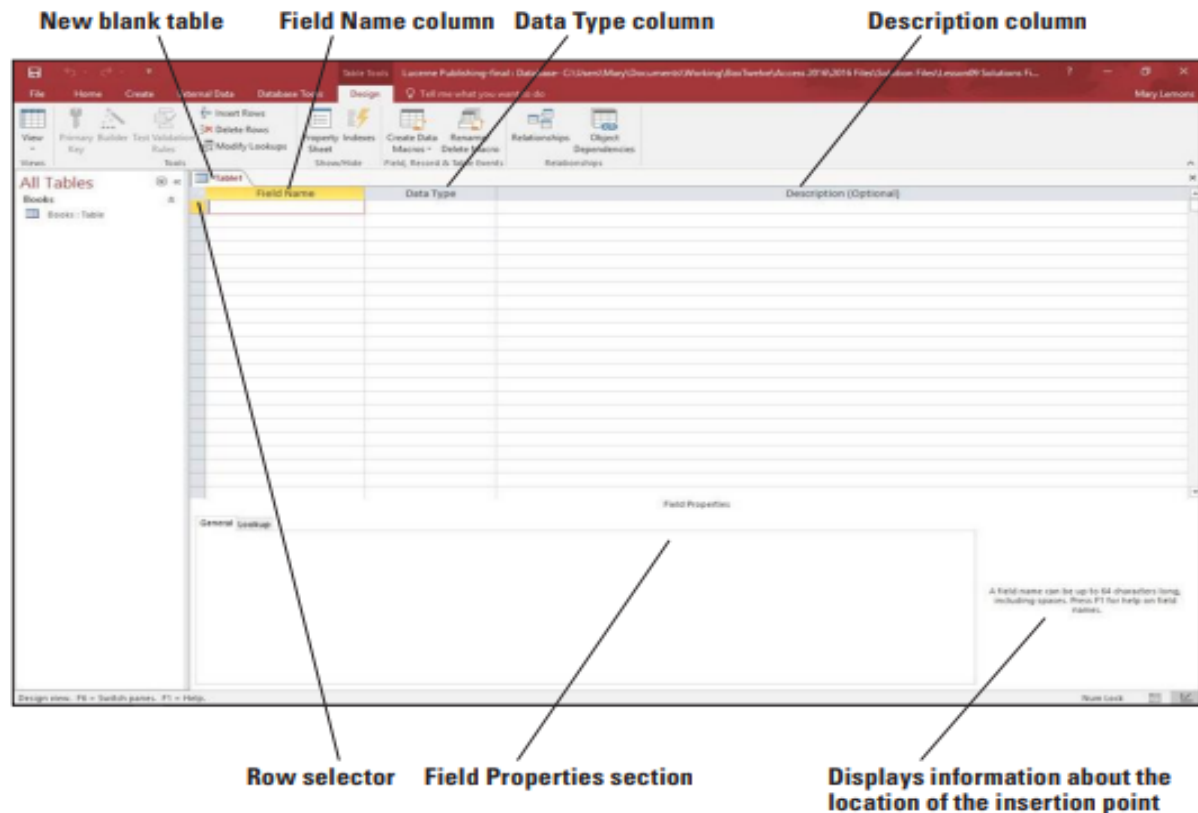


Fig. 26 (Custom Table)

Summarize Table Data:

- Open “**Students**” table
- On the “**Home**” tab, in the “**Records**” group, click the “**Totals**” button. The Total row appears below the row
- Click the “**down arrow**” in the “**Last Name**” column of the Total row. Select “**Count**” from the menu. The number of records in the column is counted

Student List		Students	
	ID	Last Name	First Name
+	1	Stewart	John
+	3	Rahman	Saad
+	5	Rahman	Saad
*	(New)		
	Total		
		None	
		Count	

Fig. 27 (Summarize Table)

- Click the “**down arrow**” in the “**Fee**” column of the Total row and then select “**Sum**” from the menu

Level	Fee	Date of Birth
8th Grade	10000	8/6/2002
	20000	
	5000	
	0	

None

Sum

Average

Count

Maximum

Minimum

Standard Deviation

Variance

Fig. 28 (Summarize Table)

- Save the Table.

ID	Last Name	First Name	E-mail Address	Level	Fee	D
1	Stewart	John	john@yahoo.com	8th Grade	10000	
3	Rahman	Saad	bsef19m021@pucit.edu.p		20000	
5	Rahman	Saad	bsef19m021@pucit.edu.p		5000	
(New)					0	
Total	3				35000	

Fig. 29 (Summarize Table)

Create a Multi Item form:

- Open “**Students**” table
- On the “**Create**” tab, in the “**Forms**” group, click the “**More Forms**” button. On the menu that appears, click the “**Multiple Items**” button

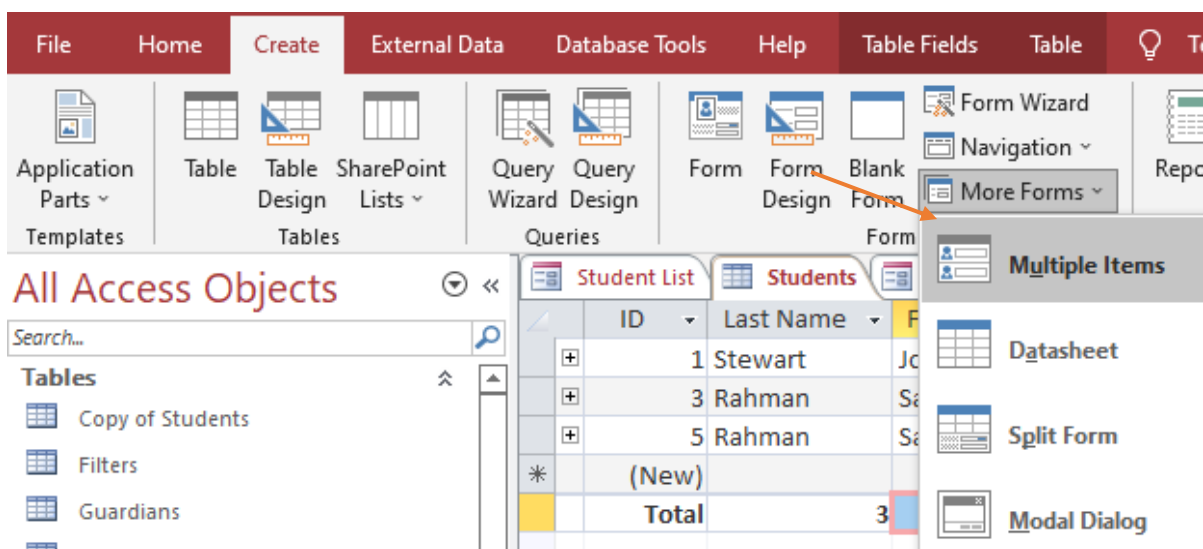
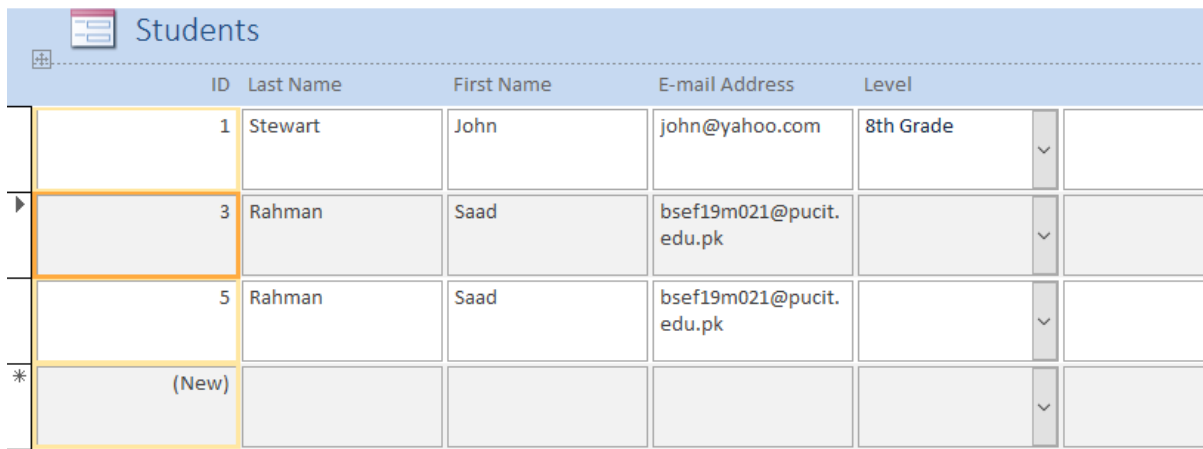


Fig. 30 (Muti Item Form)

Access creates the form and displays it in Layout view



ID	Last Name	First Name	E-mail Address	Level
1	Stewart	John	john@yahoo.com	8th Grade
3	Rahman	Saad	bsef19m021@pucit.edu.pk	
5	Rahman	Saad	bsef19m021@pucit.edu.pk	
(New)				

Fig. 31 (Muti Item Form)

Create a Split Form:

- Open “Students” table
- On the “Create” tab, in the “Forms” group, click the “More Forms” button. On the menu that appears, click the “Split Form” button

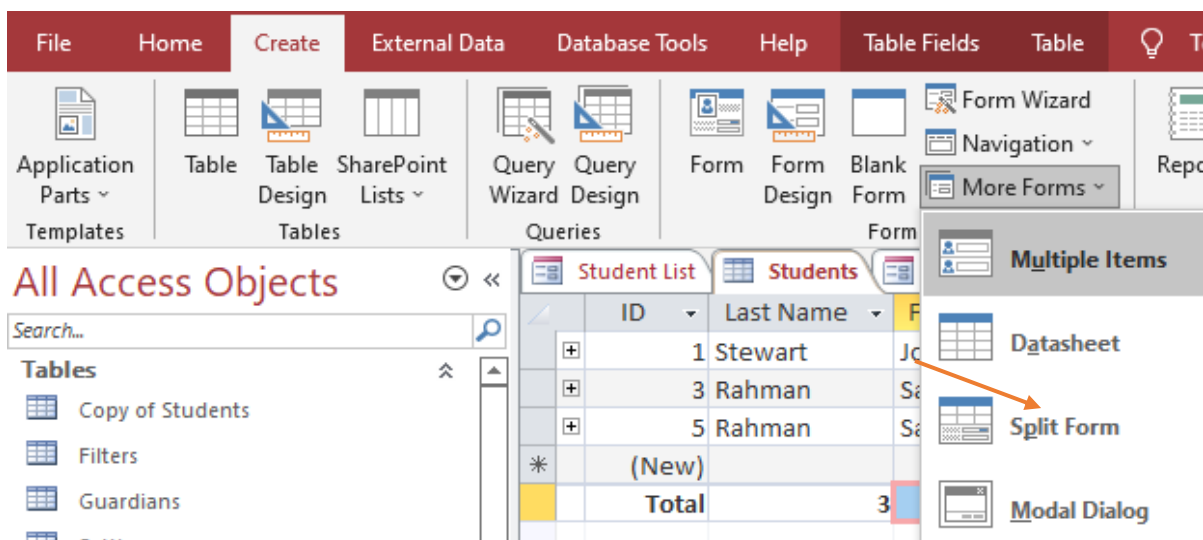


Fig. 32 (Split Form)

Access creates the form and displays it in Form view and Datasheet view at the same time

ID	Last Name	First Name	E-mail Address	Level	Fee	Date of Birth	ID Number
1	Stewart	John	john@yahoo.com	8th Grade	10000	8/6/2002	
3	Rahman	Saad	bsef19m021@pucit.edu.pk		20000		
5	Rahman	Saad	bsef19m021@pucit.edu.pk		5000		
* (New)					0		

Fig. 33 (Split Form)

Create Sub Forms:

- On the “Create” tab, in the “Forms” group, click “Form Wizard”

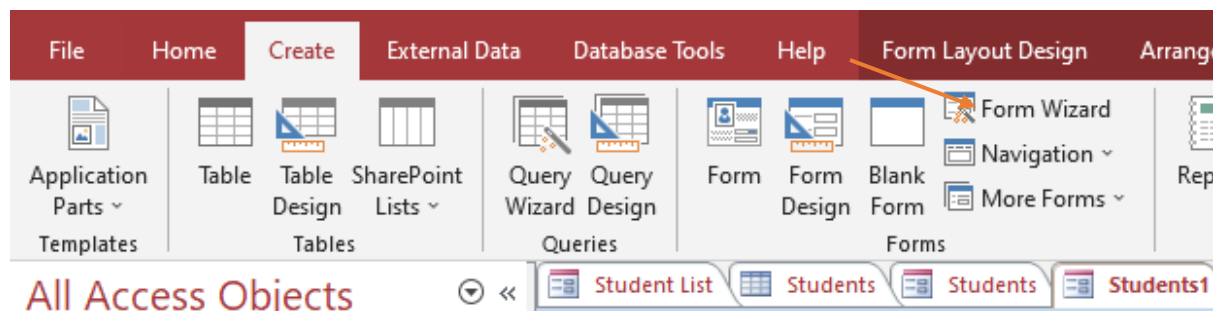


Fig. 34 (Split Form)

- In the first screen on the Form Wizard, click the “down arrow” in the Tables/Queries box and then click “Table: Students”
- In the “Available Fields” box, double-click the “First Name” and the “Last Name” fields to move them to the “Selected Fields” box
- Click the “down arrow” in the Tables/Queries box and then click “Table: Student Attendance”
- In the “Available Fields” box, double-click the “Attendance Date” and the “Status” fields to move them to the “Selected Fields” box
- Click “Next”

Form Wizard

Which fields do you want on your form?
You can choose from more than one table or query.

Tables/Queries
Table: Student Attendance

Available Fields:
ID
Student ID

Selected Fields:
First Name
Last Name
Attendance Date
Status

Buttons: Cancel, < Back, Next >, Finish

An orange arrow points to the 'Next >' button.

Fig. 35 (Form Wizard dialog)

- In the “**How do you want to view your data?**” box, click “**by Students**”
- Select “**the Form with subform(s)**” option
- Click “**Next**”

Form Wizard

How do you want to view your data?

by Students
by Student Attendance

First Name, Last Name
Attendance Date, Status

☒ Form with subform(s) ☐ Linked forms

Buttons: Cancel, < Back, Next >, Finish

An orange arrow points to the 'Next >' button.

Fig. 36 (Form Wizard dialog)

- Select the “**Tabular**” option
- Click “**Finish**”

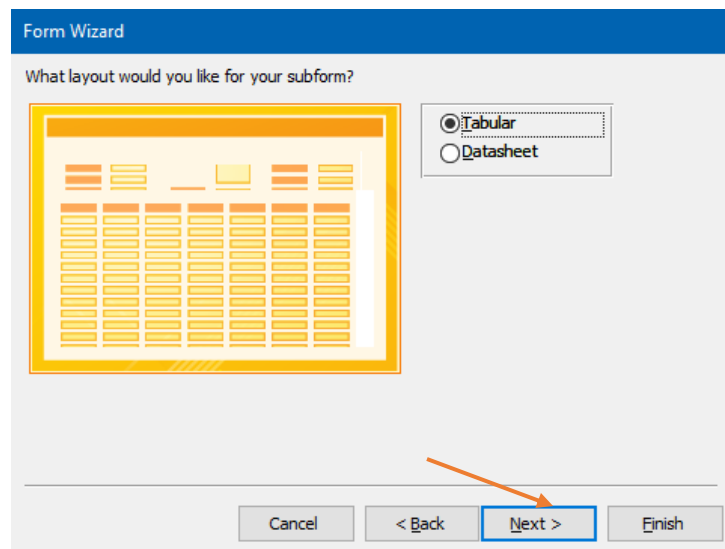


Fig. 37 (Form Wizard dialog)

Subform will be created.

 The image shows a screenshot of a Microsoft Access form titled 'Students2'. It has a light blue header bar. Below the header, there are two text boxes: 'First Name' with the value 'John' and 'Last Name' with the value 'Stewart'. Below these is a section titled 'Student Attendance'. Inside this section is a table with columns 'Attendance Date' and 'Status'. The table contains three rows of data:

Attendance Date	Status
8/25/2015	Absent - Unexcused
8/26/2015	Present
8/27/2015	Present

 At the bottom of the form, there is a status bar that says 'Record: 1 of 3' and a search box.

Fig. 38 (Sub Form)

Create a Navigation Form:

- On the “Create” tab, in the “Forms” group, click the “Navigation” button and then click “Horizontal Tabs”

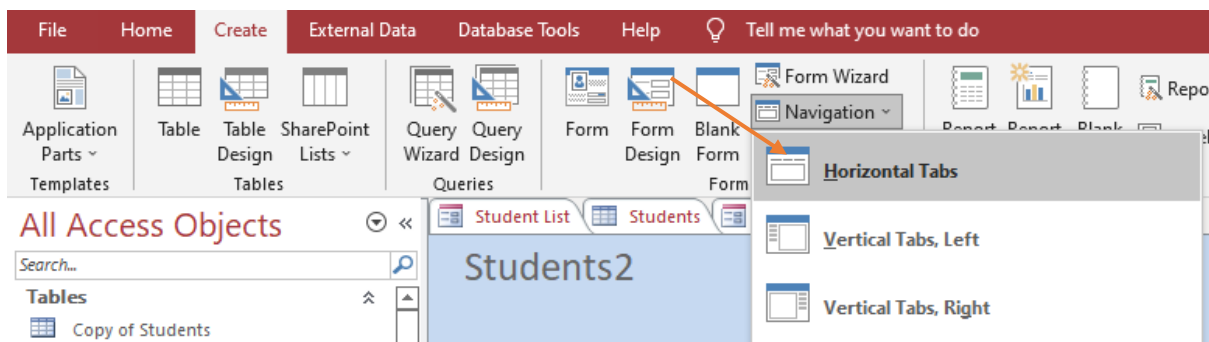
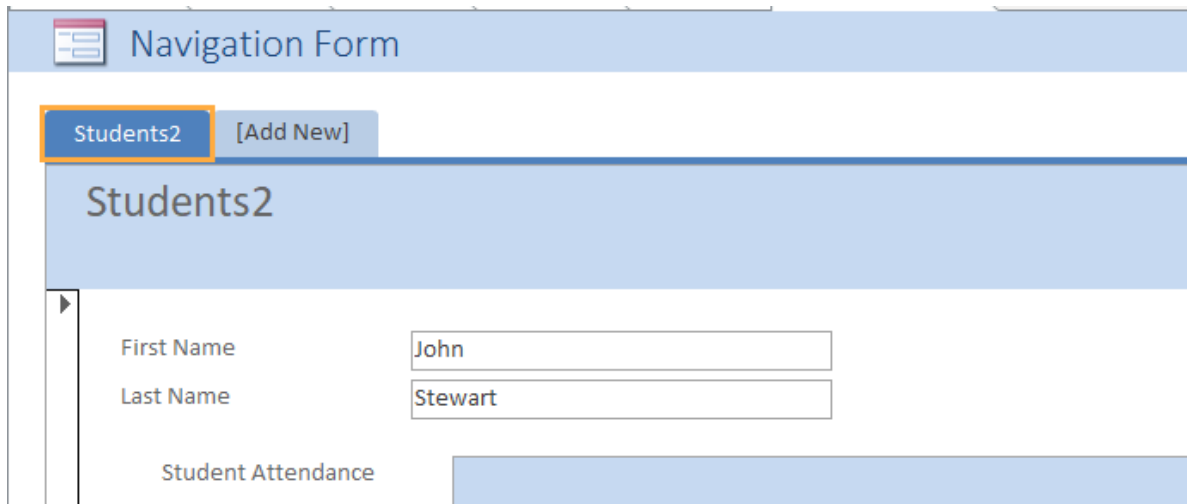


Fig. 39 (Navigation Form)

- Click and drag the “**Student form**” object from the “**Navigation Pane**” to the “**Add New**” tab near the top of the form. The form tab is renamed “**Students**” and all the Student form’s controls appear. A new [Add New] tab appears next to the “**Students**” tab



Navigation Form

Students2 [Add New]

Students2

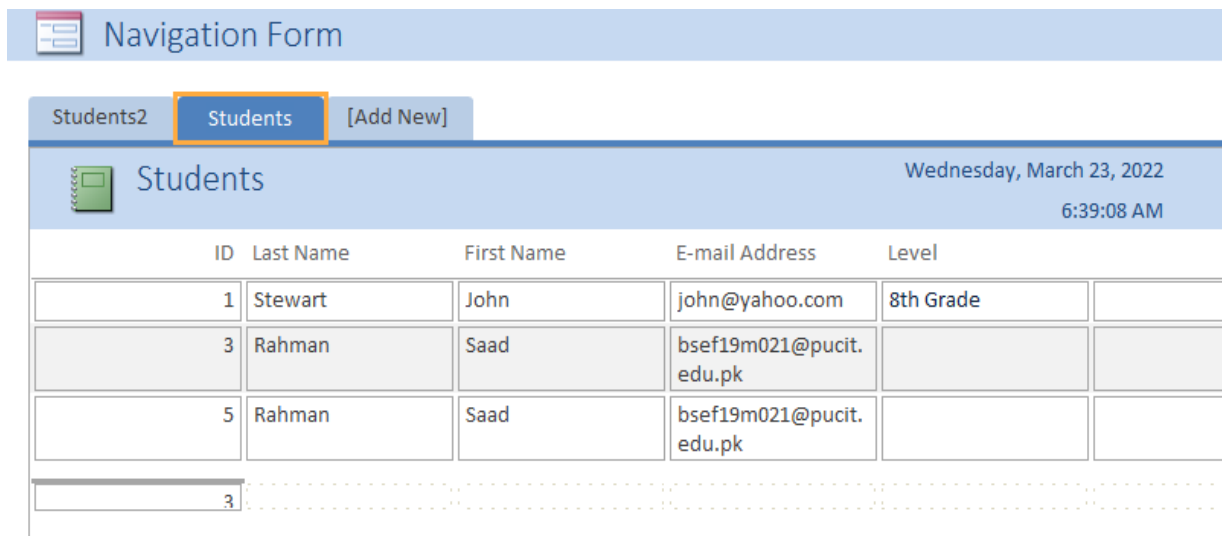
First Name John

Last Name Stewart

Student Attendance

Fig. 40 (Navigation Form)

- Click and drag the “**Student report**” object from the “**Navigation Pane**” to the “**Add New**” tab near the top of the form. The form tab is renamed “**Students**” and all the Student’s report controls appear. A new [Add New] tab appears next to the “**Students**” tab



Navigation Form

Students2 Students [Add New]

Students Wednesday, March 23, 2022 6:39:08 AM

ID	Last Name	First Name	E-mail Address	Level
1	Stewart	John	john@yahoo.com	8th Grade
3	Rahman	Saad	bsef19m021@pucit.edu.pk	
5	Rahman	Saad	bsef19m021@pucit.edu.pk	
3				

Fig. 41 (Navigation Form)

- Save and close the Navigation Form

Task 01: Student Attendance Record**[20 minutes / 35 marks]**

- Open the Pre-Lab document
- Create a simple query in “**Students**” table which selects:
 - Email Address
 - First Name
 - Last Name respectively
- Find Duplication in “**Student Attendance**” on the basis of “**Attendance Date**” field
- Create a multiple table query between “**Students**” and “**Student Attendance**” tables which selects:
 - First Name
 - Last Name
 - Attendance Status
 - Subject
 - Attendance Date respectively
- There must be a relation established between the tables
- Name access file with “**Your Roll No**”
- Email the file to the TA, the subject should be “**Lab 10_Task 01_Your Roll No**”

Task 02: Query Criteria**[10 minutes / 15 marks]**

- For the above multiple table query, add following criteria's:
 - “**Status**” field should be “**Present**”
 - “**First Name**” should contain a character “**e**”
 - User should be asked to input the “**Subject**” name
- Create a Multi Item Form for “**Students**” Table

Post-Lab activities:

Task 01: Course Assignment

[Estimated time 30 minutes / 30 marks]

- Design a Database with Tables:
 - Teachers
 - Courses
- The fields in the “**Teachers**” table must be:
 - First Name
 - Last Name
 - Age
 - Email
 - Course ID
- The fields in the “**Course**” table must be:
 - ID
 - Course Name
- Create a Relationship between Course & Teacher table
- Create a Multi Table query with fields selected:
 - First Name
 - Last Name
 - Age
 - Course Name
- Apply following query criteria's:
 - Teacher's age should be “>**30** and <**60**”
 - Course Name ends with “**T**”
- Create a “**Split Form**” of each table
- Create a “**Navigation Form**” and add Split forms in it

Submissions:

- For Pre-Lab Activity:
 - Perform Pre-Lab as mentioned above.
 - Save the respective document in folder “RollNo_Pre-Lab-10”.
 - Then zip the whole folder (RollNo_Pre-Lab-10.zip), and email it to your respective TA.
- For In-Lab:
 - Perform mentioned tasks of In-Lab activity.
 - Make a folder on Desktop by the name “RollNo_In-Lab-10”.
 - Then save each document in folder “RollNo_In-Lab-10”.
- For Post-Lab Activity:
 - Perform Post-Lab as mentioned above.
 - Save the respective document in folder “RollNo_Post-Lab-10”.
 - Then zip the whole folder (RollNo_Post-Lab-10.zip), and email it to your respective TA.

Evaluations Metric:

- All the Lab tasks will be evaluated offline by TA's.
- Division of Pre-Lab tasks: [10 marks]
 - Task 01 (Creating Workbook) [10 marks]
- Division of In-Lab tasks: [50 marks]
 - Task 01 (Student Attendance Record) [35 marks]
 - Task 02 (Query Criteria) [15 marks]
- Division of Post-Lab tasks: [30 marks]
 - Task 01 (Course Assignment) [30 marks]

References and Additional Material:

- Mary Lemons, Microsoft Official Academic Course, Microsoft Access 2016, Wiley Publisher, 2016. ISBN: 978-111-927443-8.
https://drive.google.com/drive/u/1/folders/1V9nh8WIKOIQvi_ig98_YCaP7Vvei-tQz
- Learn Microsoft ® Access:
<https://support.microsoft.com/en-us/access>

Lab Time Activity Simulation Log:

- Slot – 01 – 00:00 – 00:15: Settlement and attendance
- Slot – 02 – 00:15 – 00:30: Demonstration on screen (Microsoft ® Access)
- Slot – 03 – 00:30 – 00:45: Demonstration on screen (Microsoft ® Access)
- Slot – 04 – 00:45 – 01:00: Demonstration on screen (Microsoft ® Access)
- Slot – 05 – 01:00 – 01:15: Demonstration on screen (Microsoft ® Access)
- Slot – 06 – 01:15 – 01:30: Demonstration on screen (Microsoft ® Access)
- Slot – 07 – 01:30 – 01:45: Demonstration on screen (Microsoft ® Access)
- Slot – 08 – 01:45 – 02:00: Discussion on In-Lab Task
- Slot – 09 – 02:00 – 02:15: Discussion on In-Lab Task
- Slot – 10 – 02:15 – 02:30: In-Lab Tasks
- Slot – 11 – 02:30 – 02:45: In-Lab Tasks
- Slot – 12 – 02:45 – 03:00: Discussion on Post-Lab Task