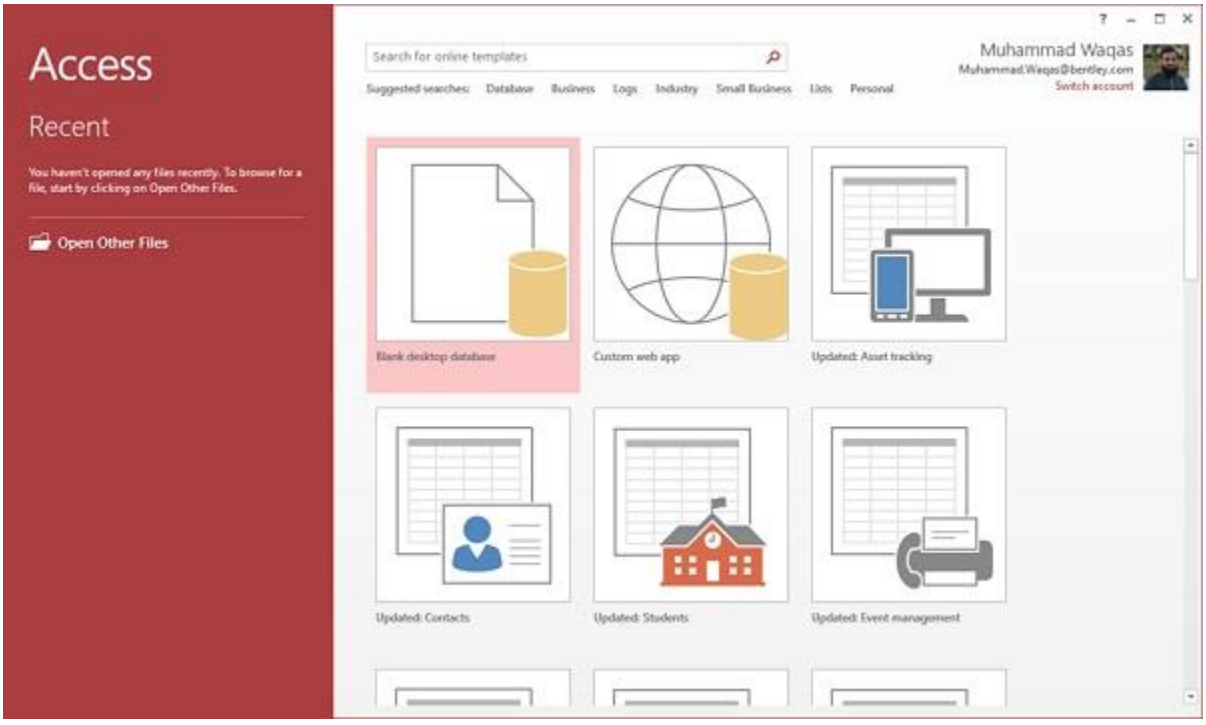
CGS 1060C Access Assignment

Contents

Create Database

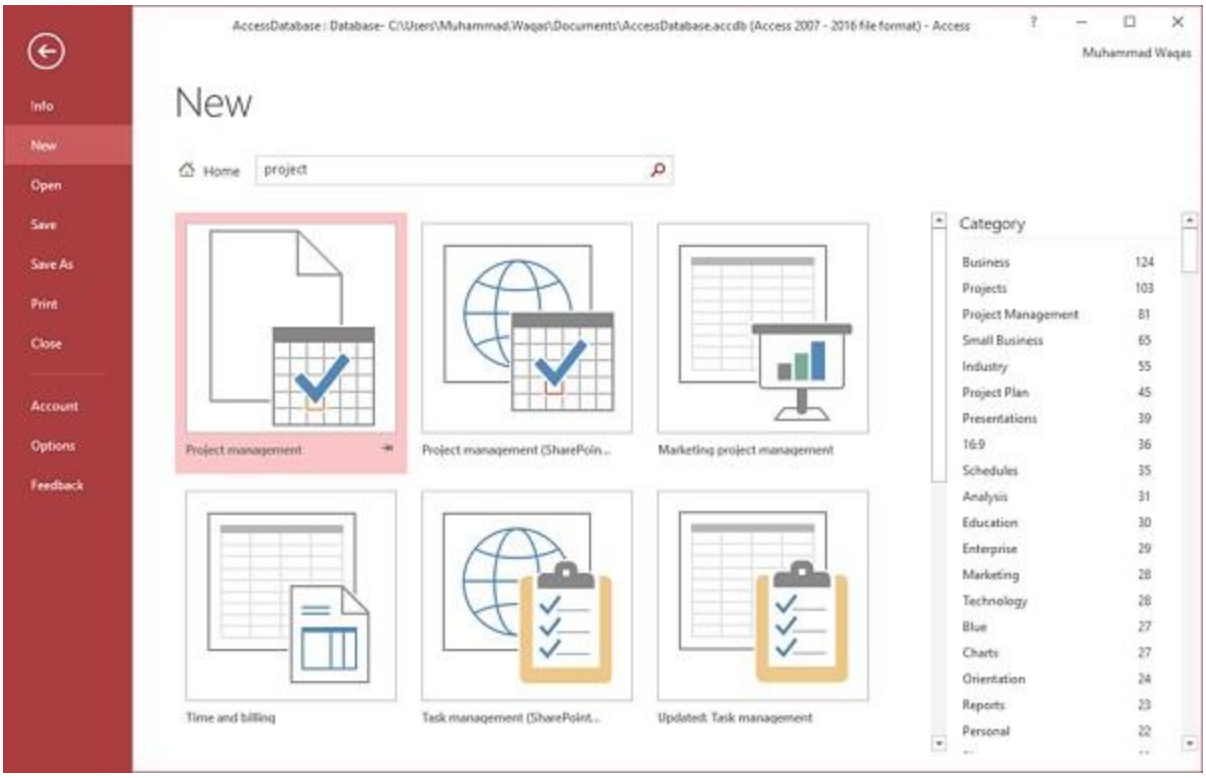
In this chapter, we will be covering the basic process of starting Access and creating a database. This chapter will also explain how to create a desktop database by using a template and how to build a database from scratch.

To create a database from a template, we first need to open MS Access and you will see the following screen in which different Access database templates are displayed.

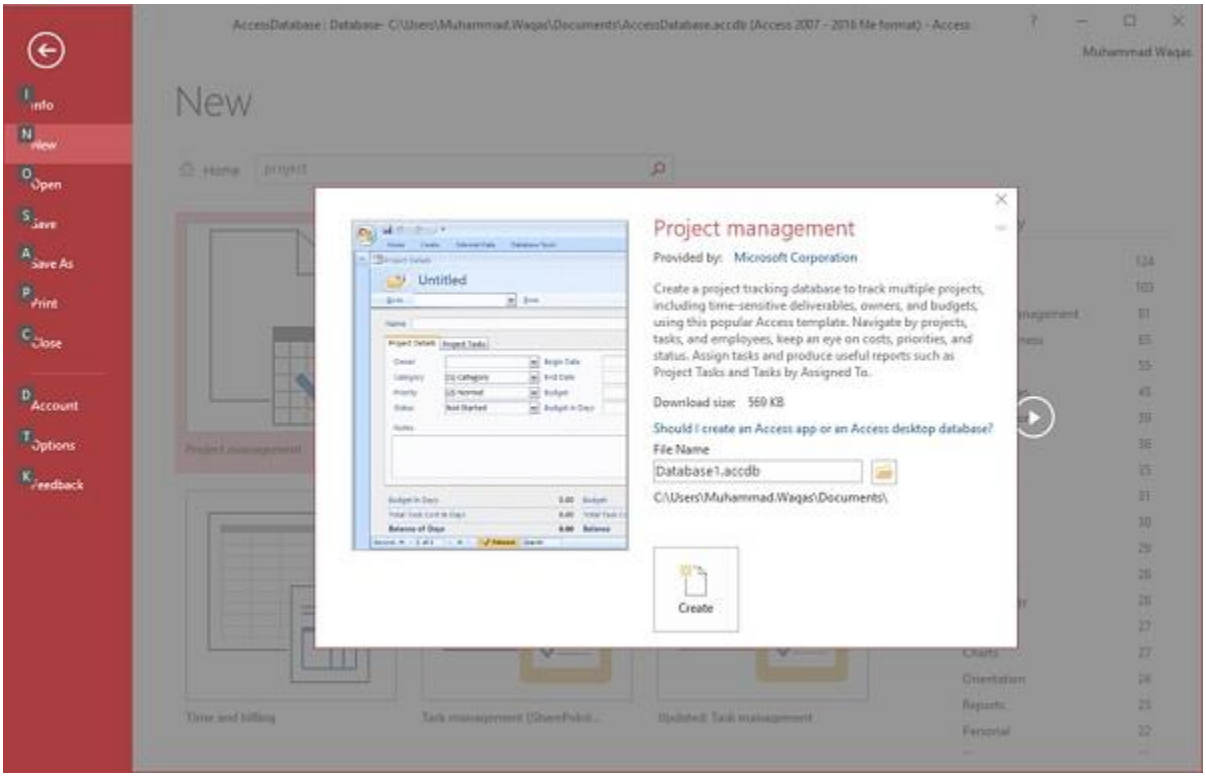


To view the all the possible databases, you can scroll down or you can also use the search box.

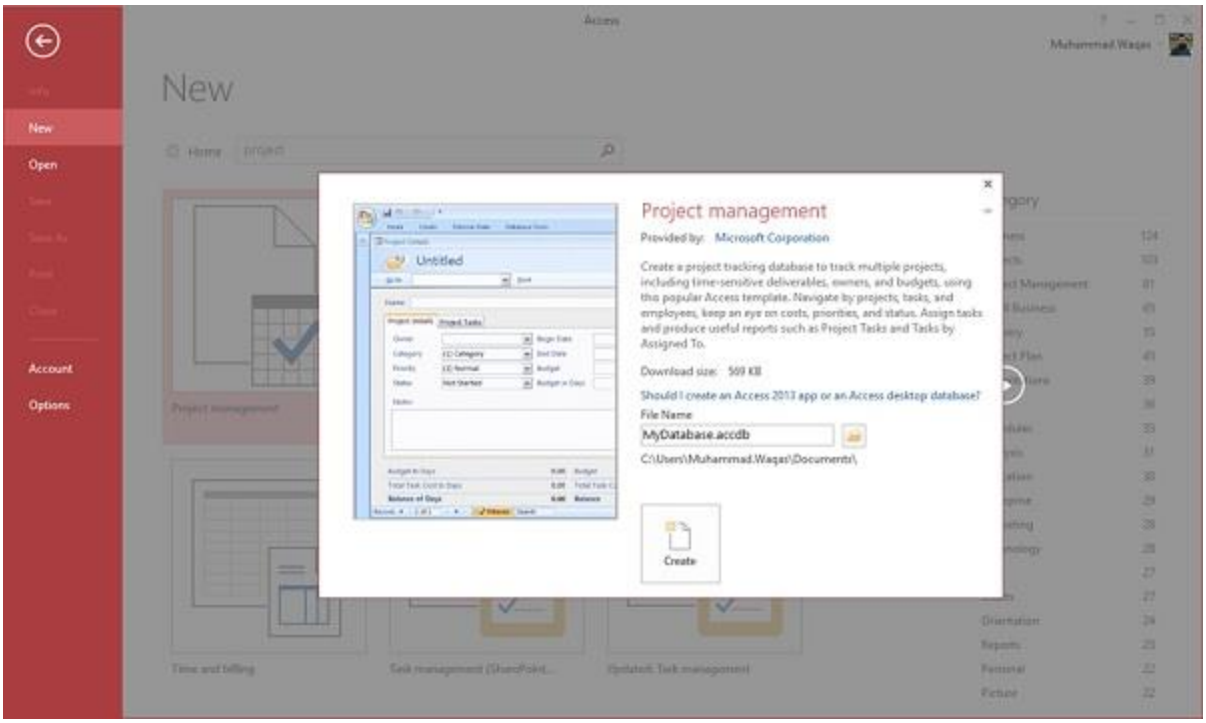
Let us enter project in the search box and press Enter. You will see the database templates related to project management.



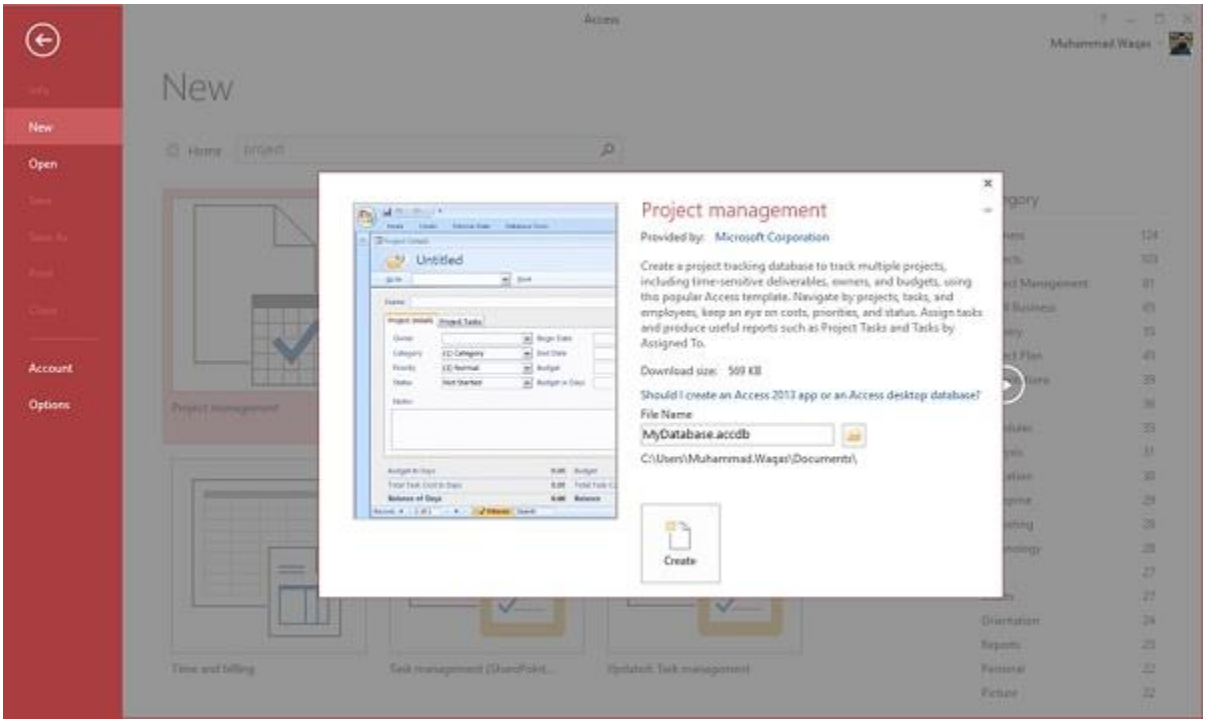
Select the first template. You will see more information related to this template.



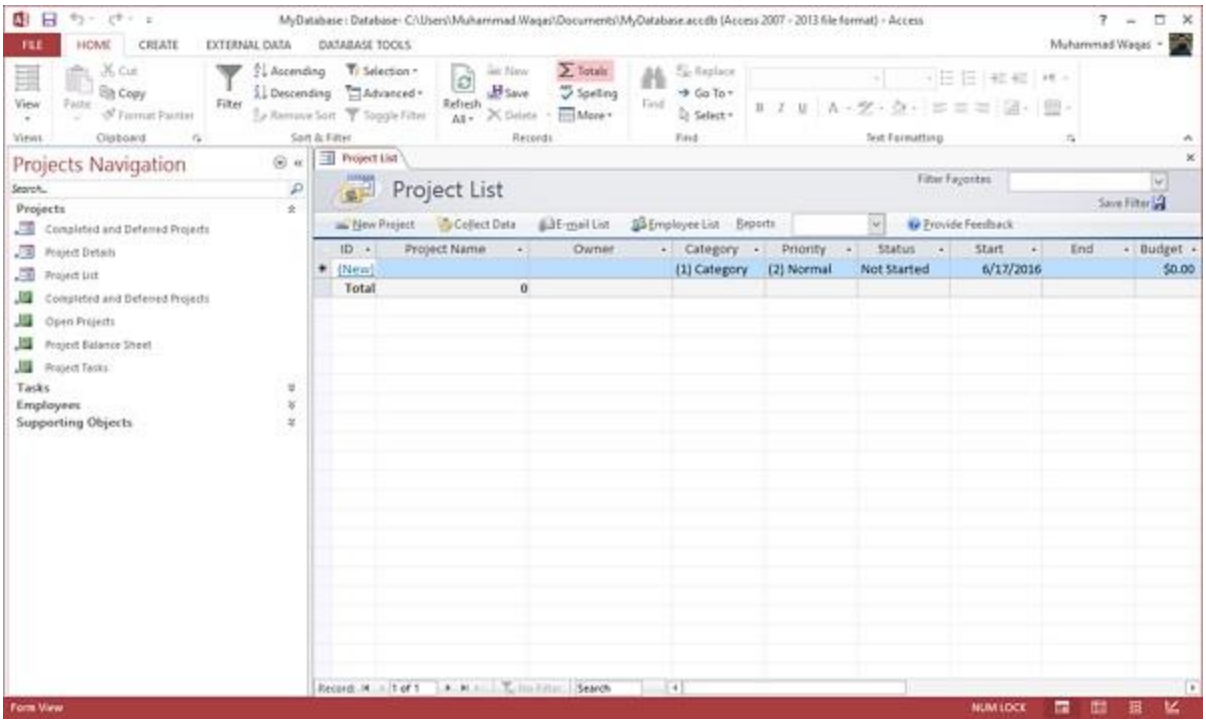
After selecting a template related to your requirements, enter a name in the **File name** field and you can also specify another location for your file if you want.



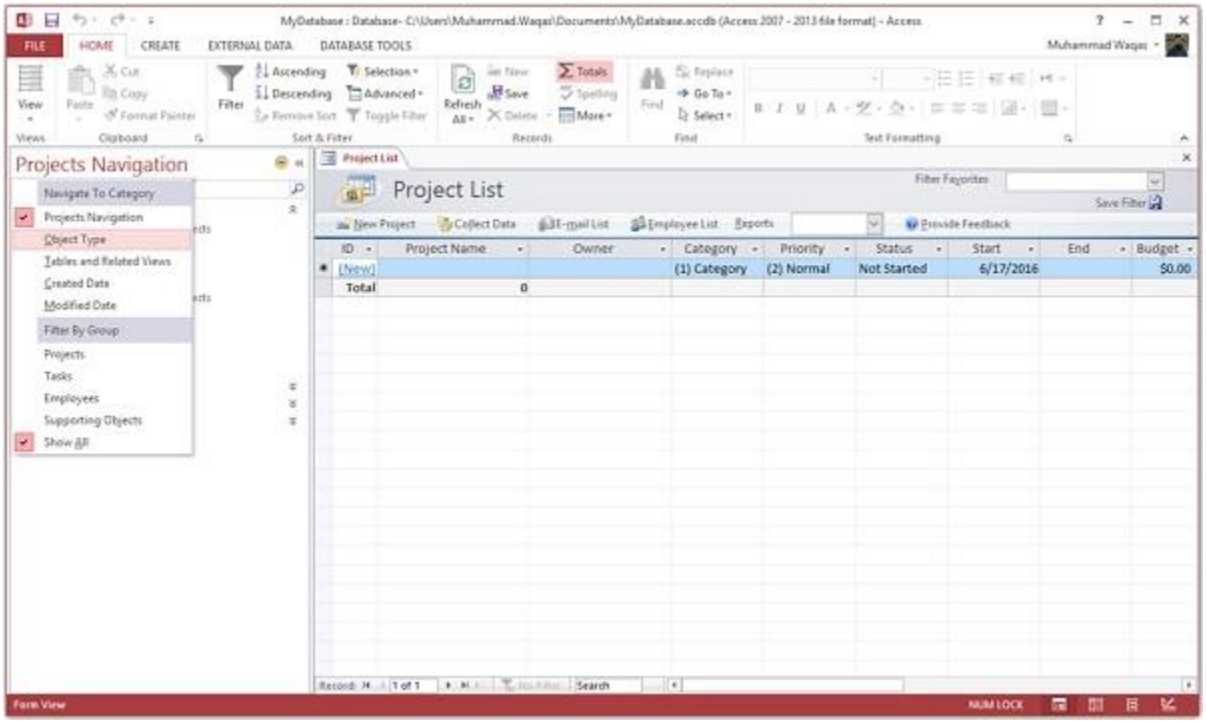
Now, press the Create option. Access will download that database template and open a new blank database as shown in the following screenshot.



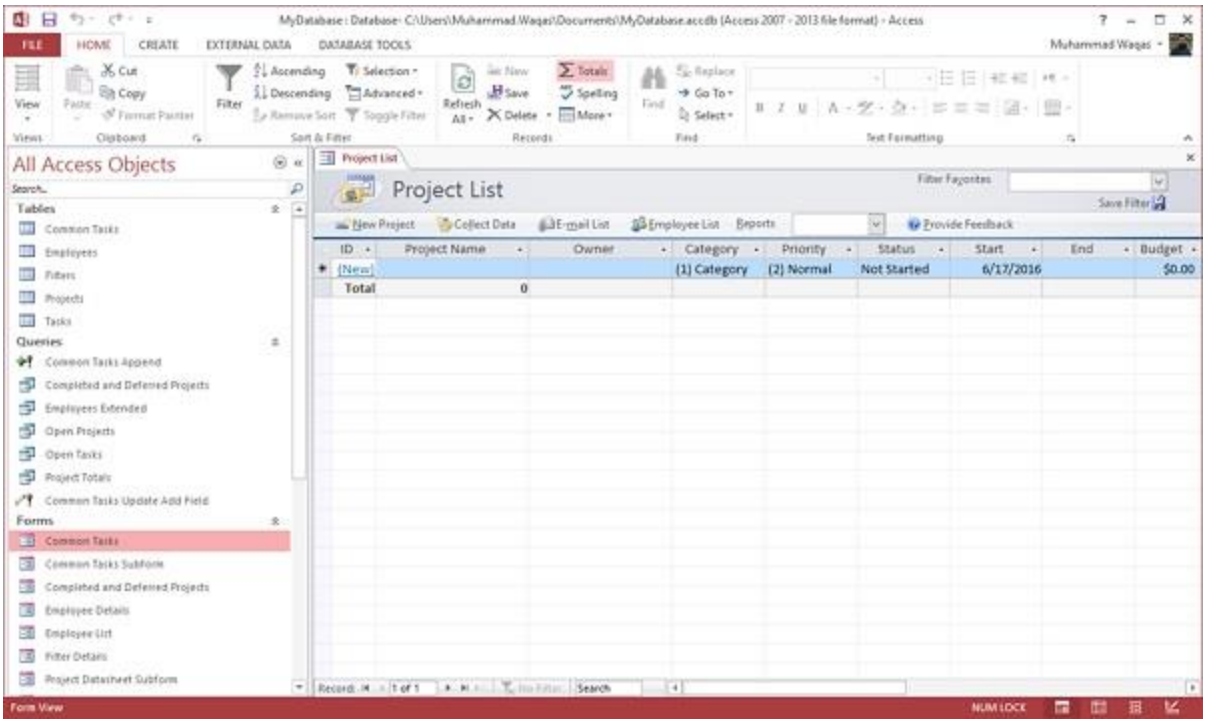
Now, click the Navigation pane on the left side and you will see all the other objects that come with this database.



Click the Projects Navigation and select the Object Type in the menu.



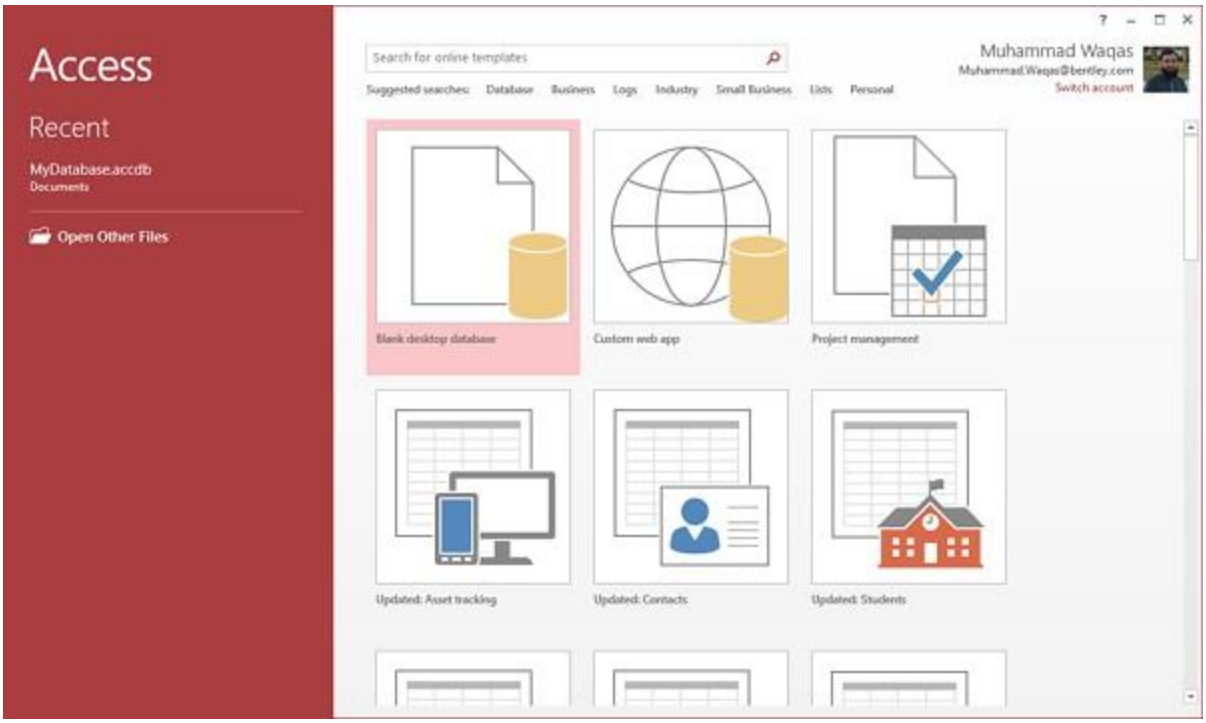
You will now see all the objects types — tables, queries, etc.



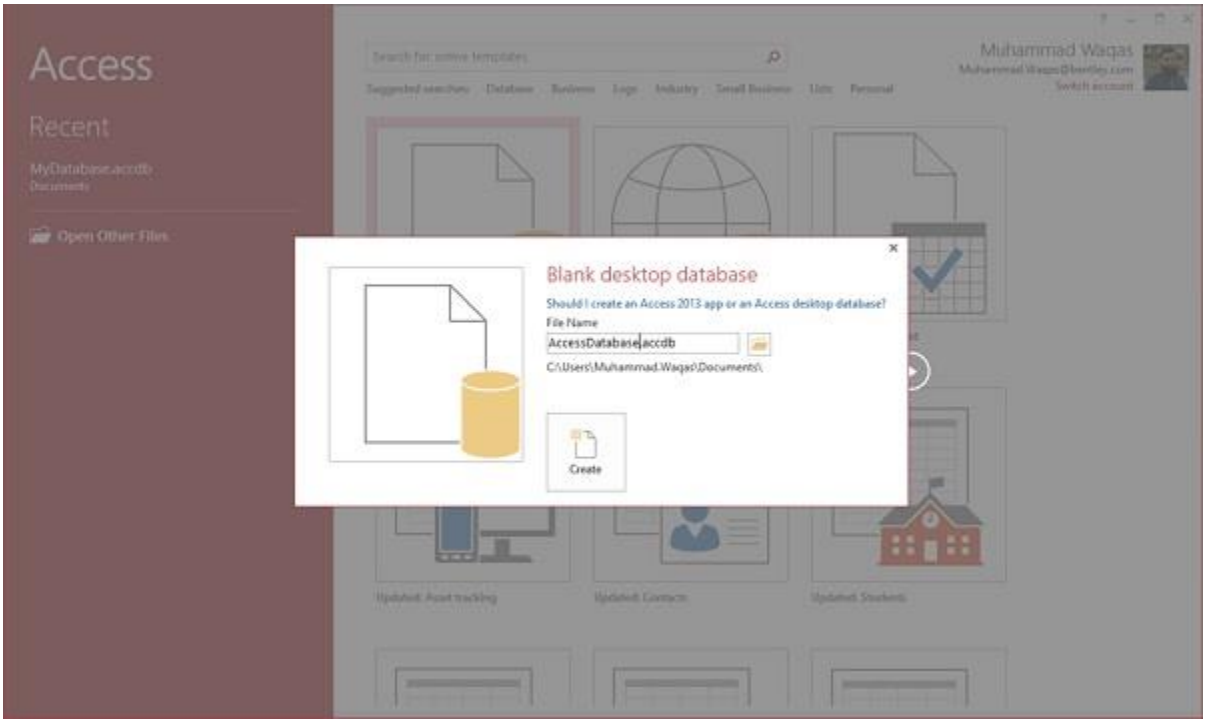
Create Blank Database

Sometimes database requirements can be so specific that using and modifying the existing templates requires more work than just creating a database from scratch. In such case, we make use of blank database.

Step 1 – Let us now start by opening MS Access.



Step 2 − Select Blank desktop database. Enter the name and click the Create button.



Step 3 − Access will create a new blank database and will open up the table which is also completely blank.

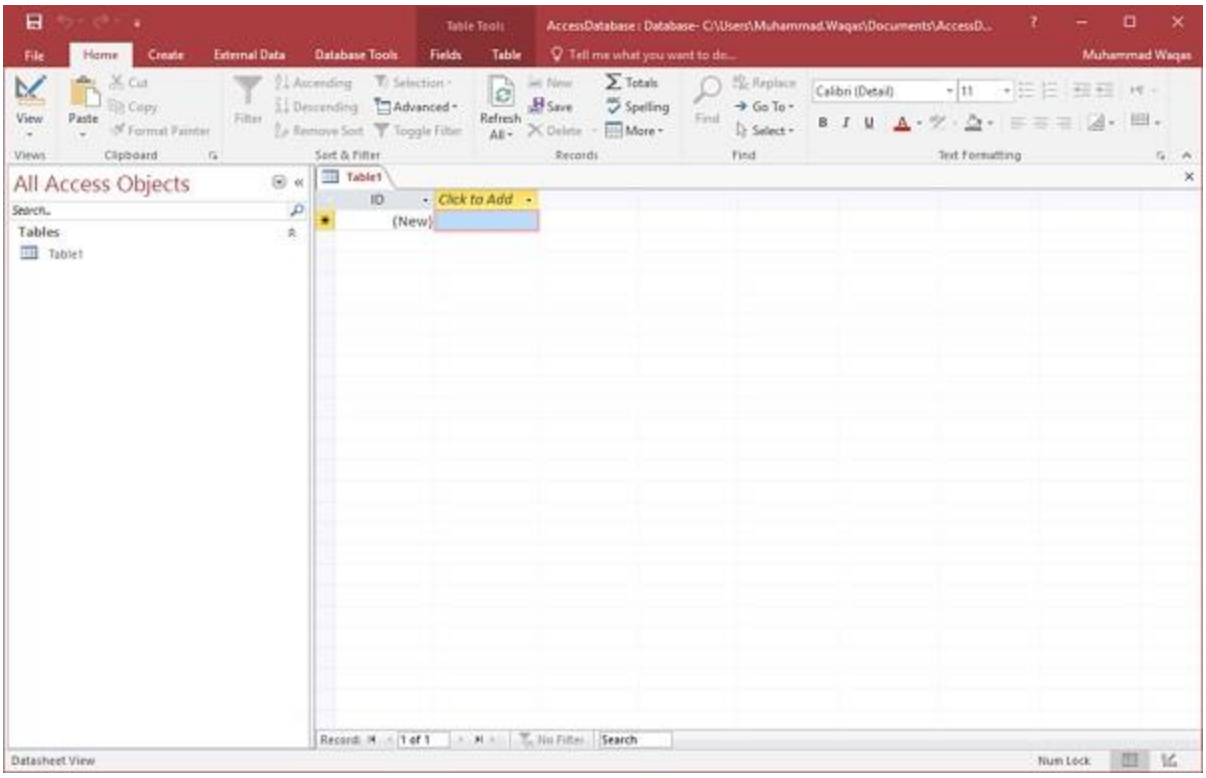


Table Tools
AccessDatabase : Database- C:\Users\Muhammad.Waqas\Documents\AccessD...
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External Data
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Tables
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(New)
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Datasheet View
Num Lock

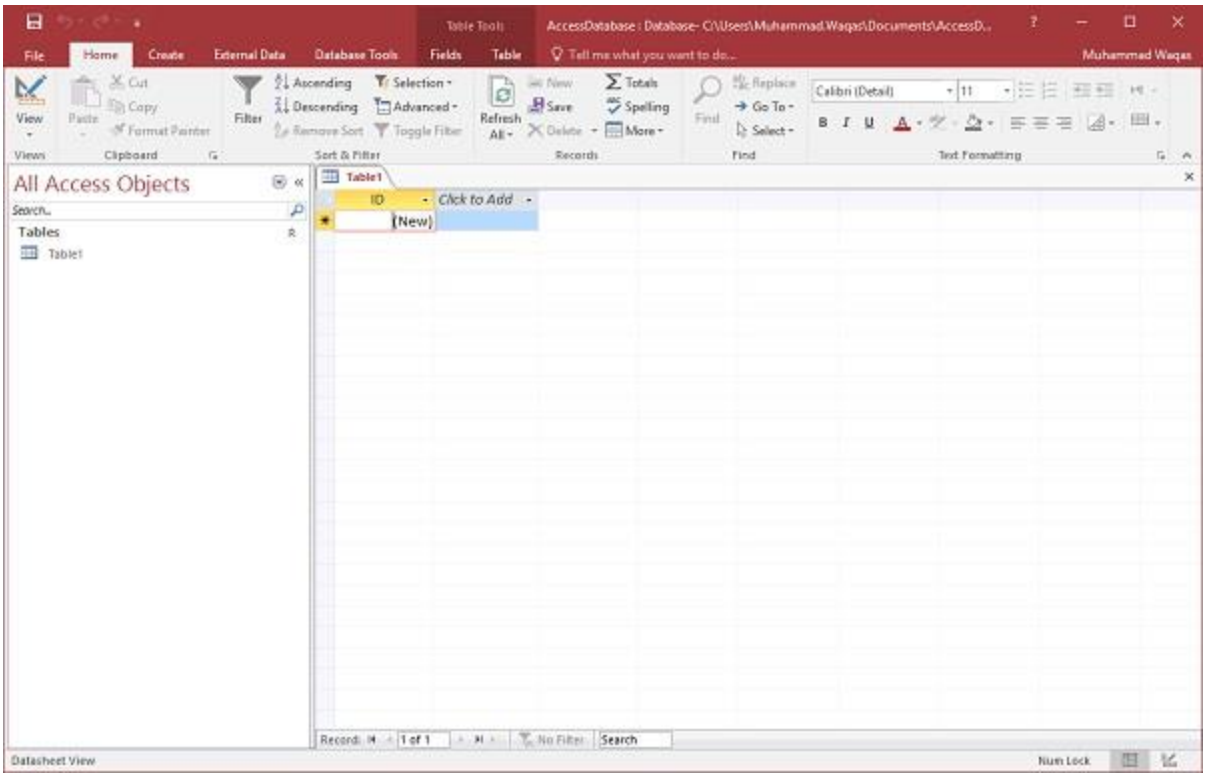
Create Tables

When you create a database, you store your data in tables. Because other database objects depend so heavily on tables, you should always start your design of a database by creating all of its tables and then creating any other object. Before you create tables, carefully consider your requirements and determine all the tables that you need.

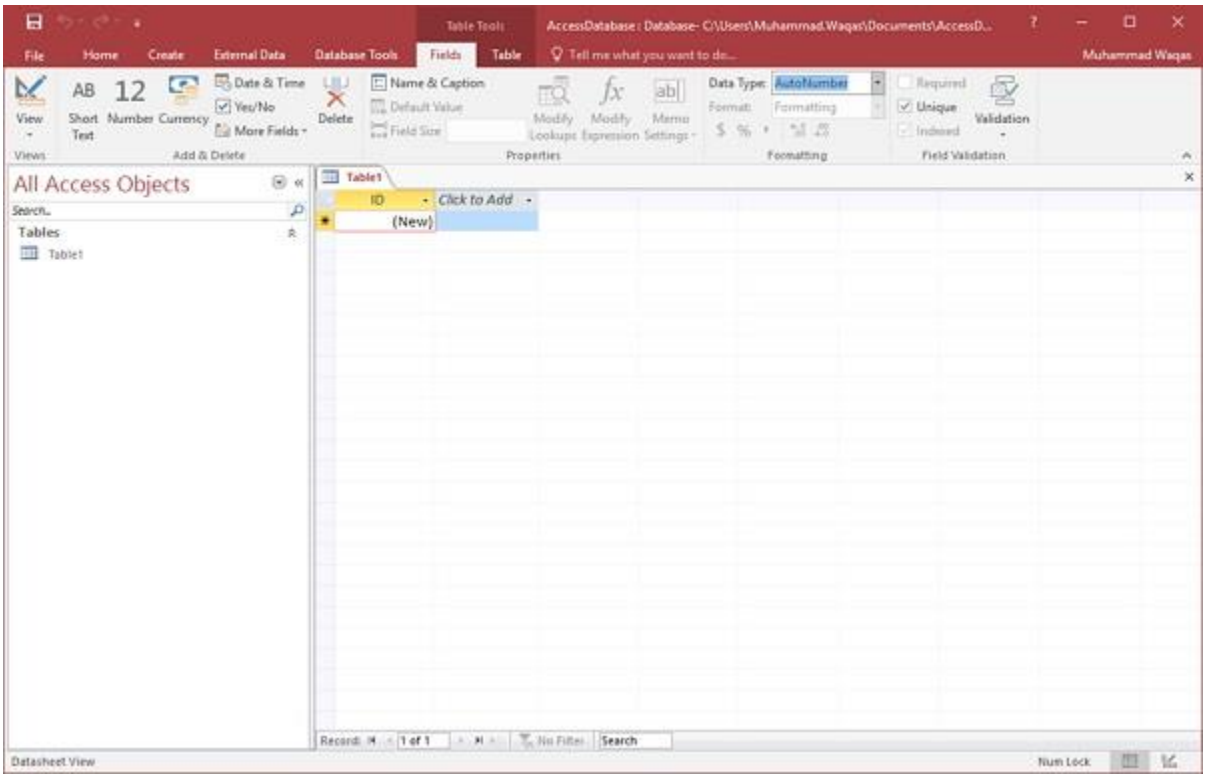
Let us try and create the first table that will store the basic contact information concerning the employees as shown in the following table –

Field Name	Data Type
EmployeeID	AutoNumber
FirstName	Short Text
LastName	Short Text
Address1	Short Text
Address2	Short Text
City	Short Text
State	Short Text
Zip	Short Text
Phone	Short Text
Phone Type	Short Text

Let us now have short text as the data type for all these fields and open a blank database in Access.

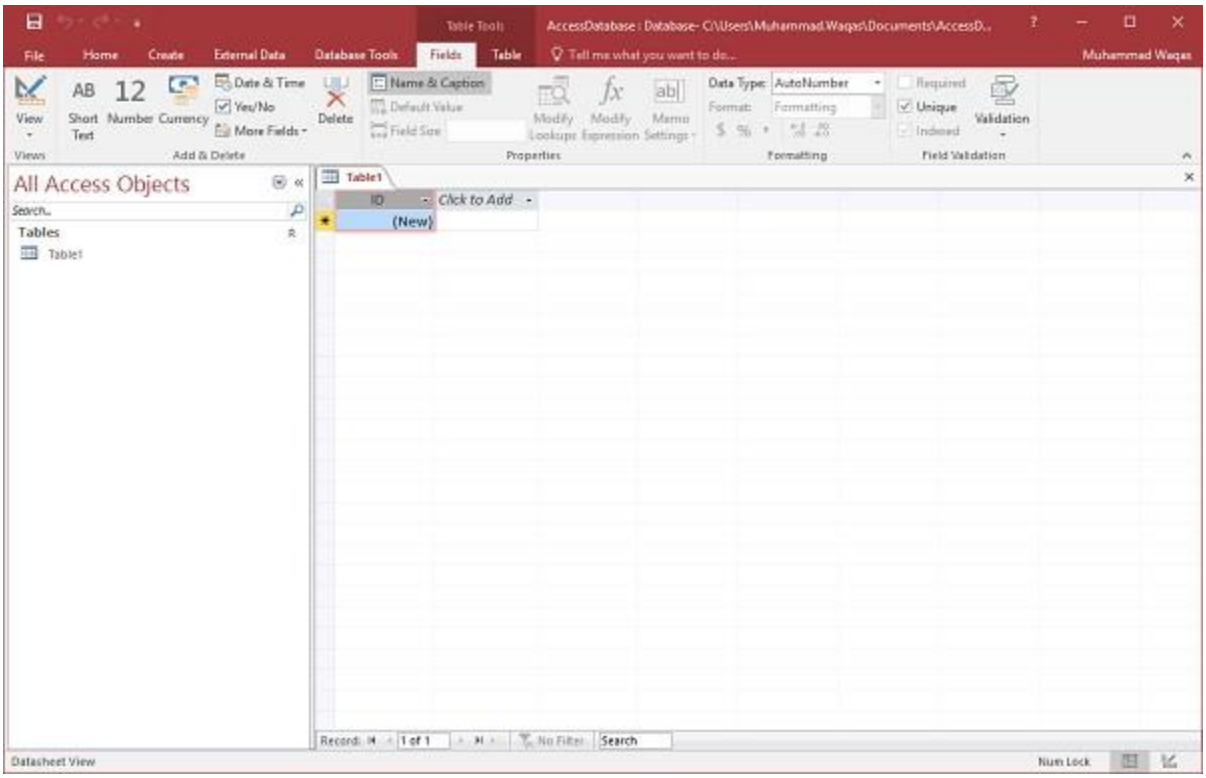


This is where we left things off. We created the database and then Access automatically opened up this table-one-datasheet view for a table.

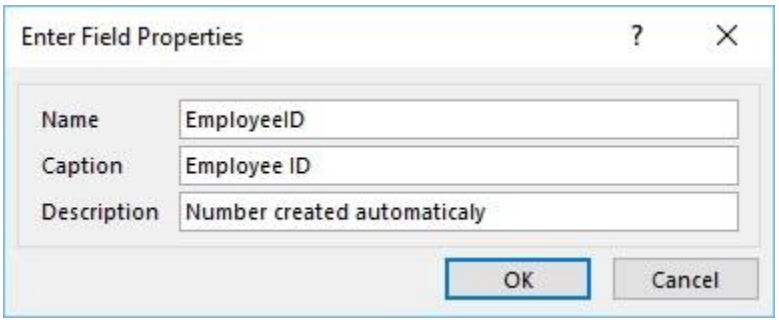


Let us now go to the Field tab and you will see that it is also automatically created. The ID which is an AutoNumber field acts as our unique identifier and is the primary key for this table.

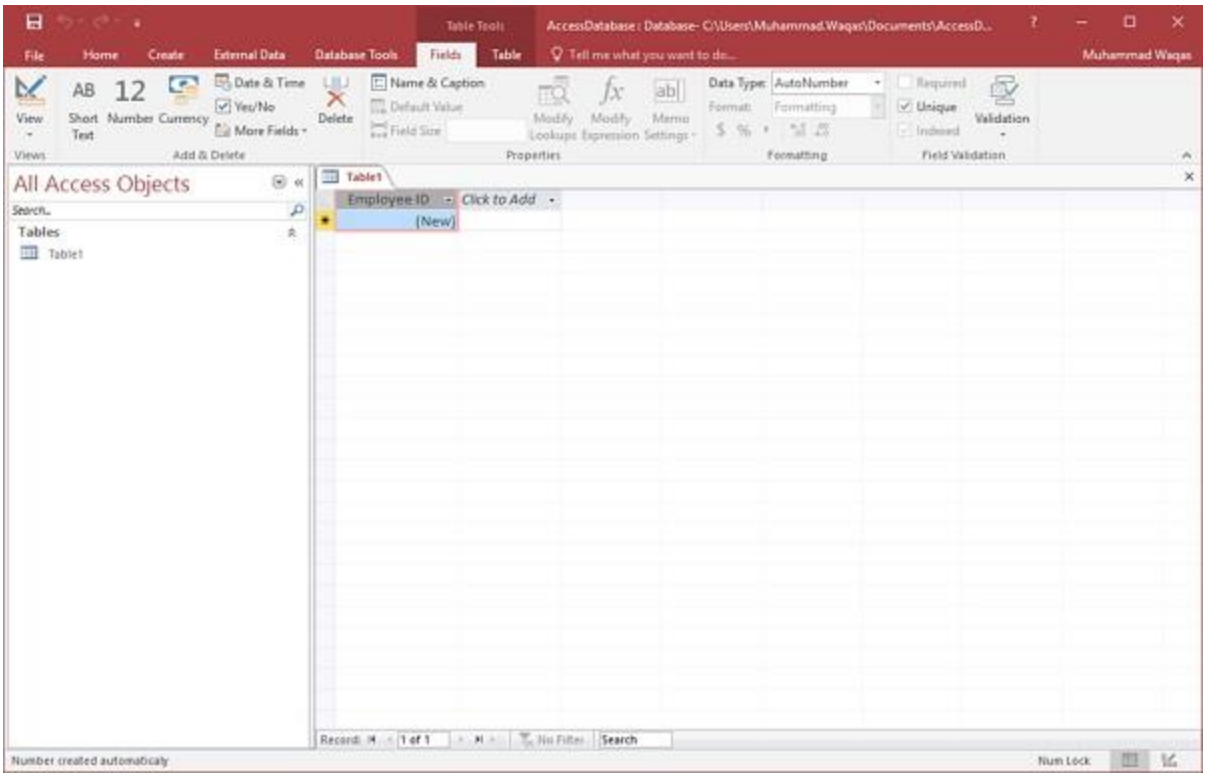
The ID field has already been created and we now want to rename it to suit our conditions. This is an Employee table and this will be the unique identifier for our employees.



Click on the **Name & Caption** option in the Ribbon and you will see the following dialog box.

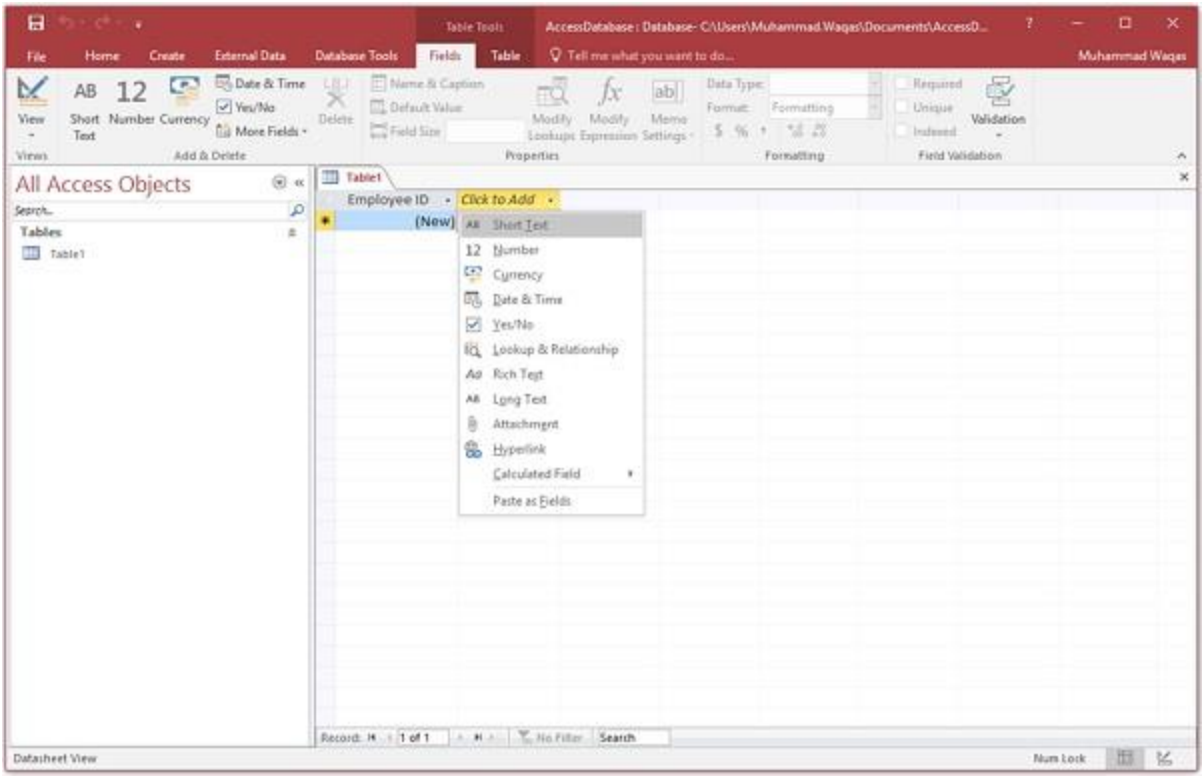


Change the name of this field to **EmployeeID** to make it more specific to this table. Enter the other optional information if you want and click Ok.

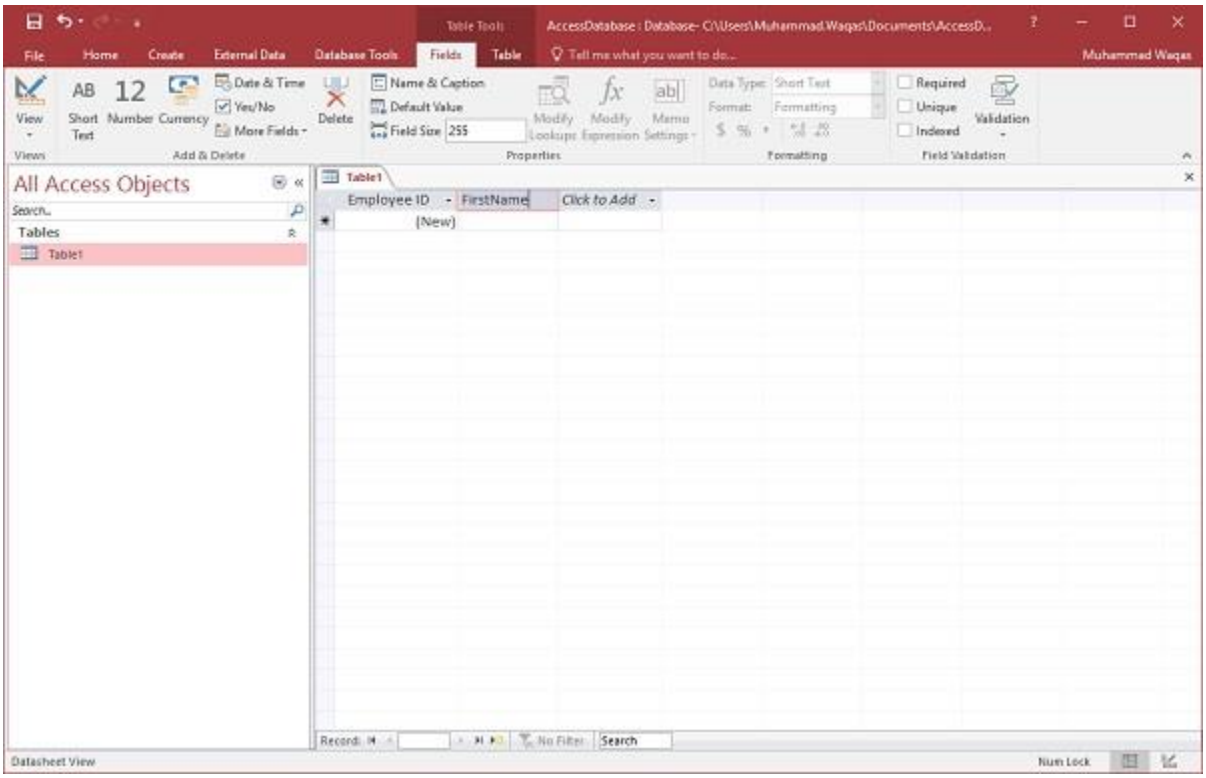


We now have our employee ID field with the caption Employee ID. This is automatically set to auto number so we don't really need to change the data type.

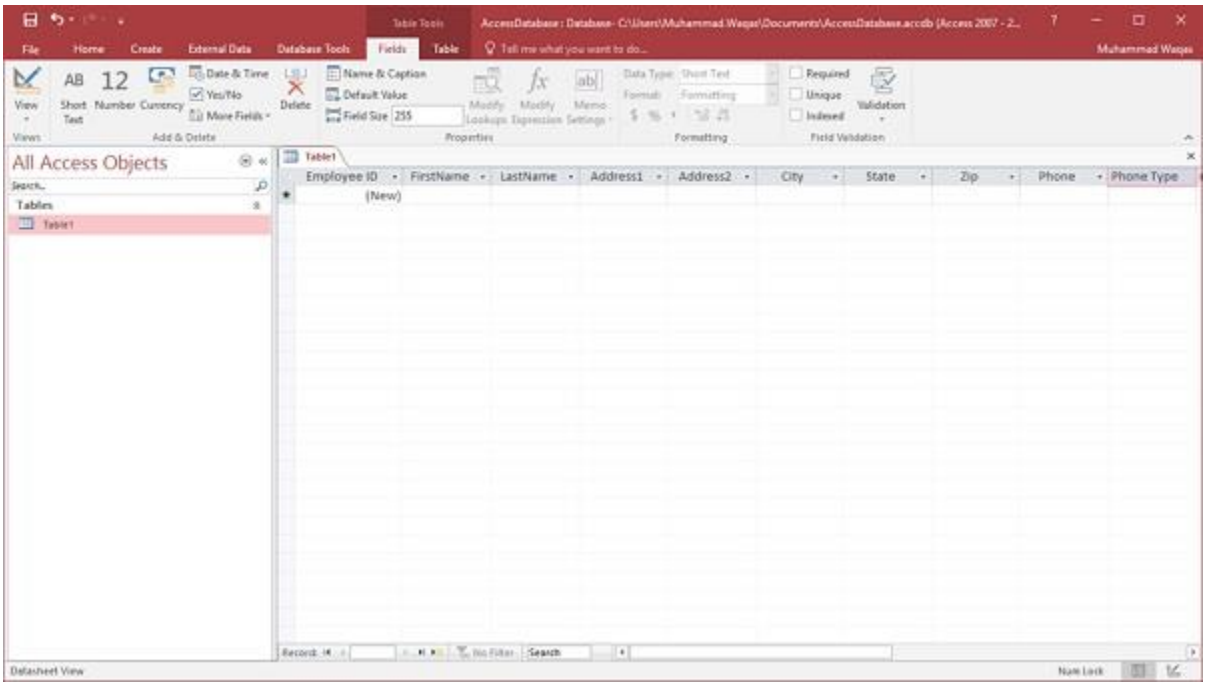
Let us now add some more fields by clicking on **click to add**.



Choose **Short Text** as the field. When you choose short text, Access will then highlight that field name automatically and all you have to do is type the field name.

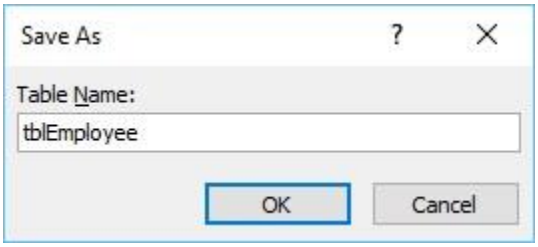


Type **FirstName** as the field name. Similarly, add all the required fields as shown in the following screenshot.



Once all the fields are added, click the Save icon.

You will now see the **Save As** dialog box, where you can enter a table name for the table.



Enter the name of your table in the Table Name field. Here the **tbl** prefix stands for table. Let us click Ok and you will see your table in the navigation pane.

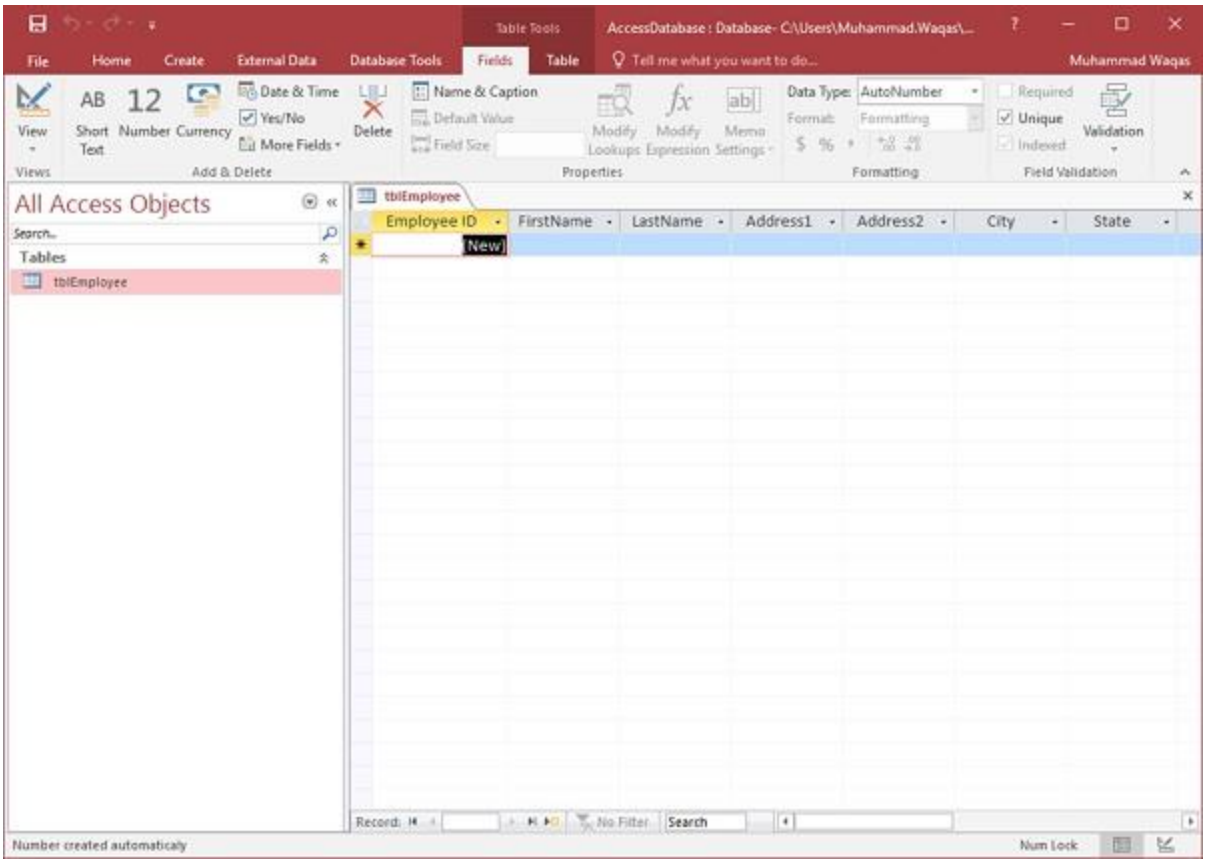


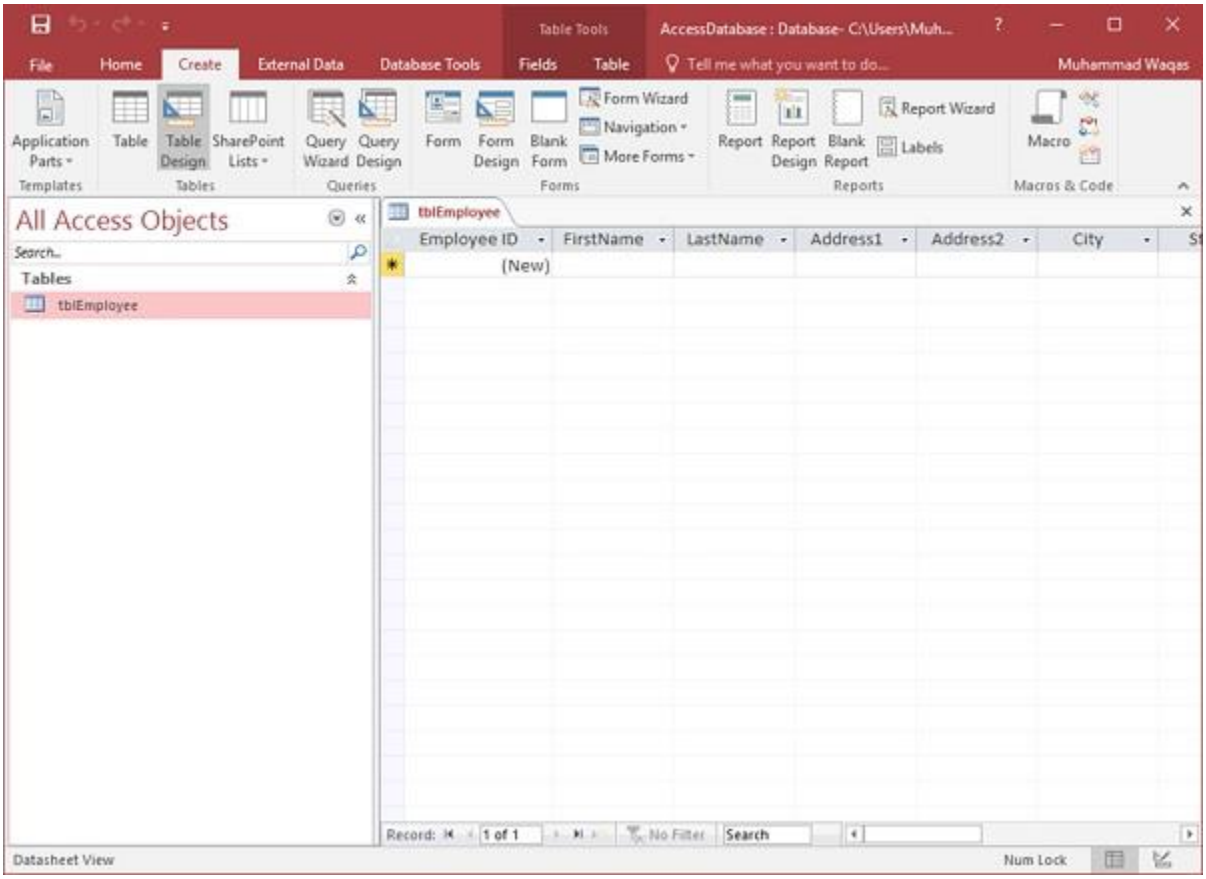
Table Design View

As we have already created one table using **Datasheet View**. We will now create another table using the **Table Design View**. We will be creating the following fields in this table. These tables will store some of the information for various book projects.

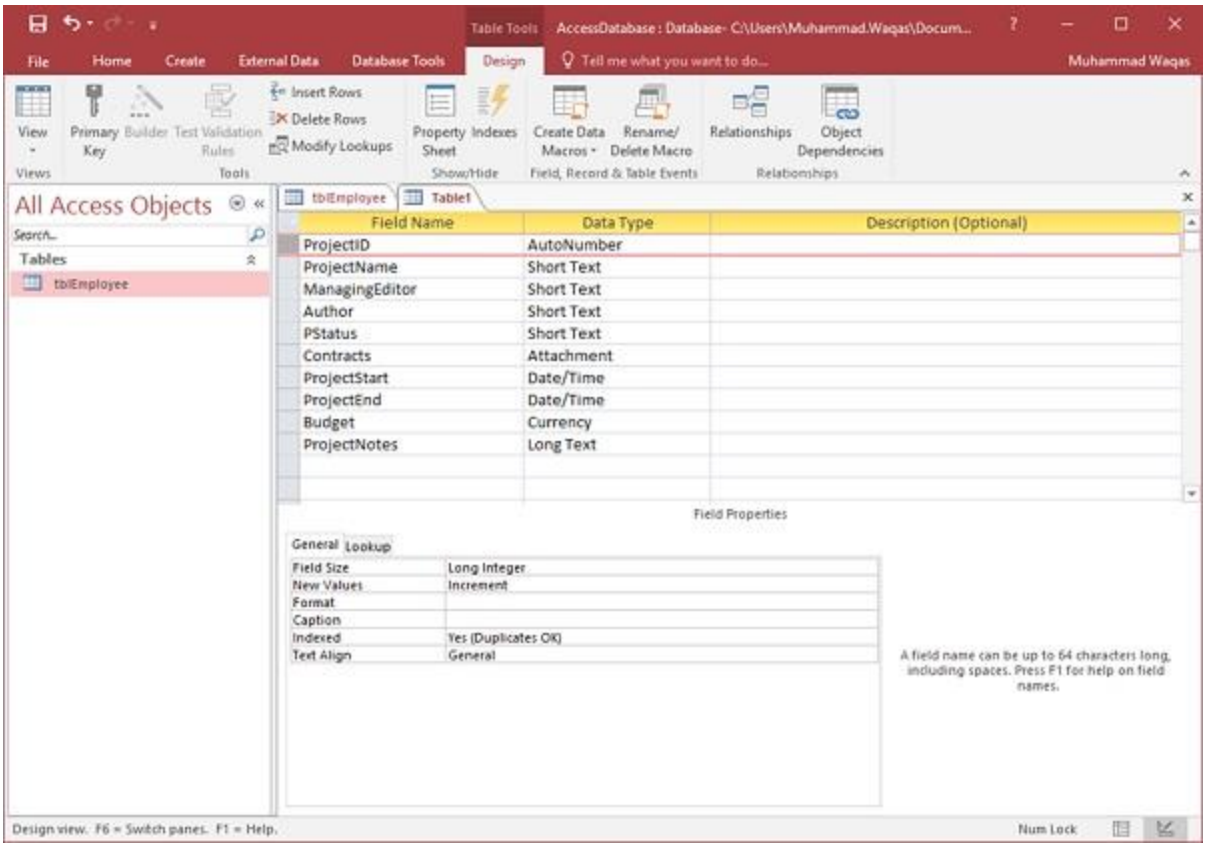
Field Name	Data Type
Project ID	AutoNumber
ProjectName	Short Text
ManagingEditor	Short Text
Author	Short Text
PStatus	Short Text
Contracts	Attachment

ProjectStart	Date/Time
ProjectEnd	Date/Time
Budget	Currency
ProjectNotes	Long Text

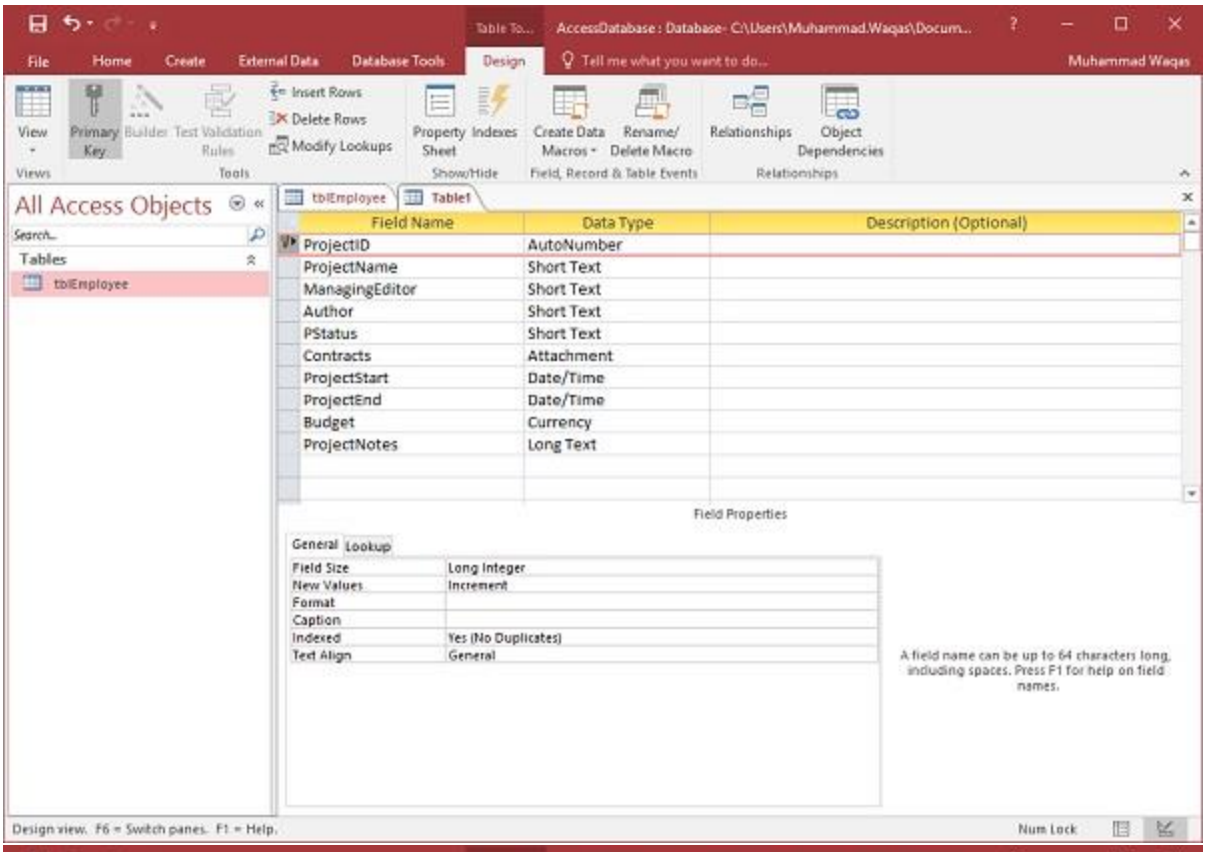
Let us now go to the Create tab.



In the tables group, click on Table and you can see this looks completely different from the Datasheet View. In this view, you can see the **field name** and **data type** side by side.



We now need to make **ProjectID** a primary key for this table, so let us select **ProjectID** and click on **Primary Key** option in the ribbon.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Database Tools
Design
Tell me what you want to do...
Muhammad Waqas
View
Primary Key
Builder
Test Validation Rules
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Delete Rows
Modify Lookups
Property Sheet
Indexes
Create Data Macros
Rename/ Delete Macro
Relationships
Object Dependencies
Views
Tools
Show/Hide
Field, Record & Table Events
Relationships
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tblEmployee
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Field Name
Data Type
Description (Optional)
ProjectID
AutoNumber
ProjectName
Short Text
ManagingEditor
Short Text
Author
Short Text
PStatus
Short Text
Contracts
Attachment
ProjectStart
Date/Time
ProjectEnd
Date/Time
Budget
Currency
ProjectNotes
Long Text
Field Properties
General
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Field Size
Long Integer
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Increment
Format
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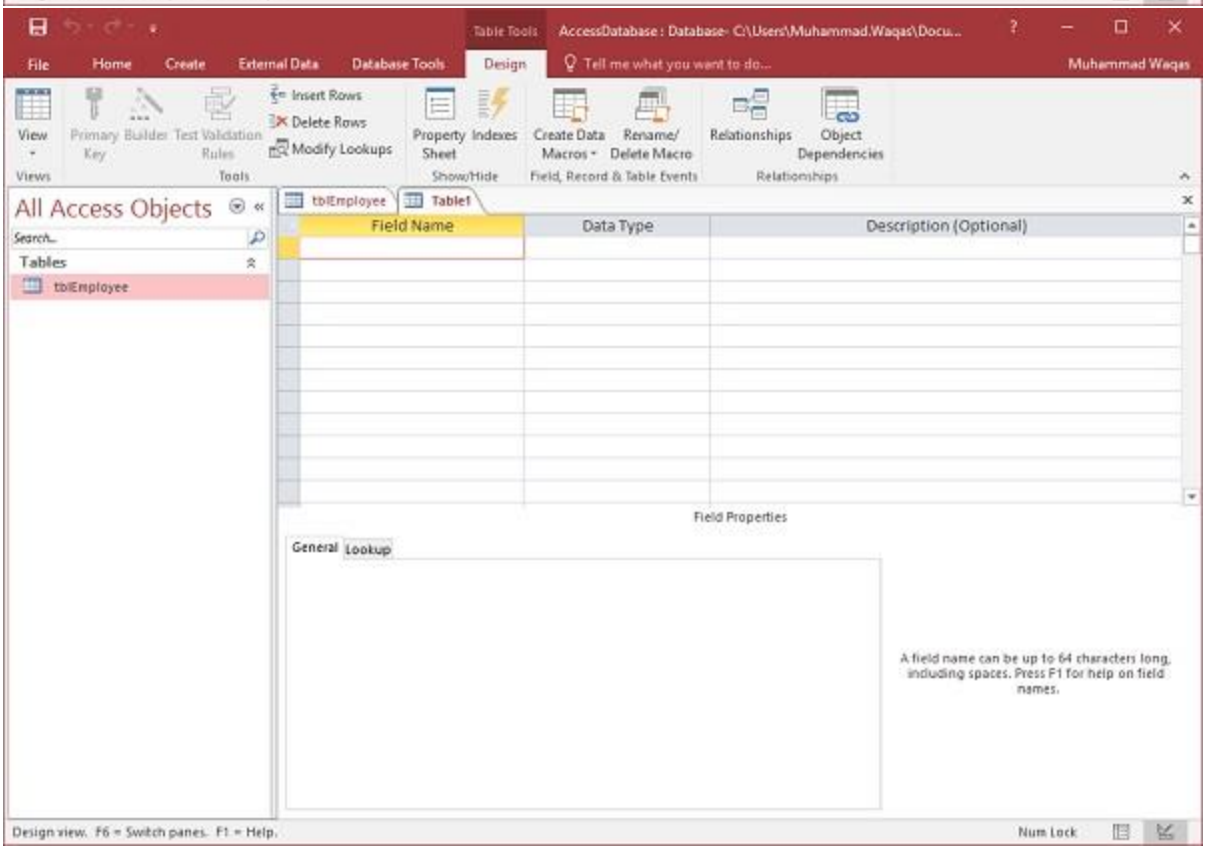
A field name can be up to 64 characters long, including spaces. Press F1 for help on field names.
Design view. F6 = Switch panes. F1 = Help.
Num Lock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View
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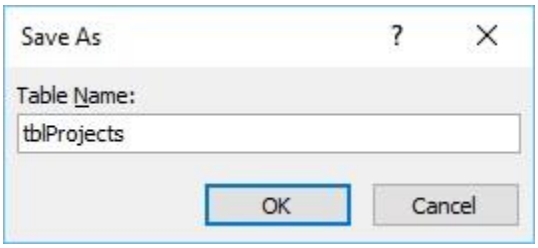
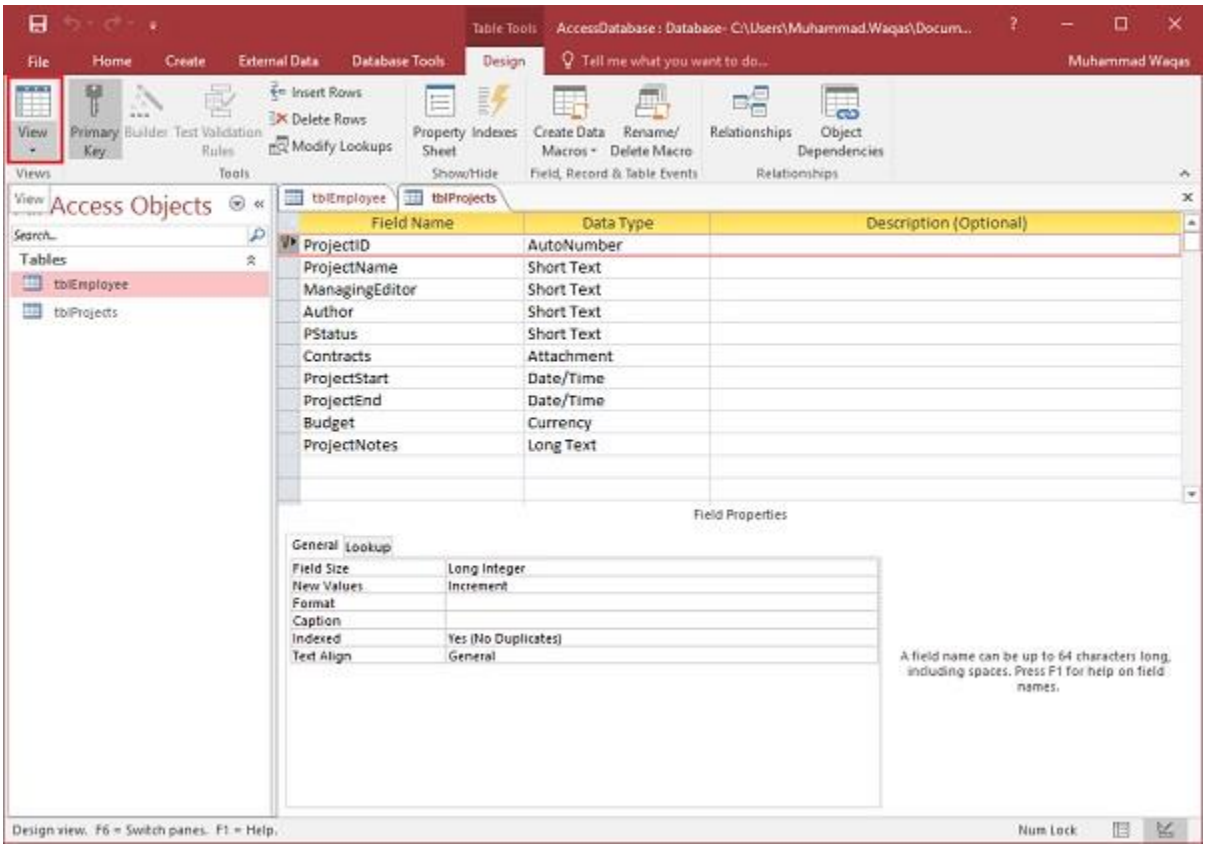
Delete Rows
Modify Lookups
Property Sheet
Indexes
Create Data Macros
Rename/ Delete Macro
Relationships
Object Dependencies
Views
Tools
Show/Hide
Field, Record & Table Events
Relationships
All Access Objects
Search...
Tables
tblEmployee
tblEmployee
Table1
Field Name
Data Type
Description (Optional)
Field Properties
General
Lookup
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.
Num Lock

You can now see a little key icon that will show up next to that field. This shows that the field is part of the table's primary key.

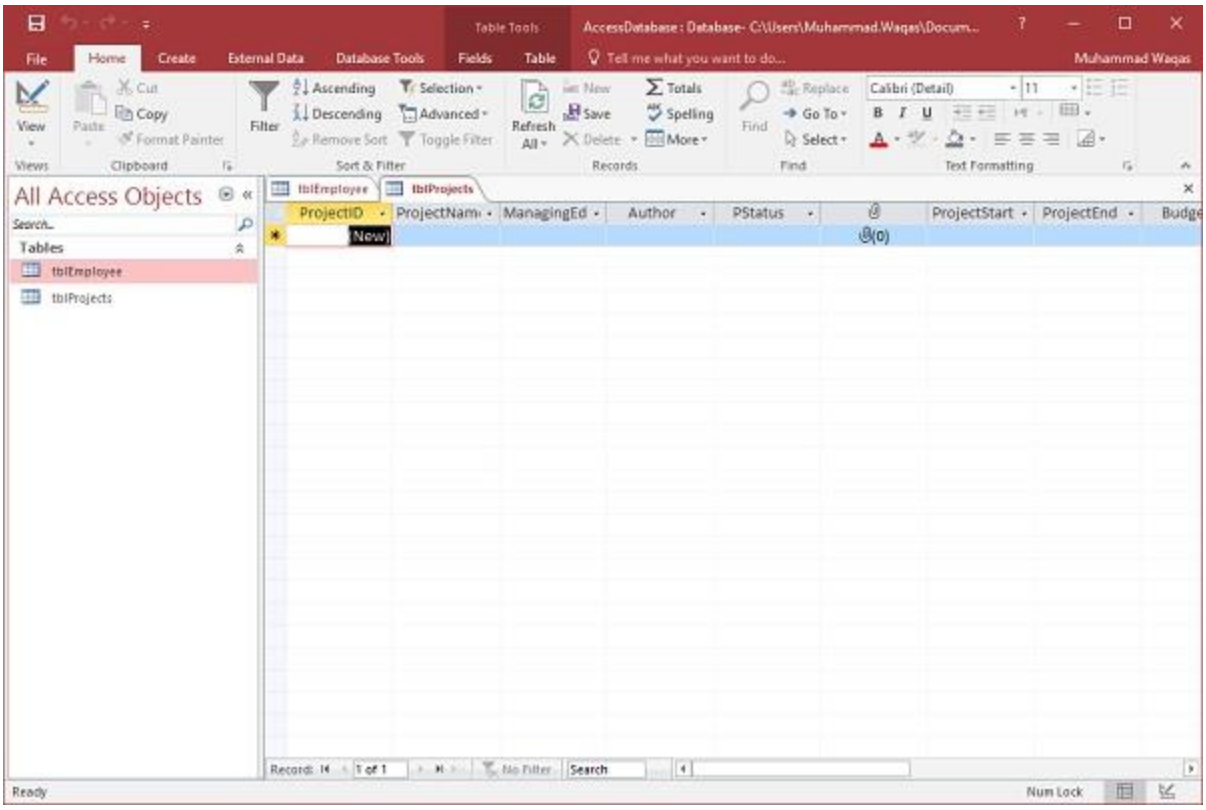
Let us save this table and give this table a name.



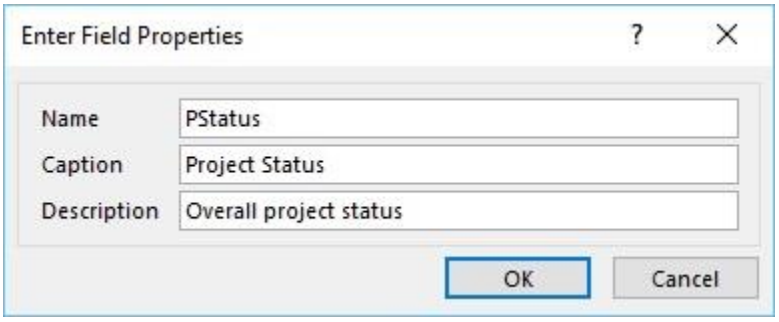
Click Ok and you can now see what this table looks like in the Datasheet View.



Let us click the datasheet view button on the top left corner of the ribbon.



If you ever want to make changes to this table or any specific field, you don't always have to go back to the Design View to change it. You can also change it from the Datasheet View. Let us update the PStatus field as shown in the following screenshot.



Click Ok and you will see the changes.

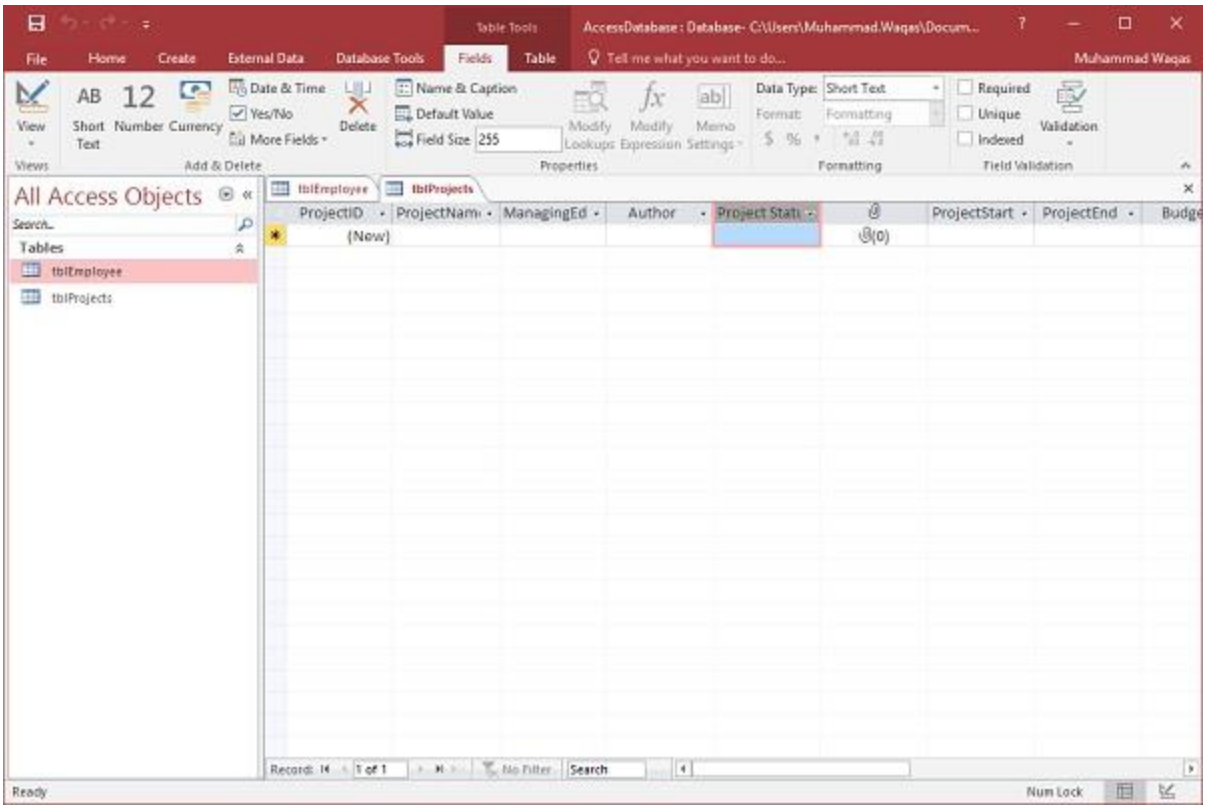


Table Tools
AccessDatabase : Database- C:\Users\Muhammad.Waqas\Docum...
File
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Database Tools
Fields
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Tell me what you want to do...
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Currency
Date & Time
Yes/No
More Fields
Delete
Name & Caption
Default Value
Field Size 255
Modify Lookups
Modify Expression
Memo Settings
Data Type: Short Text
Format
Formatting
Required
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Views
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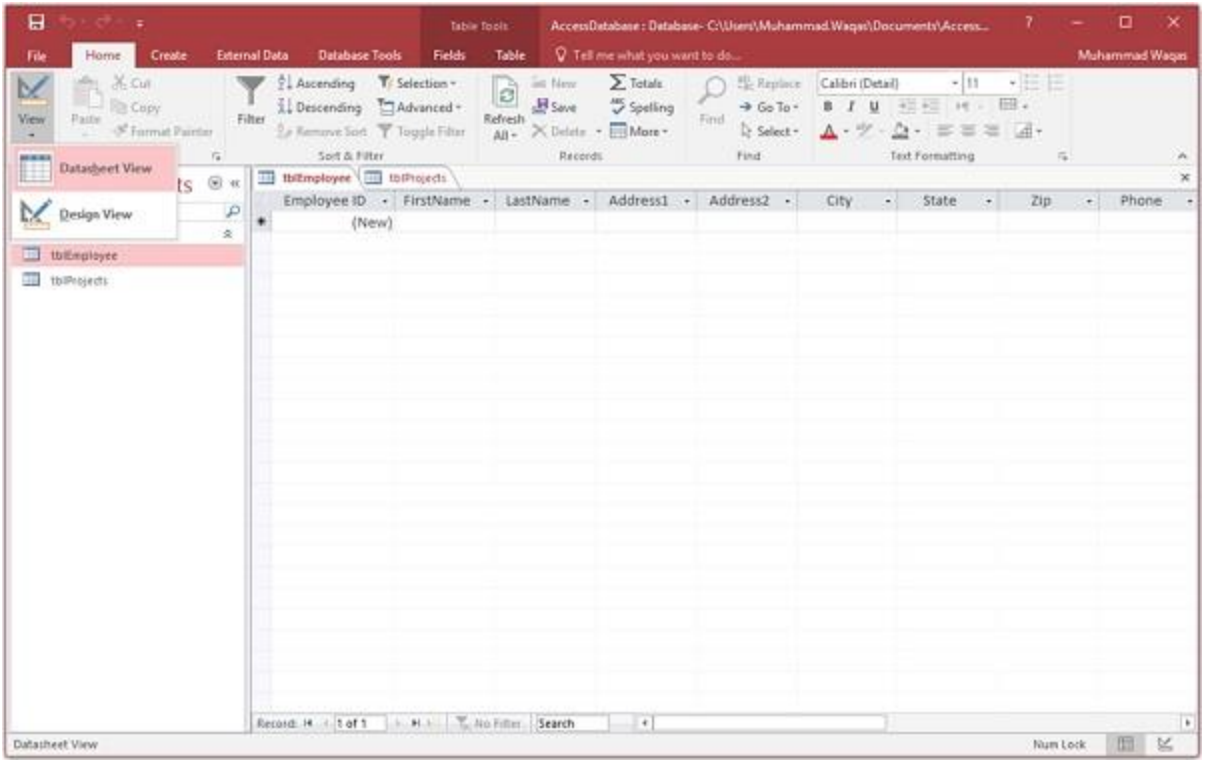
Adding Data

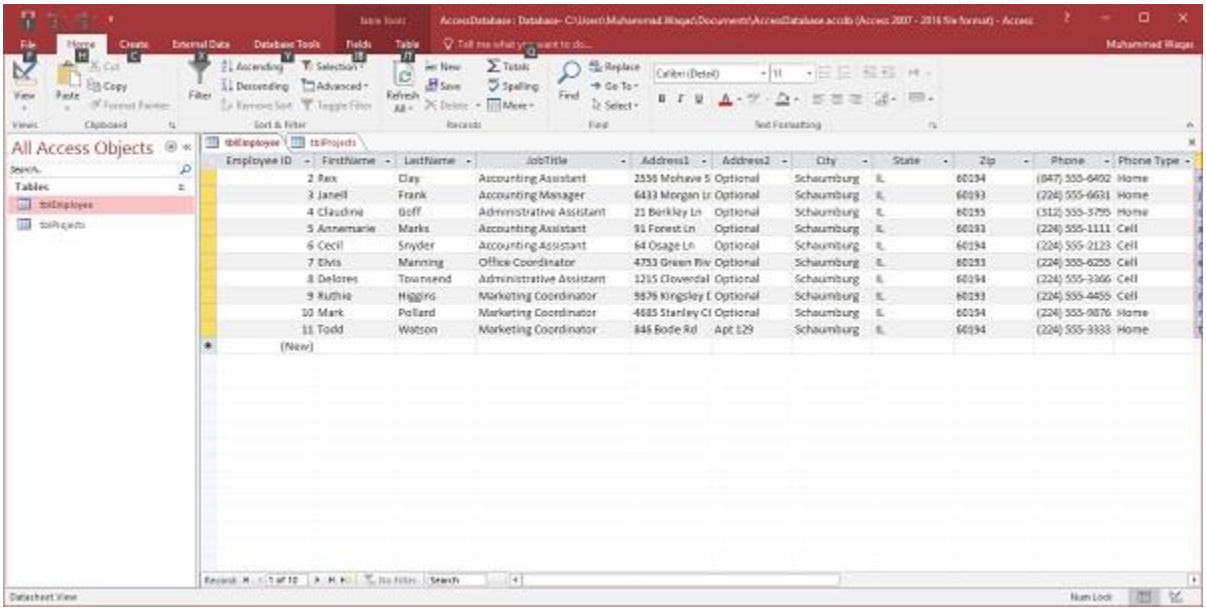
An Access database is not a file in the same sense as a Microsoft Office Word document or a Microsoft Office PowerPoint are. Instead, an Access database is a collection of objects like tables, forms, reports, queries etc. that must work together for a database to function properly. We have now created two tables with all of the fields and field properties necessary in our database. To view, change, insert, or delete data in a table within Access, you can use the table's Datasheet View.

- A datasheet is a simple way to look at your data in rows and columns without any special formatting.
- Whenever you create a new web table, Access automatically creates two views that you can start using immediately for data entry.
- A table open in Datasheet View resembles an Excel worksheet, and you can type or paste data into one or more fields.
- You do not need to explicitly save your data. Access commits your changes to the table when you move the cursor to a new field in the same row, or when you move the cursor to another row.
- By default, the fields in an Access database are set to accept a specific type of data, such as text or numbers. You must enter the type of data that the field is set to accept. If you don't, Access displays an error message –

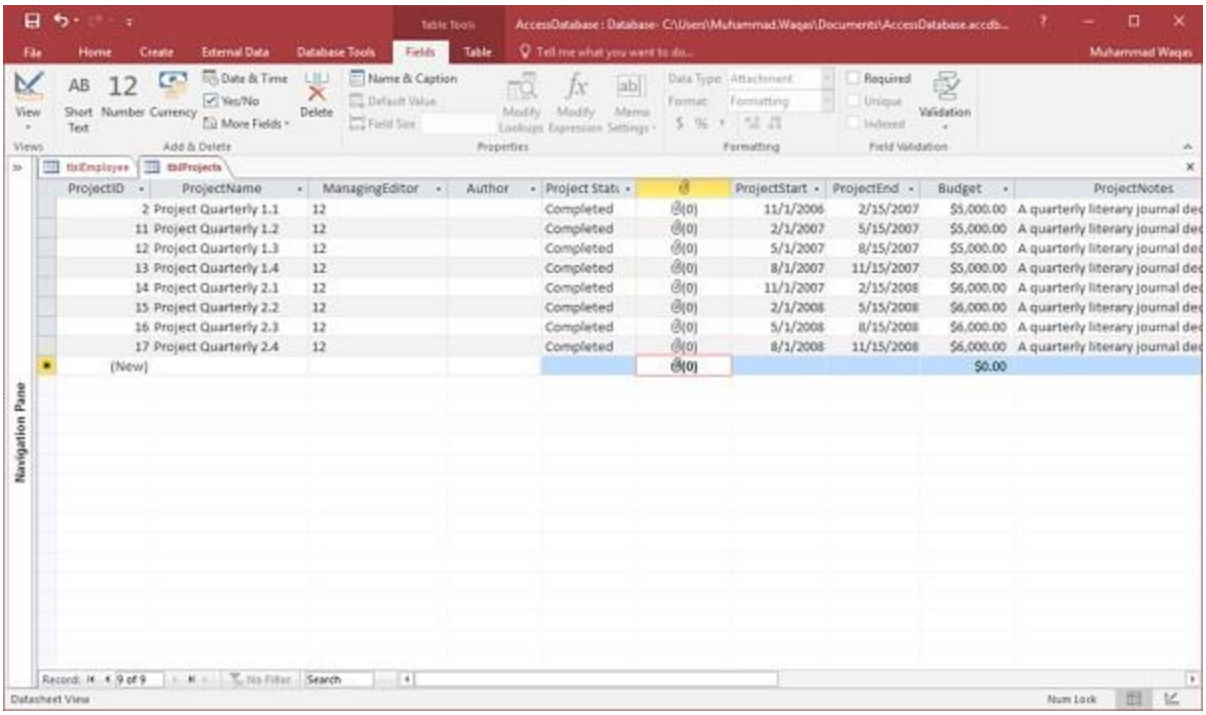
Let us add some data into your tables by opening the Access database we have created.



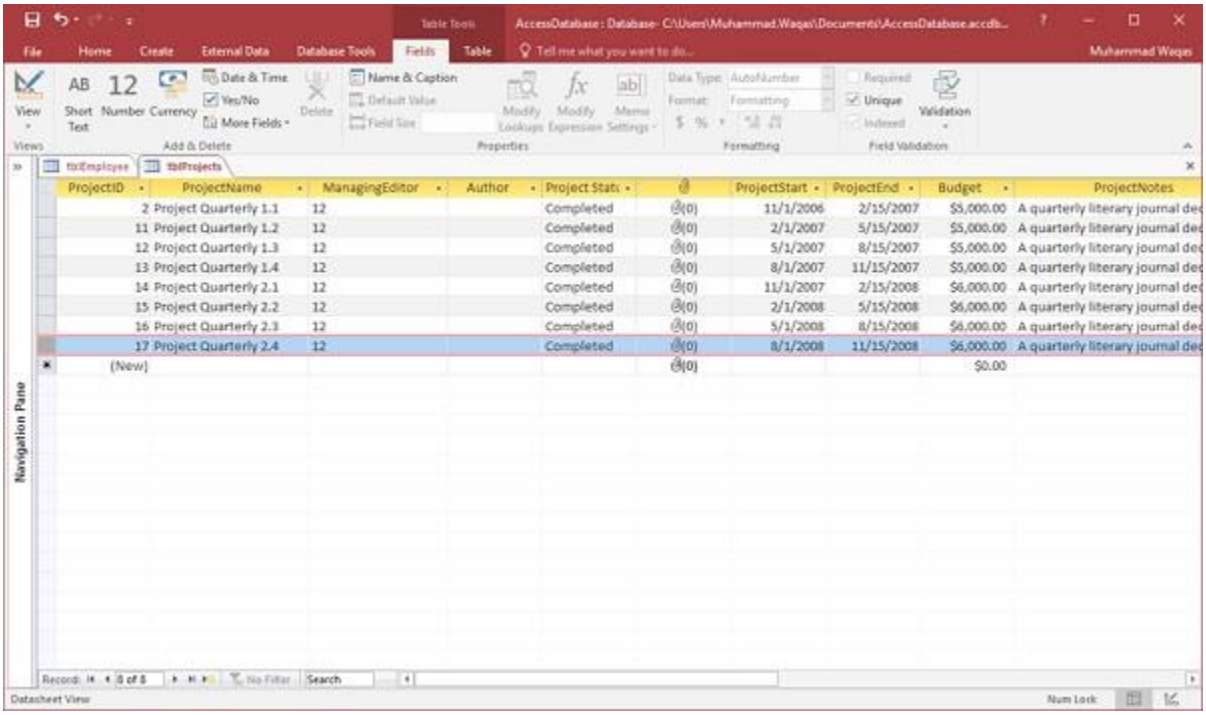
Select the **Views** → **Datasheet** View option in the ribbon and add some data as shown in the following screenshot.



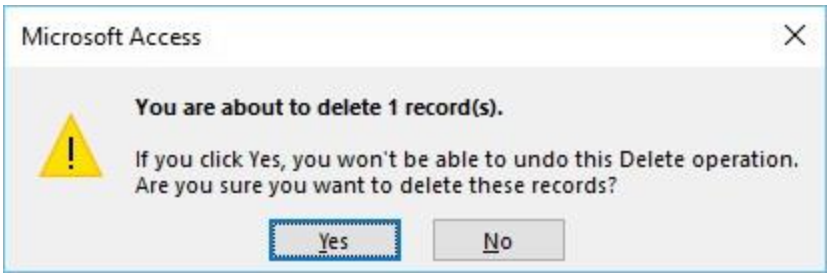
Similarly, add some data in the second table as well as shown in the following screenshot.



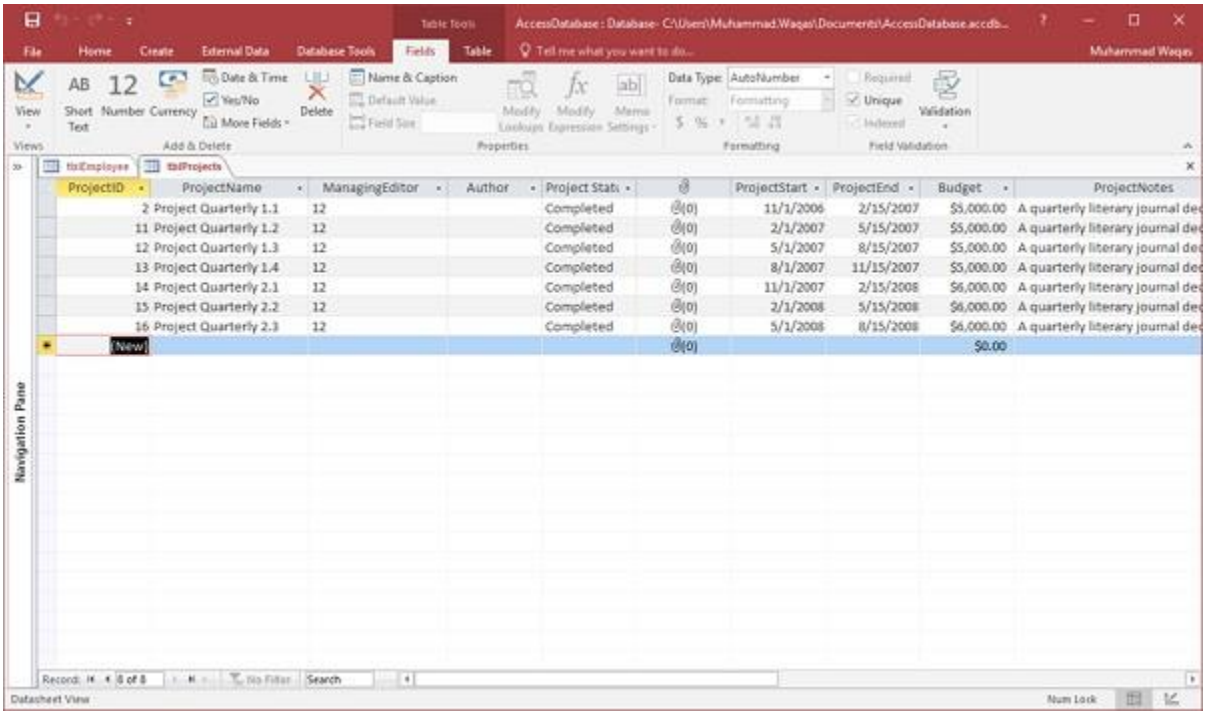
You can now see that inserting a new data and updating the existing data is very simple in Datasheet View as working in spreadsheet. But if you want to delete any data you need to select the entire row first as shown in the following screenshot.



Now press the delete button. This will display the confirmation message.



Click **Yes** and you will see that the selected record is deleted now.



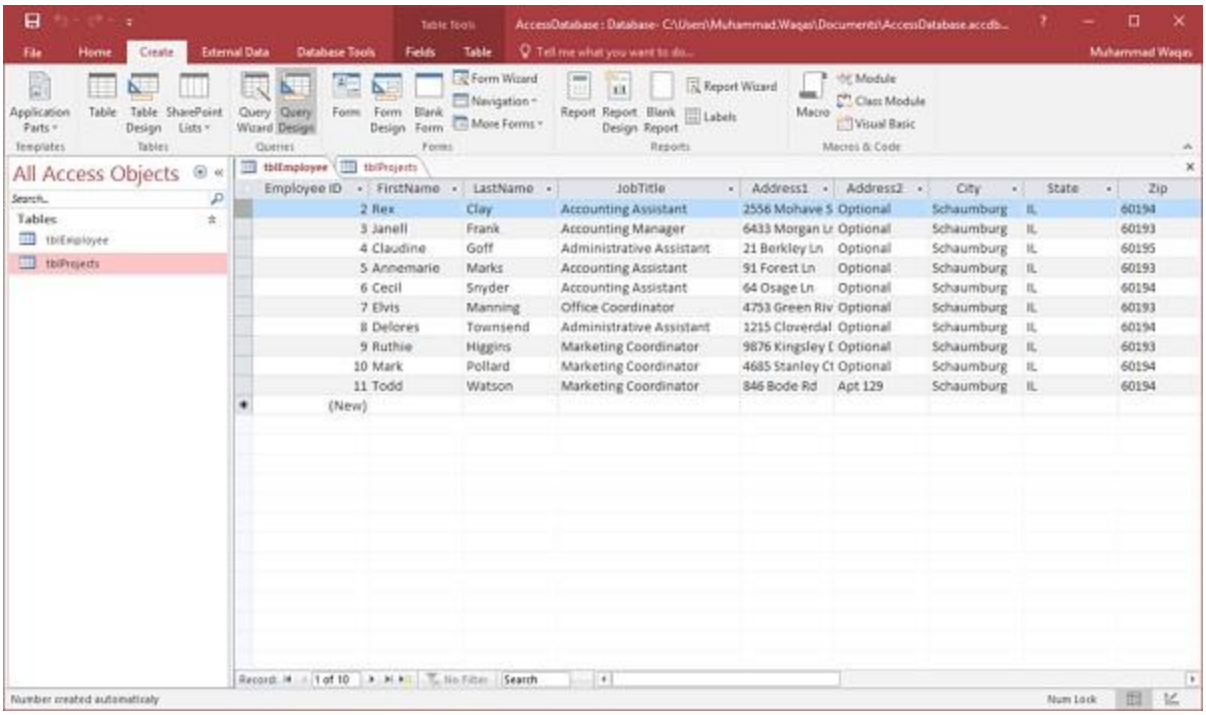
Query Data

A query is a request for data results, and for action on data. You can use a query to answer a simple question, to perform calculations, to combine data from different tables, or even to add, change, or delete table data.

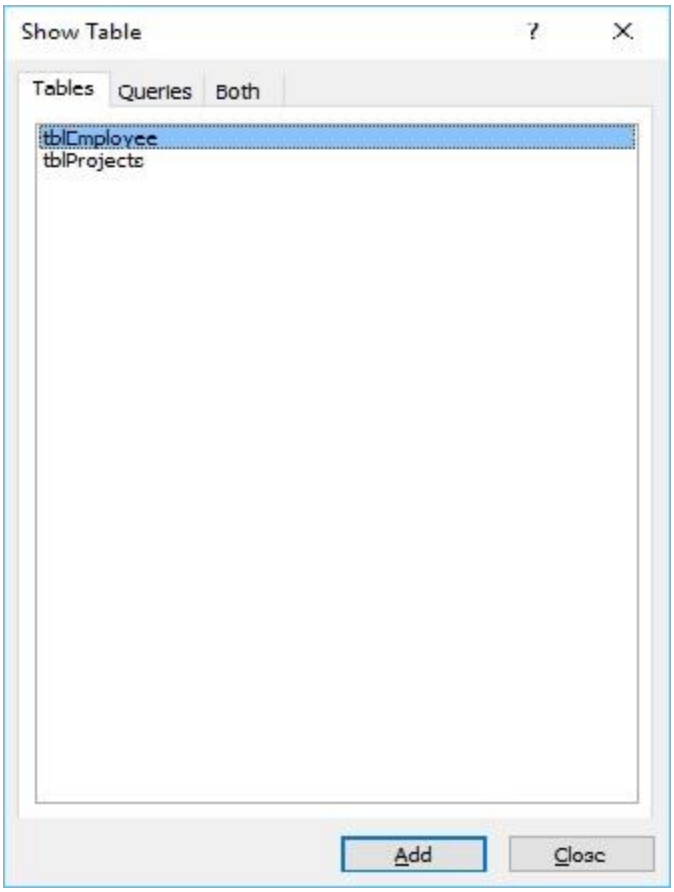
- As tables grow in size they can have hundreds of thousands of records, which makes it impossible for the user to pick out specific records from that table.
- With a query you can apply a filter to the table's data, so that you only get the information that you want.
- Queries that you use to retrieve data from a table or to make calculations are called select queries.
- Queries that add, change, or delete data are called action queries.
- You can also use a query to supply data for a form or report.
- In a well-designed database, the data that you want to present by using a form or report is often located in several different tables.
- The tricky part of queries is that you must understand how to construct one before you can actually use them.

Create Select Query

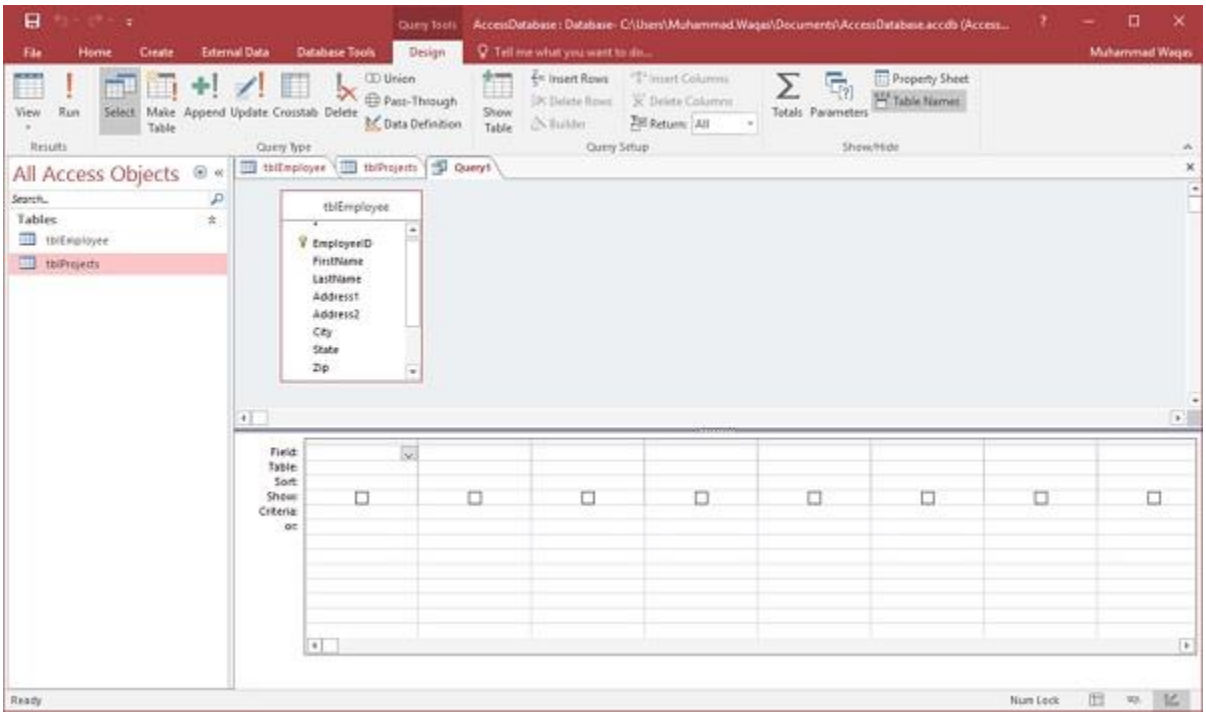
If you want to review data from only certain fields in a table, or review data from multiple tables simultaneously or maybe just see the databased on certain criteria, you can use the **Select** query. Let us now look into a simple example in which we will create a simple query which will retrieve information from **tblEmployees** table. Open the database and click on the **Create** tab.



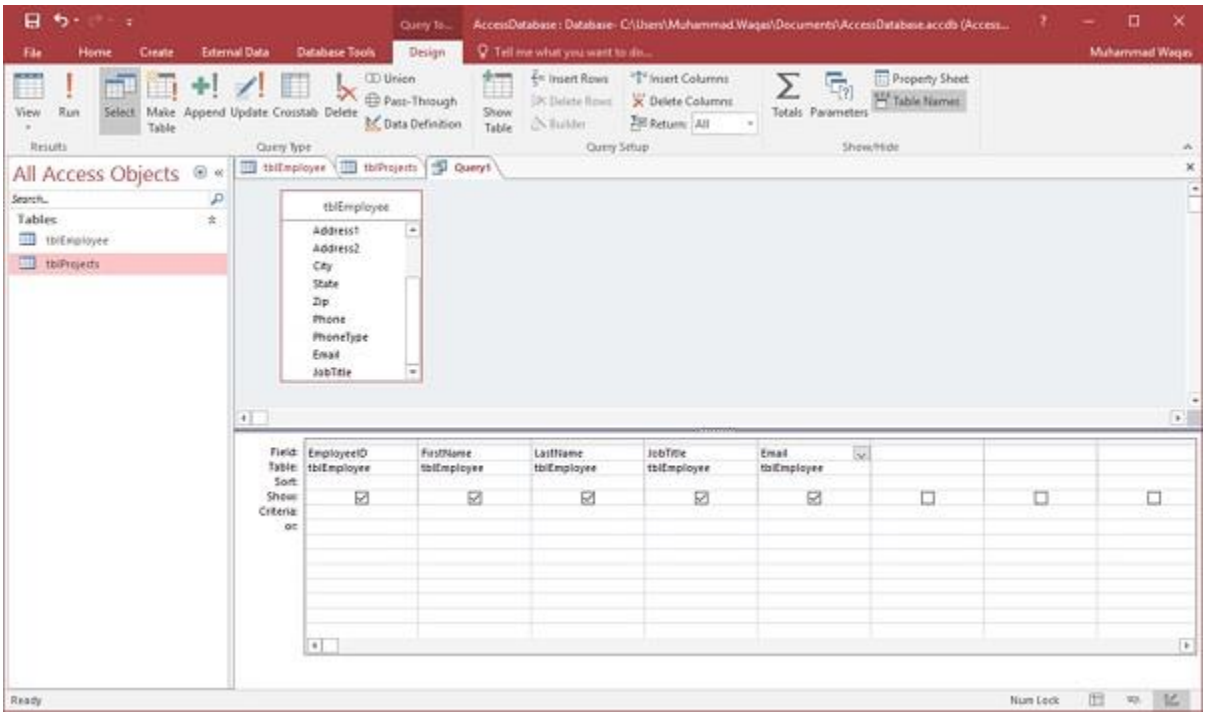
Click **Query Design**.



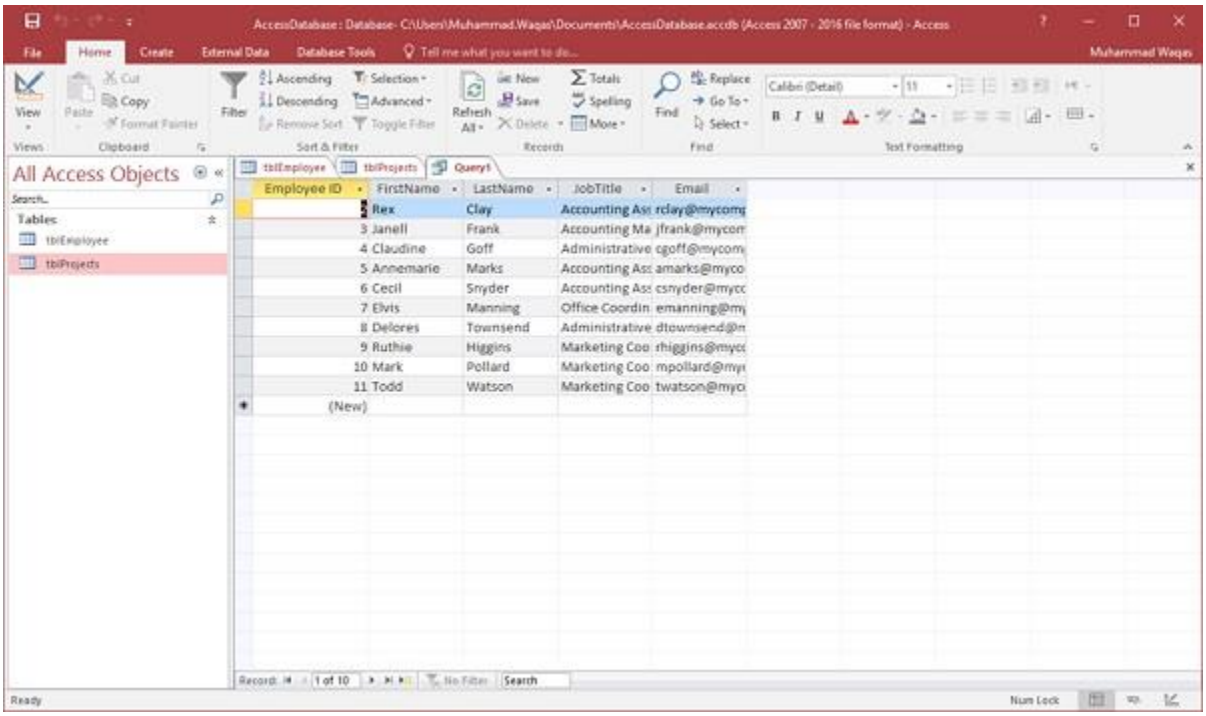
In the **Tables** tab, on the **Show Table** dialog, double-click the **tblEmployees** table and then **Close** the dialog box.



In the tblEmployees table, double-click all those fields which you want to see as result of the query. Add these fields to the query design grid as shown in the following screenshot.



Now click **Run** on the **Design** tab, then click **Run**.



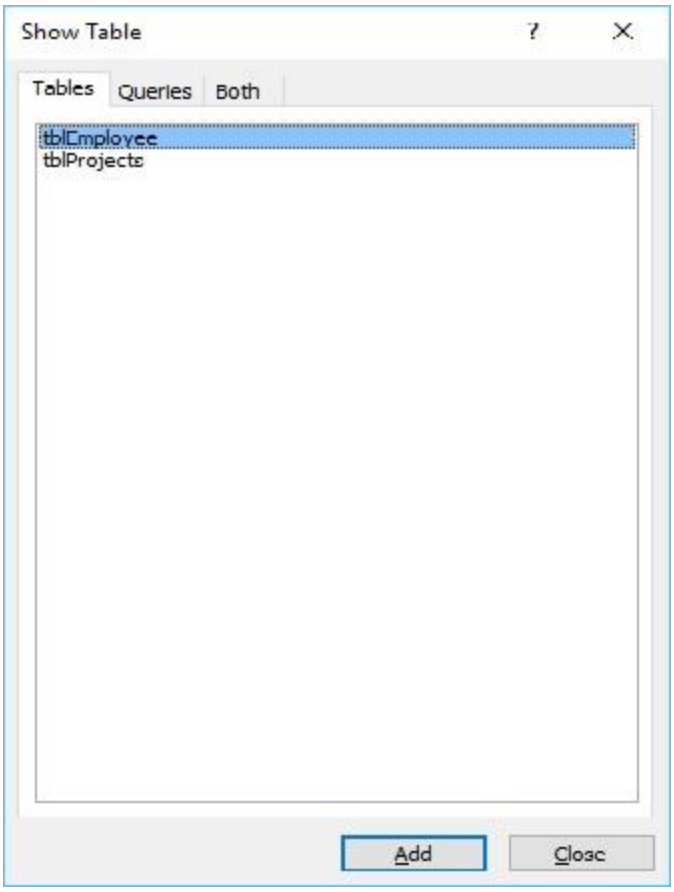
The query runs, and displays only data in those field which is specified in the query.

Query criteria helps you to retrieve specific items from an Access database. If an item matches with all the criteria you enter, it appears in the query results. When you want to limit the results of a query based on the values in a field, you use query criteria.

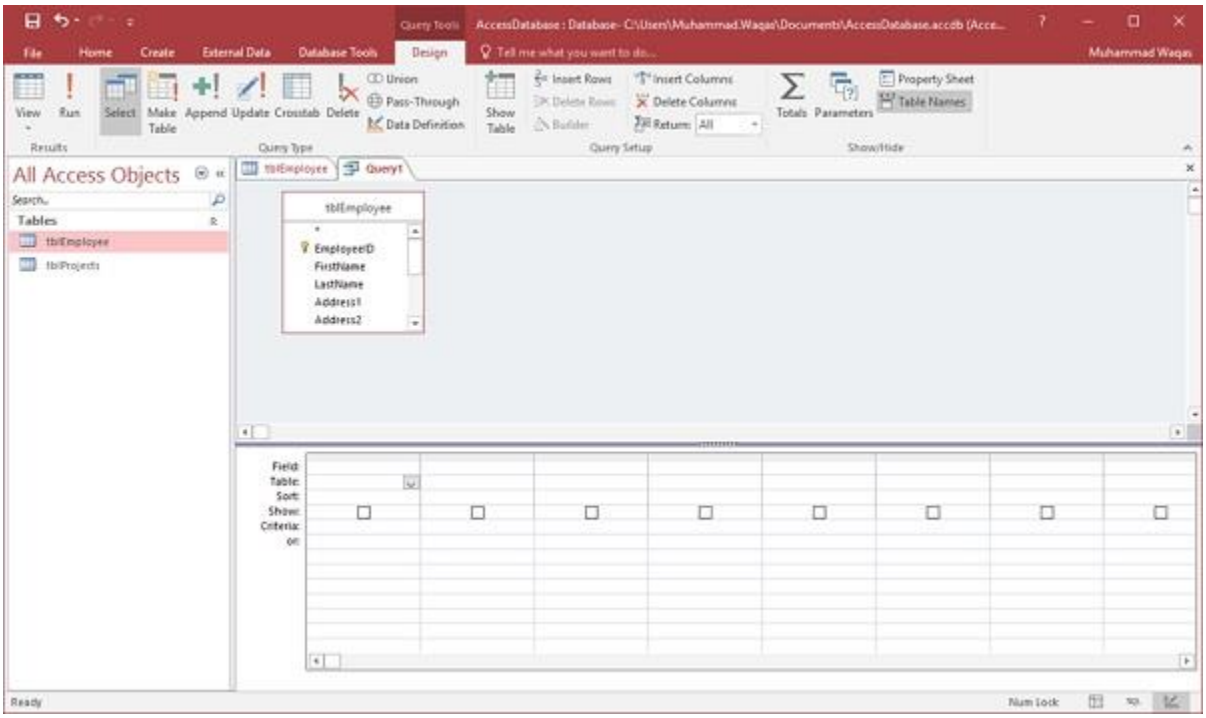
- A query criterion is an expression that Access compares to query field values to determine whether to include the record that contains each value.
- Some criteria are simple, and use basic operators and constants. Others are complex, and use functions, special operators, and include field references.
- To add some criteria to a query, you must open the query in the Design View.
- You then identify the fields for which you want to specify criteria.

Example

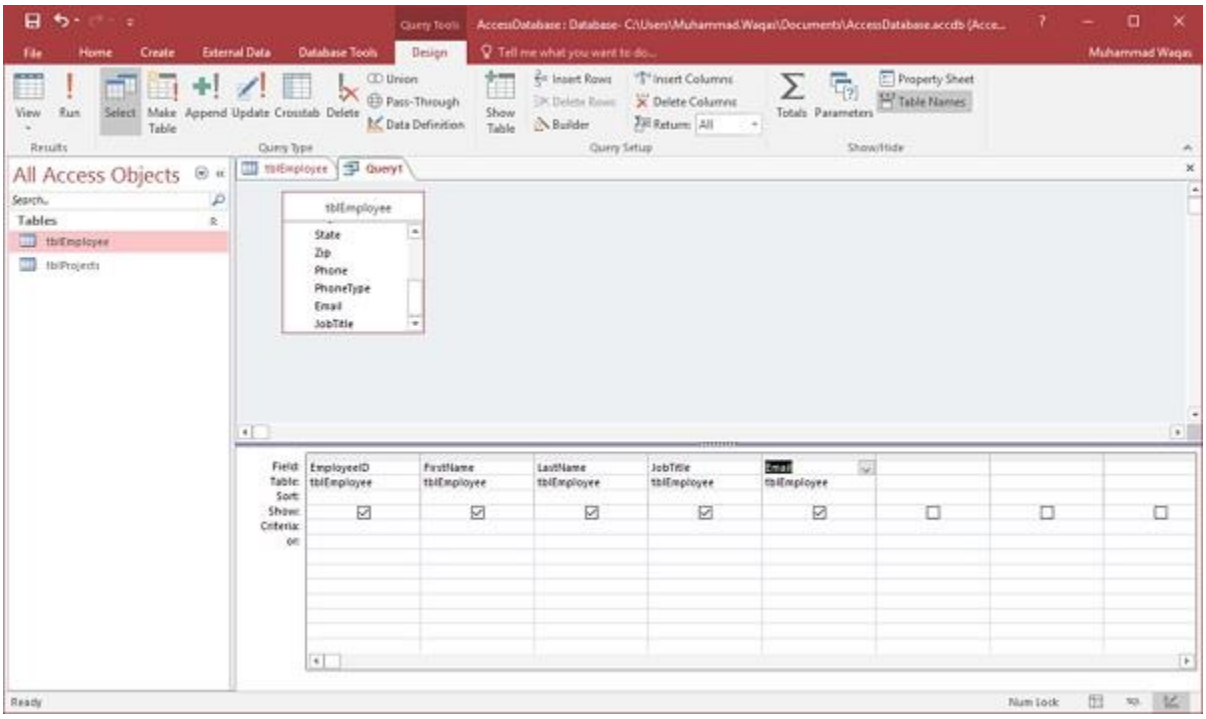
Let's look at a simple example in which we will use criteria in a query. First open your Access database and then go to the Create tab and click on Query Design.



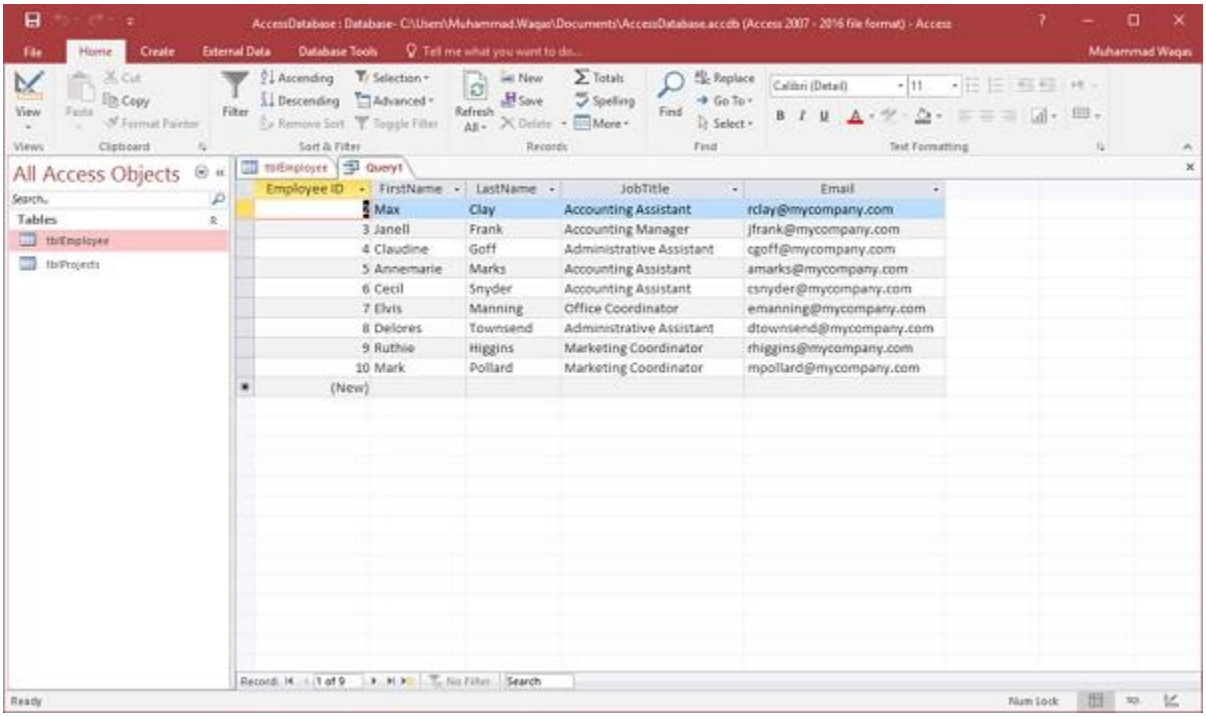
In the Tables tab on Show Table dialog, double-click on the **tblEmployees** table and then close the dialog box.



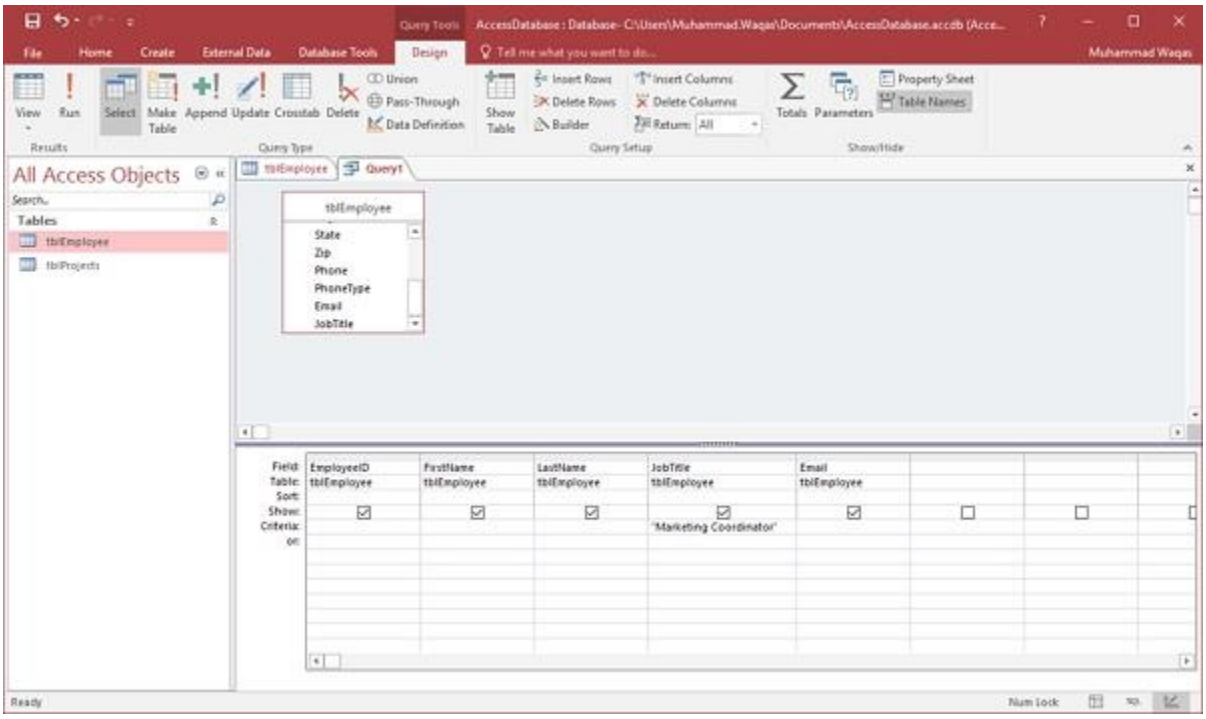
Let us now add some field to the query grid such as EmployeeID, FirstName, LastName, JobTitle and Email as shown in the following screenshot.



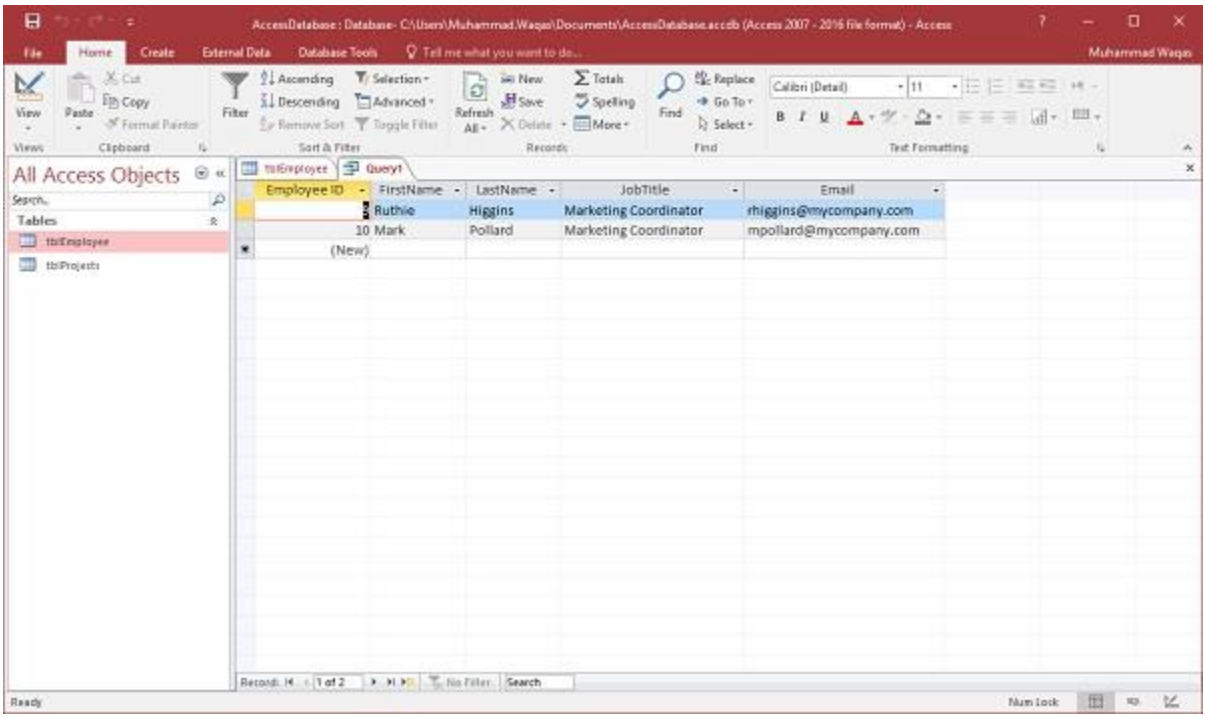
Let us now run your query and you will see only these fields as query result.



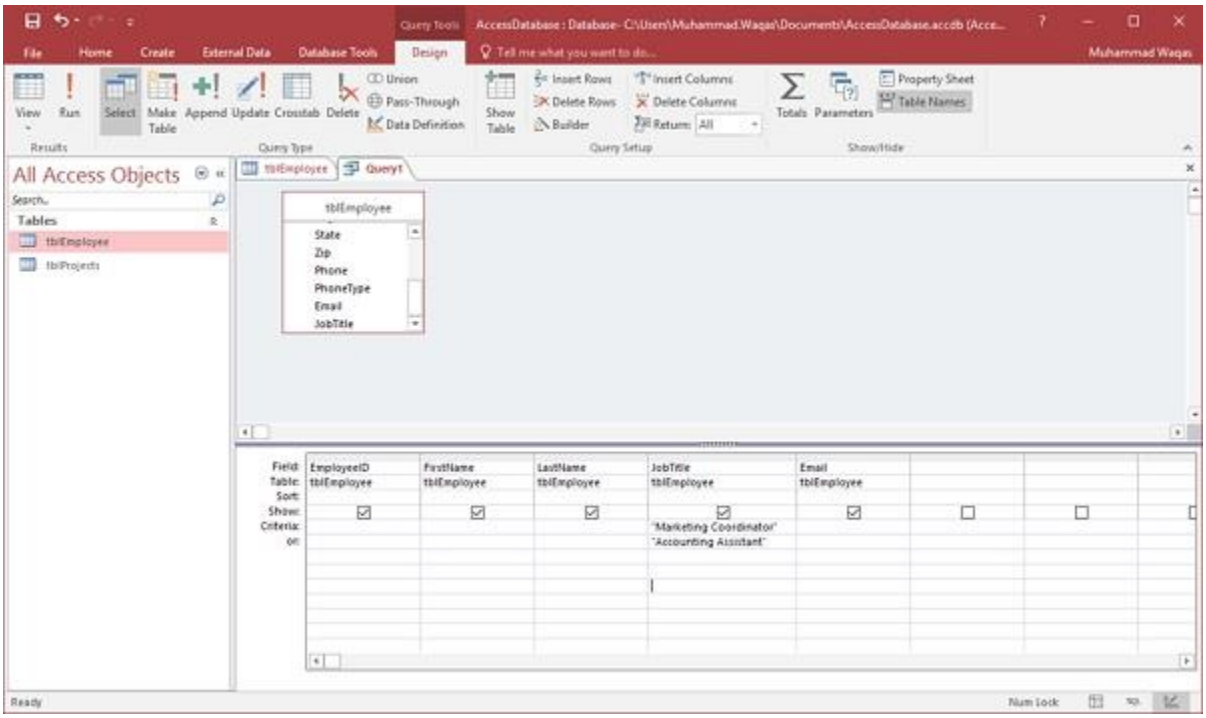
If you want to see only those whose JobTitle are Marketing Coordinator then you will need to add the criteria for that. Let's go to the Query Design again and in Criteria row of JobTitle enter Marketing Coordinator.



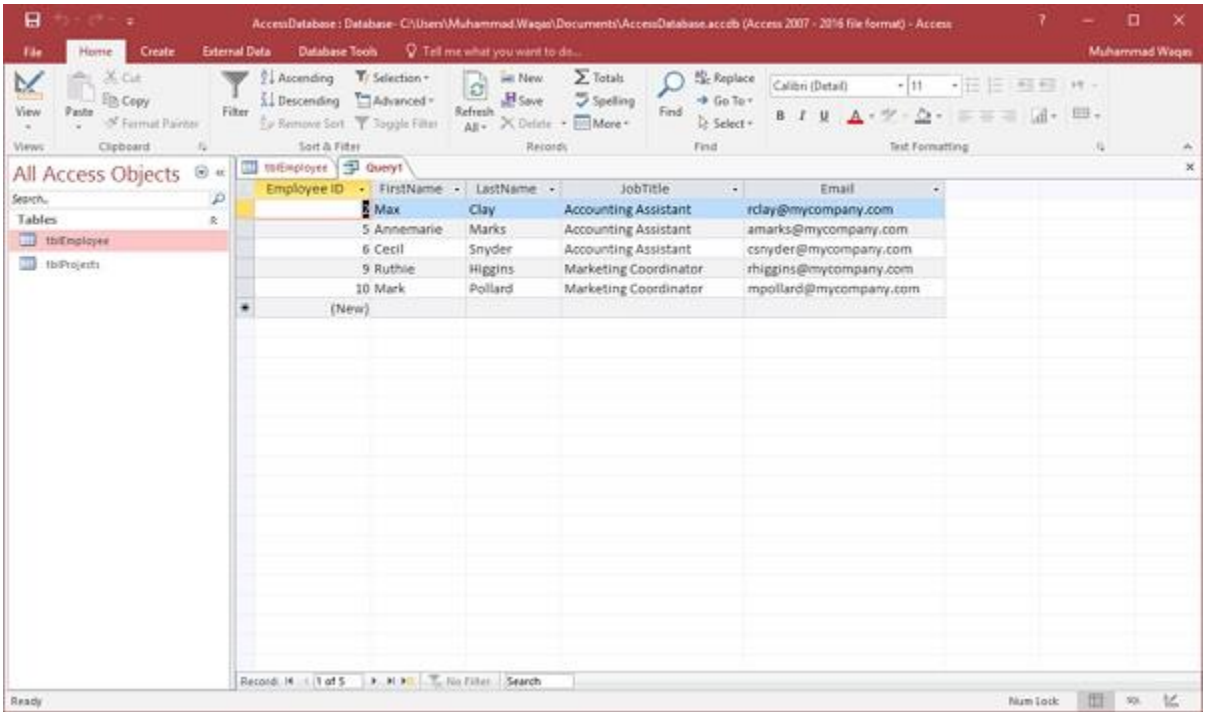
Let us now run your query again and you will see that only Job title of Marketing Coordinators are retrieved.



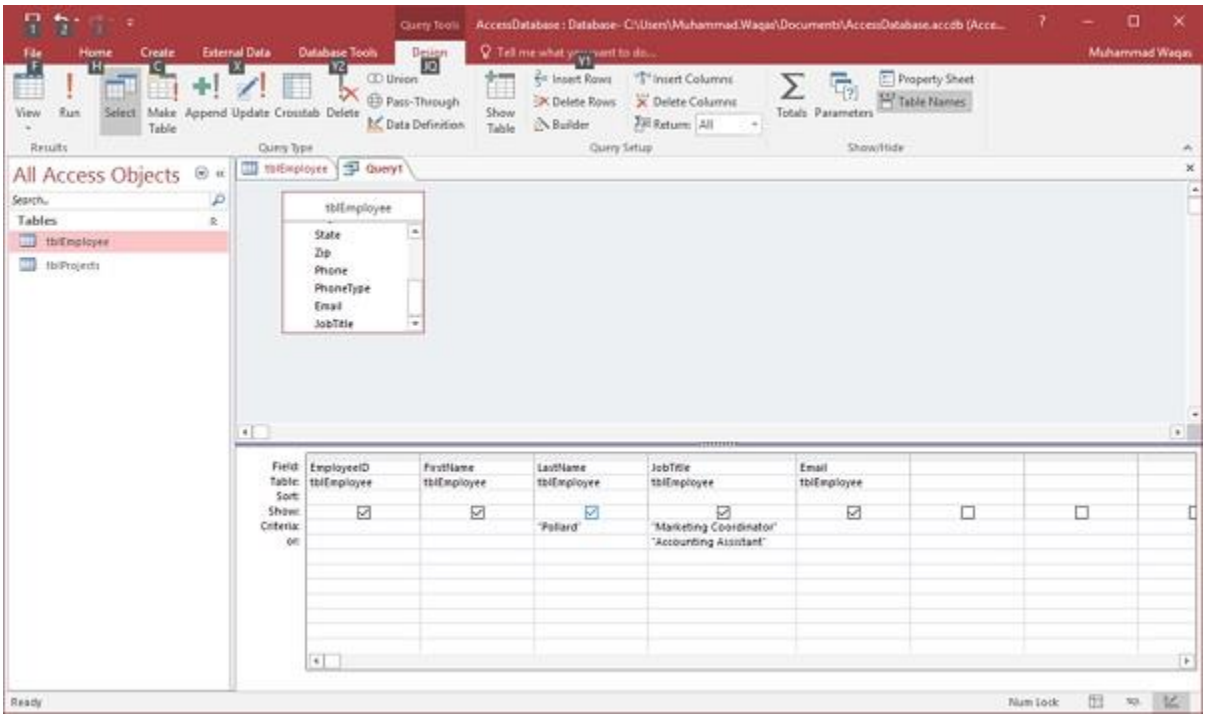
If you want to add criteria for multiple fields, just add the criteria in multiple fields. Let us say we want to retrieve data only for “Marketing Coordinator” and “Accounting Assistant”; we can specify the OR row operator as shown in the following screenshot –



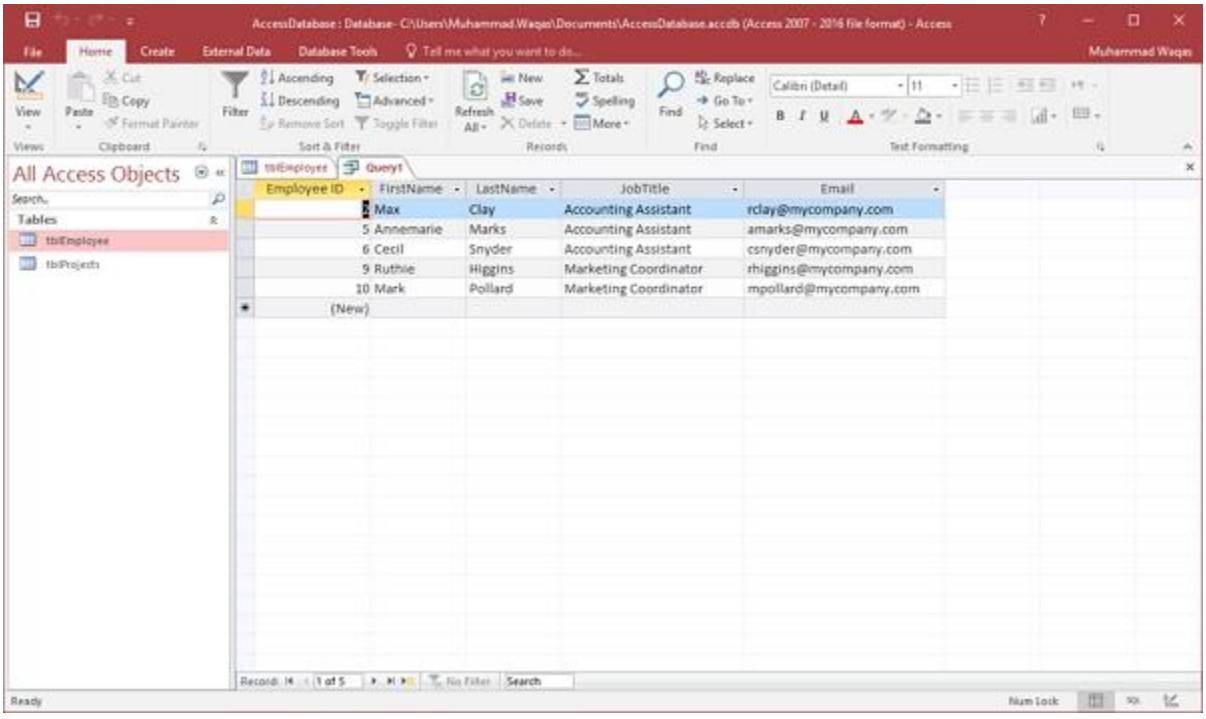
Let us now run your query again and you will see the following results.



If you need to use the functionality of the **AND** operator, then you have to specify the other condition in the Criteria row. Let us say we want to retrieve all Accounting Assistants but only those Marketing Coordinator titles with “Pollard” as last name.



Let us now run your query again and you will see the following results.



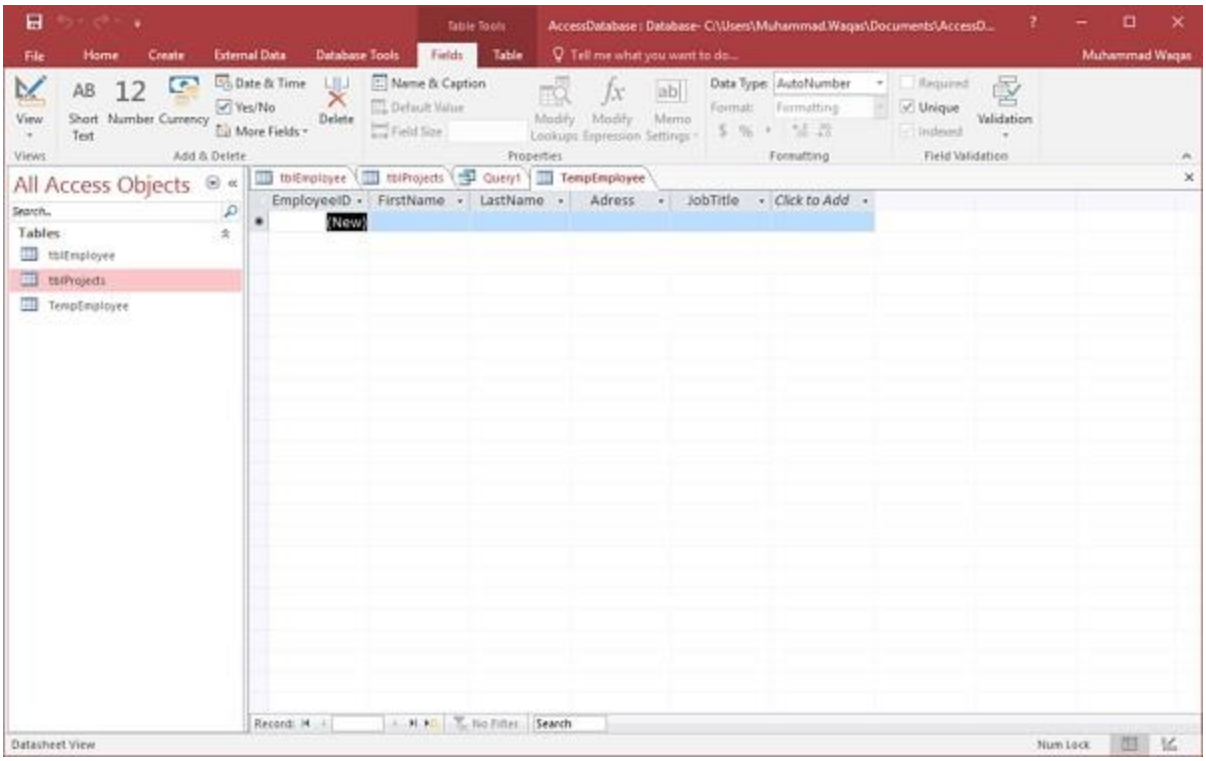
In MS Access and other DBMS systems, queries can do a lot more than just displaying data, but they can actually perform various actions on the data in your database.

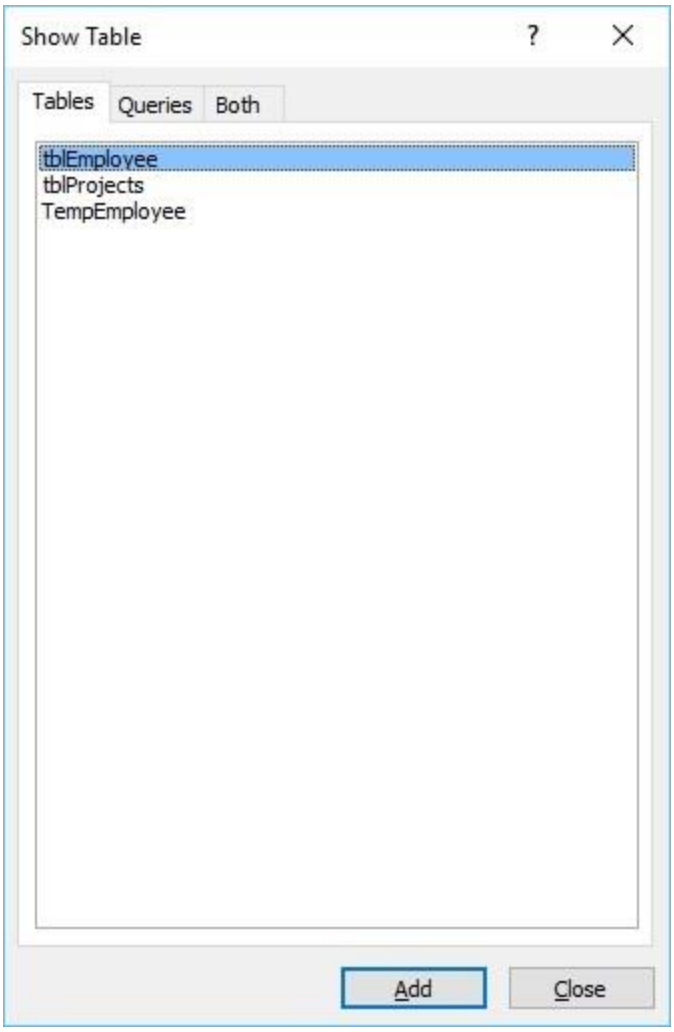
- Action queries are queries that can add, change, or delete multiple records at one time.
- The added benefit is that you can preview the query results in Access before you run it.
- Microsoft Access provides 4 different types of Action Queries –
    - Append
    - Update
    - Delete
    - Make-table
- An action query cannot be undone. You should consider making a backup of any tables that you will update by using an update query.

Create an Append Query

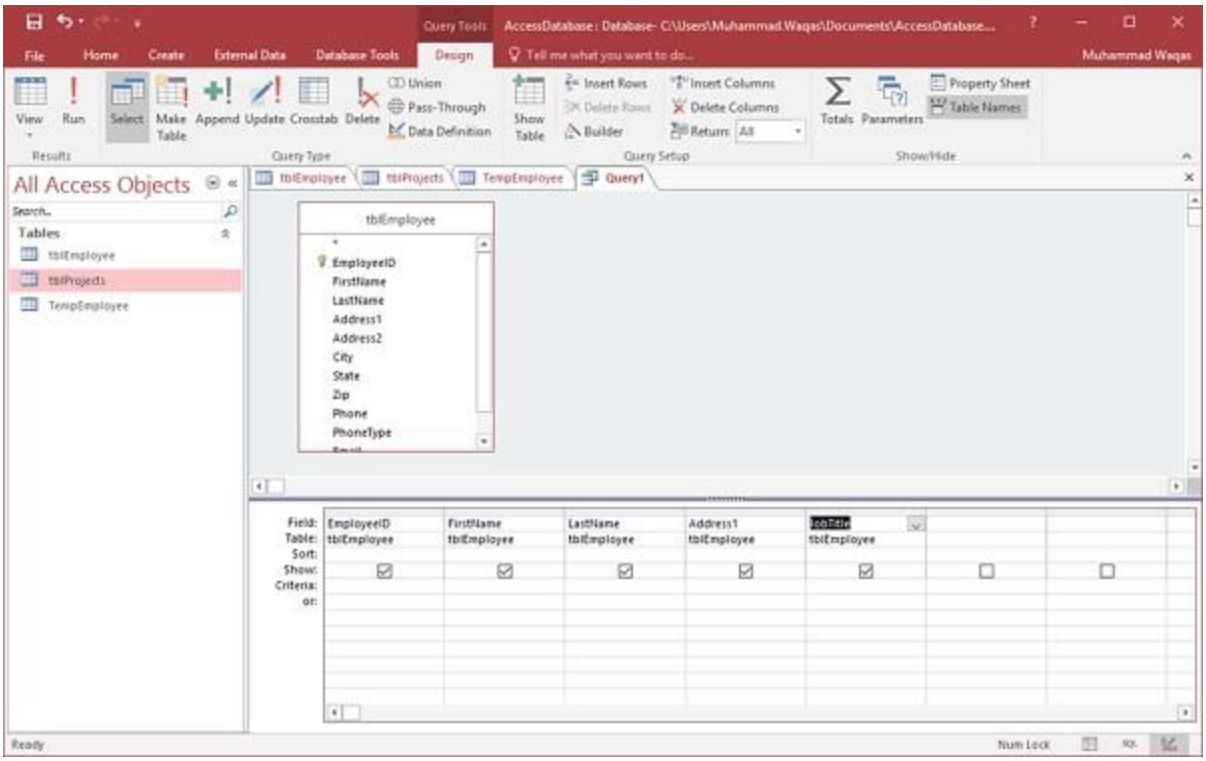
You can use an Append Query to retrieve data from one or more tables and add that data to another table. Let us create a new table in which we will add data from the **tblEmployees** table. This will be temporary table for demo purpose.

Let us call it **TempEmployees** and this contains the fields as shown in the following screenshot.

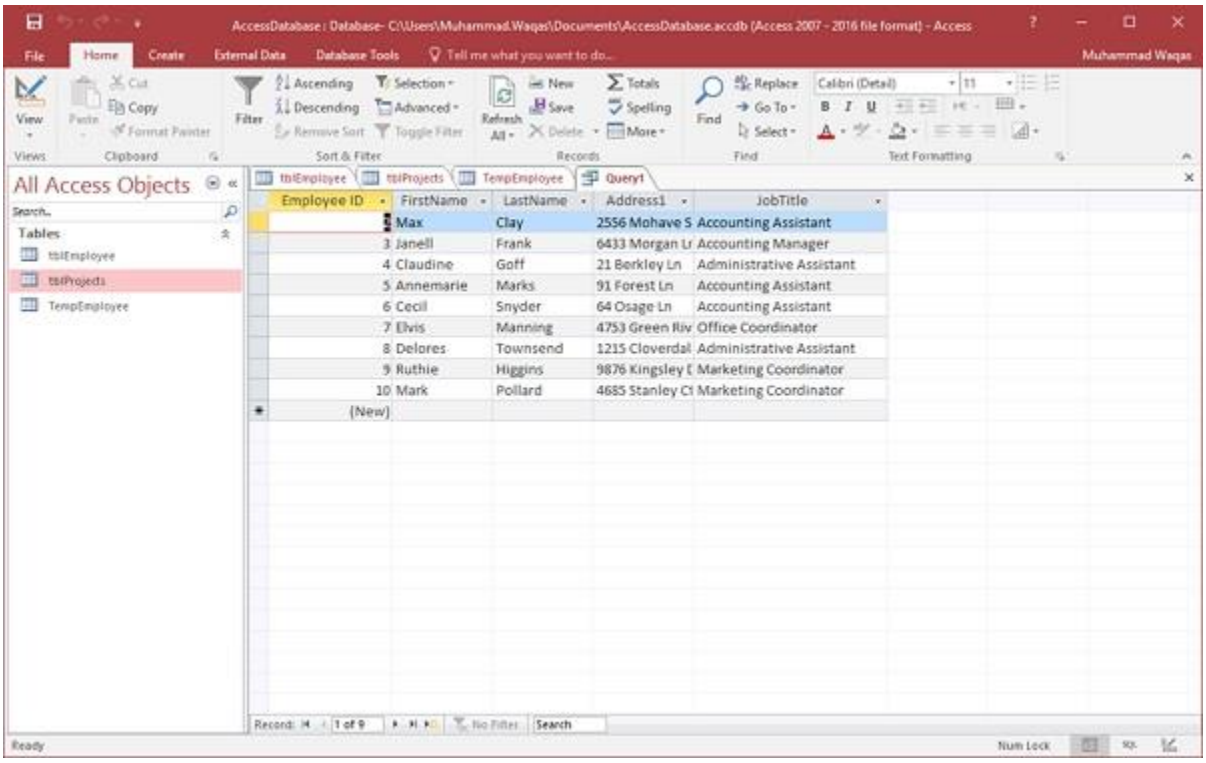

AccessDatabase : Database- C:\Users\Muhammad.Waqas\Documents\AccessD...
File
Home
Create
External Data
Database Tools
Fields
Table
Tell me what you want to do...
Muhammad Waqas
View
Short Text
Number
Currency
Date & Time
Yes/No
More Fields
Delete
Name & Caption
Default Value
Field Size
Modify Lookups
Modify Expression
Memo Settings
Data Type: AutoNumber
Format:
Formatting
Required
Unique
Indexed
Validation
Views
Add & Delete
Properties
Formatting
Field Validation
All Access Objects
Search...
Tables
tblEmployee
tblProjects
TempEmployee
tblEmployee
tblProjects
Query1
TempEmployee
EmployeeID
FirstName
LastName
Adress
JobTitle
Click to Add
(New)
Record:
No Filter
Search
Datasheet View
Num Lock



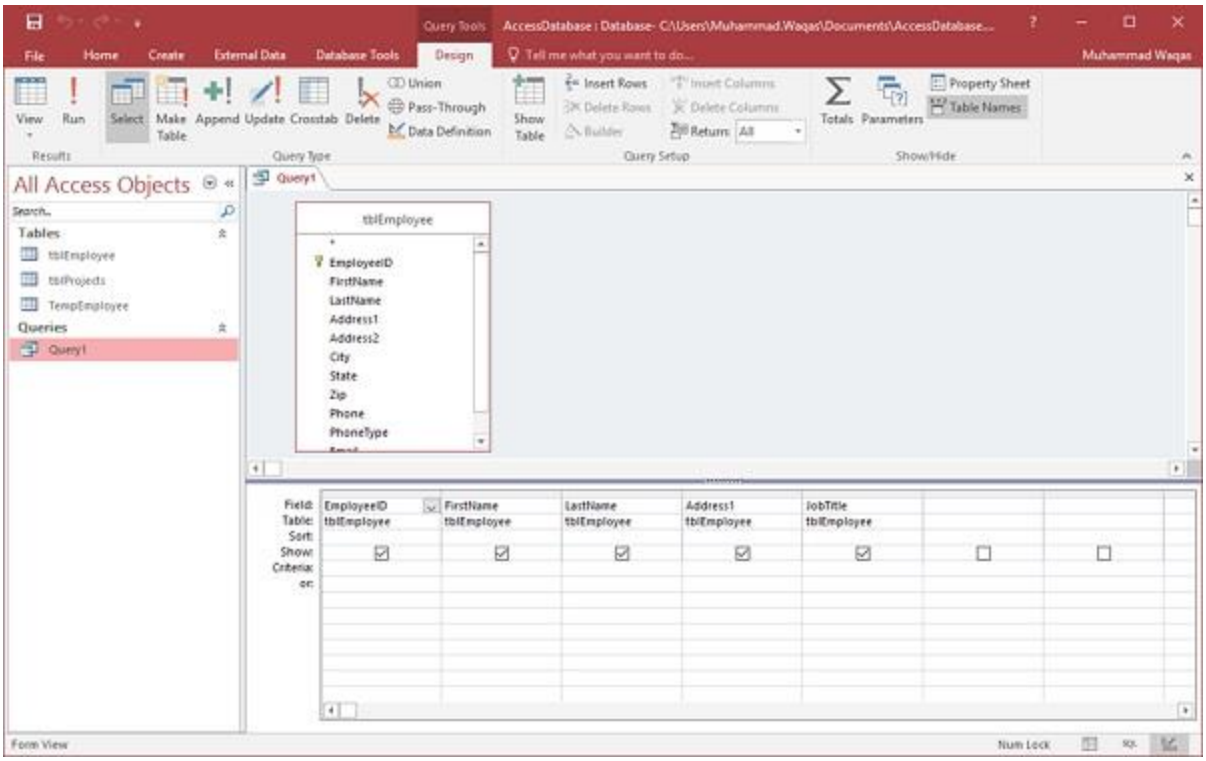
In the **Tables** tab, on the Show Table dialog box, double-click on the **tblEmployees** table and then close the dialog box. Double-click on the field you want to be displayed.



Let us run your query to display the data first.

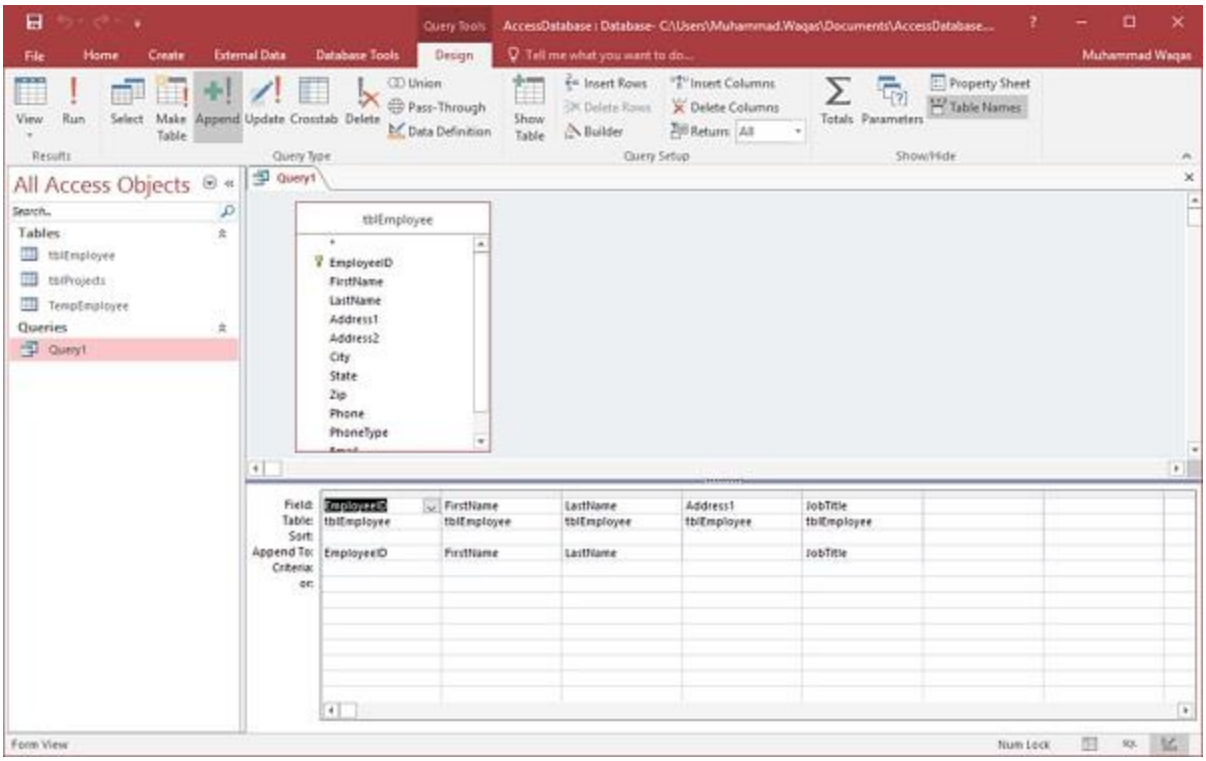


Now let us go back to Query design and select the **Append** button.

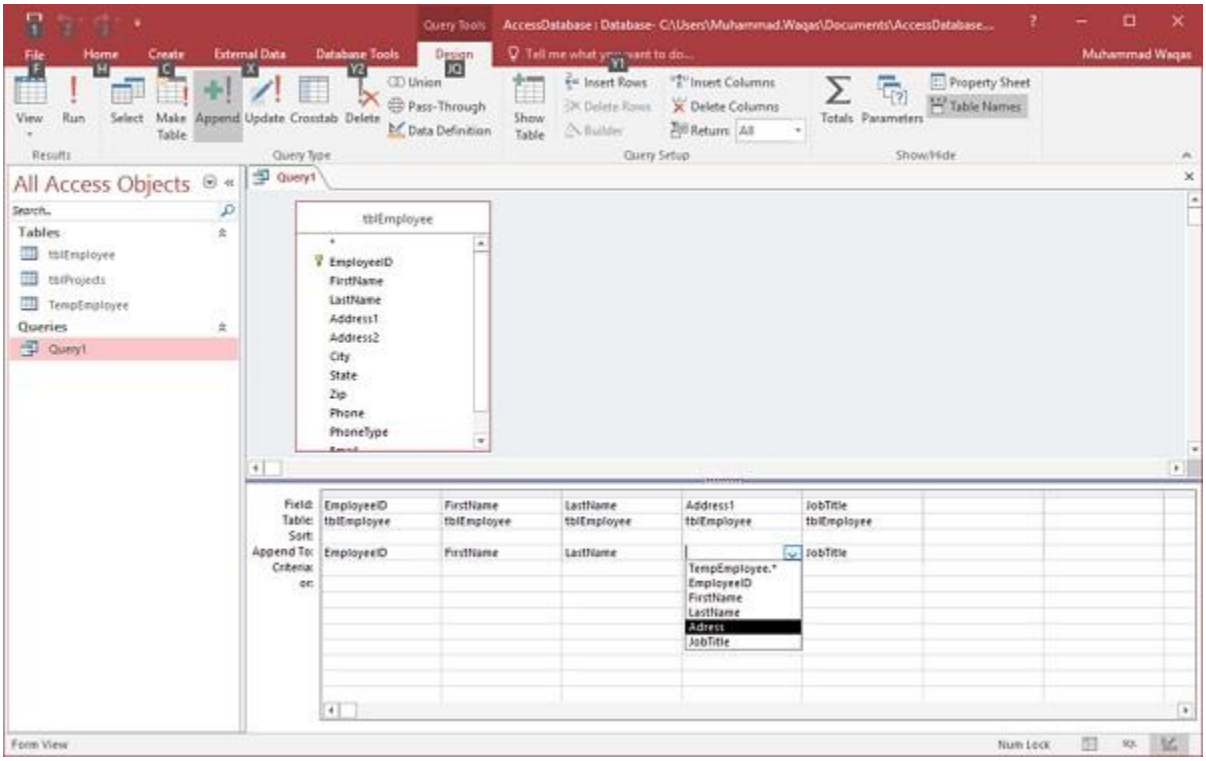


In the Query Type, select the Append option button. This will display the following dialog box.

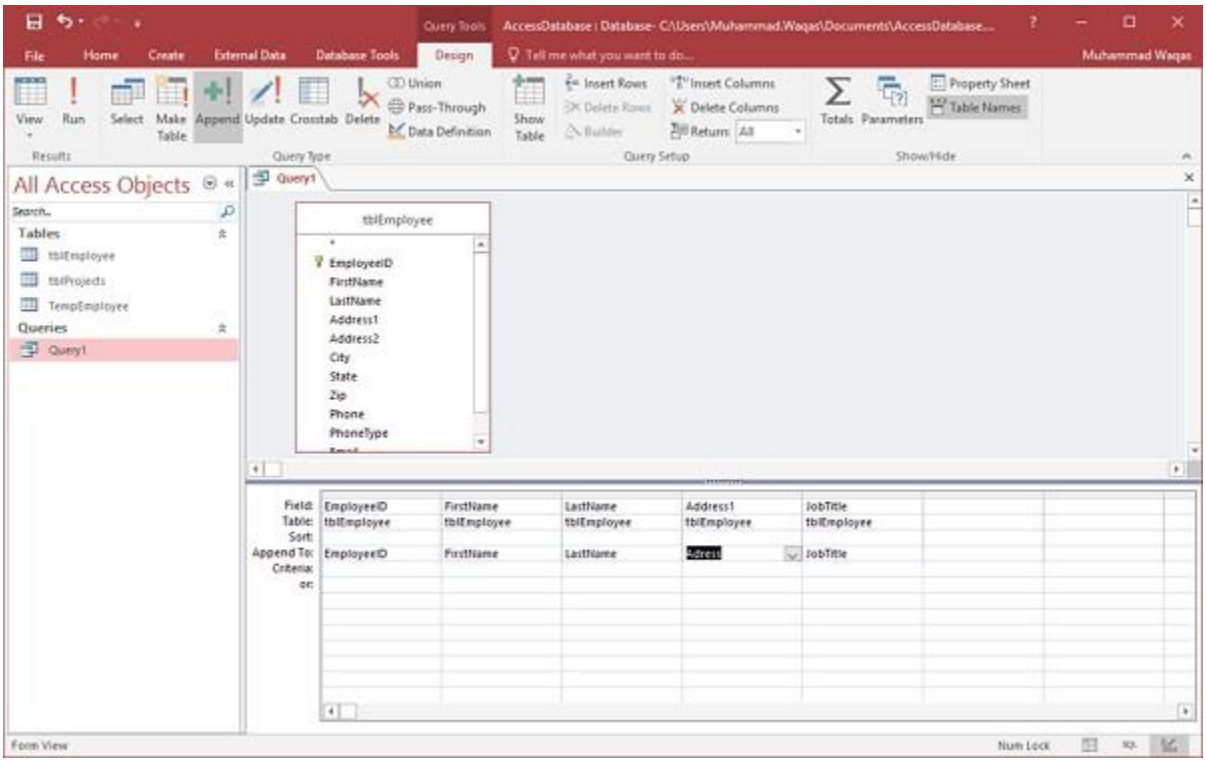
Select the table name from the drop-down list and click Ok.



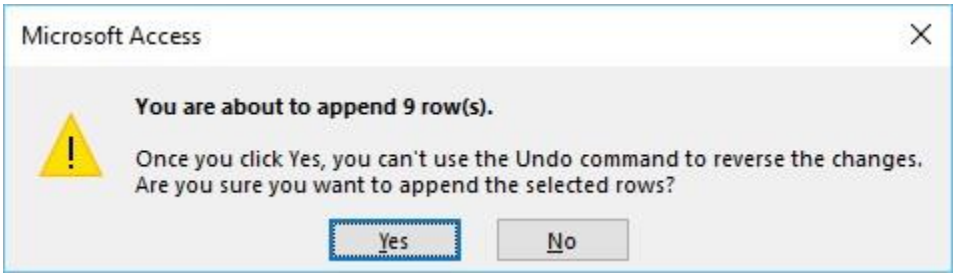
In the Query grid, you can see that in the **Append To** row all the field are selected by default except **Address1**. This because that Address1 field is not available in the **TempEmployee** table. So, we need to select the field from the drop-down list.



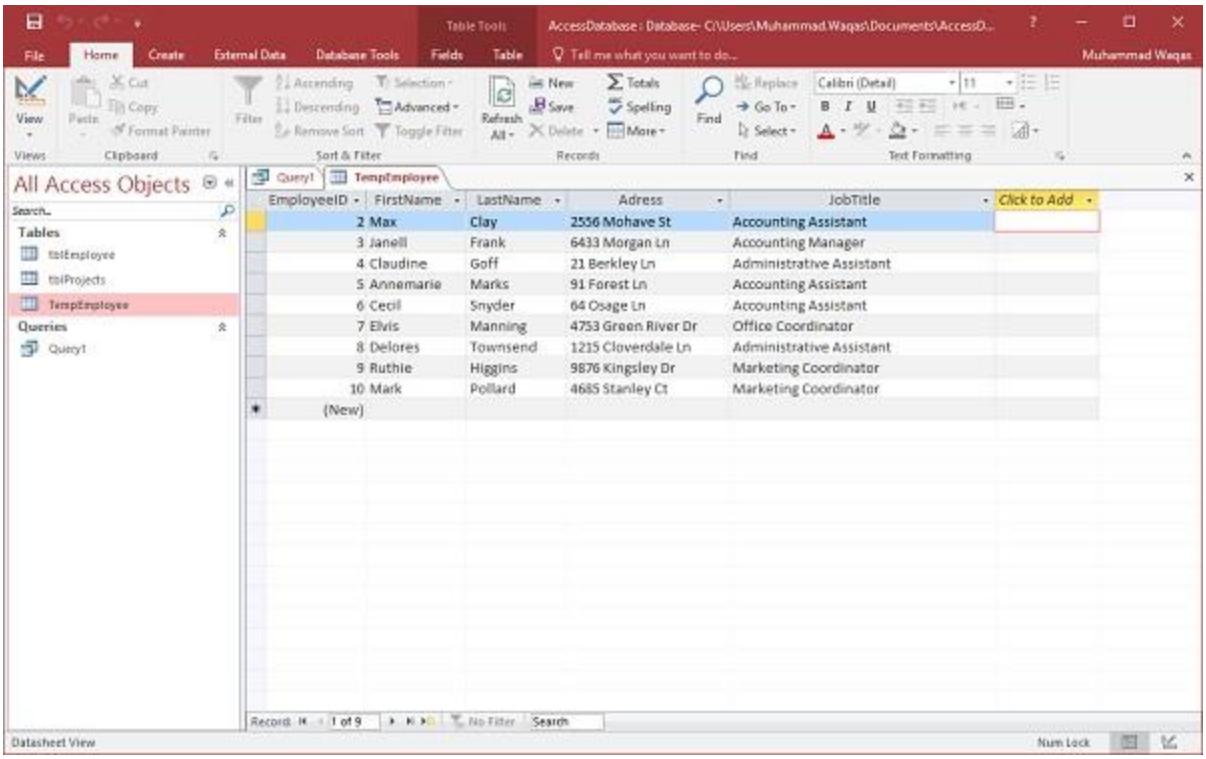
Let us look into the Address field.



Let us now run your query and you will see the following confirmation message.



Click **Yes** to confirm your action.

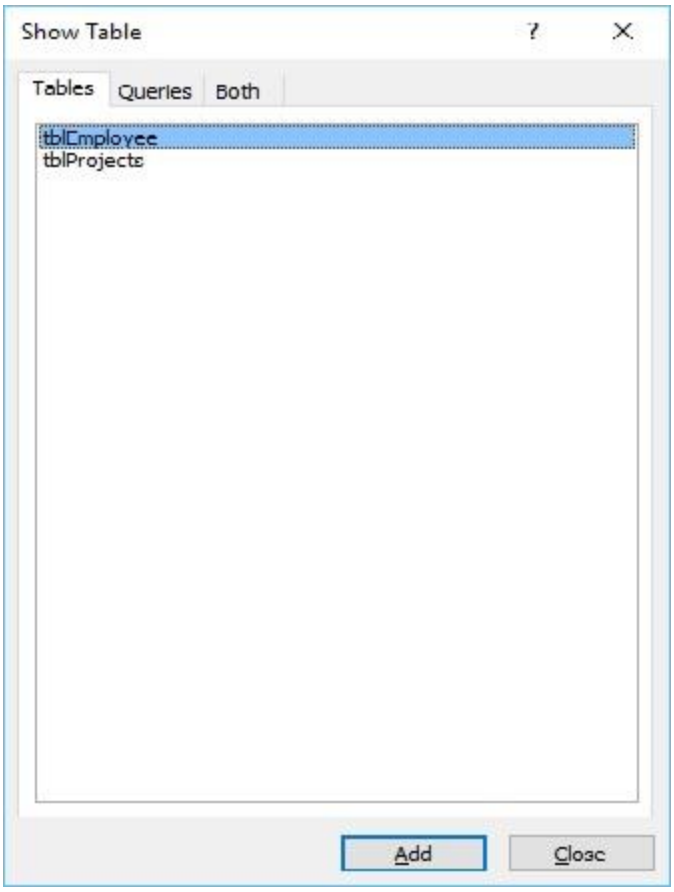


When you open the **TempEmployee** table, you will see all the data is added from the tblEmployees to the TempEmployee table.

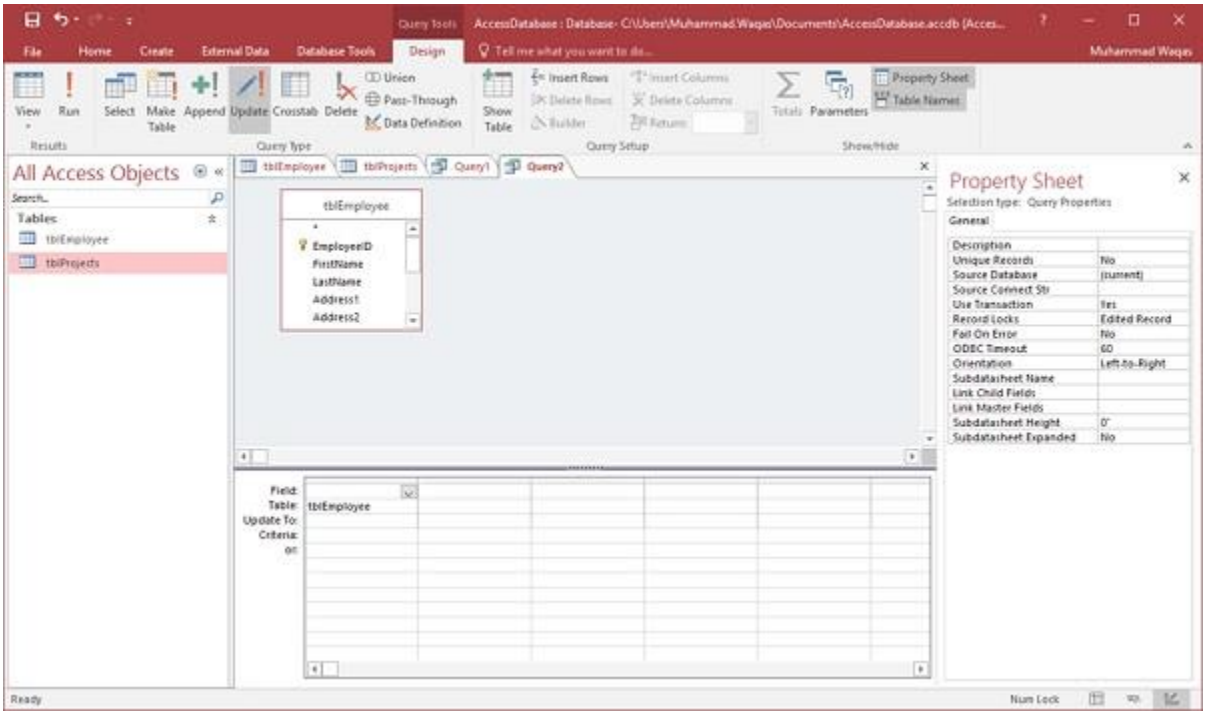
Let us understand how to create queries in this chapter.

Create an Update Query

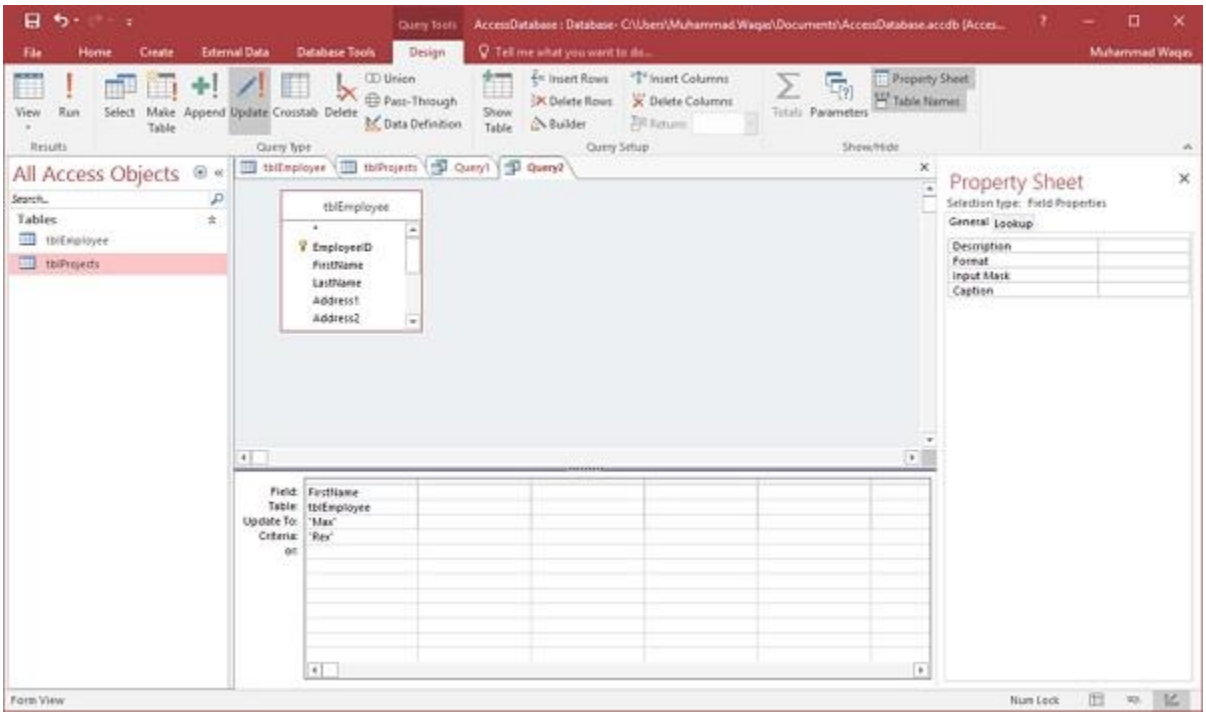
You can use an Update Query to change the data in your tables, and you can use an update query to enter criteria to specify which rows should be updated. An update query provides you an opportunity to review the updated data before you perform the update. Let us go to the Create tab again and click Query Design.



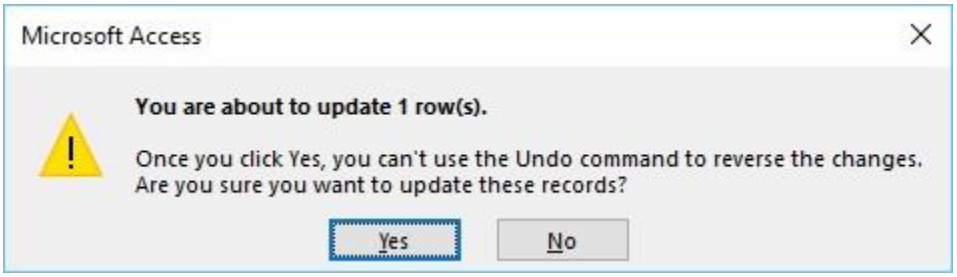
In the Tables tab, on the Show Table dialog box, double-click on the **tblEmployees** table and then close the dialog box.



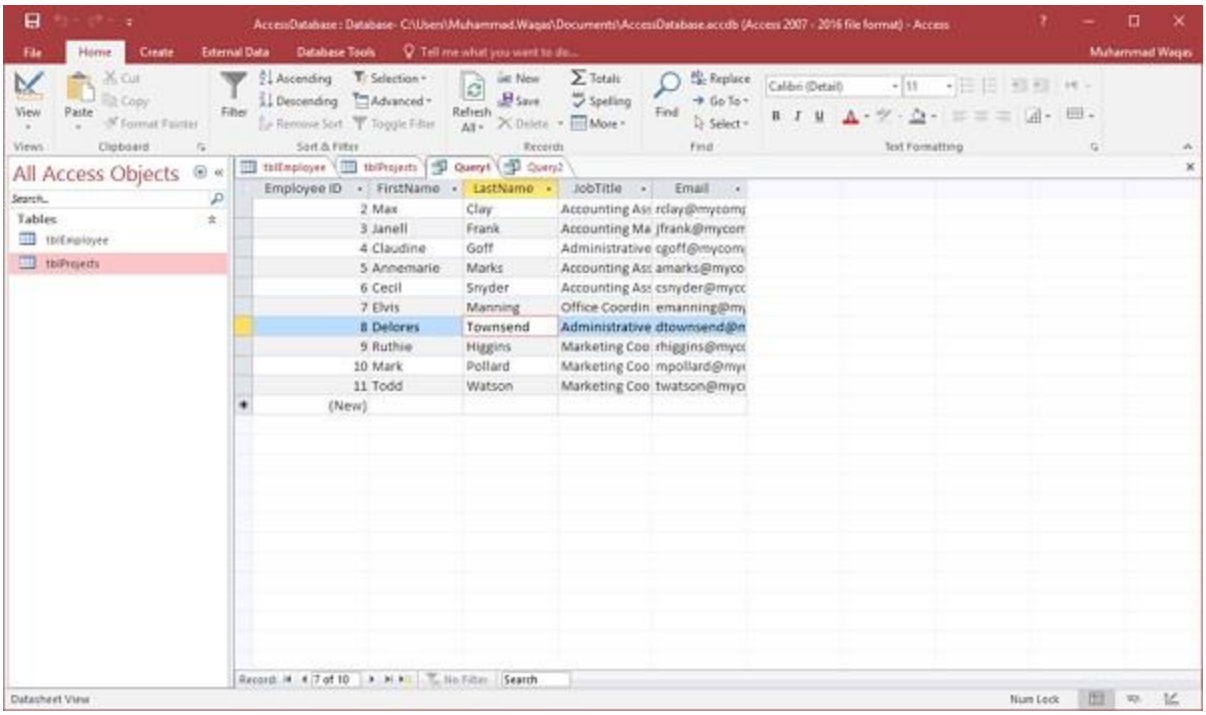
On the **Design** tab, in the Query Type group, click Update and double-click on the field in which you want to update the value. Let us say we want to update the FirstName of “Rex” to “Max”.



In the **Update** row of the **Design** grid, enter the updated value and in Criteria row add the original value which you want to be updated and run the query. This will display the confirmation message.

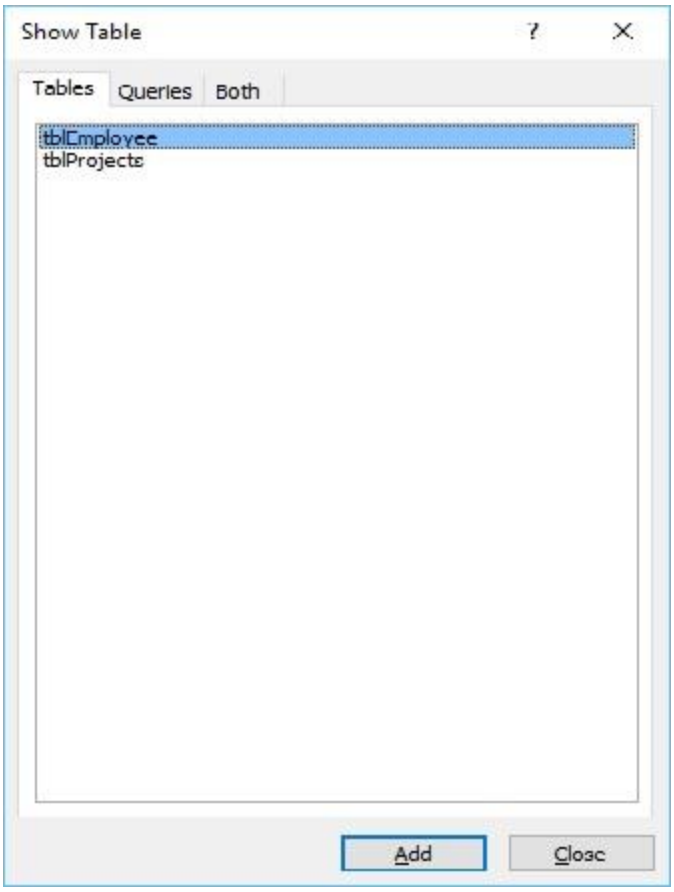


Click **Yes** and go to Datasheet View and you will see the first record — FirstName is updated to “Max” now.

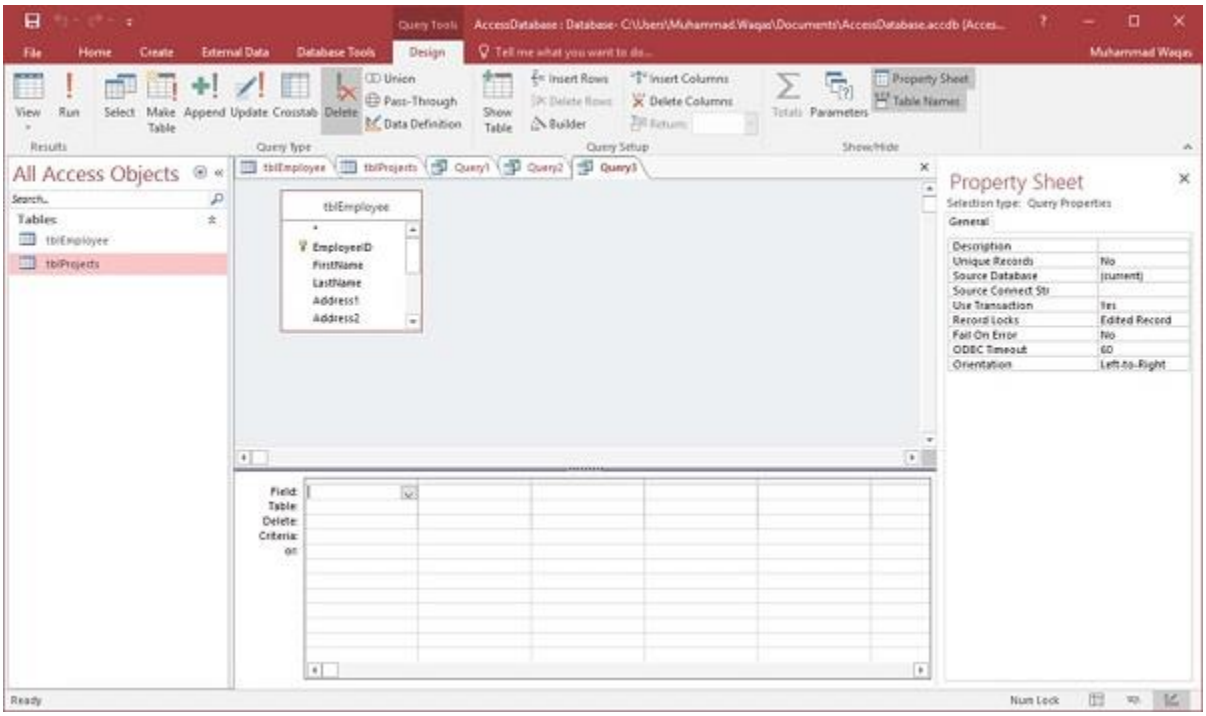


Create a Delete Query

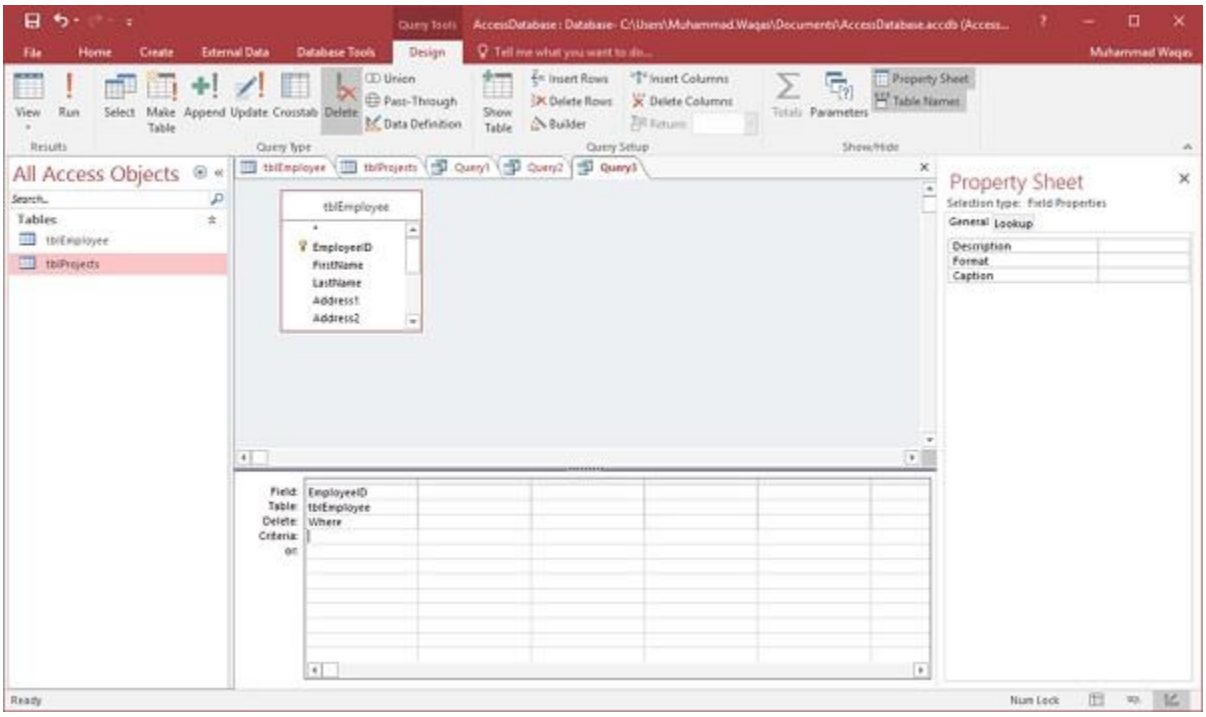
You can use a delete query to delete data from your tables, and you can use a delete query to enter criteria to specify which rows should be deleted. A Delete Query provides you an opportunity to review the rows that will be deleted before you perform the deletion. Let us go to the **Create** tab again and click **Query Design**.



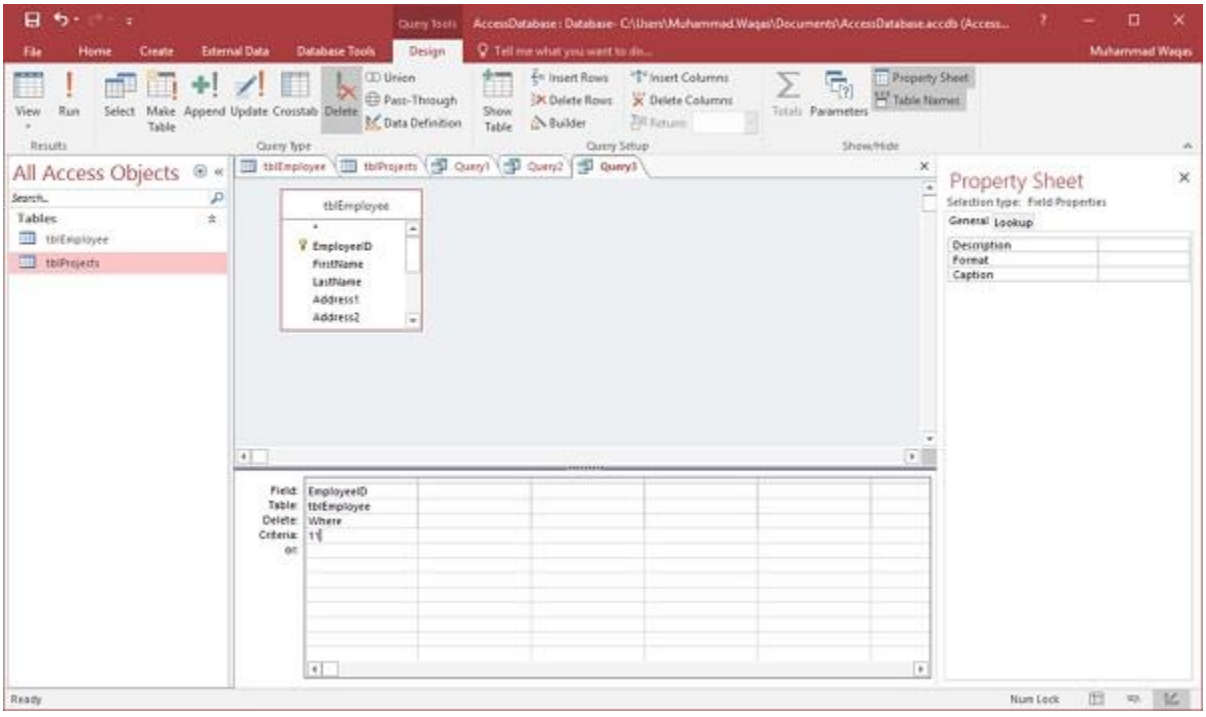
In the Tables tab on the Show Table dialog box, double-click the **tblEmployees** table and then close the dialog box.



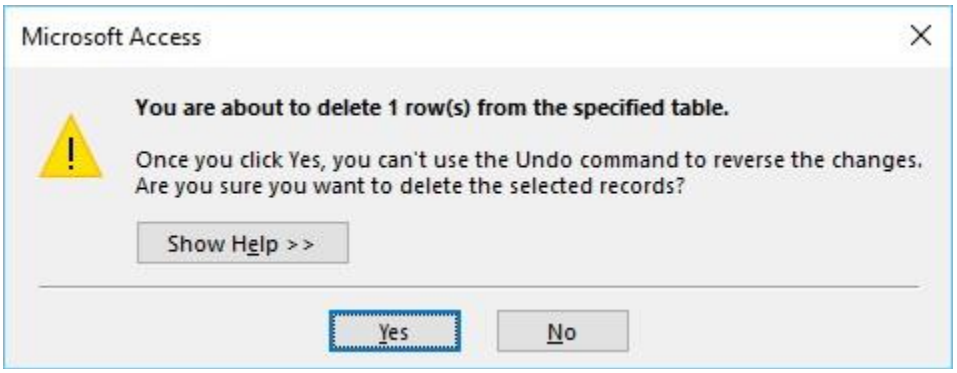
On the **Design** tab, in the **Query Type** group, click **Delete** and double-click on the **EmployeeID**.



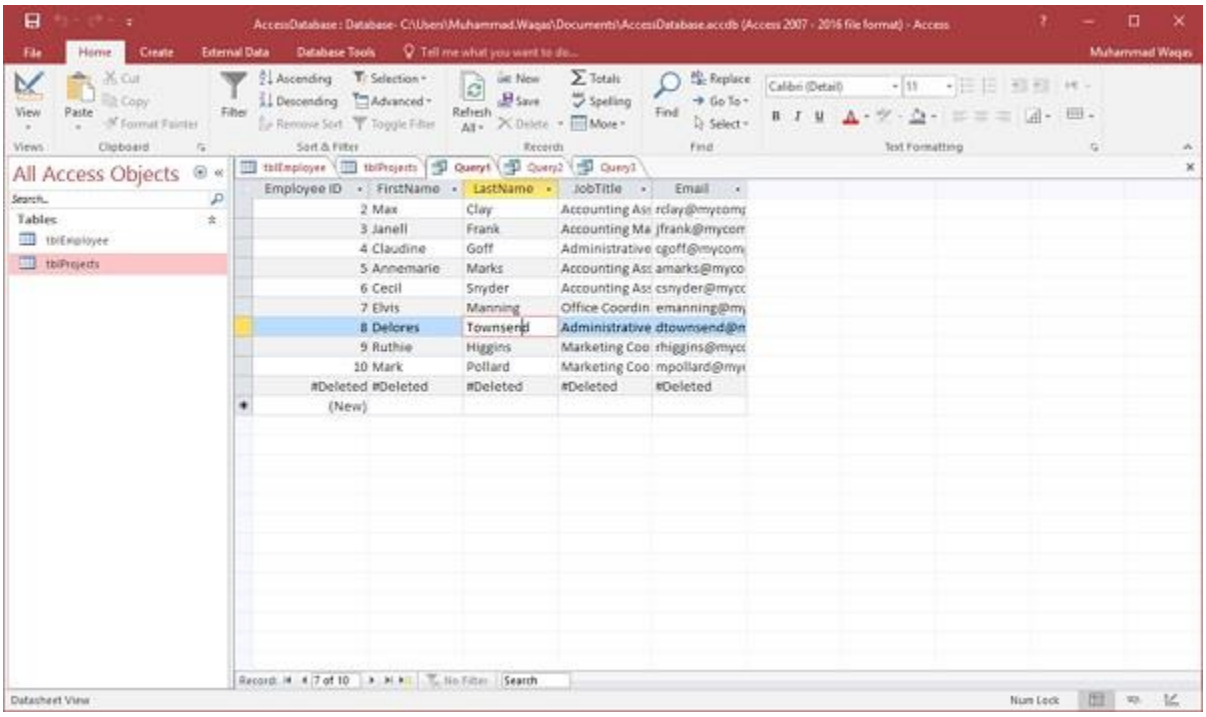
In the Criteria row of the Design Grid, type 11. Here we want to delete an employee whose EmployeeID is 11.



Let us now run the query. This query will display the confirmation message.

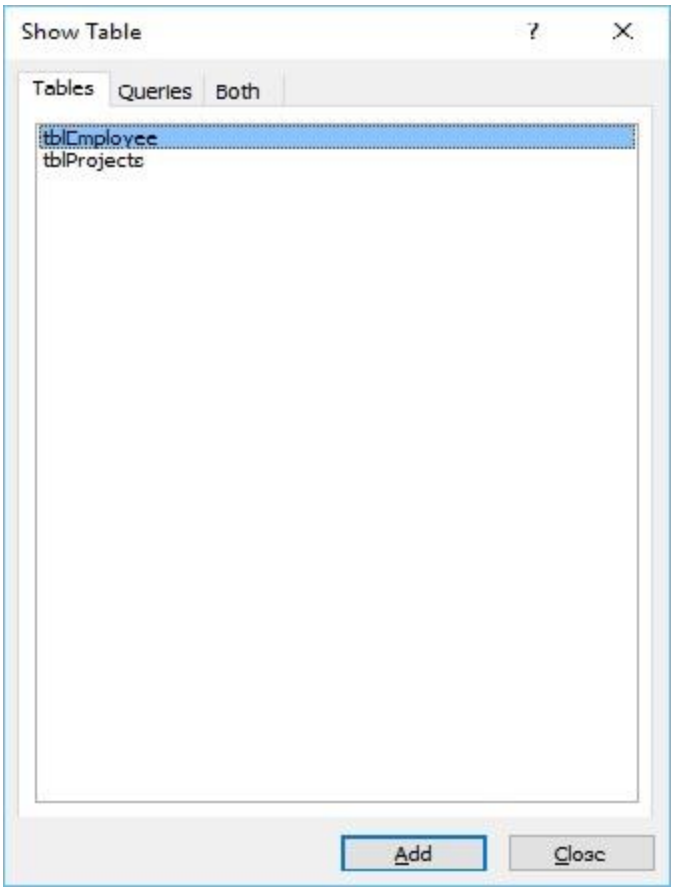


Click **Yes** and go to your Datasheet View and you will see that the specified employee record is deleted now.

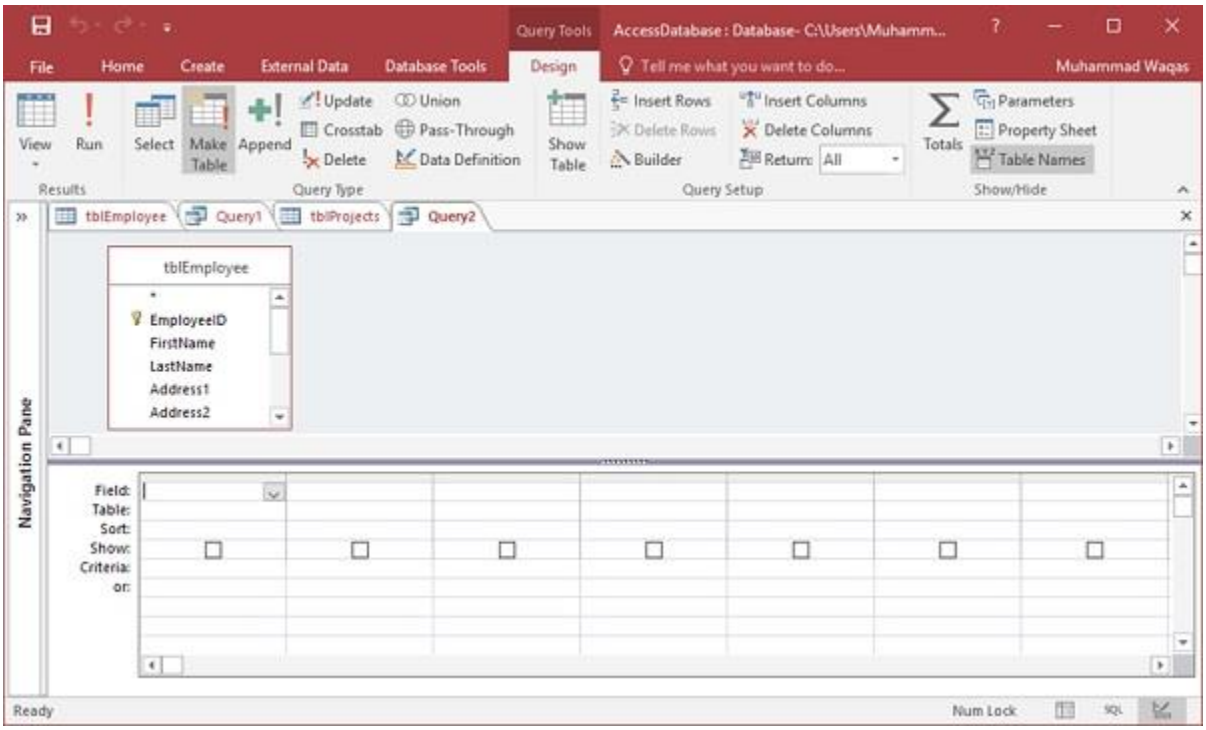


Create a Make Table Query

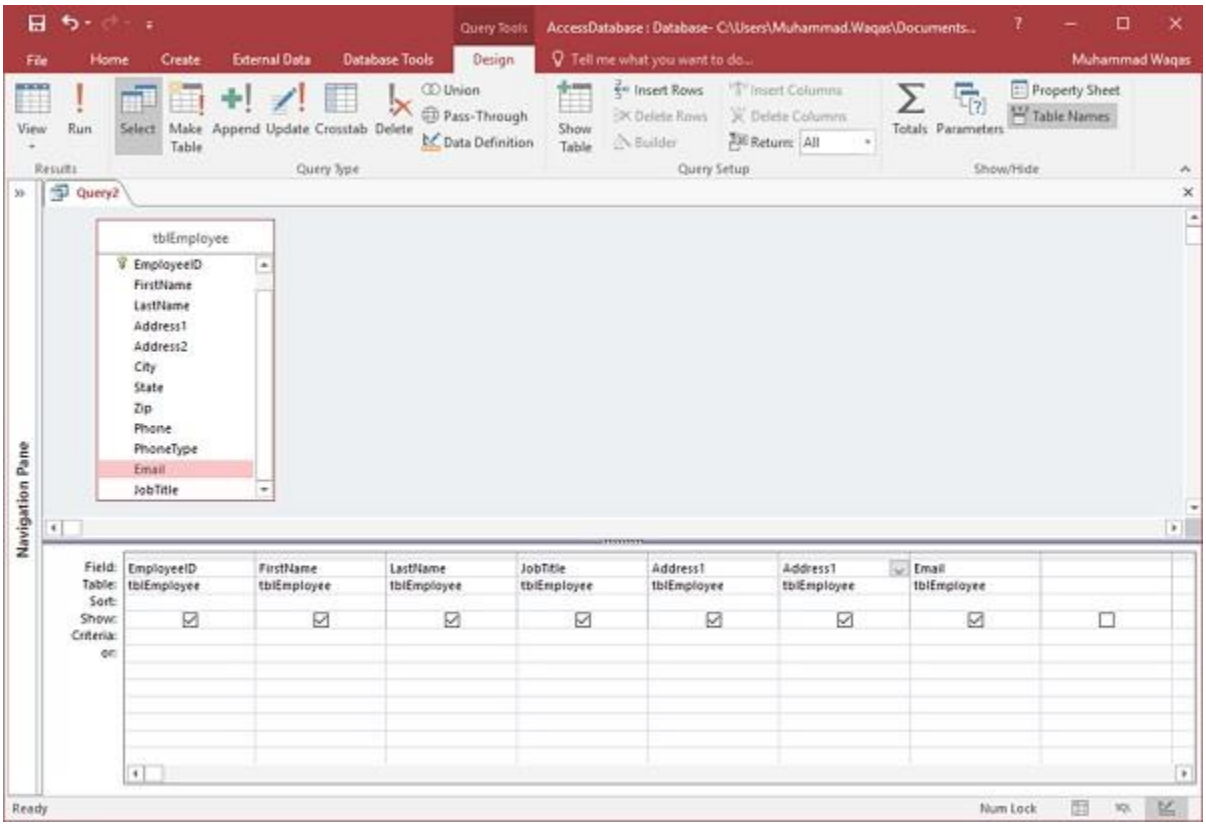
You can use a make-table query to create a new table from data that is stored in other tables. Let us go to the **Create tab** again and click **Query Design**.



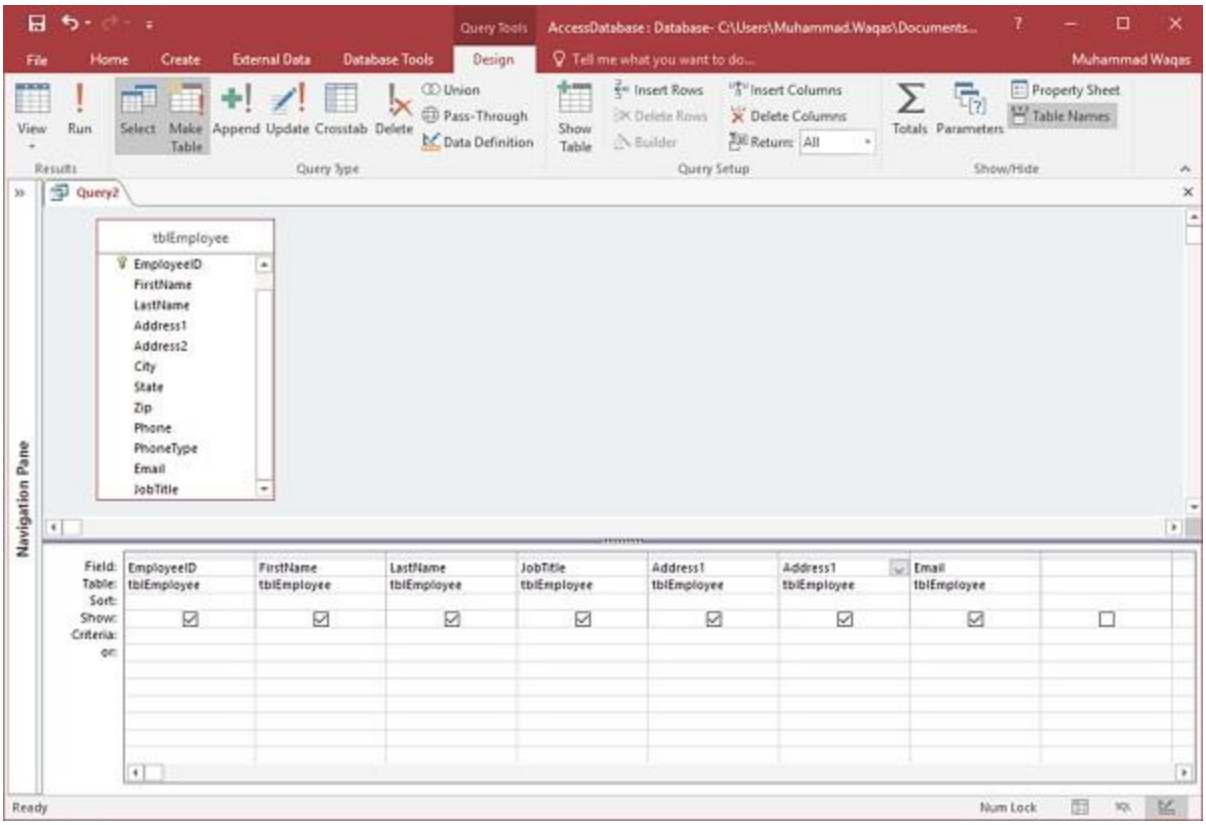
In the Tables tab, on the Show Table dialog box, double-click the **tblEmployees** table and then close the dialog box.



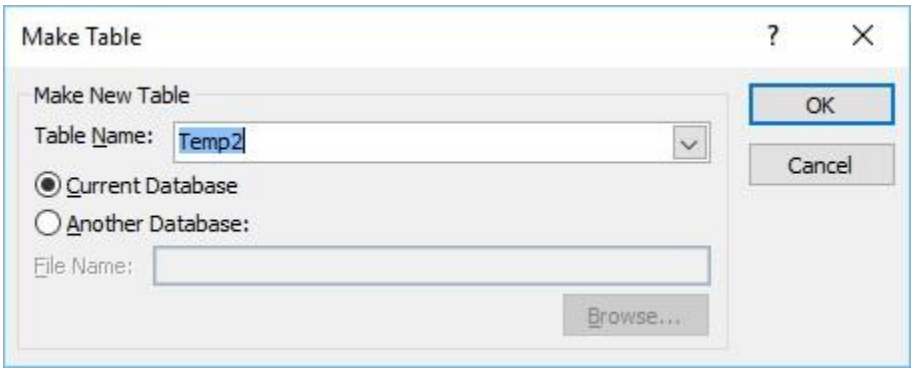
Select all those fields which you want to copy to another table.



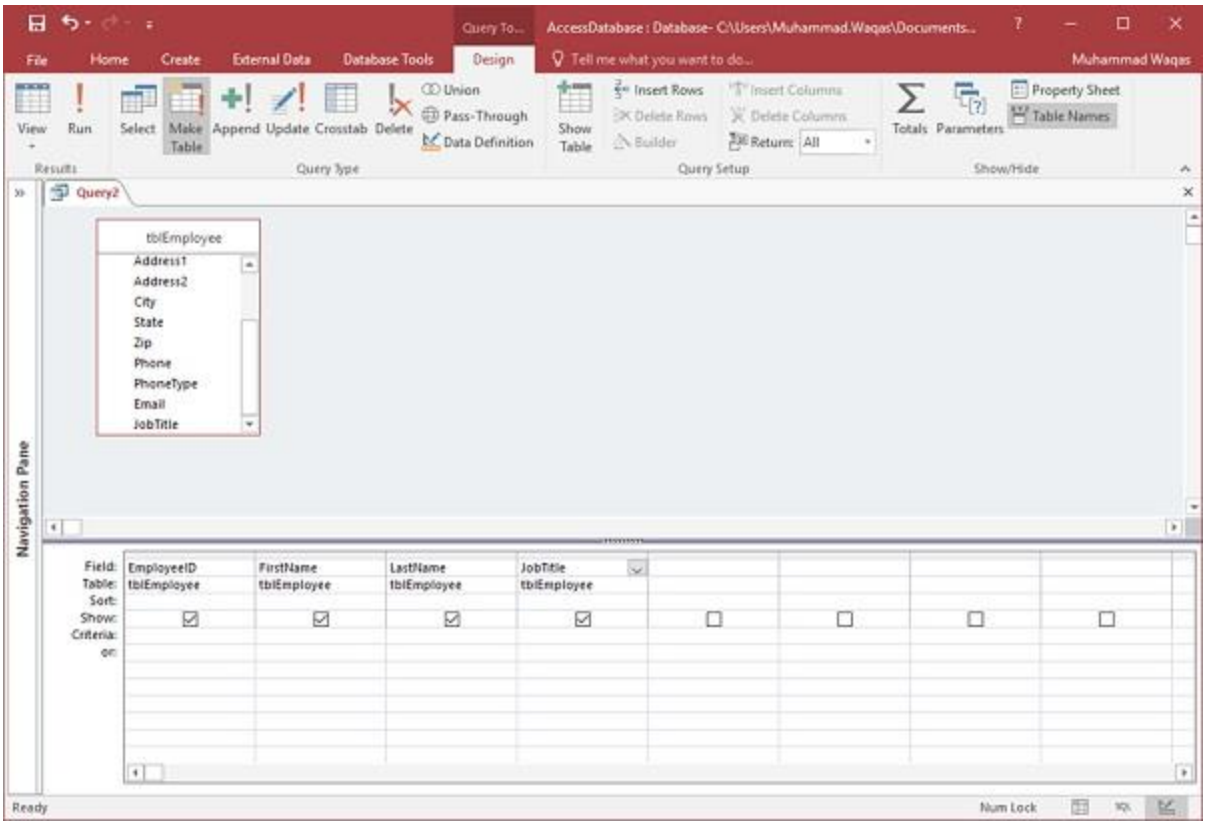
In the Query Type, select the **Make Table** option button.



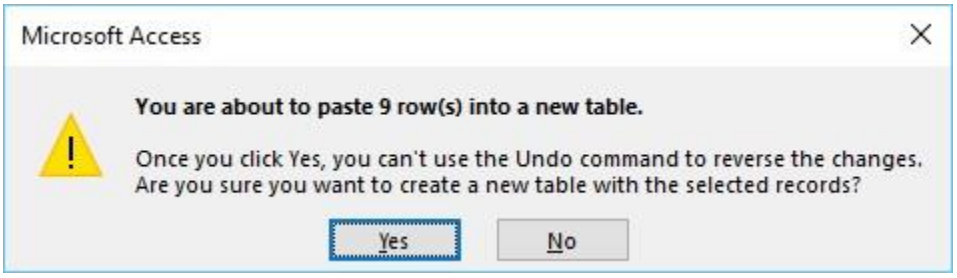
You will see the following dialog box. Enter the name of the new table you want to create and click OK.



Now run your query.



You will now see the following message.



Click **Yes** and you will see a new table created in the navigation pane.

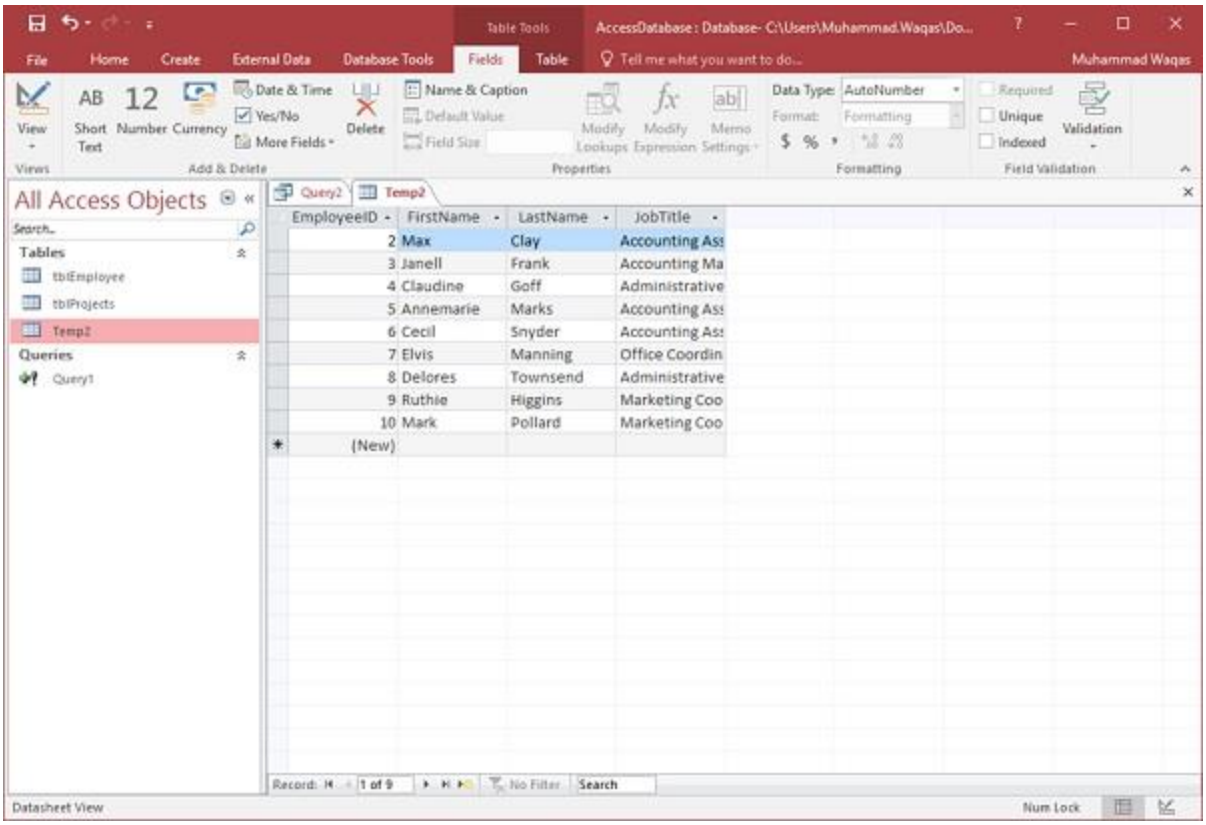


Table Tools
AccessDatabase : Database- C:\Users\Muhammad.Waqas\Do...
File
Home
Create
External Data
Database Tools
Fields
Table
Tell me what you want to do...
Muhammad Waqas
View
Short Text
Number
Currency
Date & Time
Yes/No
More Fields
Delete
Name & Caption
Default Value
Field Size
Modify Lookups
Modify Expression
Memo Settings
Data Type: AutoNumber
Format:
Formatting
Required
Unique
Indexed
Validation
Views
Add & Delete
Properties
Formatting
Field Validation
All Access Objects
Search...
Tables
tblEmployee
tblProjects
Temp2
Queries
Query1
Query2
Temp2
EmployeeID
FirstName
LastName
JobTitle
2 Max Clay Accounting Ass
3 Janell Frank Accounting Ma
4 Claudine Goff Administrative
5 Annemarie Marks Accounting Ass
6 Cecil Snyder Accounting Ass
7 Elvis Manning Office Coordin
8 Delores Townsend Administrative
9 Ruthie Higgins Marketing Coo
10 Mark Pollard Marketing Coo
(New)
Record: 1 of 9
No Filter
Search
Datasheet View
Num Lock

Relationships

In this chapter, we will understand the need to create relationships between related tables. One of the goals of good database design is to remove data redundancy.

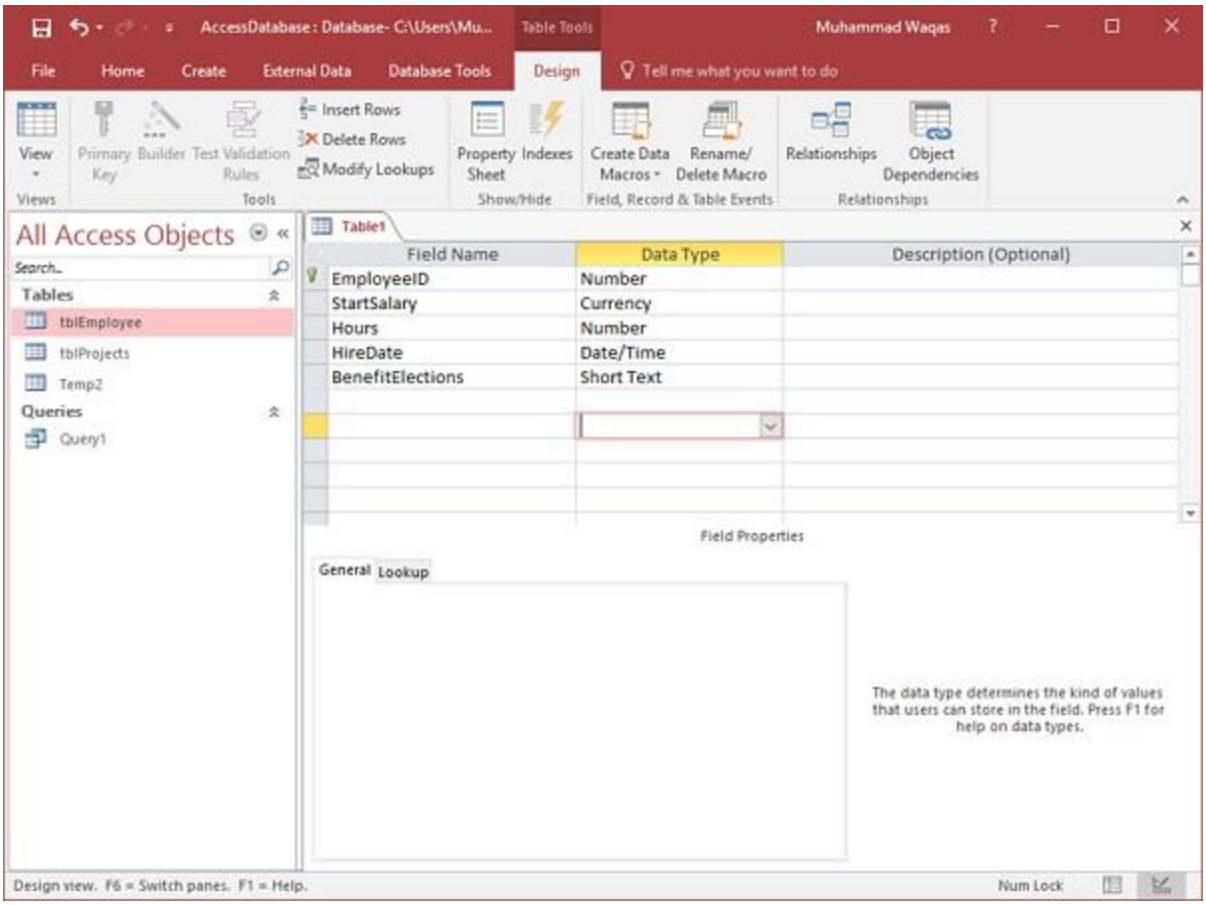
- To achieve that goal, you divide your data into many subject-based tables so that each fact is represented only once.
- To do this, all the common fields which are related to each other are placed in one table.
- To do this step correctly, you must first understand the relationship between your tables, and then specify these relationships in your Access database.

Why Create Table Relationships?

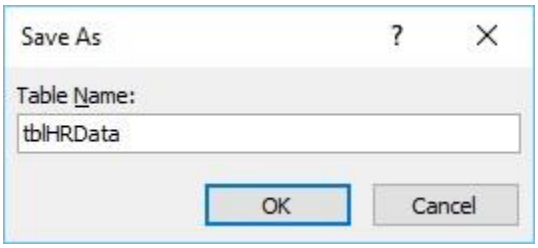
MS Access uses table relationships to join tables when you need to use them in a database object. There are several reasons why you should create table relationships before you create other database objects, such as forms, queries, macros, and reports.

- To work with records from more than one table, you often must create a query that joins the tables.
- The query works by matching the values in the primary key field of the first table with a foreign key field in the second table.
- When you design a form or report, MS Access uses the information it gathers from the table relationships you have already defined to present you with informed choices and to prepopulate property settings with appropriate default values.
- When you design a database, you divide your information into tables, each of which has a primary key and then add foreign keys to related tables that reference those primary keys.
- These foreign **key-primary key pairings** form the basis for table relationships and multi-table queries.

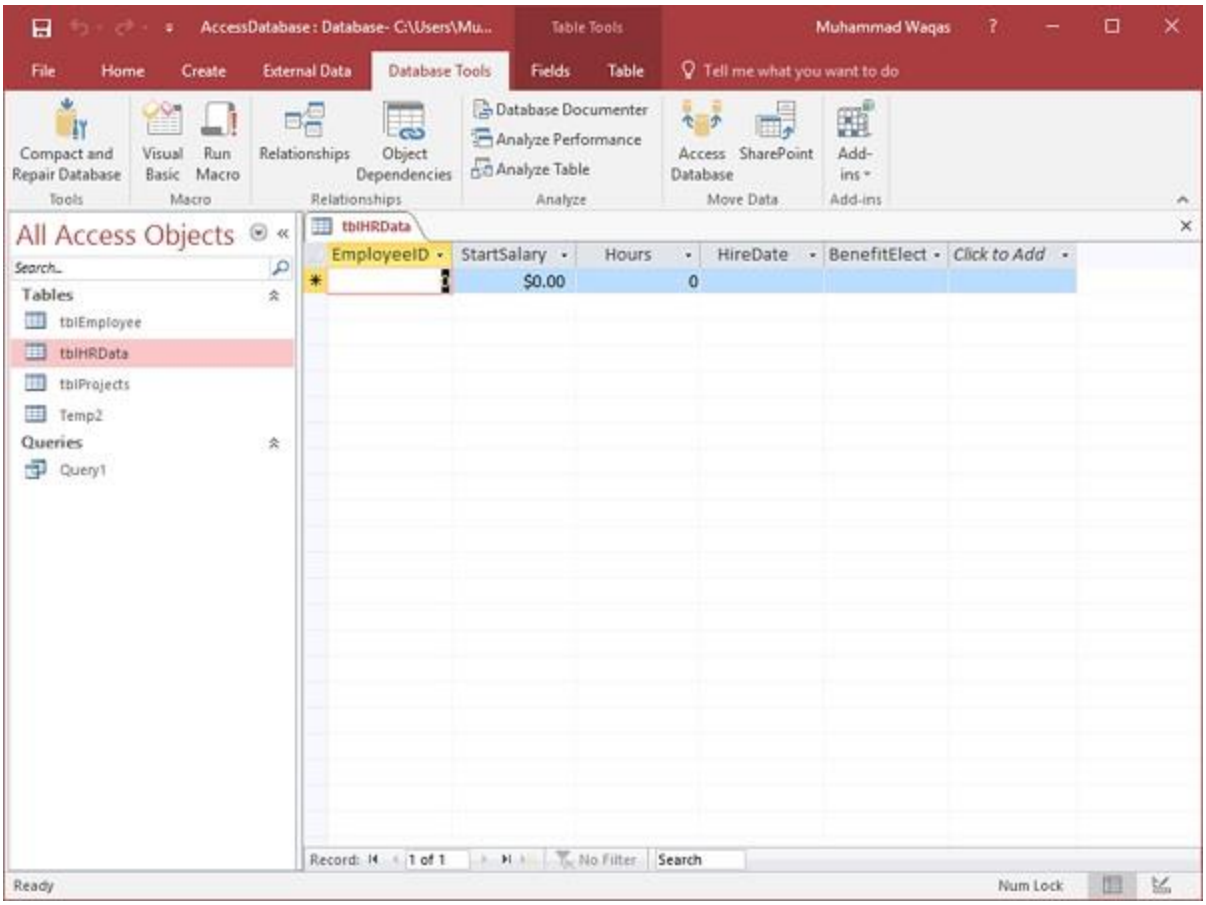
Let us now add another table into your database and name it **tblHRData** using Table Design as shown in the following screenshot.



Click on the **Save** icon as in the above screenshot.



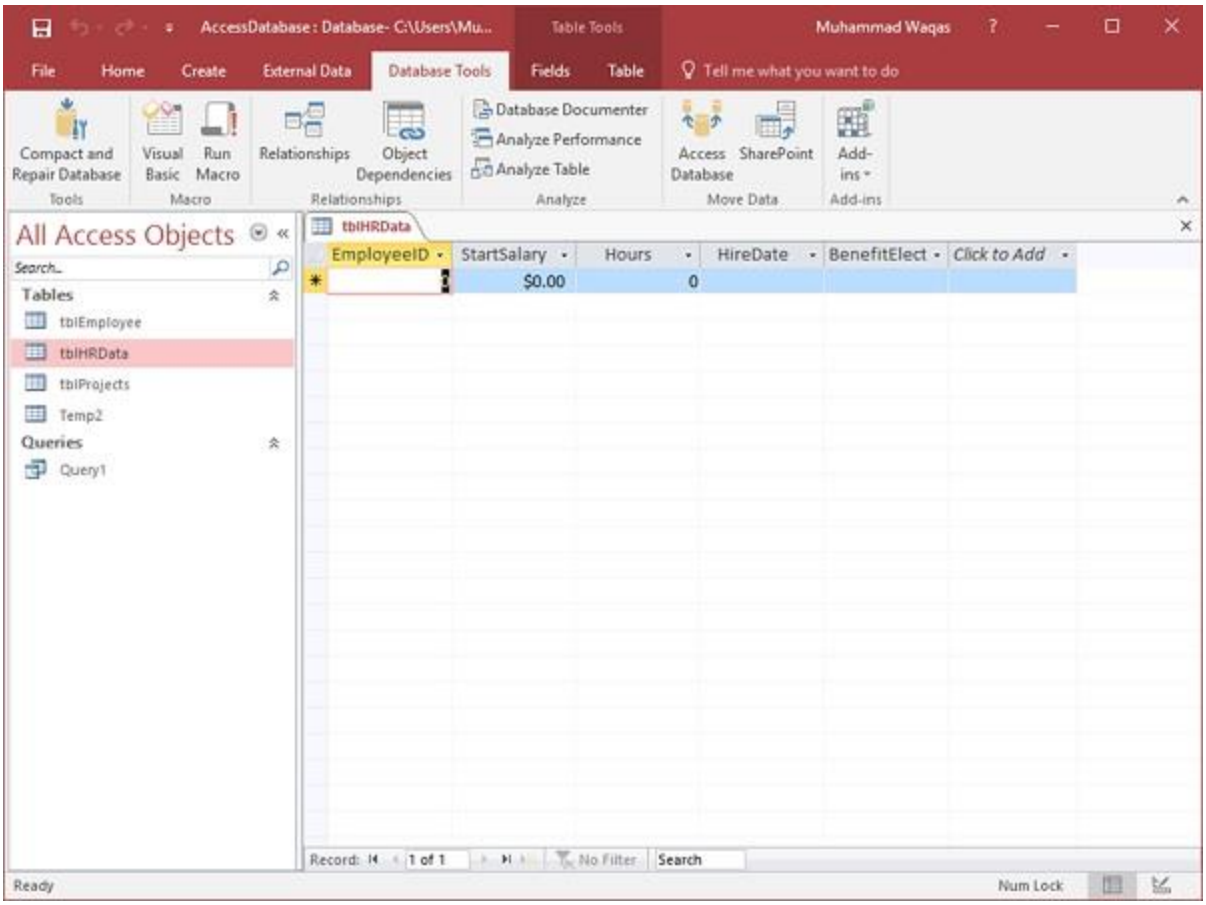
Enter **tblHRData** as table name and click **Ok**.



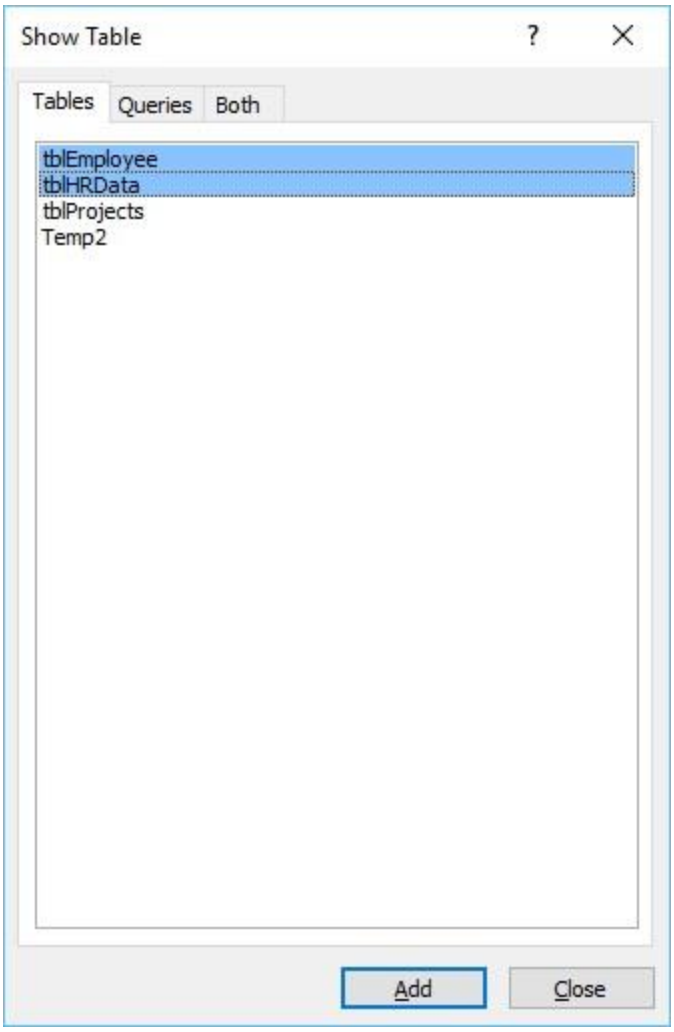
tblHRData is now created with data in it.

Let us now understand One-to-One Relationship in MS Access. This relationship is used to relate one record from one table to one and only one record in another table.

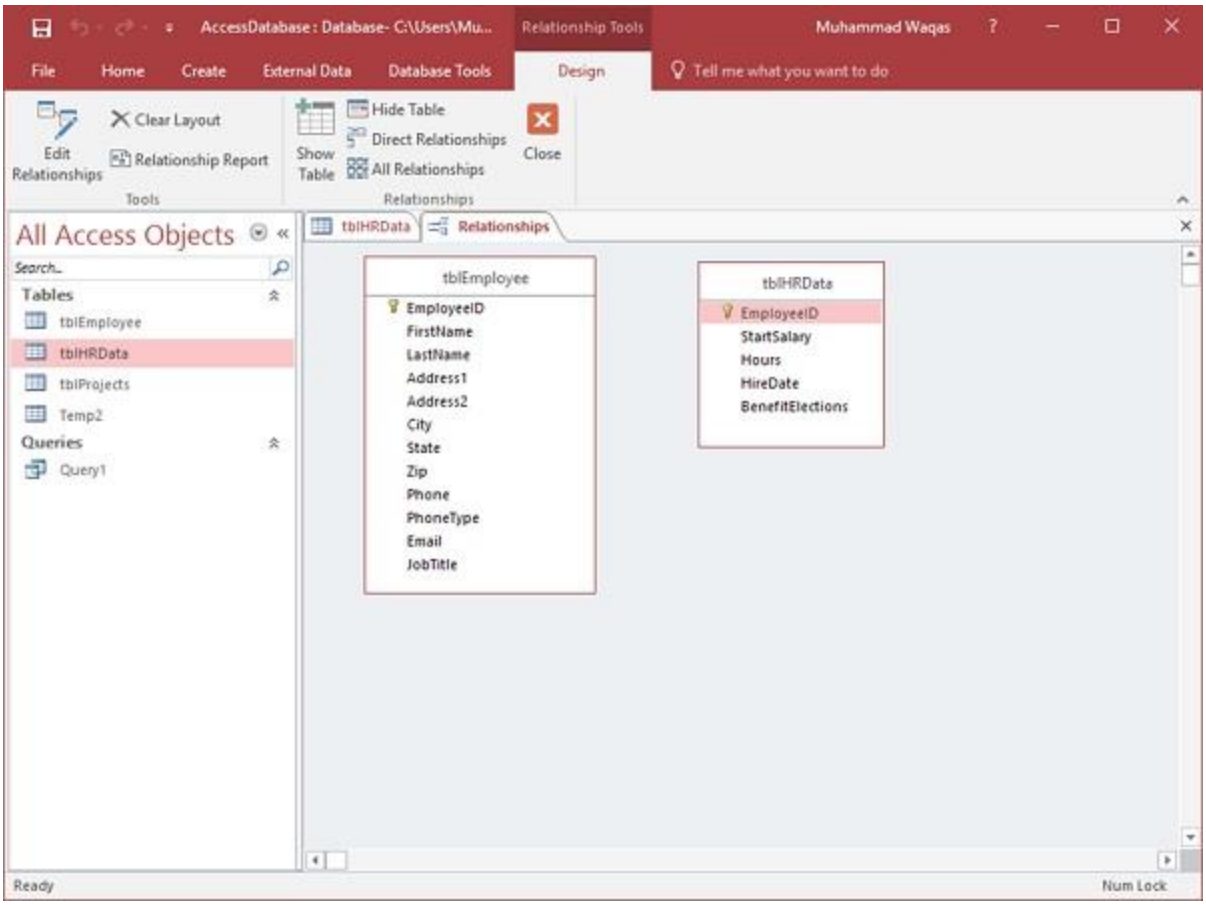
Let us now go to the **Database Tools** tab.



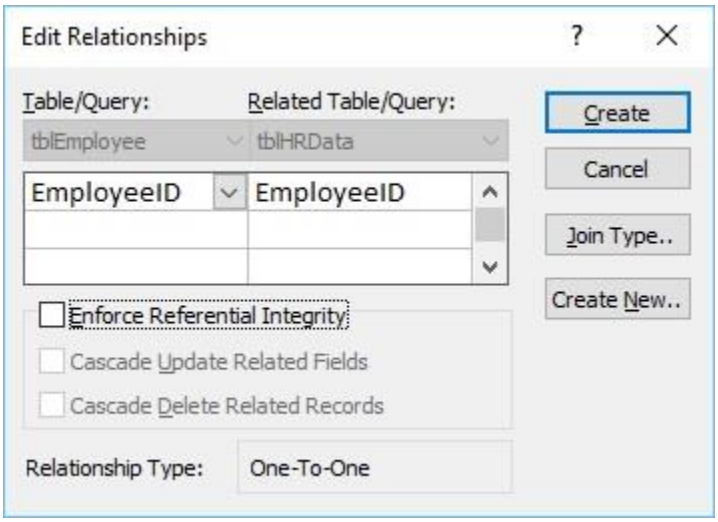
Click on the **Relationships** option.



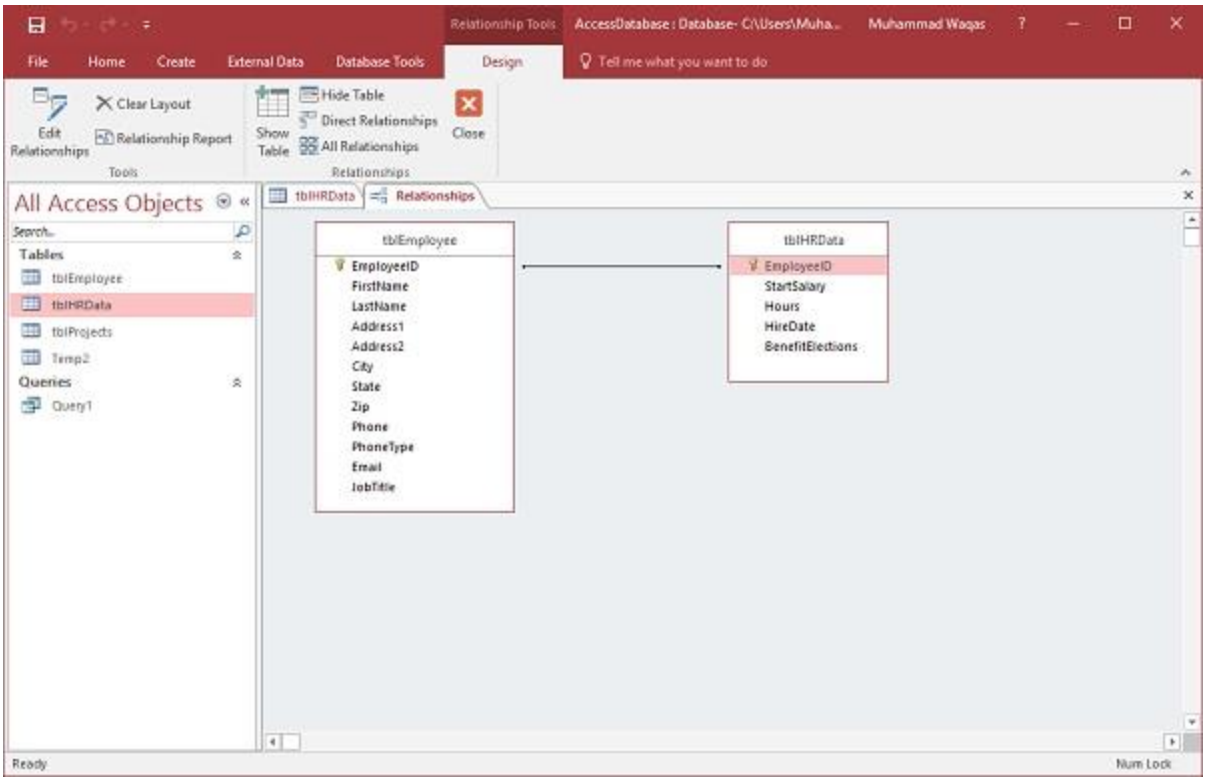
Select **tblEmployees** and **tblHRData** and then click on the Add button to add them to our view and then close the **Show Table** dialog box.



To create a relationship between these two tables, use the mouse, and click and hold the **EmployeeID** field from **tblEmployees** and drag and drop that field on the field we want to relate by hovering the mouse right over **EmployeeID** from **tblHRData**. When you release your mouse button, Access will then open the following window –

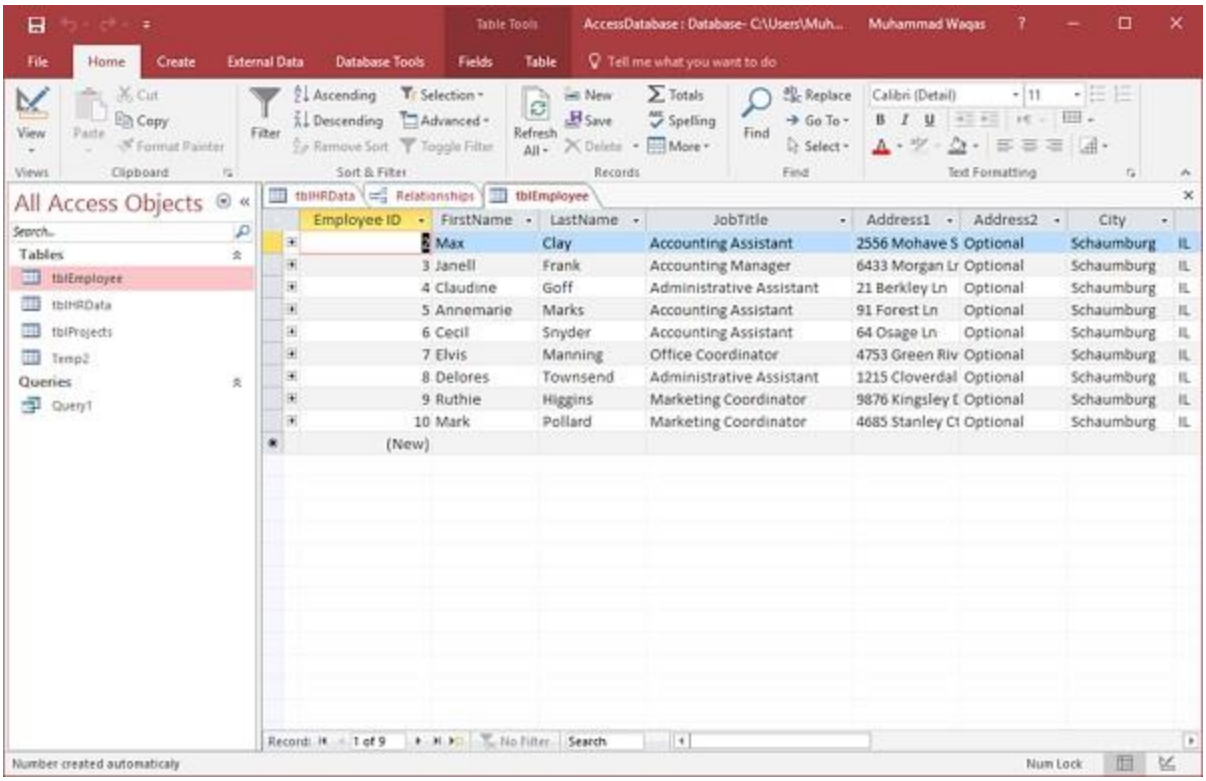


The above window relates EmployeeID of tblEmployees to EmployeeID of tblHRData. Let us now click on the **Create** button and now these two tables are related.

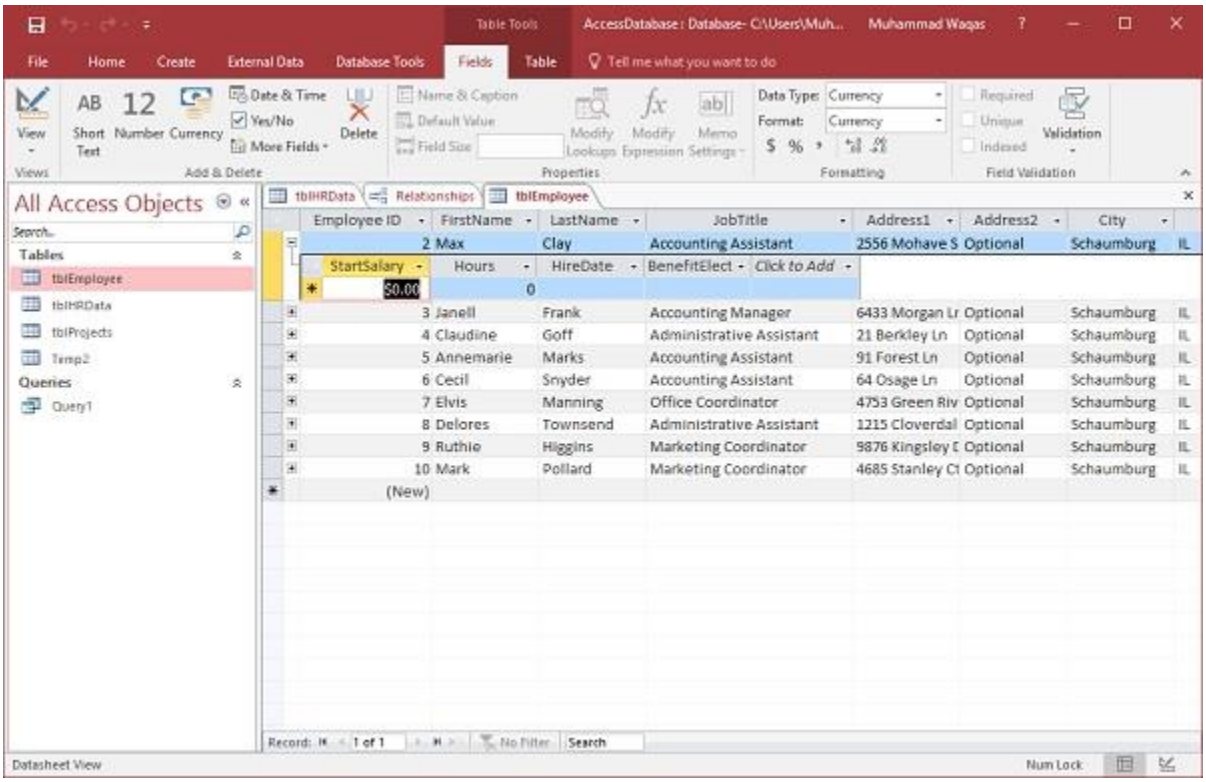


The relationship is now saved automatically and there's no real need to click on the Save button. Now that we have the most basic of relationships created, let us now go to the table side to see what has happened with this relationship.

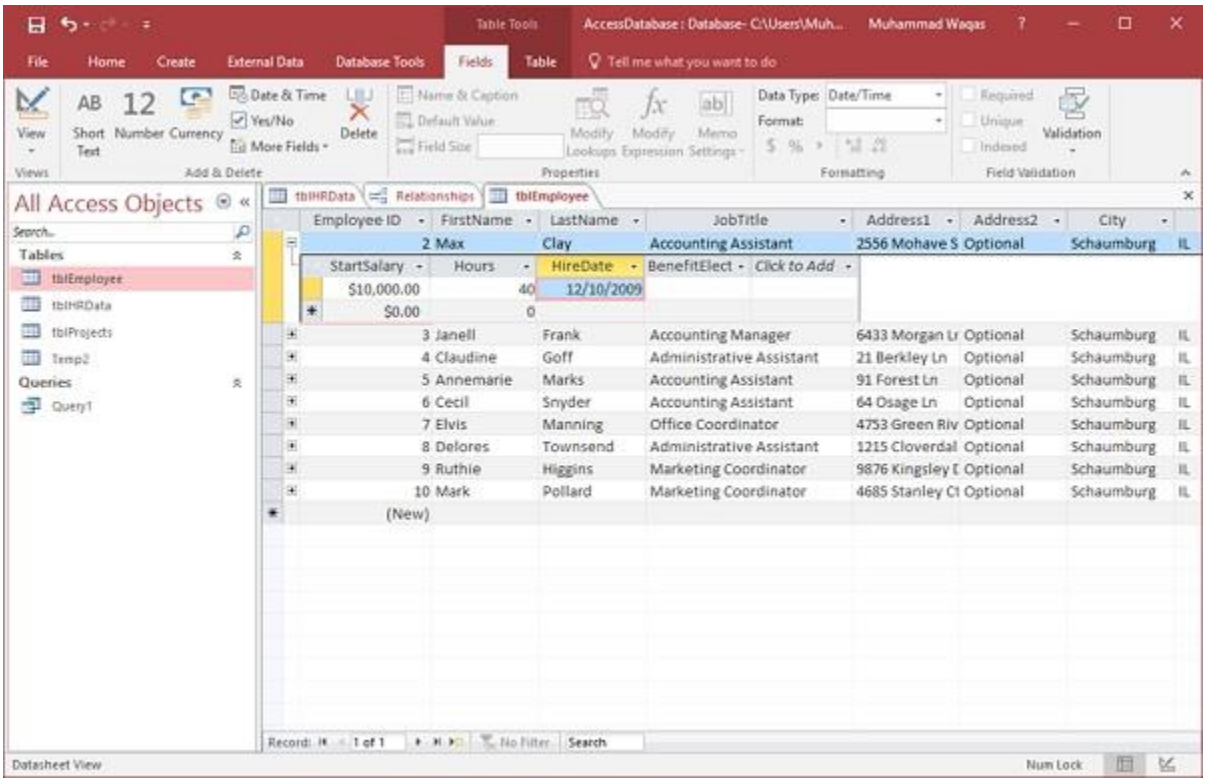
Let us open the **tblEmployees** table.



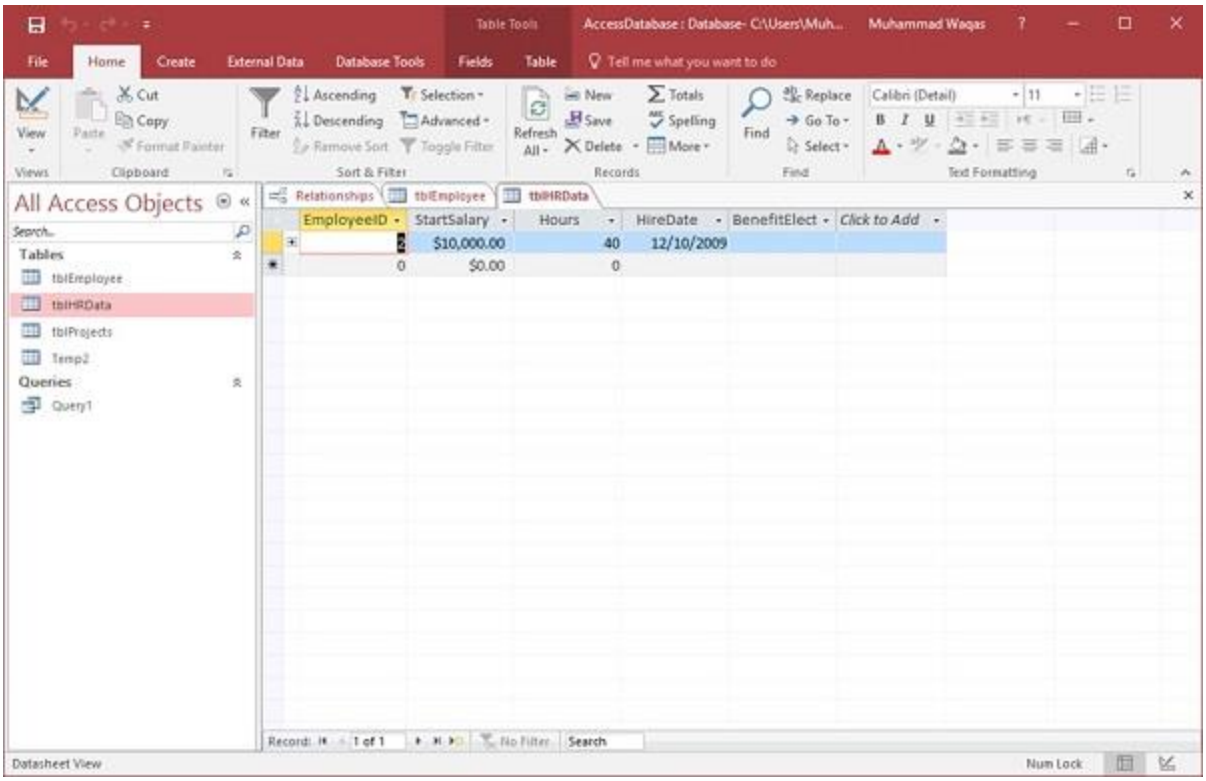
Here, on the left-hand side of each and every record, you will see a little plus sign by default. When you create a relationship, Access will automatically add a sub-datasheet to that table.



Let us click on the plus sign and you will see the information that is related to this record is on the **tblHRData** table.

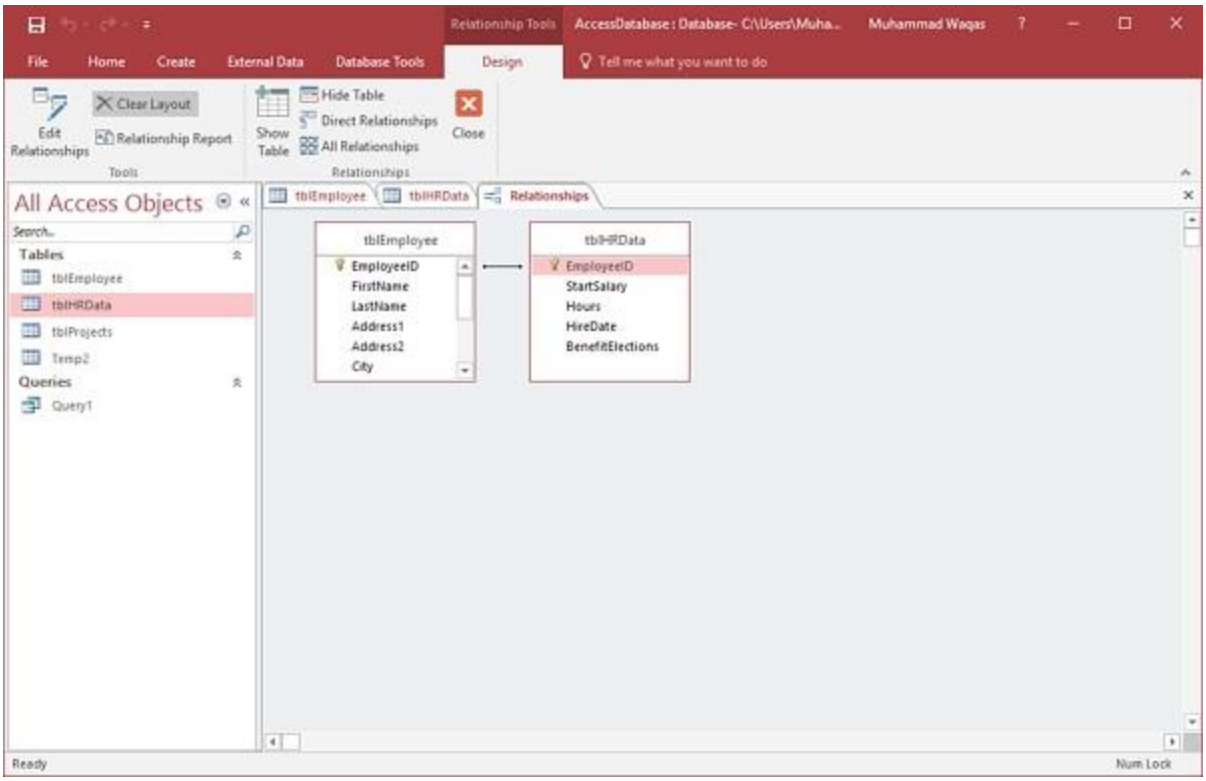


Click on the **Save** icon and open **tblHRData** and you will see that the data we have entered is already here.

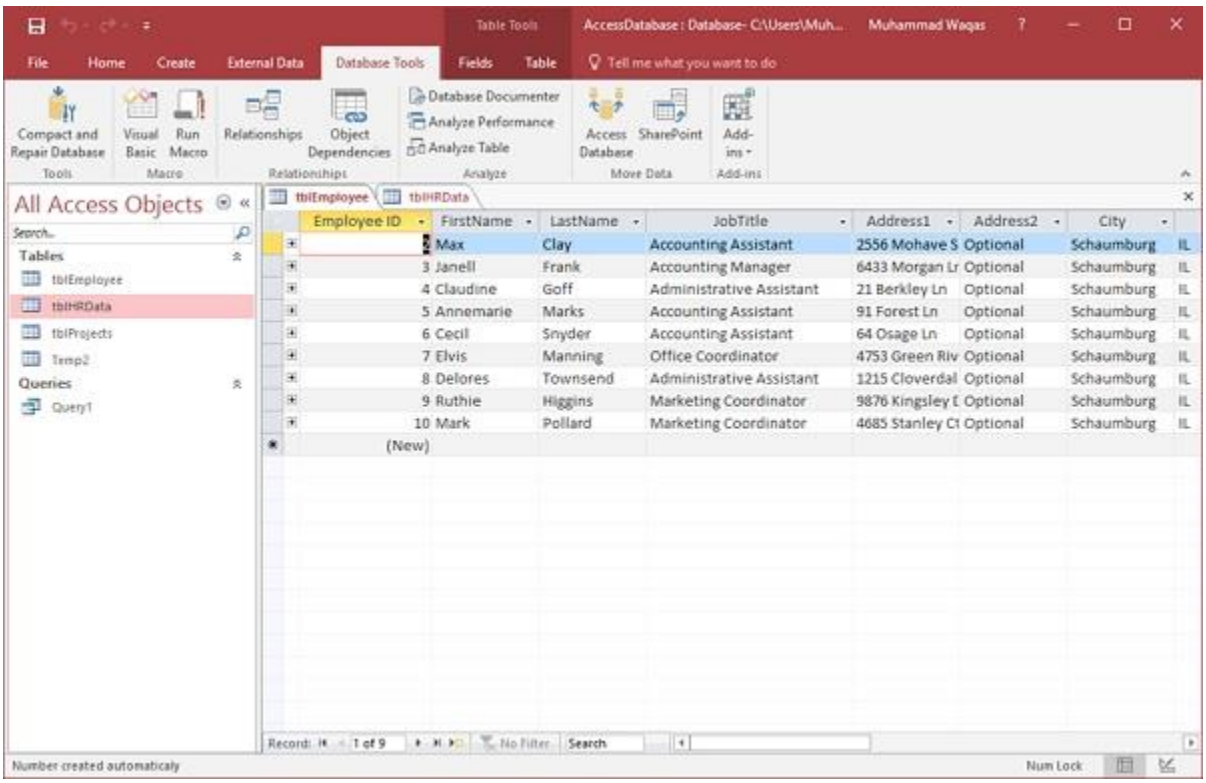


The vast majority of your relationships will more than likely be this one to many relationships where one record from a table has the potential to be related to many records in another table.

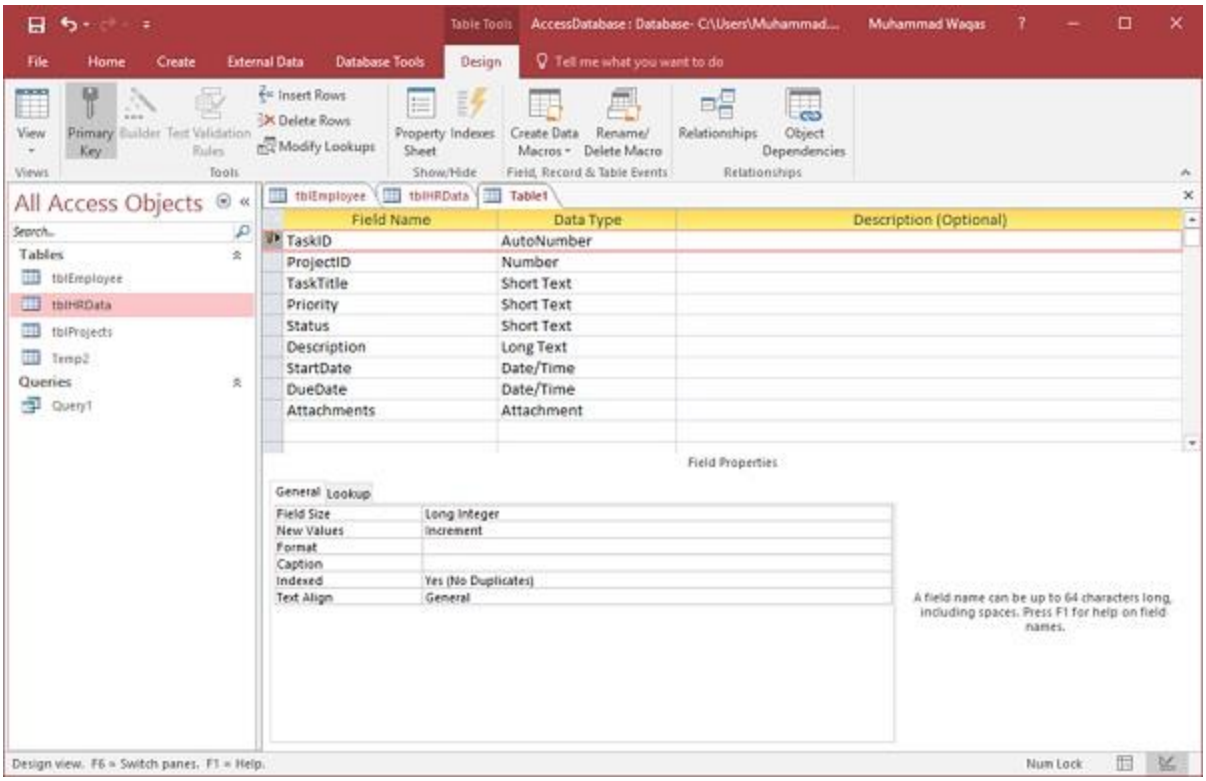
The process to create one-to-many relationship is exactly the same as for creating a one-to-one relationship.



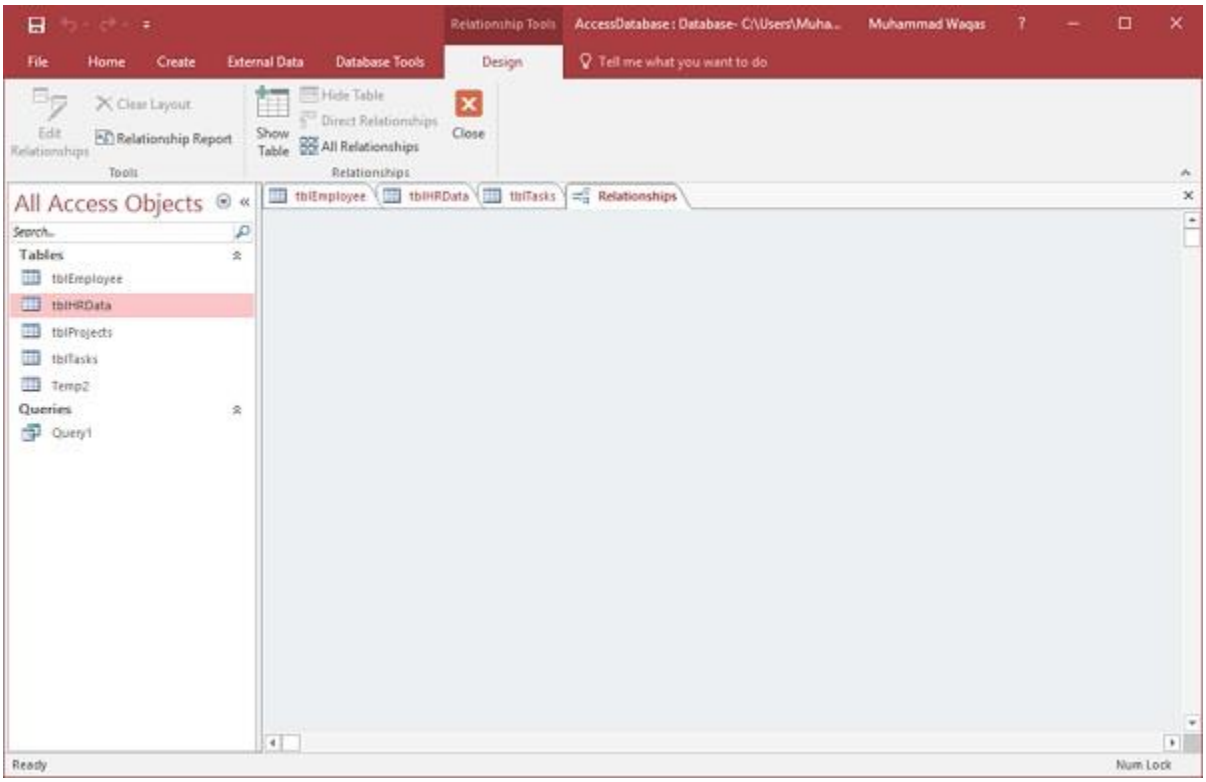
Let us first clear the layout by clicking on the **Clear Layout** option on the **Design tab**.



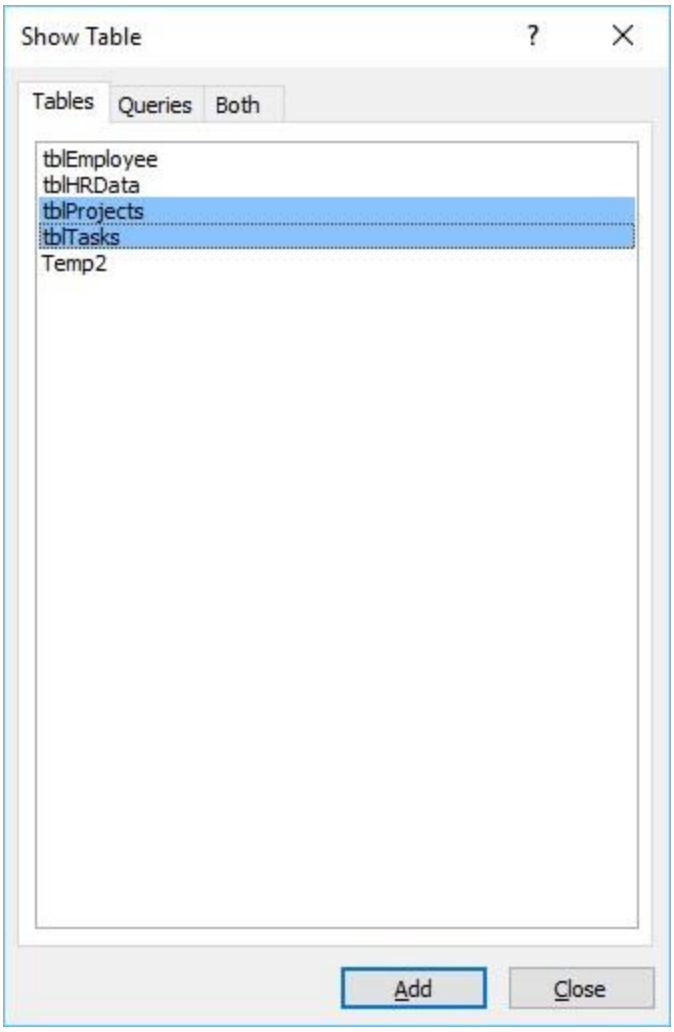
We will first add another table **tblTasks** as shown in the following screenshot.



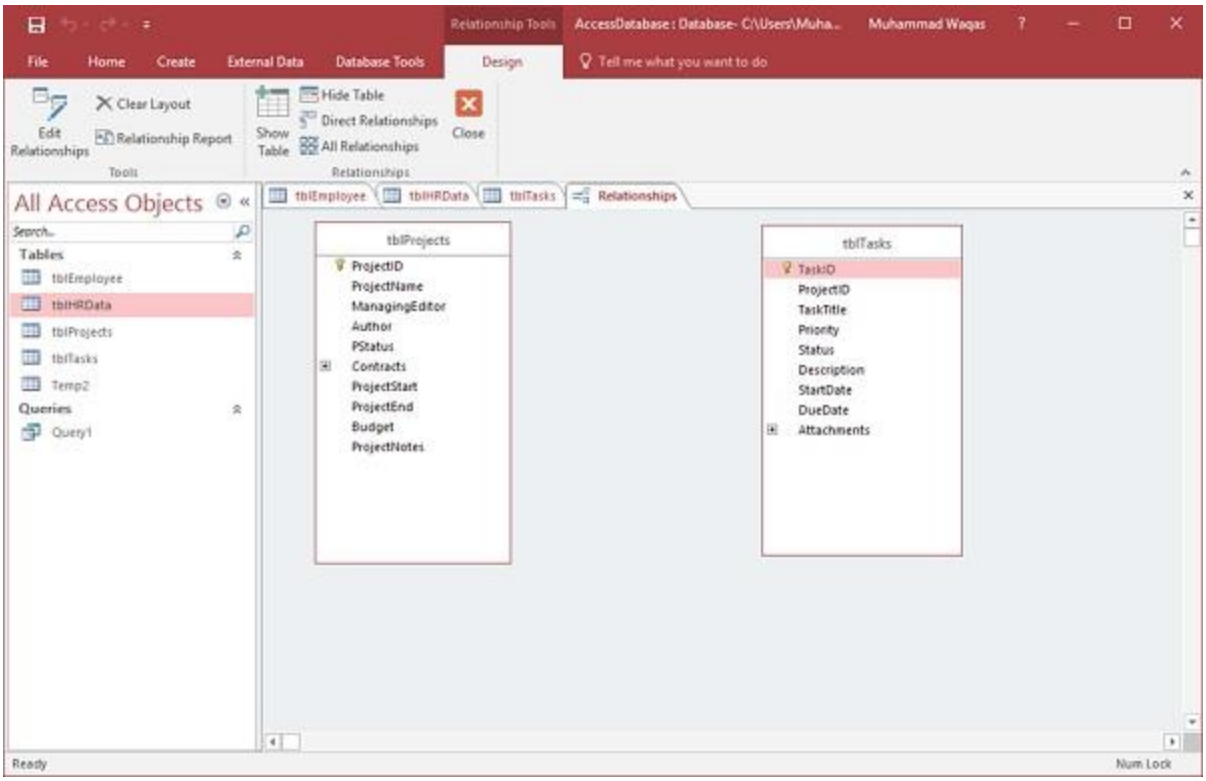
Click on the **Save** icon and enter **tblTasks** as the table name and go to the **Relationship** view.



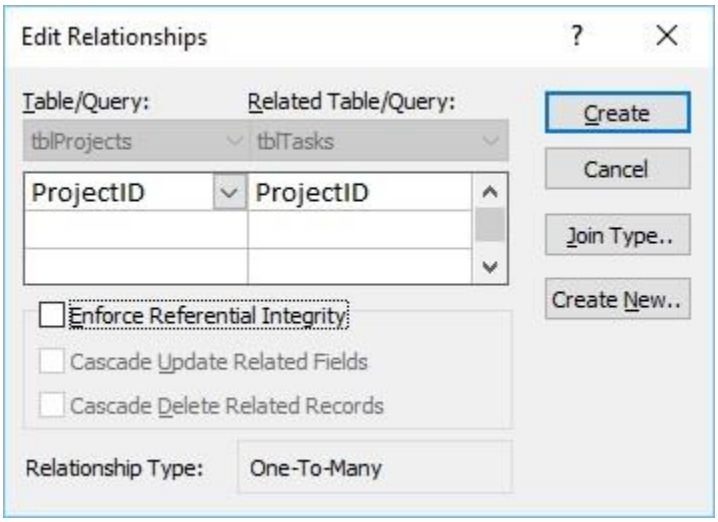
Click on the **Show Table** option.



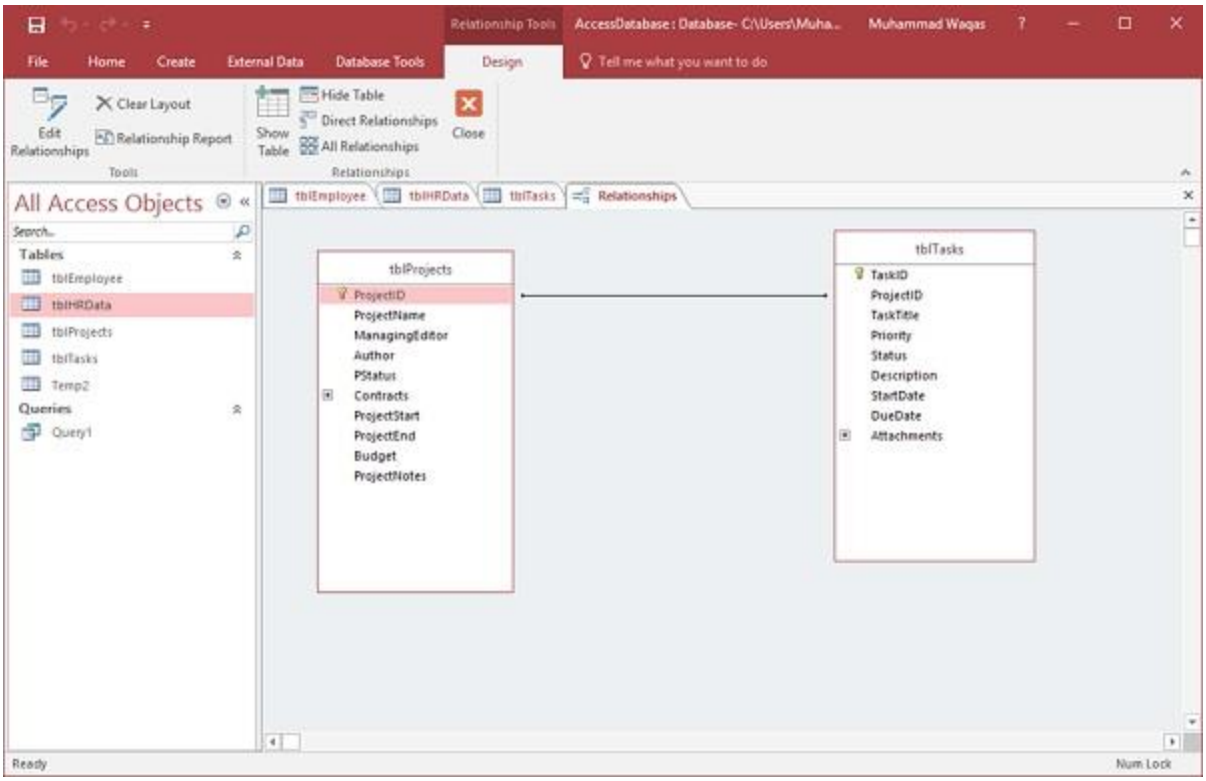
Add **tblProjects** and **tblTasks** and close the **Show Table** dialog box.



We can run through the same process once again to relate these tables. Click and hold ProjectID from tblProjects and drag that all the way over to the ProjectID from tblTasks. Further, a relationships window pops up when you release the mouse.



Click the Create button. We now have a very simple relationship created.


Relationship Tools
AccessDatabase : Database- C:\Users\Muha...
Muhammad Waqas
File
Home
Create
External Data
Database Tools
Design
Tell me what you want to do
Edit Relationships
Clear Layout
Relationship Report
Tools
Show Table
Hide Table
Direct Relationships
All Relationships
Close
Relationships
All Access Objects
Search...
Tables
tblEmployee
tblHRData
tblProjects
tblTasks
Temp2
Queries
Query1
tblEmployee
tblHRData
tblTasks
Relationships
tblProjects
ProjectID
ProjectName
ManagingEditor
Author
PStatus
Contracts
ProjectStart
ProjectEnd
Budget
ProjectNotes
tblTasks
TaskID
ProjectID
TaskTitle
Priority
Status
Description
StartDate
DueDate
Attachments
Ready
Num Lock