DBMS(303105204)

Practical No 1

Aim: **1. What is DBMS? Explain advantages of DBMS over FPS.**
2. List 15 applications of Database. Explain any 2 how Database can be helpful in managing that application?
3. Create the Database for the following:

- **Student Details using Excel.**
- **Employees Details using MS Access**
- **Facebook using Excel**

DBMS - Database Management System (DBMS) is a **software designed to define, manipulate, retrieve and manage data in a database**.

- e.g. MS SQL Server, Oracle, My SQL, SQLite, MongoDB etc.

Application of DBMS:-

- DBMS is a computerized record-keeping system.
- DBMS is required where ever data need to be stored.
  - E-Commerce (**Flikart, Amazon, Shopclues, eBay** etc...)
  - Online Television Streaming (**Hotstar, Amazon Prime** etc...)
  - Social Media (**WhatsApp, Facebook, Twitter, LinkedIn** etc...)
  - Banking & Insurance
  - Airline System
  - Railway System
  - Universities and Colleges/Schools
  - Library Management System
  - Human Resource Department
  - Hospitals store
  - Medical Stores
  - Government Organizations

A database can be helpful in managing an application in various ways. Here are two examples:

1. Data Organization and Storage: Databases provide a structured and organized way to store and manage data. By using tables, rows, and columns, a database allows for efficient storage of data related to the application. This structured storage enables easy retrieval and manipulation of data, ensuring that the application can access and process information effectively. Additionally, databases support indexing and querying mechanisms, allowing for faster search and retrieval of specific data subsets. With proper database design, data can be organized in a logical and optimized manner, improving the overall efficiency and performance of the application.
2. Data Consistency and Integrity: Databases offer mechanisms to enforce data consistency and integrity. By defining relationships and constraints between tables, such as primary keys, foreign keys, and unique constraints, the database ensures that data is accurate and reliable. This helps prevent data inconsistencies or errors that can occur when managing data manually. For example, in an e-commerce application, a database can enforce constraints to ensure that every order is associated with a valid customer and product, maintaining data integrity. Additionally, databases support transactional operations, allowing multiple database operations to be treated as a single unit. This ensures that either all the changes in a transaction are committed, or none of them are, maintaining the consistency of the data.

In summary, databases provide a structured and organized way to store and manage data, enabling efficient data storage, retrieval, and manipulation. They also offer mechanisms to enforce data consistency and integrity, ensuring that the application operates on reliable and accurate information.

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Creating a database for student details using Excel is a more manageable task. Here's a simplified example of how you can structure a student database using Excel:

1. Student Table:	
	• Create a new worksheet and name it "Students." • Create columns such as Student ID, First Name, Last Name, Date of Birth, Gender, Email, Phone Number, and any other relevant student information. • Each row represents a student, and the columns store their corresponding attributes.
2. Course Table:	
	• Create another worksheet and name it "Courses." • Create columns such as Course ID, Course Name, Instructor, and any other relevant course information. • Each row represents a course, and the columns store their corresponding attributes.
3. Enrollment Table:	
	• Create another worksheet and name it "Enrollments." • Create columns such as Enrollment ID, Student ID, Course ID, Enrollment Date, and any other relevant enrollment information. • Each row represents a student's enrollment in a course. The Student ID column stores the ID of the student, and the Course ID column stores the ID of the course.

With this basic structure, you can store and manage student details, course information, and their enrollments in Excel. You can add more tables and columns as needed, depending on the complexity of your student management requirements.

Remember that while Excel can serve as a simple and accessible tool for managing small-scale databases, if you anticipate a larger number of records or more complex operations, it might be worth considering a dedicated database management system (DBMS) such as MySQL, PostgreSQL, or Microsoft Access. These tools provide more robust features for handling data relationships, querying, and scalability.

Example:

Step-by-Step Instructions to Create Student Database in Excel

Creating a student database is very important because there must be a vast amount of data. And databases can reliably handle a huge amount of data and information. So, we are going to **create a database** to keep track of and evaluate students' performance. So, let's get started creating the student database in Excel.

Step 1: Enter Data for Student

- The name of the columns in a database in the field. We can enter fields for the database as much as we wish to.

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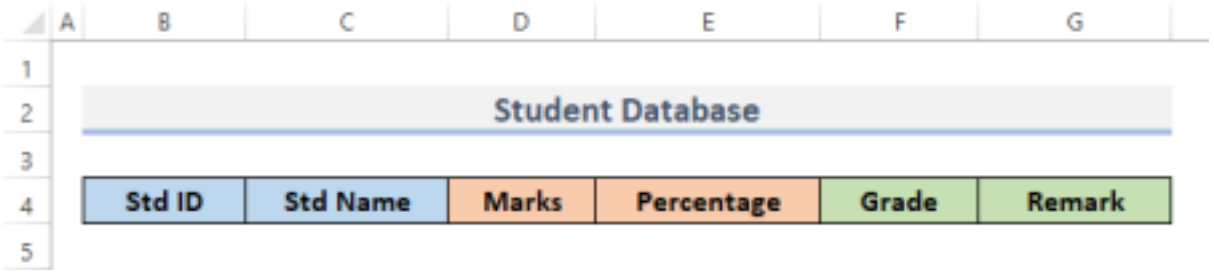
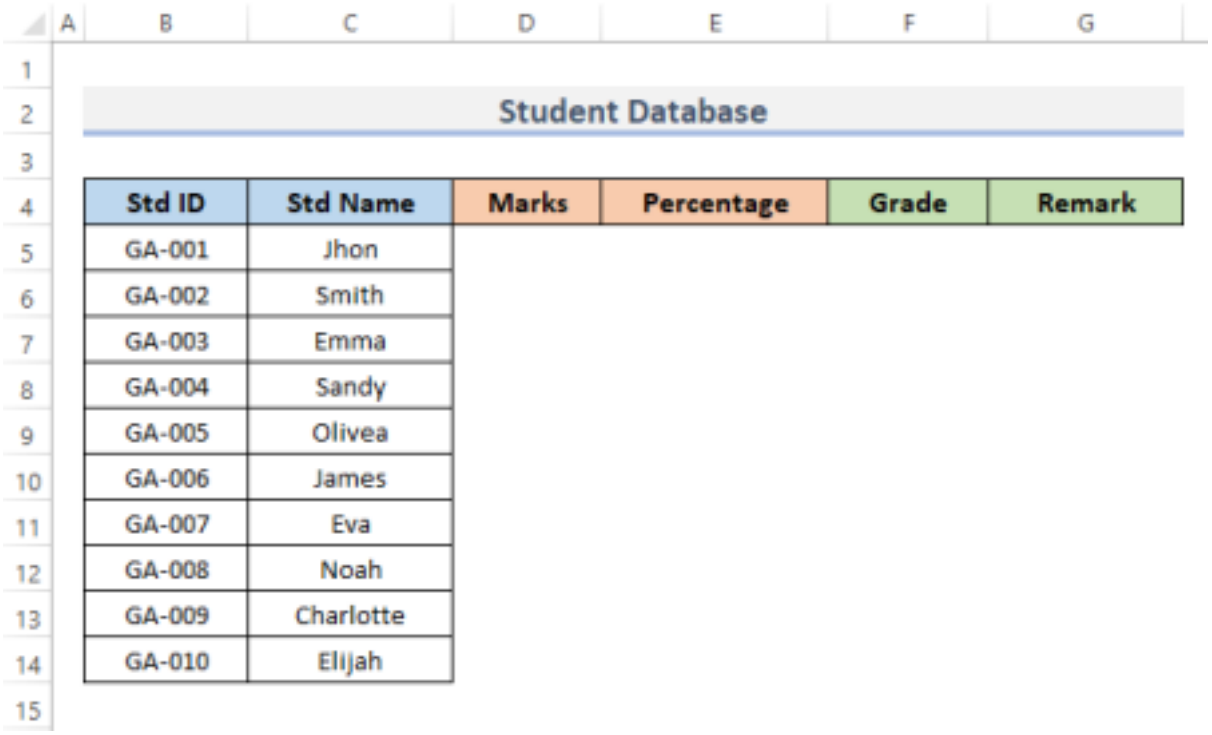
- Our database contains some **Student ID** as **Std ID**, **Student Name** as **Std Name**, total **Acquire Marks**, **Percentage** of those marks, **Grade**, and **Remark**. And those are the fields in this database.



Step 2: Launch Student Data Correctly

- Now, we need to enter the information of each student accurately.
- After entering the data field for the students, we may now quickly enter information into the database.
- In the **Fields**, each new instance will be inserted into the first abandoned lot.



Student Database

Std ID	Std Name	Marks	Percentage	Grade	Remark
GA-001	Jhon				
GA-002	Smith				
GA-003	Emma				
GA-004	Sandy				
GA-005	Olivea				
GA-006	James				
GA-007	Eva				
GA-008	Noah				
GA-009	Charlotte				
GA-010	Elijah				

Step 3: Make Grade Distribution Description

• Here, we will follow school standard grade distribution.

• We keep the mark range in one column and the grade for each mark range in another column to

make it more understandable.

Grade Description	
Marks	**Grade**
80-100	A+
70-80	A
60-70	B
50-60	C
40-50	D
Below 40	F

Step 4: Excel SUM Function to Aggregate Total Marks for Each Student

• The Database functions execute fundamental operations like **SUM**, **AVERAGE**, **MAX**, **MIN**, and so on, but they also have criterion parameters using **IF** functions that permit us to calculate just a part of the data in our database.

• To find the total marks for each student firstly, we need to know the marks they obtain in

each subject.

• For this, we just make another dataset which holds the **Student ID**, marks of **English** out of 100, marks of **Chemistry** out of 100, marks of **Physics** out of 100, and marks of **Math** out of 100.

ID	English	Chemistry	Physics	Math
GA-001	78	70	90	47
GA-002	56	74	58	60
GA-003	90	68	98	73
GA-004	66	76	73	34
GA-005	31	33	56	30
GA-006	33	72	40	42
GA-007	89	88	95	80
GA-008	85	56	63	75
GA-009	93	59	64	66
GA-010	46	79	85	91

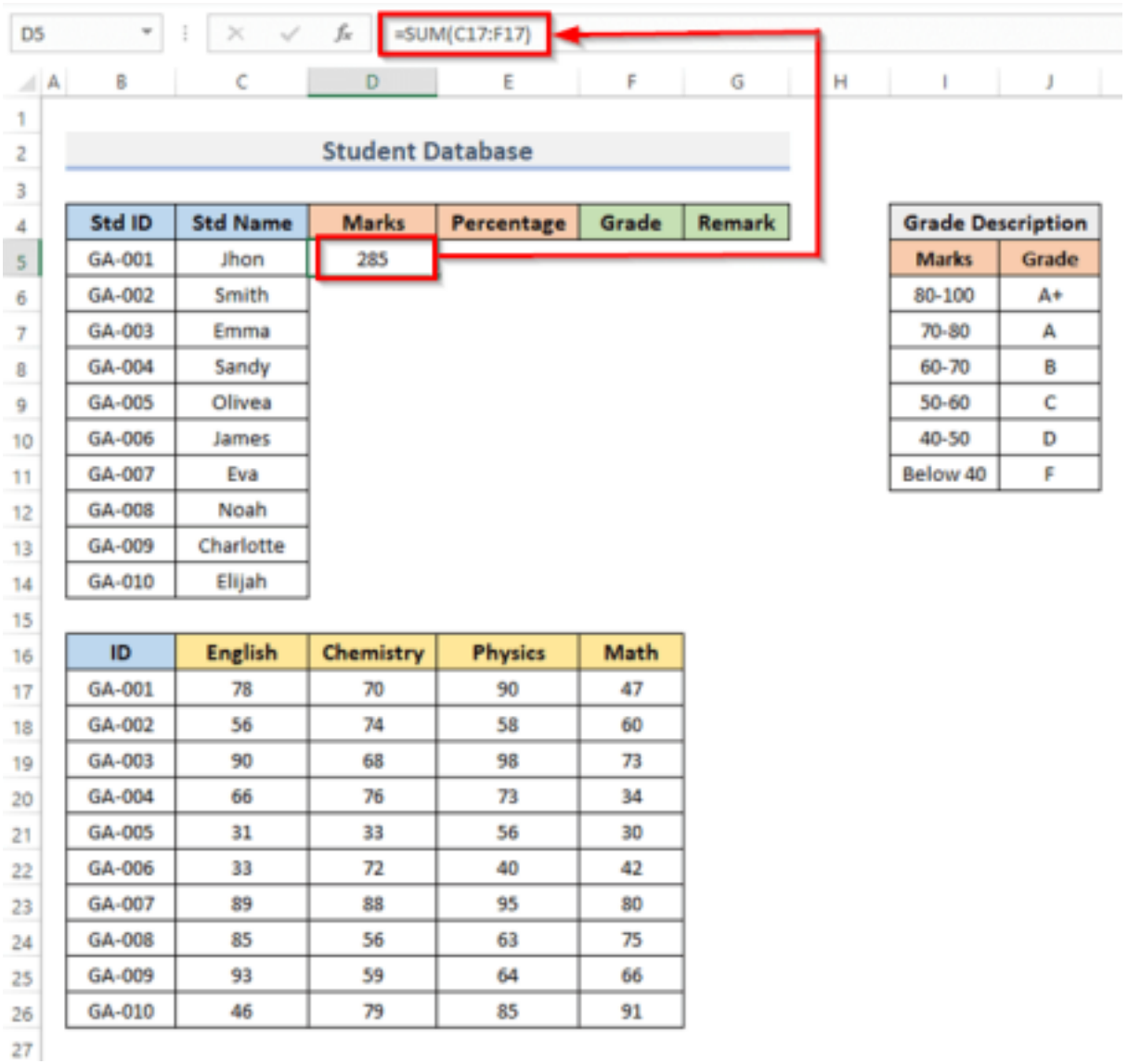
• Now, we need to find the total number of marks for each student. For this, we are using the **SUM** function.

• Further, select the cell where you want to put the formula combining the **SUM** function. So, we select cell **D5**.

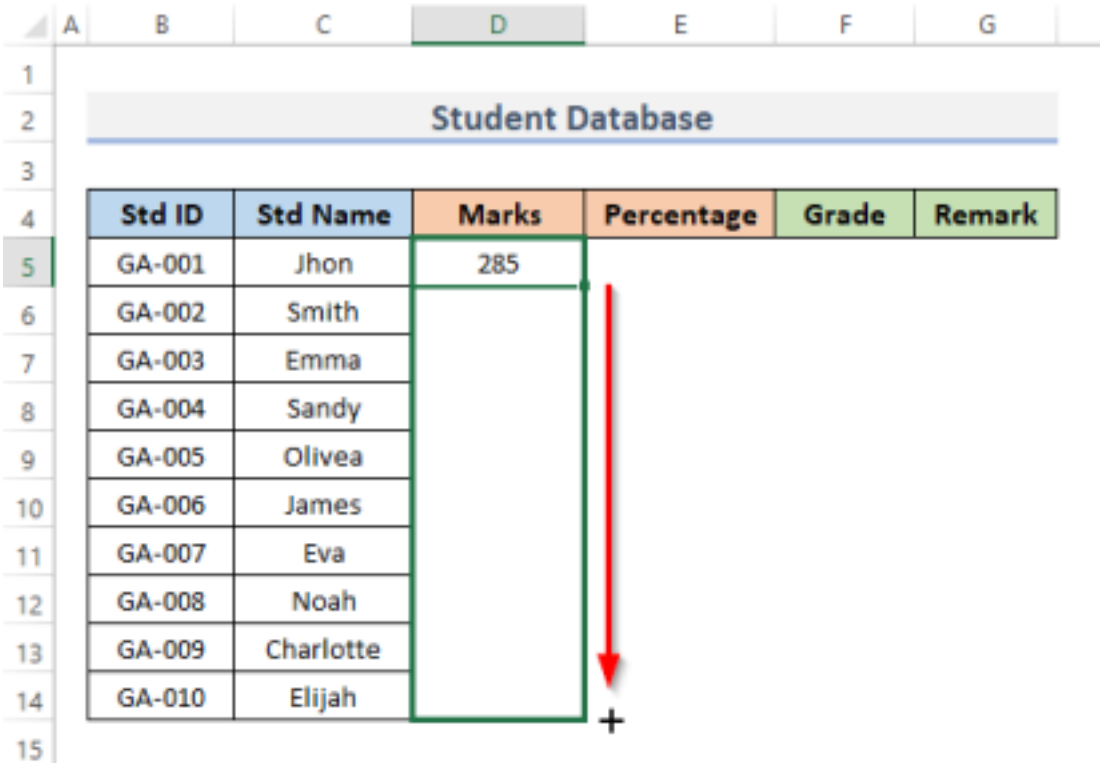
• Then, put the formula into that selected cell.

=SUM(C17:F17)

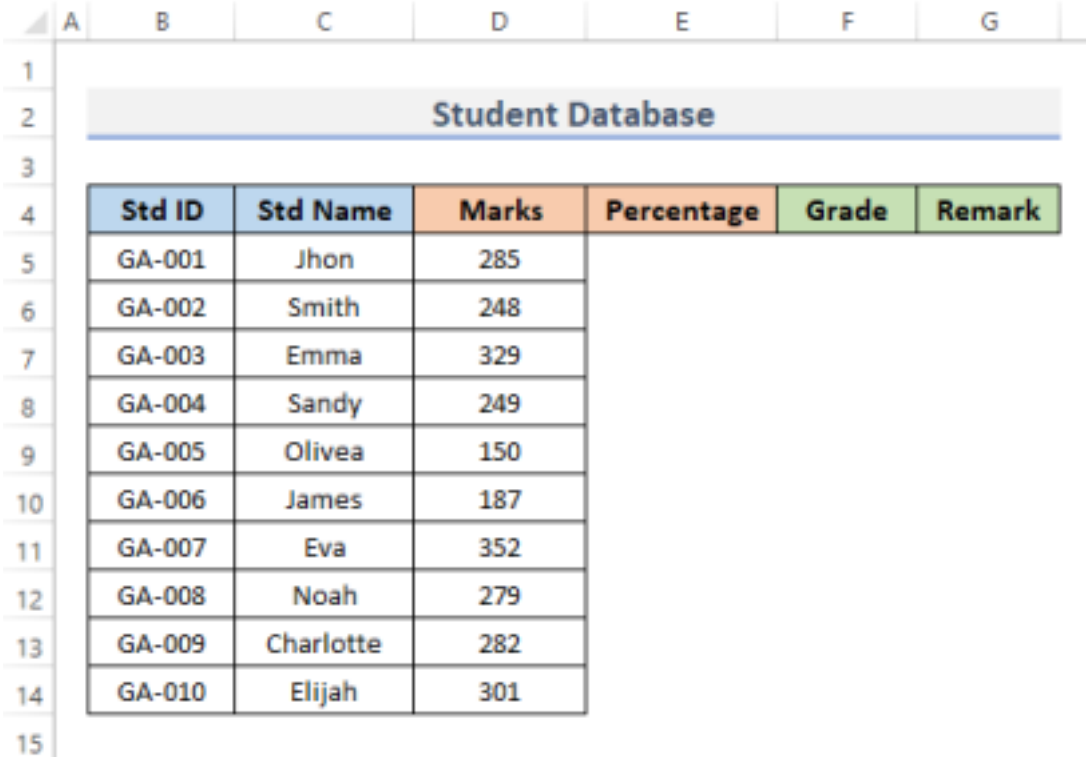
• Furthermore, press **Enter** to see the result.



• Drag the **Fill Handle** down to duplicate the formula over the range. Or, to **AutoFill** the range, double-click on the **Plus** (+) symbol.



• Finally, we can see the total marks of each student in column **D**.



Student Database

Std ID	Std Name	Marks	Percentage	Grade	Remark
GA-001	Jhon	285			
GA-002	Smith	248			
GA-003	Emma	329			
GA-004	Sandy	249			
GA-005	Olivea	150			
GA-006	James	187			
GA-007	Eva	352			
GA-008	Noah	279			
GA-009	Charlotte	282			
GA-010	Elijah	301			

Read More: How to Use Database Functions in Excel (With Examples)

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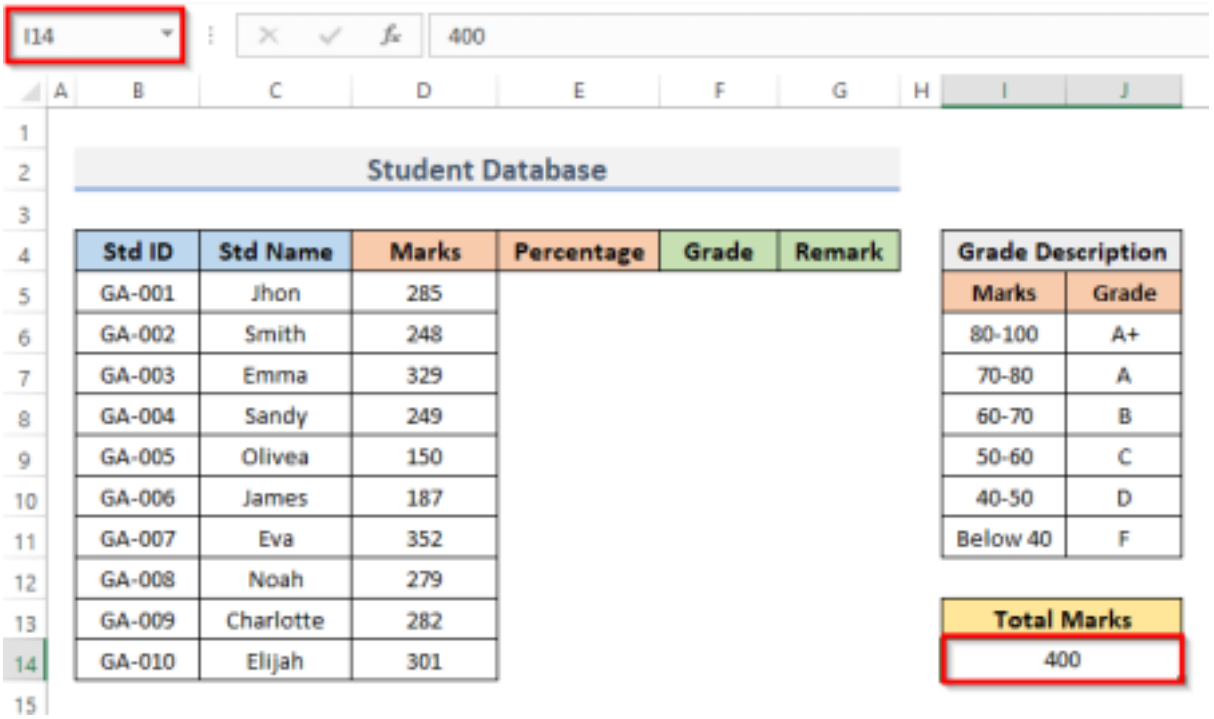
Step 5: Find out Percentage

To find the percentage of marks each student obtains, we need to put the total marks of the examination. We already know that **English** scores out of **100**, **Chemistry** scores out of **100**, **Physics** scores out of **100**, and **Math** scores out of **100**, a total of **400** marks.

• To begin with, we will put this into cell **I14**, we need this cell to construct our formula. And this cell will take into the formula as an absolute cell reference.



I14 | 400

Student Database

Std ID	Std Name	Marks	Percentage	Grade	Remark
GA-001	Jhon	285			
GA-002	Smith	248			
GA-003	Emma	329			
GA-004	Sandy	249			
GA-005	Olivea	150			
GA-006	James	187			
GA-007	Eva	352			
GA-008	Noah	279			
GA-009	Charlotte	282			
GA-010	Elijah	301			

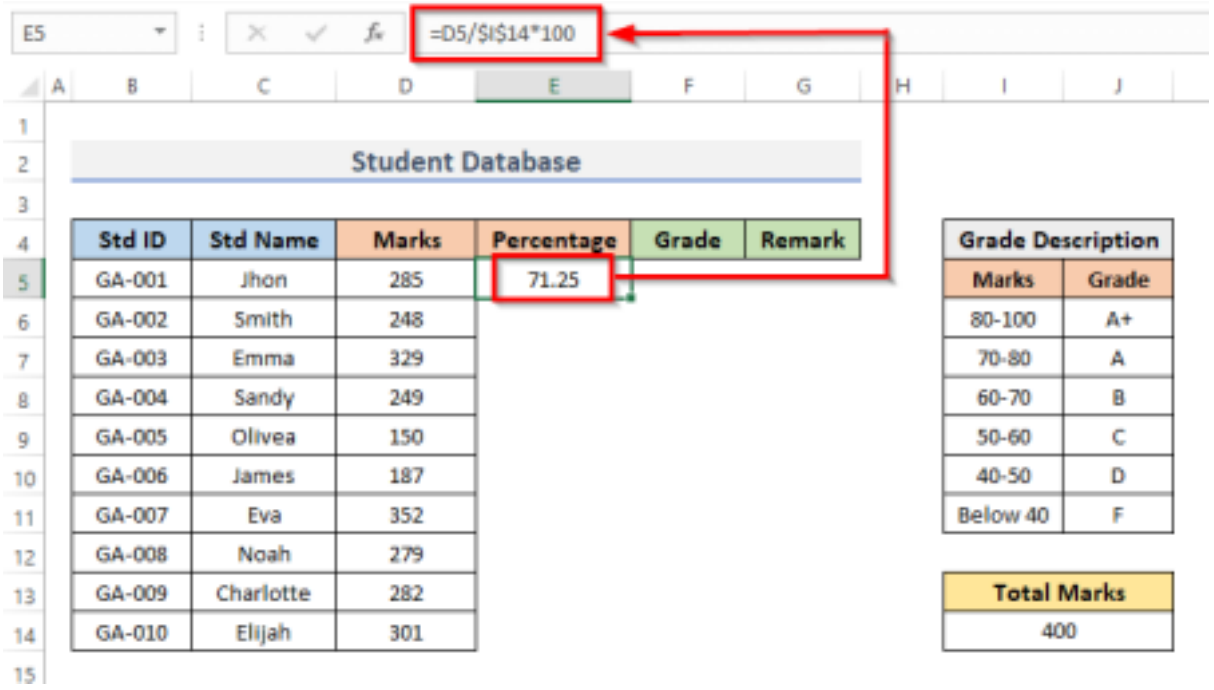
Grade Description	
Marks	Grade
80-100	A+
70-80	A
60-70	B
50-60	C
40-50	D
Below 40	F

Total Marks
400

• Similarly, as in the previous step, select cell **E5** and substitute the formula.

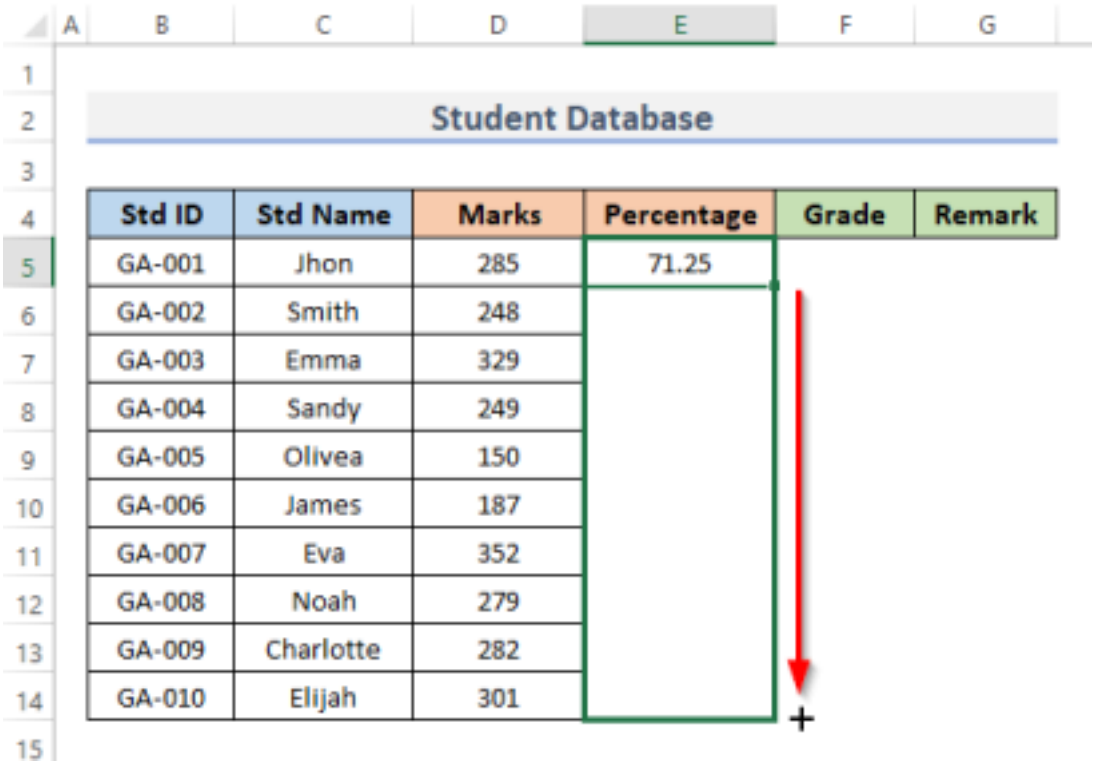
=D5/I14*100

• Then, press **Enter**. And the formula will show in the formula bar.

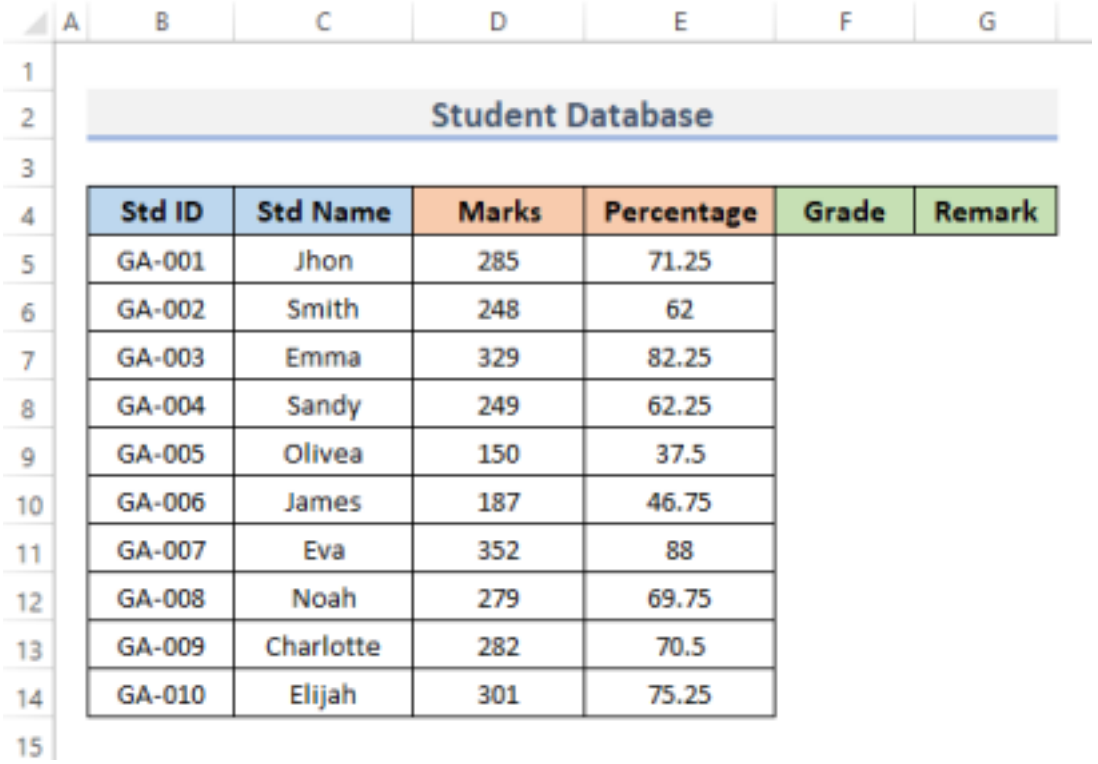


• Further, to replicate the formula throughout the range, drag the **Fill Handle** downward.

To **AutoFill** the range, double-click on the **Plus** (+) symbol.



• In the end, we will find the percentage of marks of each student.



Student Database

Std ID	Std Name	Marks	Percentage	Grade	Remark
GA-001	Jhon	285	71.25		
GA-002	Smith	248	62		
GA-003	Emma	329	82.25		
GA-004	Sandy	249	62.25		
GA-005	Olivea	150	37.5		
GA-006	James	187	46.75		
GA-007	Eva	352	88		
GA-008	Noah	279	69.75		
GA-009	Charlotte	282	70.5		
GA-010	Elijah	301	75.25		

Step 6: Discover Grade of Each Student

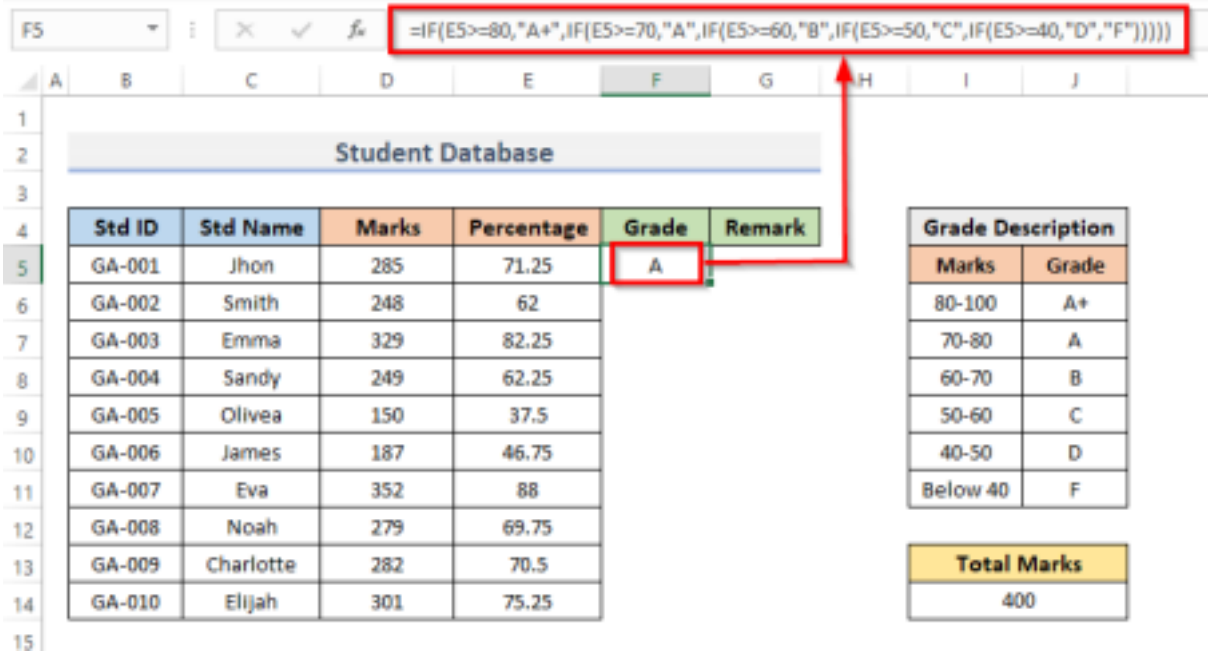
Now, we need to find the grade of each student. For this, we are going to use **the IF function** and make an easy criterion to find the grade.

• In the first place, choose the cell where you want to put the formula for finding the grade.

• Then, enter the following formula there.

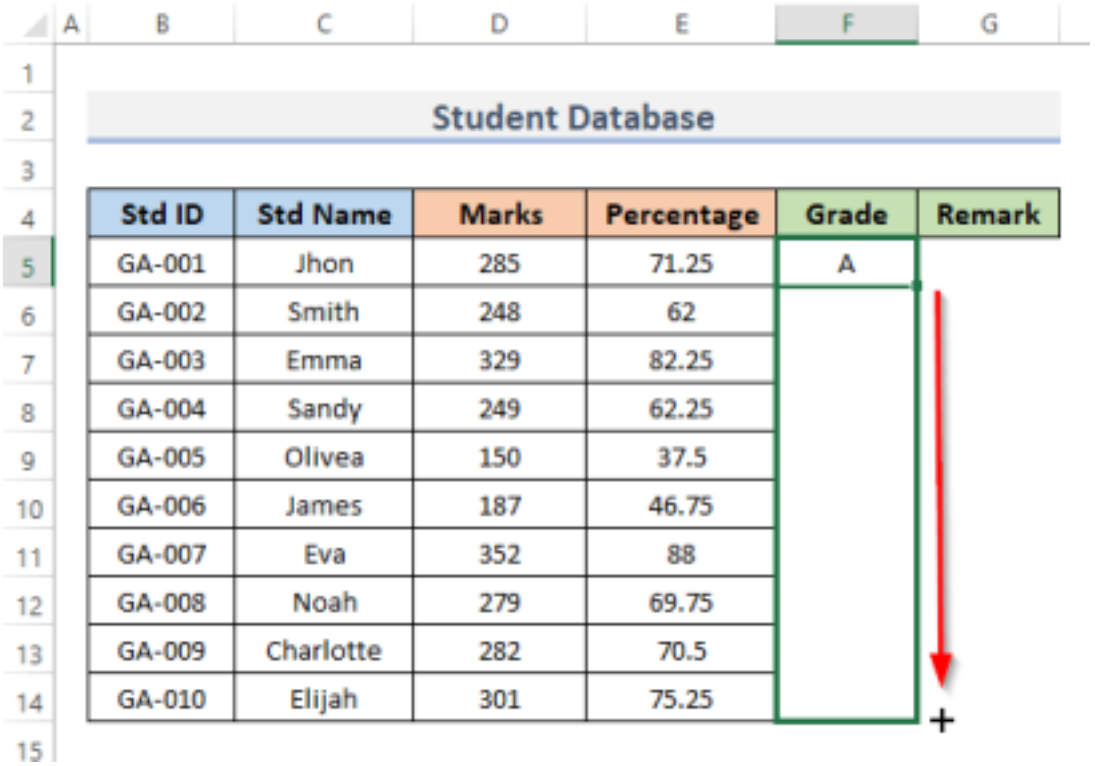
=IF(E5>=80,"A+",IF(E5>=70,"A",IF(E5>=60,"B",IF(E5>=50,"C",IF(E5>=40,"D","F")))))

• After that, to complete the operation hit the **Enter** key.



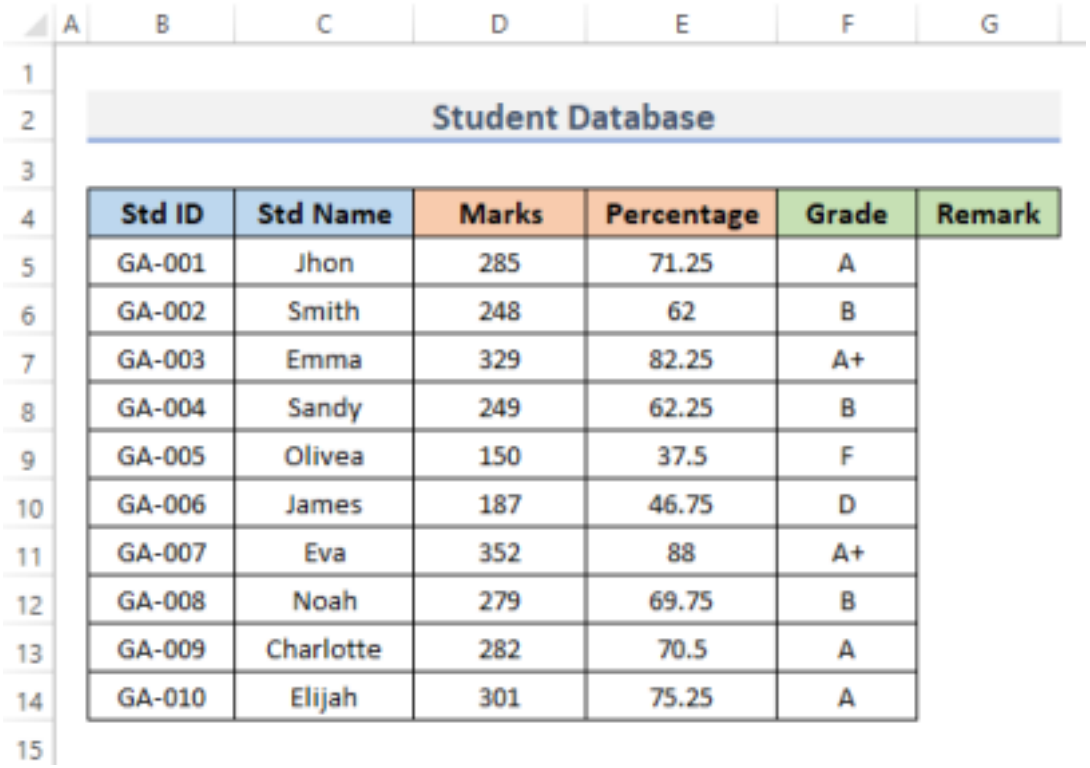
• Furthermore, to copy the formula over the range, drag the **Fill Handle** down or double-click on

the **Plus** (+) icon.



Student Database					
Std ID	Std Name	Marks	Percentage	Grade	Remark
GA-001	Jhon	285	71.25	A	
GA-002	Smith	248	62		
GA-003	Emma	329	82.25		
GA-004	Sandy	249	62.25		
GA-005	Olivea	150	37.5		
GA-006	James	187	46.75		
GA-007	Eva	352	88		
GA-008	Noah	279	69.75		
GA-009	Charlotte	282	70.5		
GA-010	Elijah	301	75.25		

• Lastly, we will get all the grades of each student into the database.



Student Database					
Std ID	Std Name	Marks	Percentage	Grade	Remark
GA-001	Jhon	285	71.25	A	
GA-002	Smith	248	62	B	
GA-003	Emma	329	82.25	A+	
GA-004	Sandy	249	62.25	B	
GA-005	Olivea	150	37.5	F	
GA-006	James	187	46.75	D	
GA-007	Eva	352	88	A+	
GA-008	Noah	279	69.75	B	
GA-009	Charlotte	282	70.5	A	
GA-010	Elijah	301	75.25	A	

Step 7: Obtain Remark

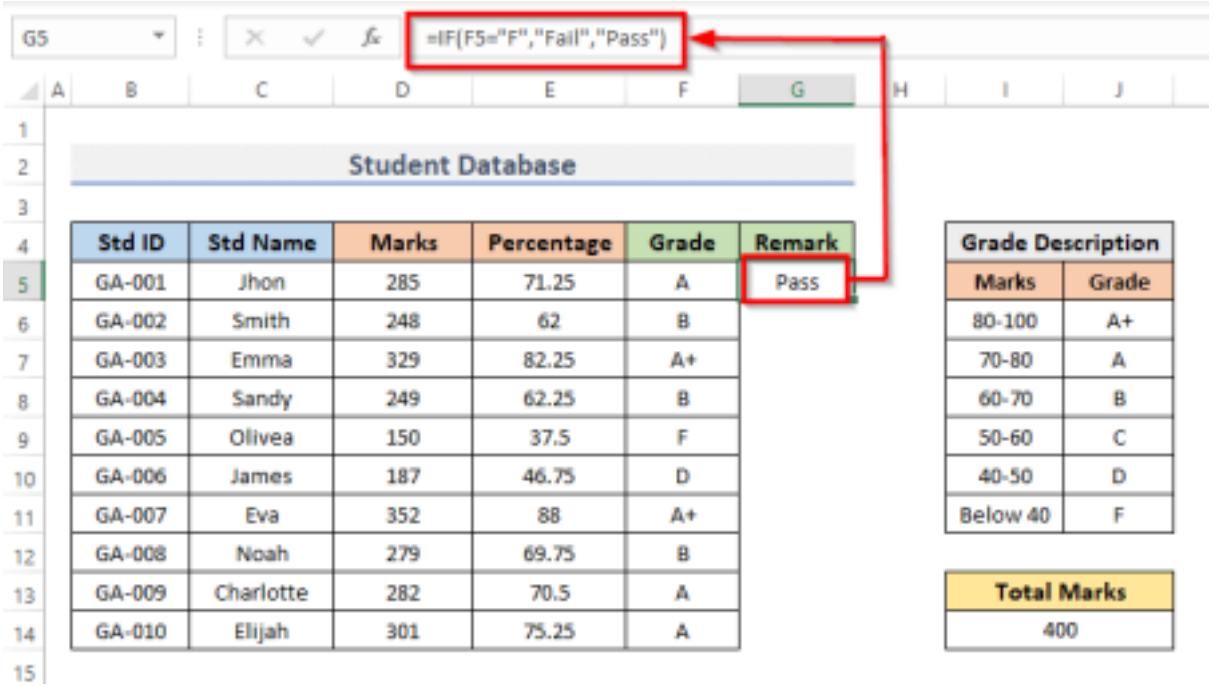
Here, we will obtain a column to make a comment on their result. The student got the pass mark or the fail mark.

• Likewise the previous steps, first, select cell **G5**.

• Then, in that selected cell, type in the formula below.

=IF(F5="F","Fail","Pass")

• Hit **Enter** to see the result.



• Now, drag the **Fill Handle** downward to repeat the formula across the range. double-click on the **Plus** (+) sign to **AutoFill** the range.

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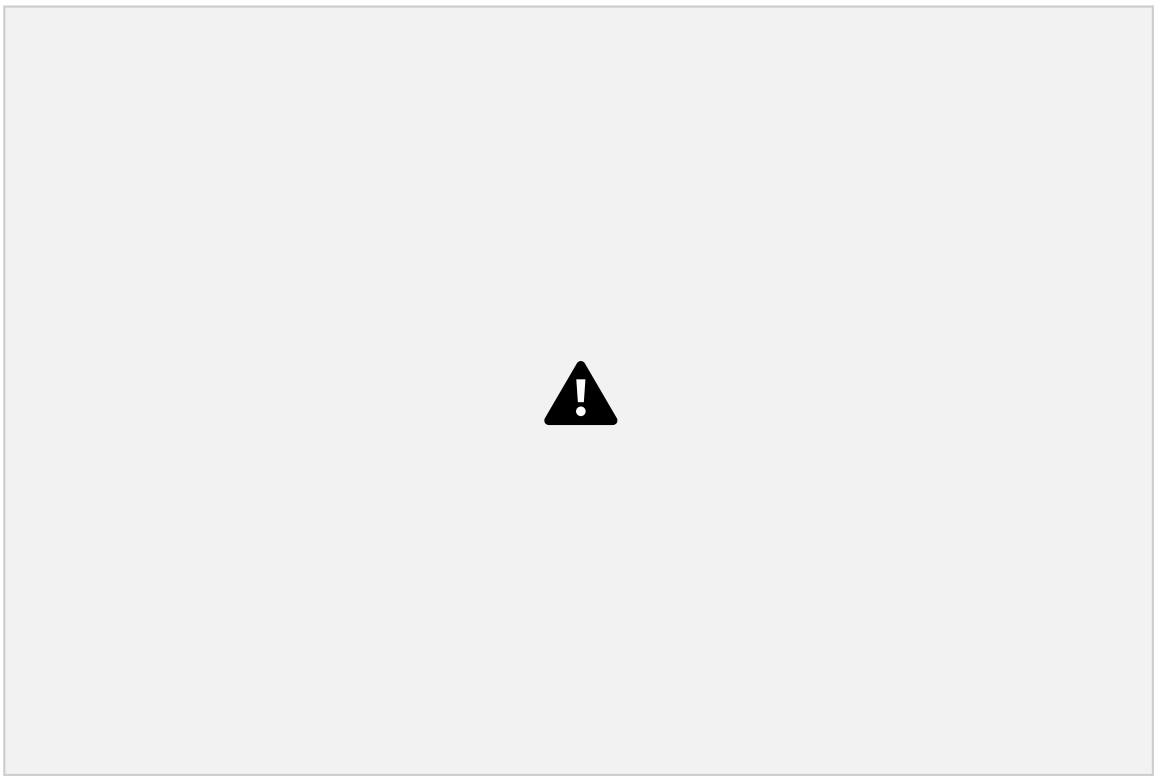
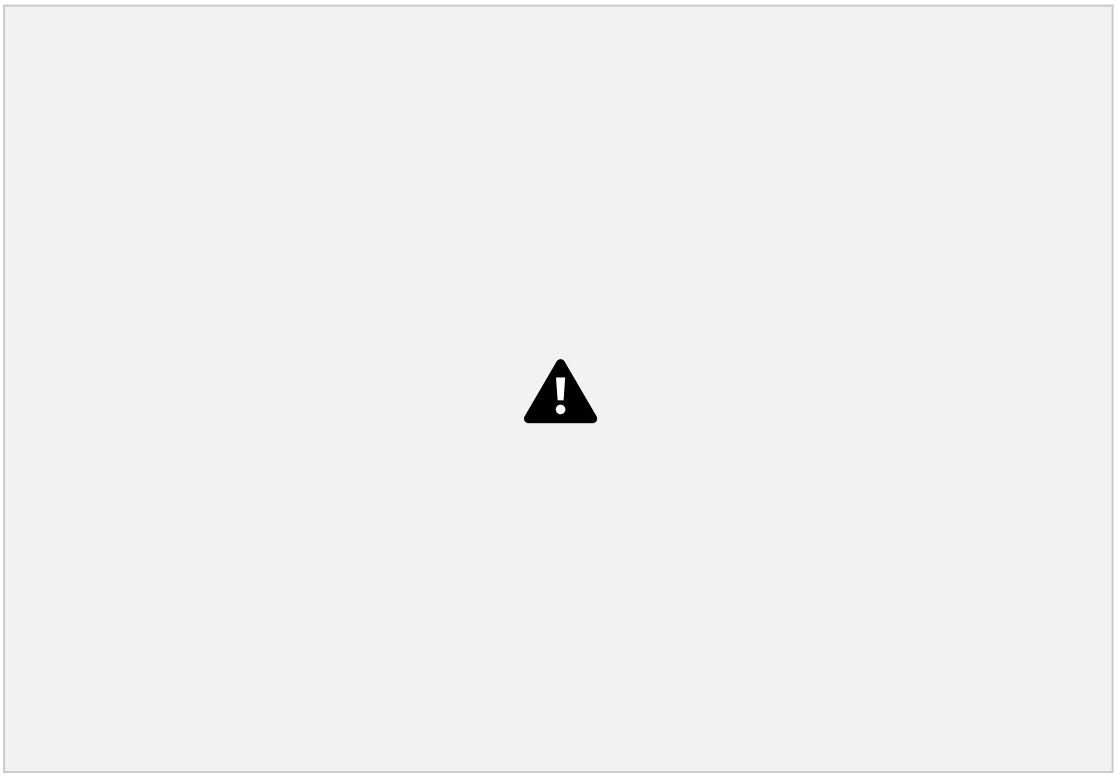


• In the end, we will be able to see the remarks of each student.

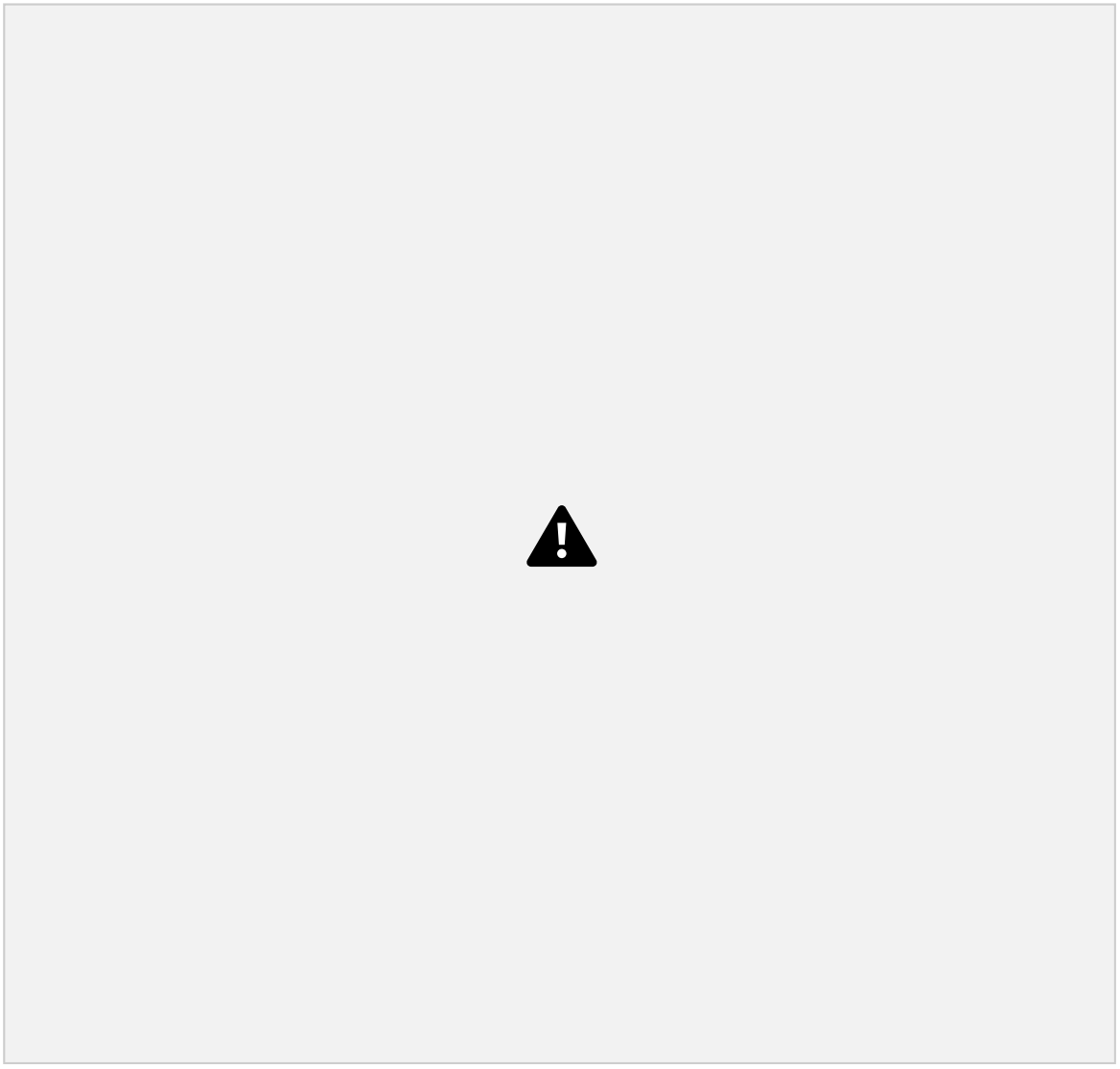


Step 8: Create Table

The most significant advantage of including a table is that it allows you to visually categorize information. Excel tables are flexible by default, which means they grow and shrink as you add and

delete rows and columns. Tables allow for quick and easy reading of concerns shown in rows and columns. Now, the final step, creating the table for the database.

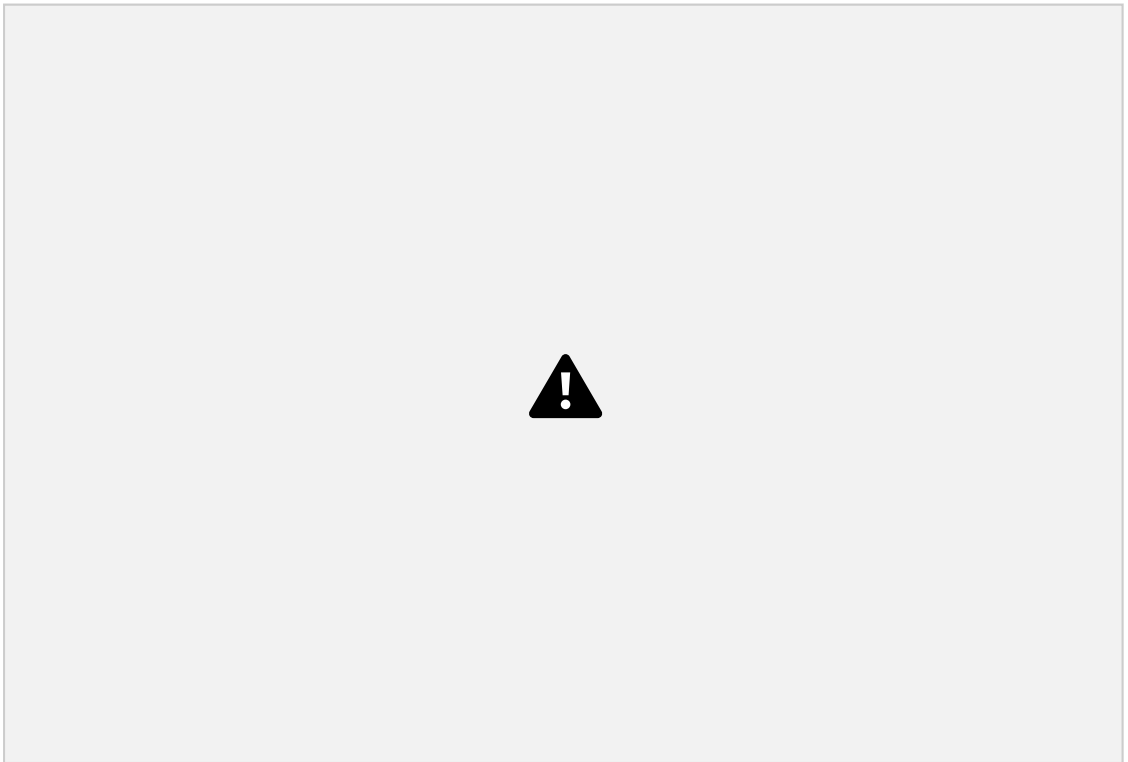
- Firstly, select the whole range of data
- Go to the **Insert** tab from the ribbon.
- Then, from the **Tables** category, click on **Table**.



• This will open a **Create Table** dialog box.

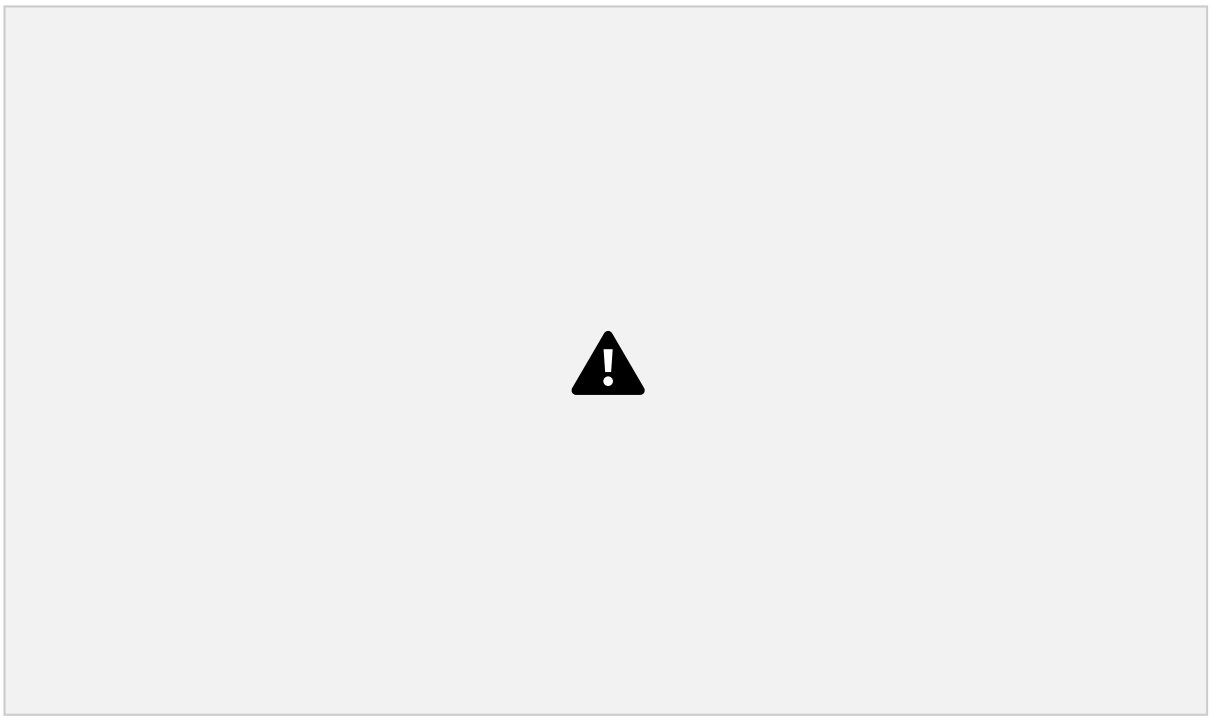
• Check Mark on the **My table has headers** box.

• Further, click on the **OK** button to complete the process.



• This will create a table for your database.

• Now you can easily modify the table.



Final Template of Student Database in Excel

This is the final template of the student database. You can utilize the template and modify the input cells to meet your needs.

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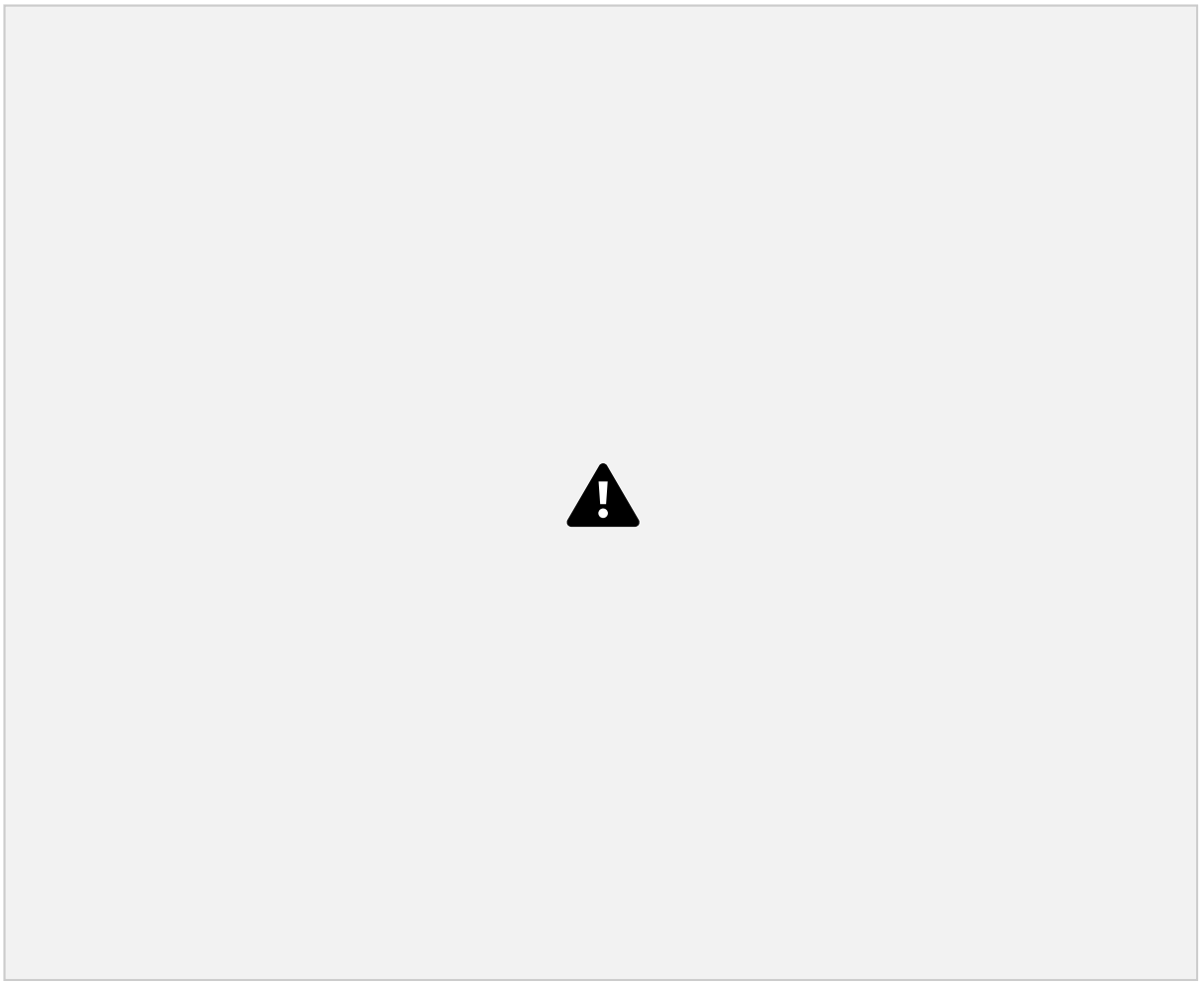

Why Do We Use Excel to Create Databases?

Microsoft Excel is made up of rows and columns that contain our data, which we refer to as records. Because it is the most widely used tool, we save our data in Excel, which considers a database. Excel is a strong tool that allows us to interact with data, thus having the data in Excel will make your life simpler. Excel is employed to test and calculate data and can hold vast quantities of data in workbooks that have one or even more sheets as spreadsheet software.

Conclusion

By following the above steps, we will be able to create a **student database in excel** easily.
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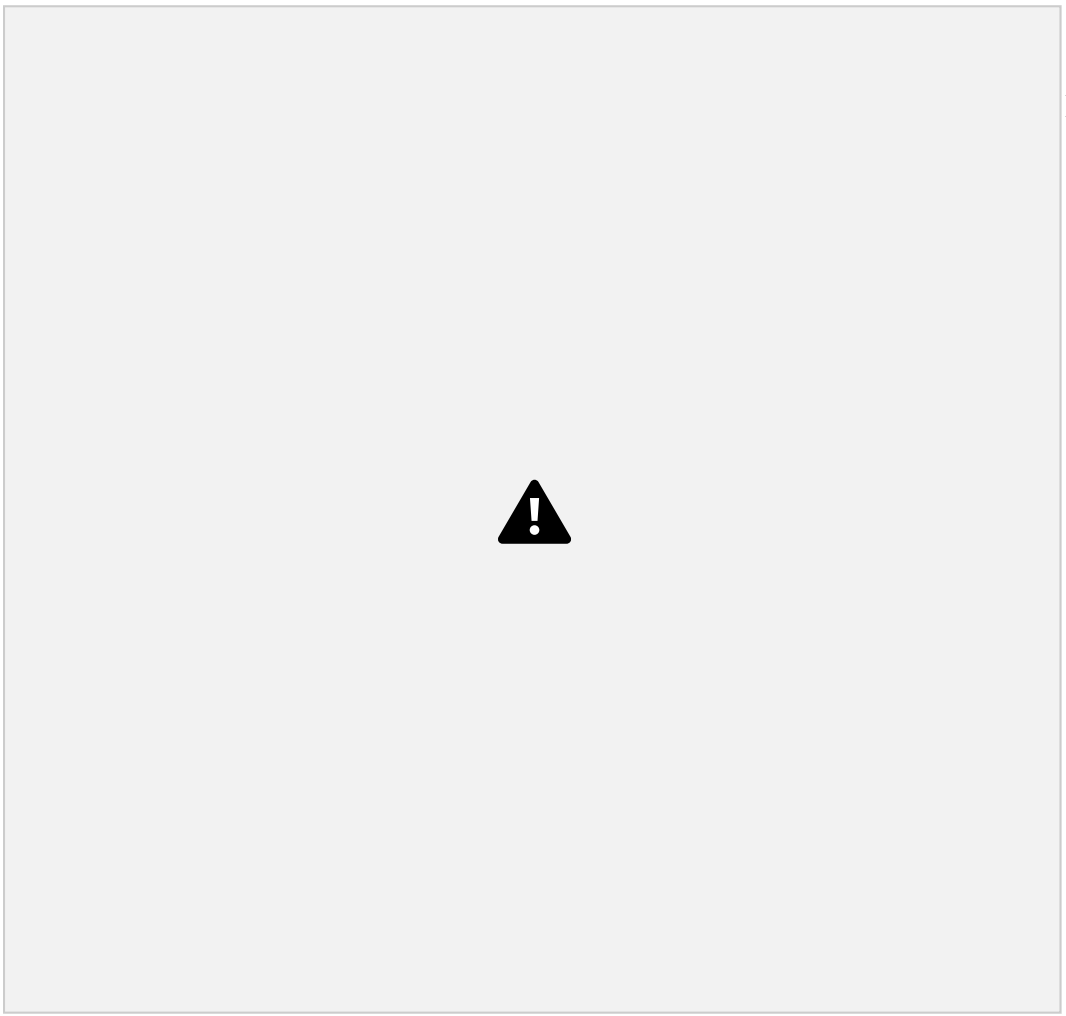
Creating Data Base through Microsoft Access

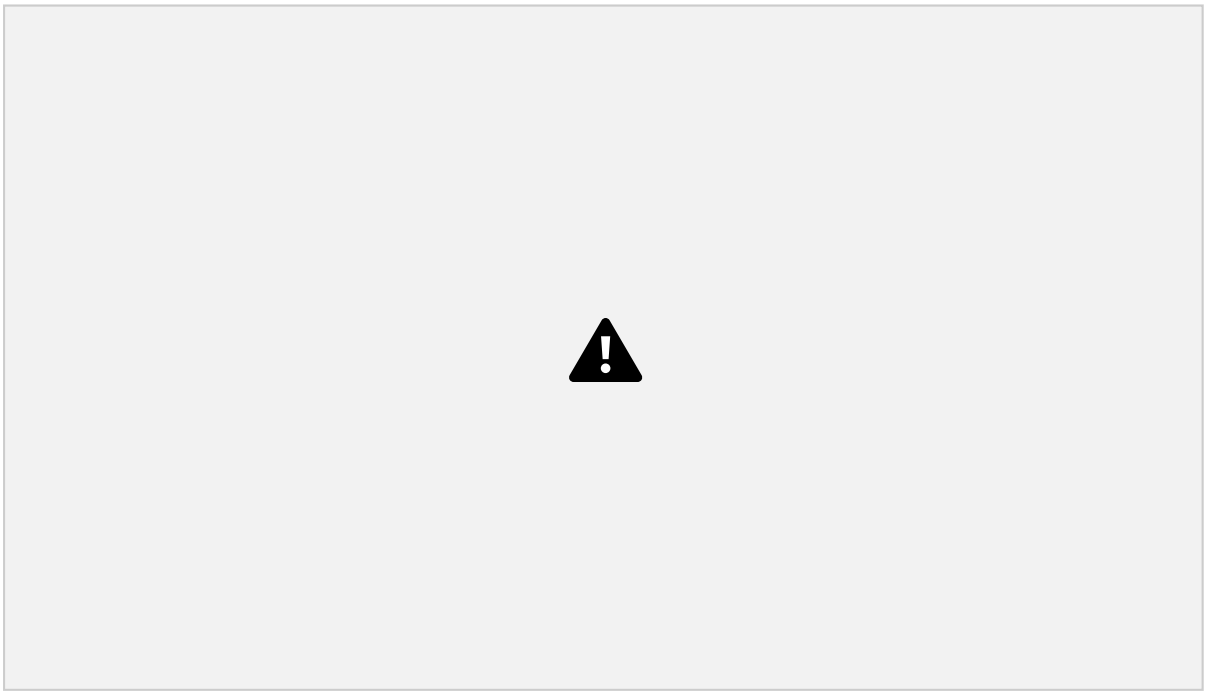
To create a database for employee details using Microsoft Access, follow these steps:

1. Open Microsoft Access and create a new Blank Database. 2. Design the Tables:	
	• Click on the "Table Design" option to create a new table. • Add the necessary fields for storing employee information. For example, include fields such as EmployeeID (AutoNumber, Primary Key), FirstName, LastName, DateOfBirth, Gender, Email, Phone, Address, Department, Position, Salary, and any other relevant employee details. • Save the table with a meaningful name, such as "Employees."
3. Create Additional Tables (if needed):	
	• Depending on your requirements, you may need additional tables to handle related information such as departments, positions, or salary scales. • Follow the same steps as above to create and define the necessary fields for each additional table.
4. Establish Relationships:	
	• Click on the "Database Tools" tab, then select "Relationships." • Drag and drop the Primary Key field (EmployeeID) from the "Employees" table to the corresponding foreign key field in related tables (e.g., DepartmentID in a "Departments" table). • Repeat this step for any other tables that have relationships with the "Employees" table. • Ensure that the relationships are appropriately defined (e.g., one-to-one, one-to-many) and set any necessary referential integrity rules.
5. Create Forms and Reports (optional):	

	• Forms: Click on the "Create" tab and choose "Form Design" to create a user-friendly form for data entry and viewing employee details. You can customize the form layout and include controls like text boxes, drop-down lists, and buttons. • Reports: Click on the "Create" tab and select "Report Design" to create printable reports based on employee data. You can design the report layout, specify the data fields to include, and apply formatting as needed.
6. Enter and Manage Data:	
	• Open the "Employees" table or use the created form to enter employee details manually. • You can also import data from external sources, such as Excel spreadsheets or CSV files, by using the "External Data" tab.

By following these steps, you can create a database for employee details using Microsoft Access. Remember to save your database periodically and consider implementing proper security measures, such as password protection, to ensure data integrity and confidentiality.

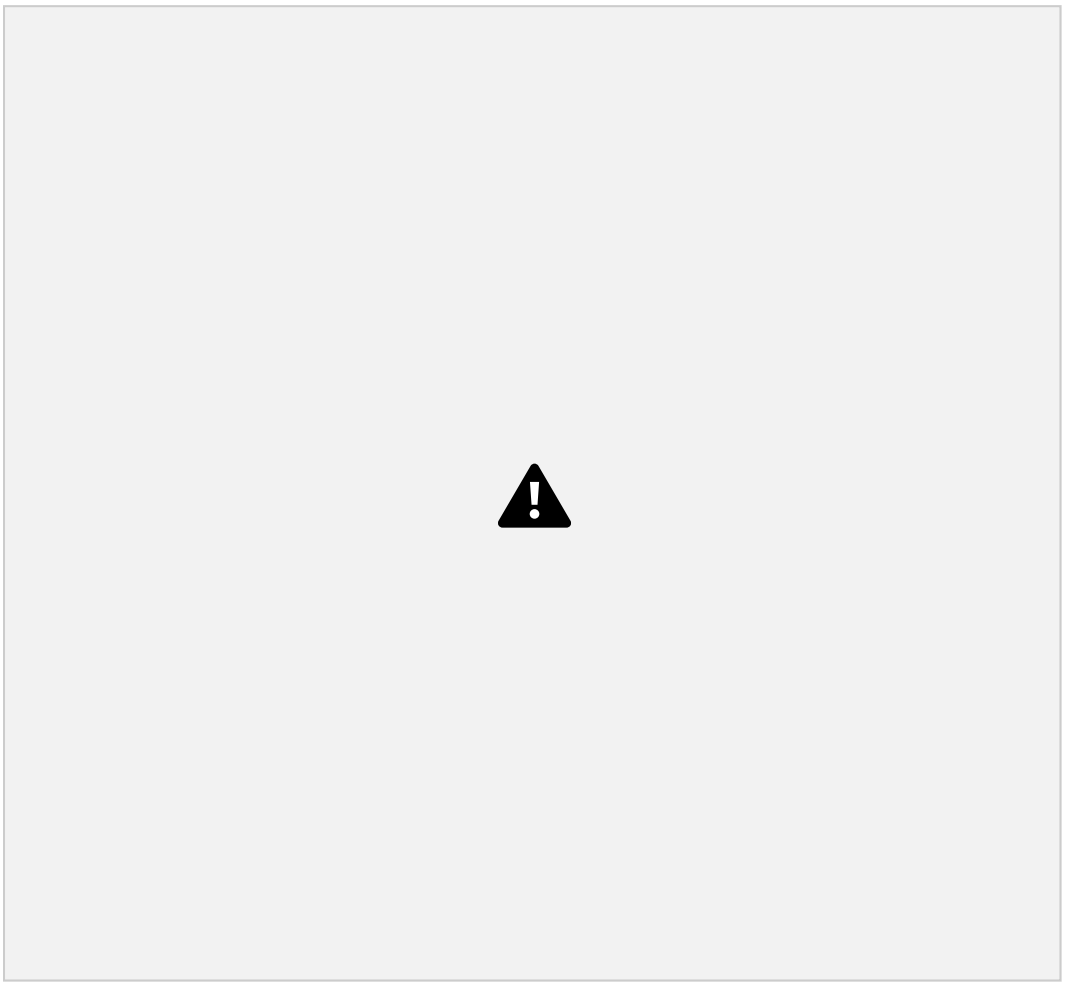


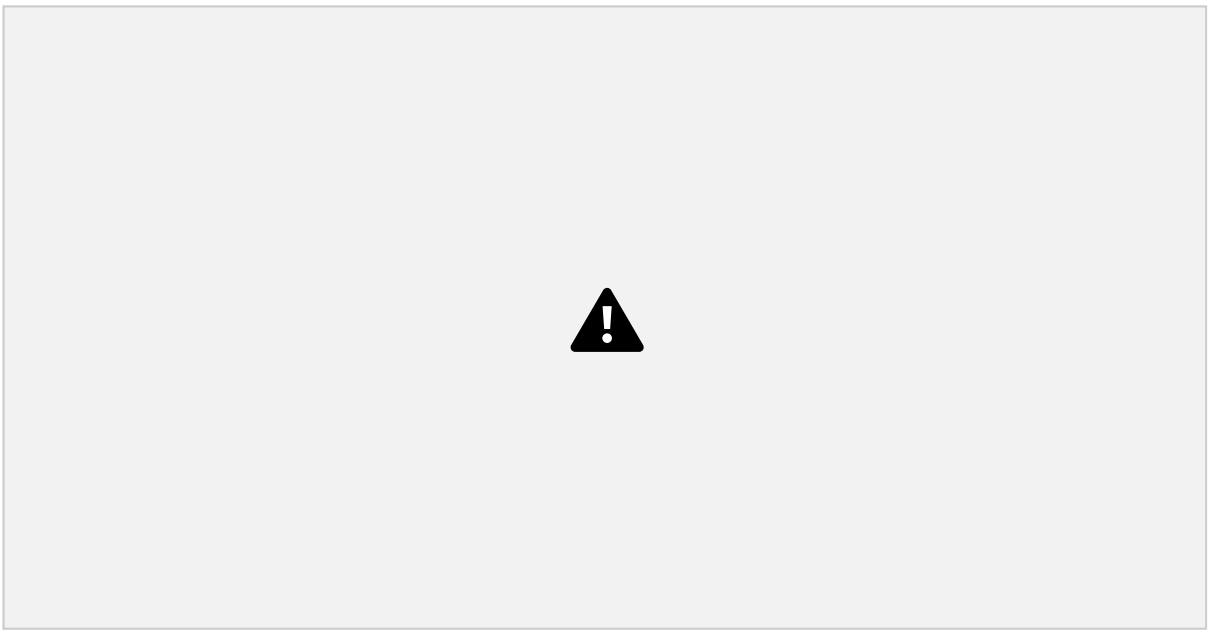


Solution

Step 1: Start->All programmes->Microsoft office->Microsoft Access

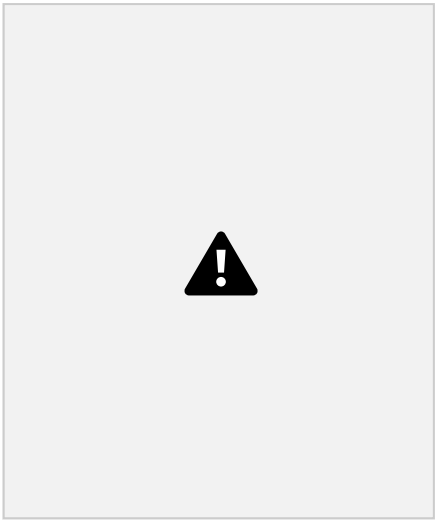
2010. **Step 2 :** Name the data base **Dink Ltd** and click on create tab.





Step 3: Click on **View** and then **Design view** and name the table as '**Employee',** click ok.

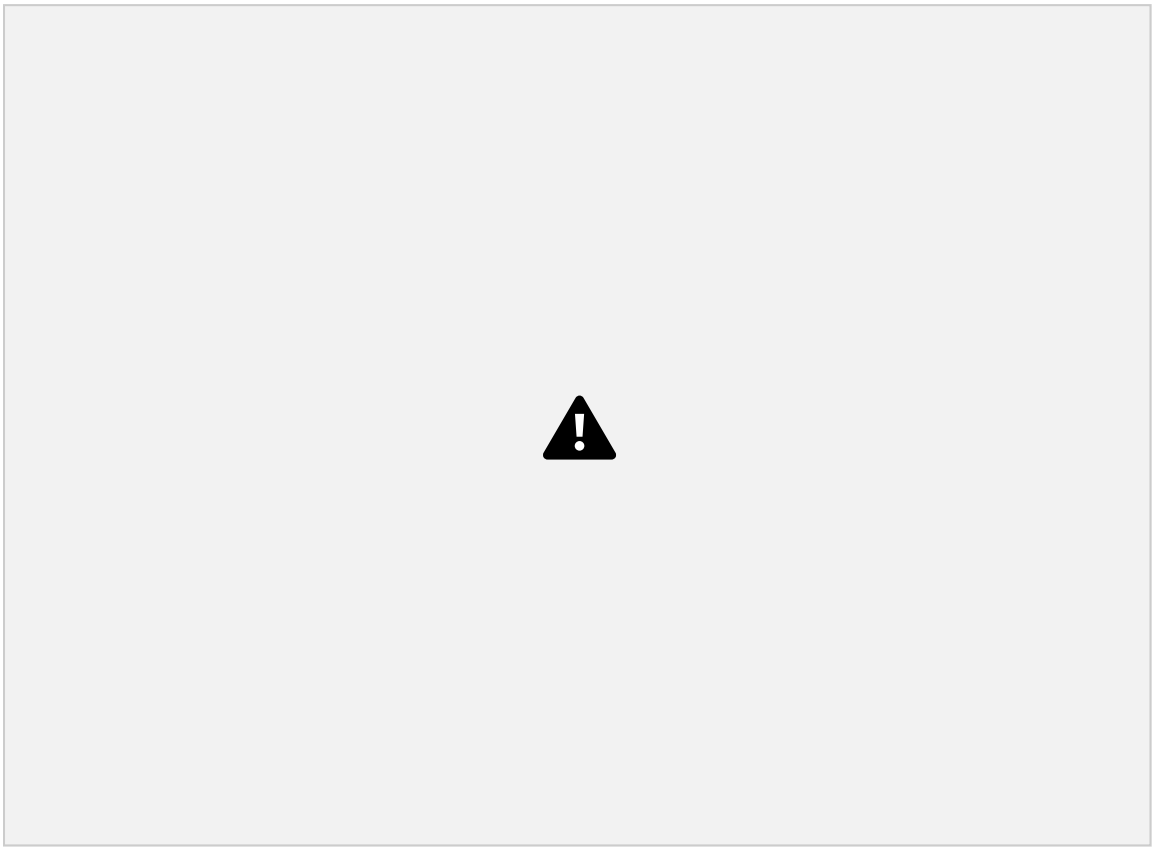
Design view allows you to create or change the table, form, or other database object, and configure the fields. **Datasheet view** shows the data **in the** database. It also allows you to

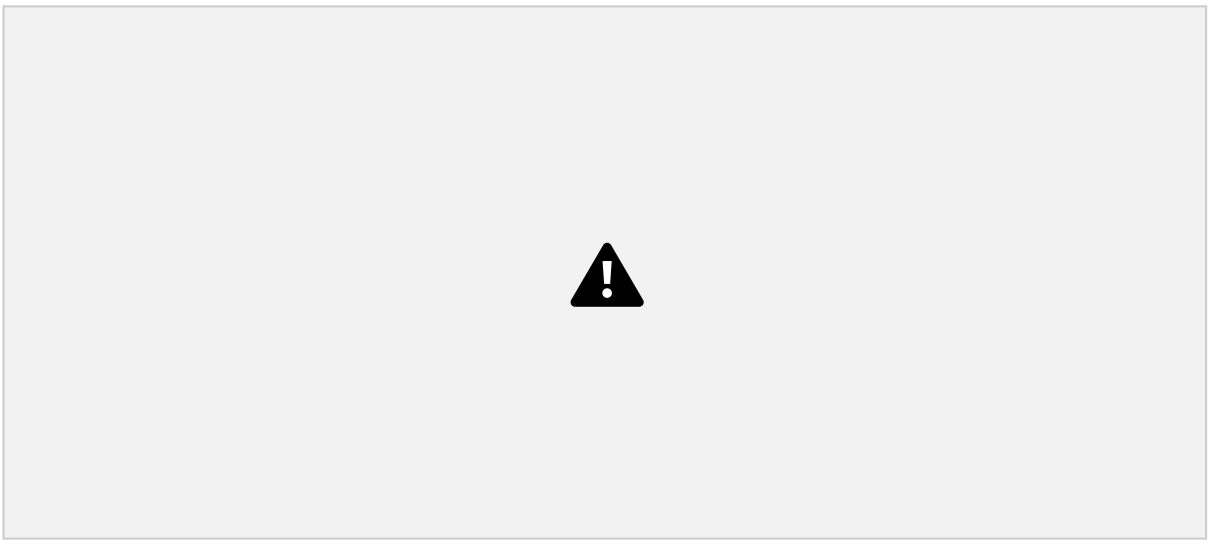
enter and edit the data It does not let you change the format of the database, other than minor changes. 

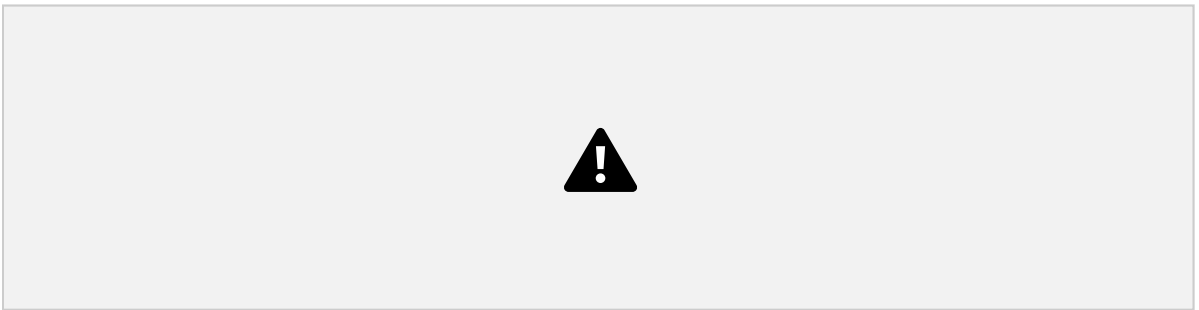
Step 4: After clicking on view and selecting design view, start inserting field name and field properties as given in the question.

a) For entering **employee code and employee name** we choose the data type as **text.**

and **experience** as **Number.**





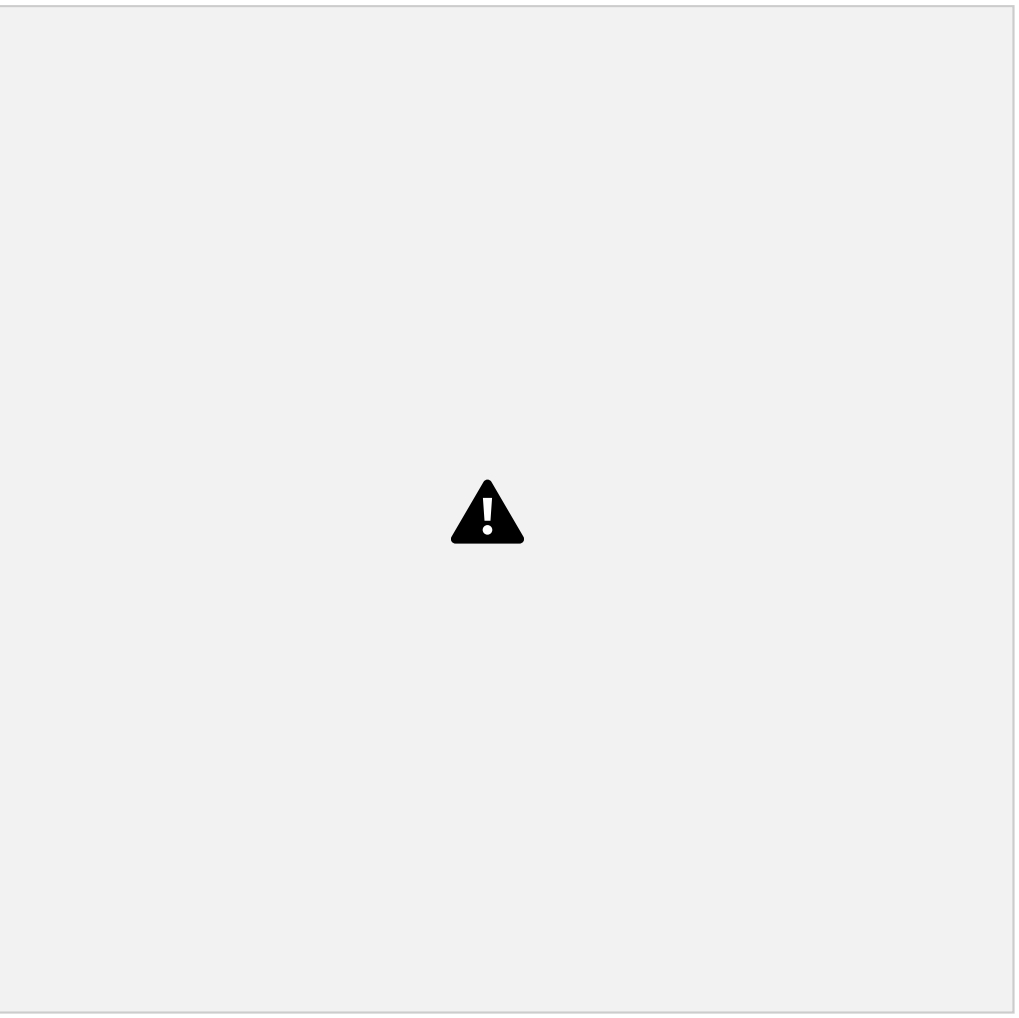


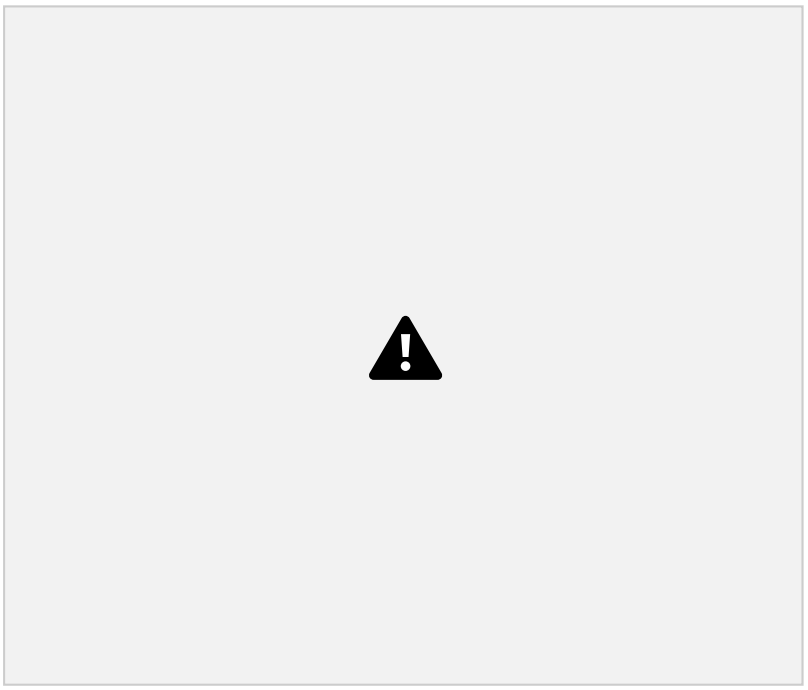
b) When we are entering ***DEPARTMENT*** as field name we select **data type as *LOOKUP WIZARD***
as follows.

Note: We are choosing **lookup wizard** as data type the reason being there are 03 options are given (Finance, Marketing, HR) in the question for **department field.**

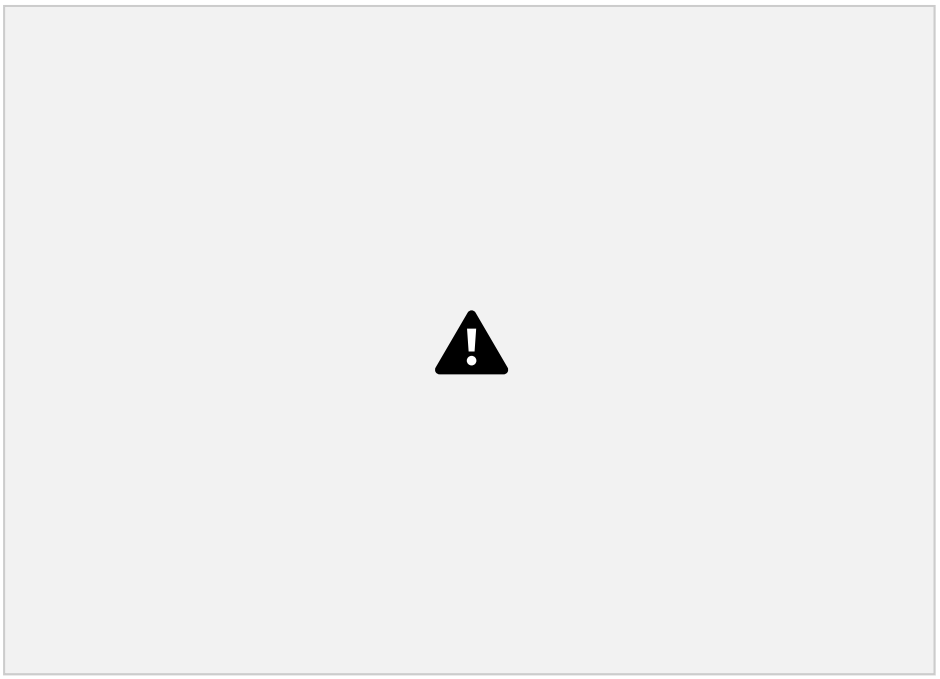
Steps for creating lookup wizard

1)





2)



3)

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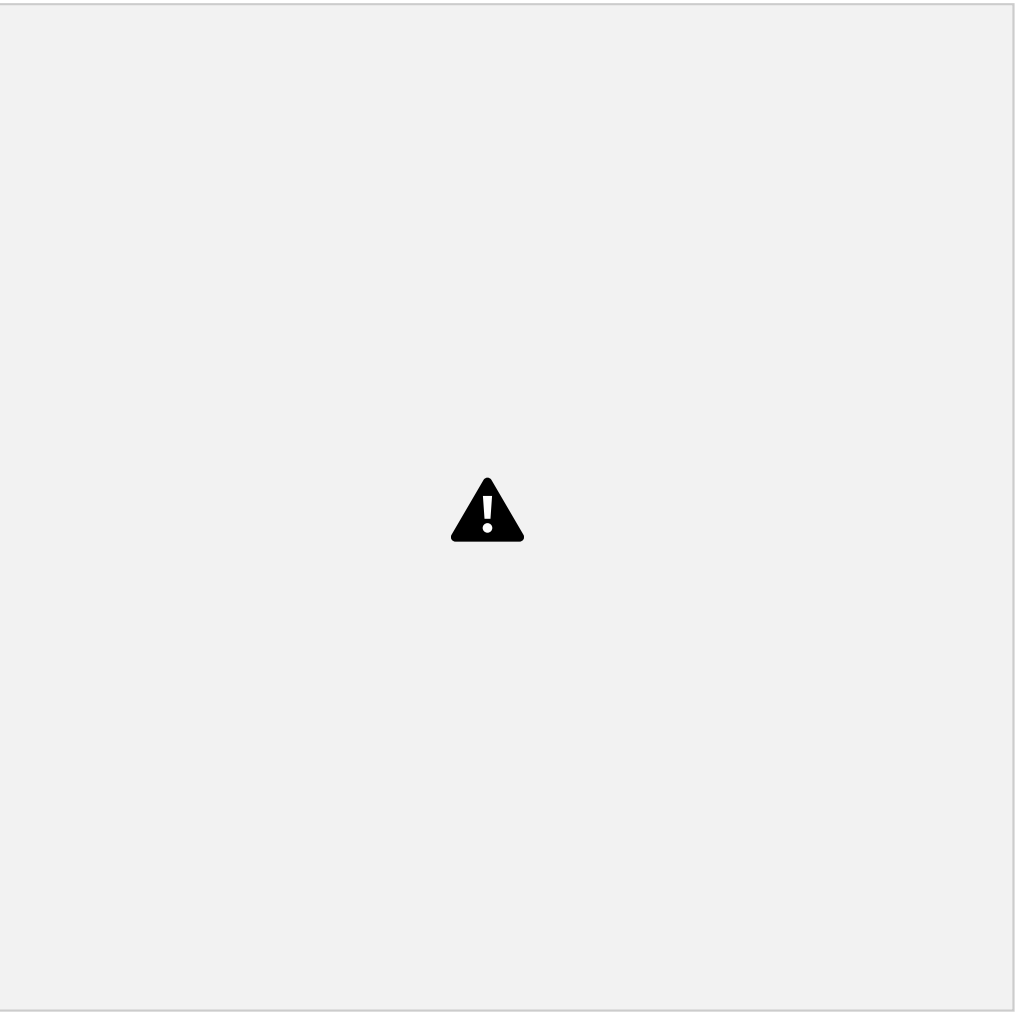
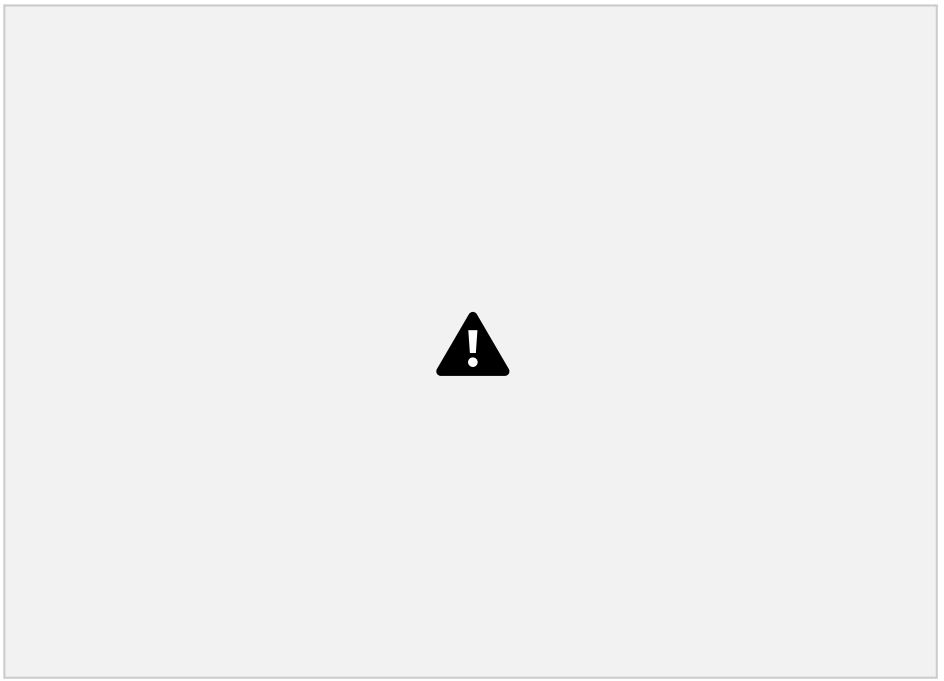
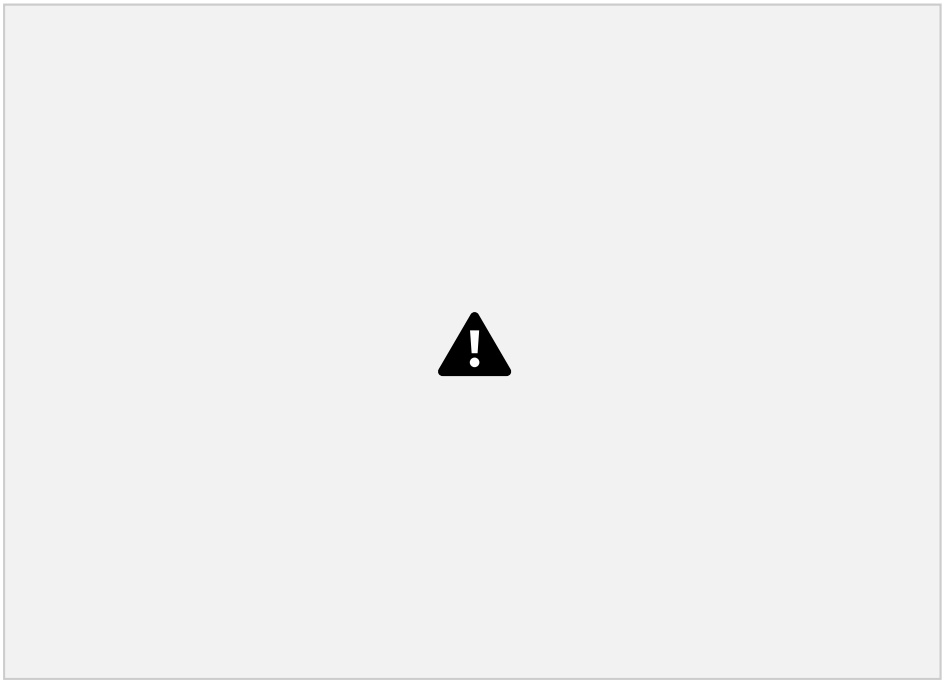




4)



Click on finish

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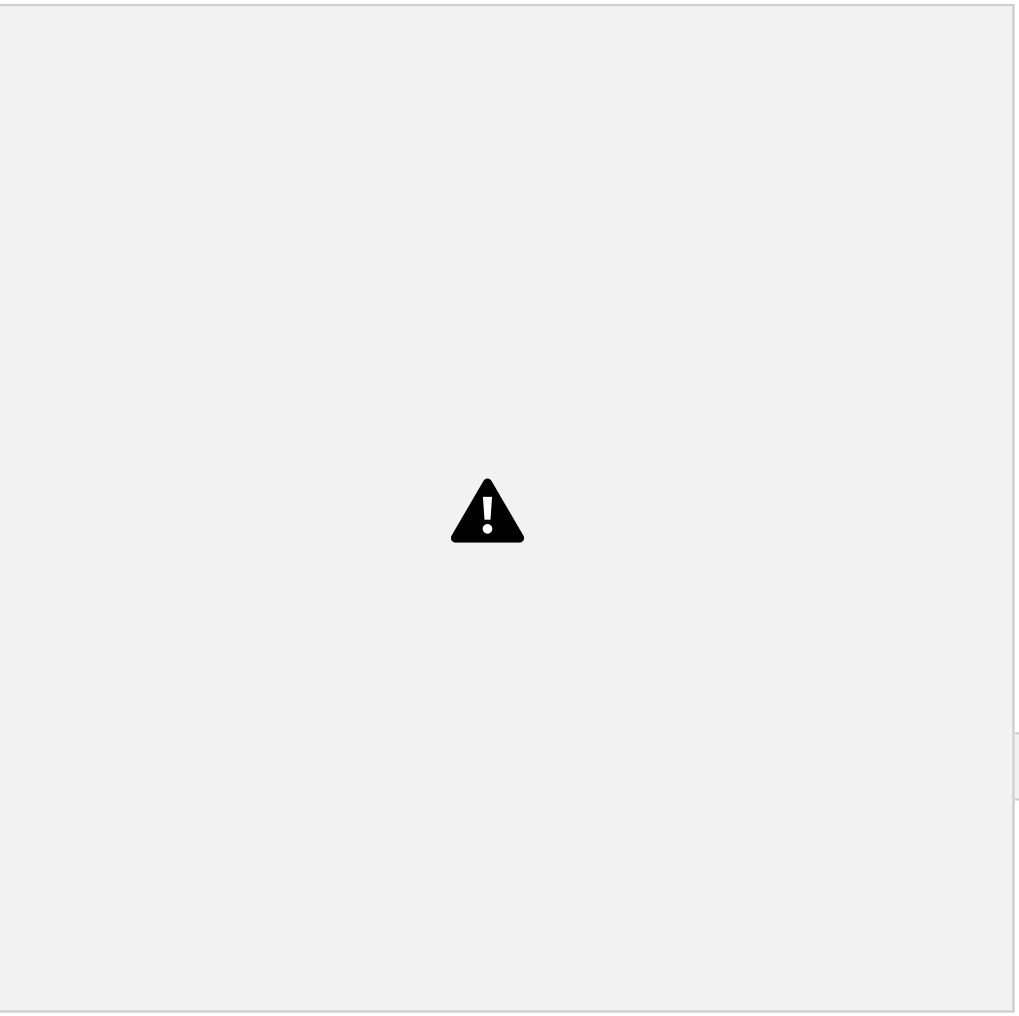
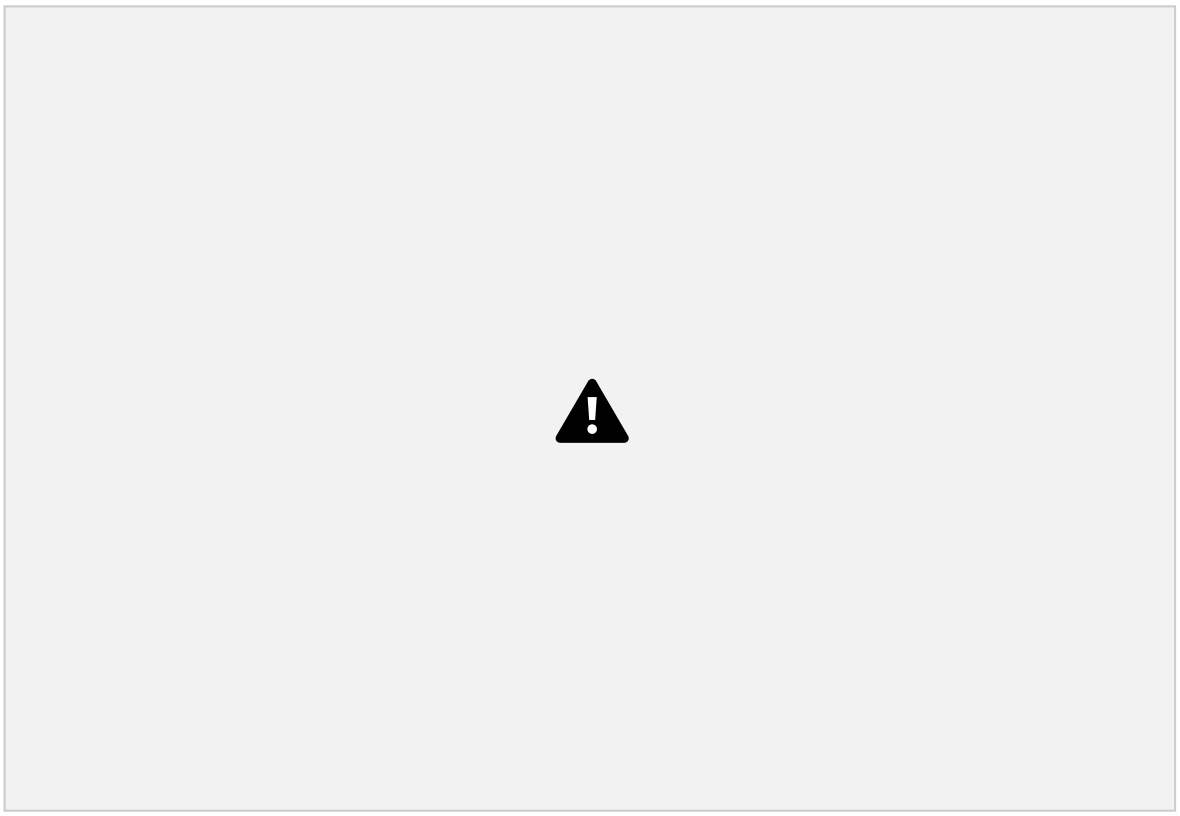
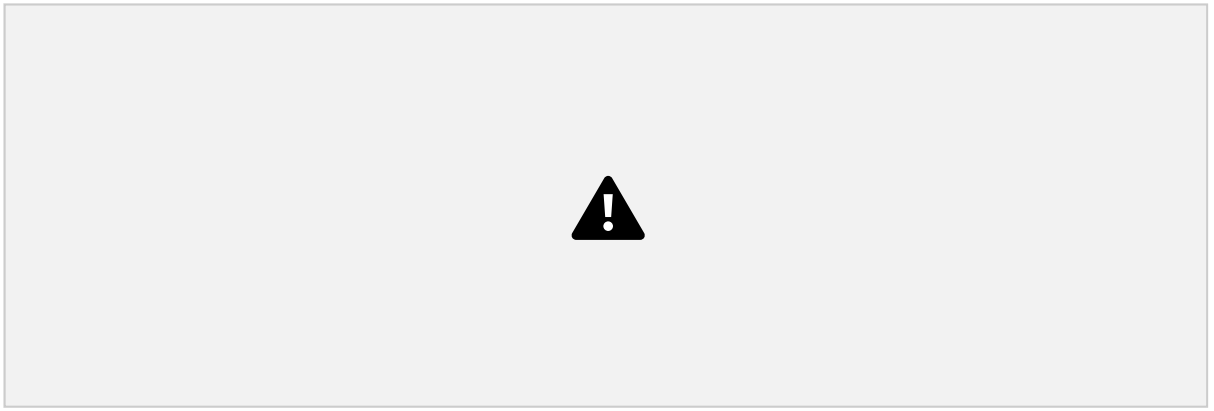
Step 5: After inserting all fields, make **Empcode** as primary key(unique key).

A **primary key** is a field in a table which uniquely identifies each row/record in a database table. **Primary keys** must contain unique values. A **primary key** column cannot have NULL values. A table can have only one **primary key**, which may consist of single or multiple fields.

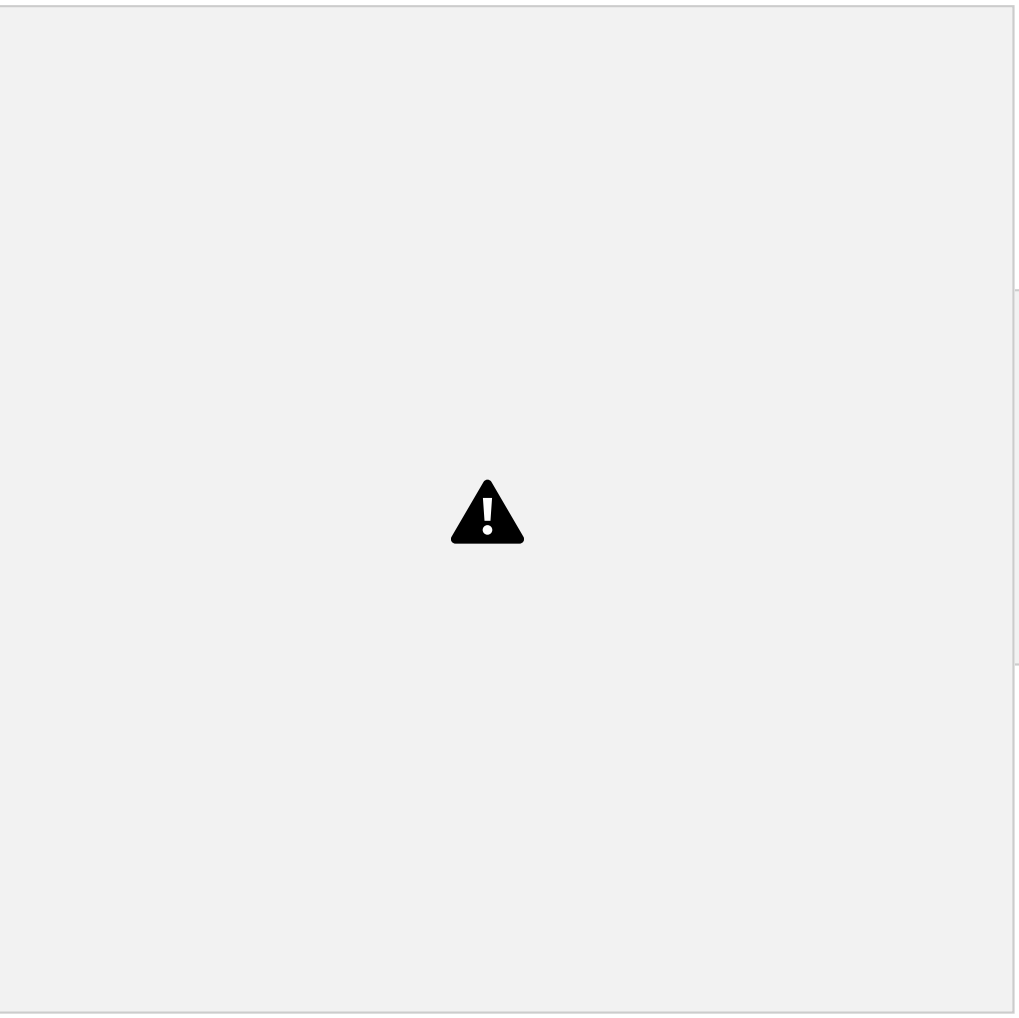


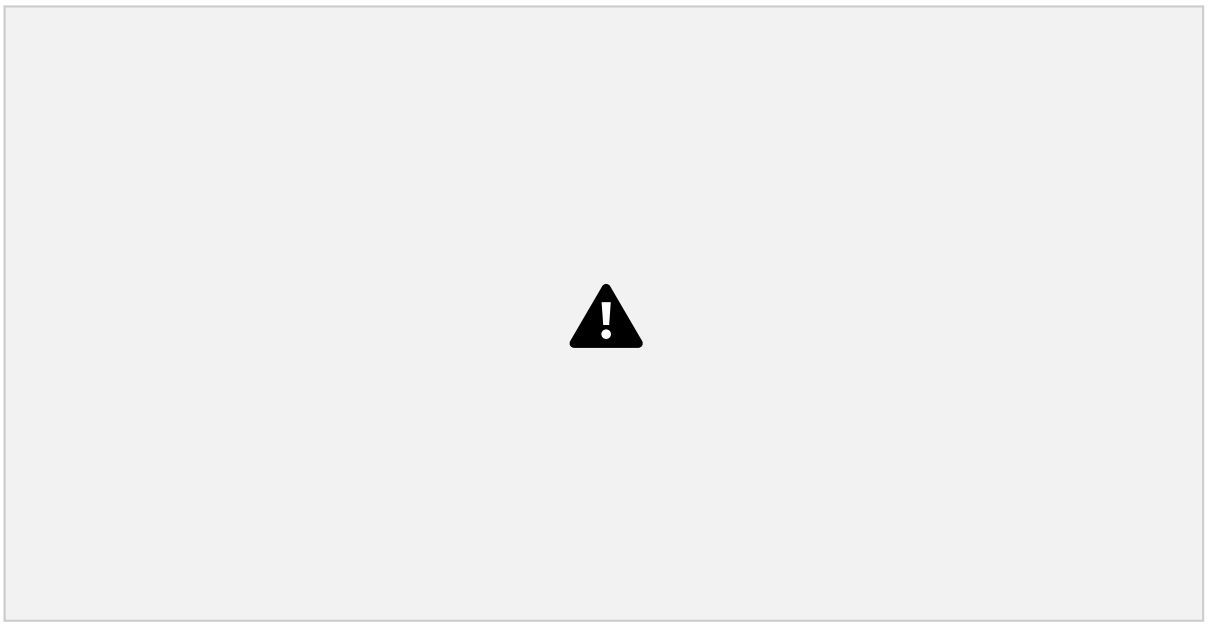


Step 6: After the designing is complete, click the **x sign** of the work area to save the table
design.



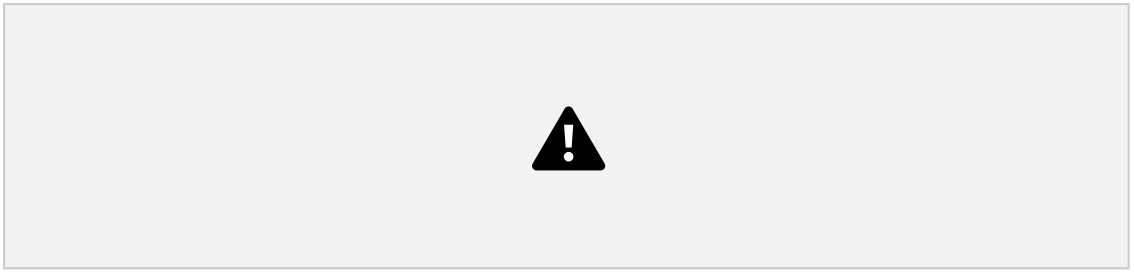
Step 7: Click on **create tab** and click on **table design** for creating second table named as **pay details. (following the above steps as per step no4)**





Note: For basic pay(**bpay**) we need to choose **data type as CURRRENCY** and in field

properties we need to set validation rule and validation text as mentioned in the



question.

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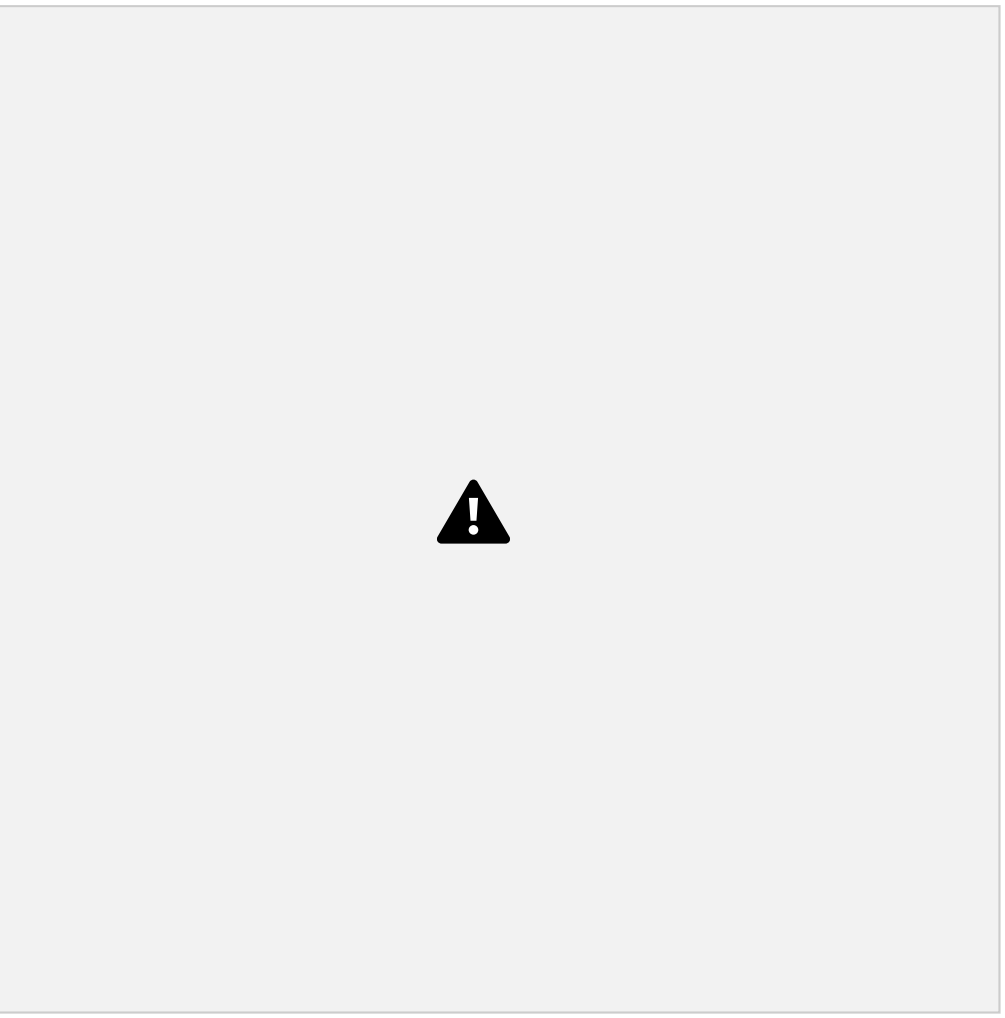
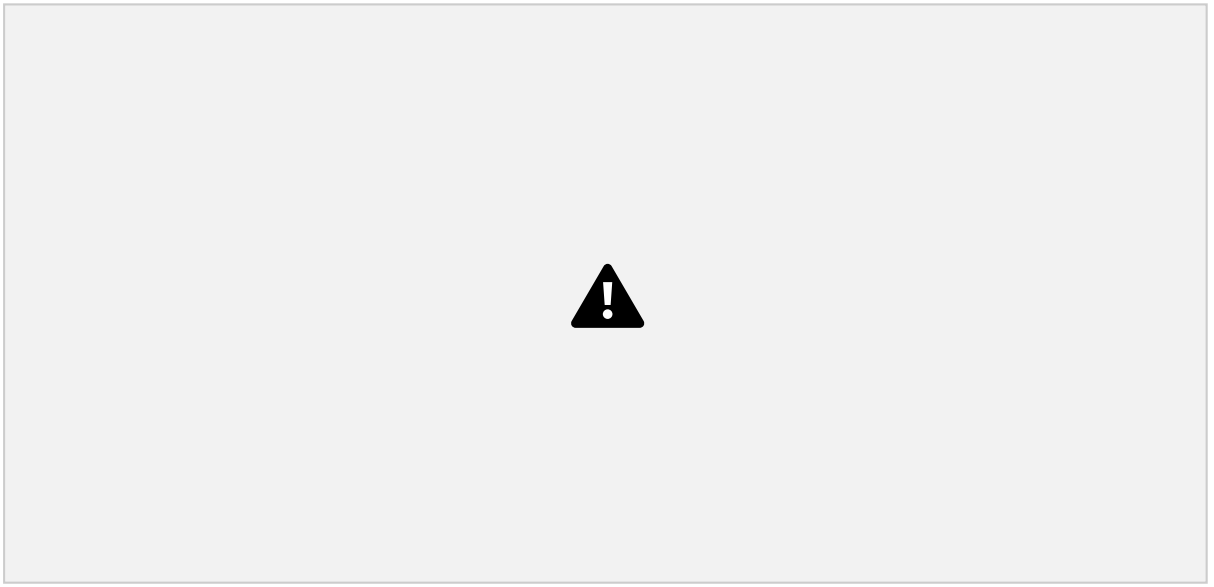
Step 8: After the designing is complete, click the **x sign** of the work area to save the table design.

Note: Ignore the message that appears to define a primary key ad press **NO** as this table doesn't contain a primary key.

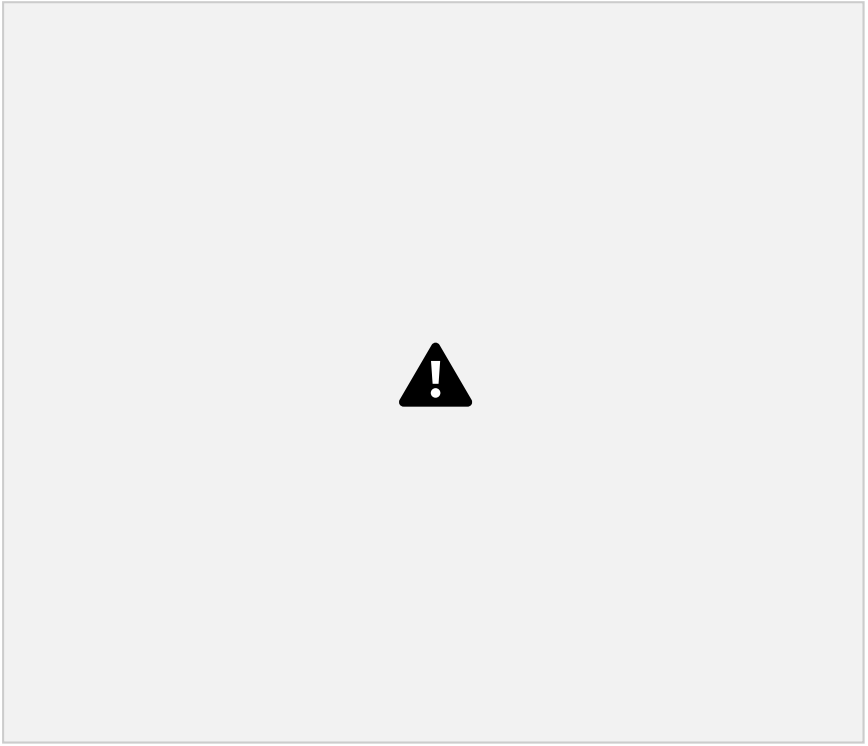
Step 9 : Enter six records of the employees by clicking on **DATASHEET VIEW(refer step no 3) or** double click the table in which the record has to be entered.

EMPLOYEE TABLE





BASIC PAY DETAILS TABLE



Now these tables are created and database has been prepared.

Create the Database Facebook using Excel

Creating a full-fledged Facebook-like database in Excel would be a complex and time consuming task, as Excel is primarily designed for spreadsheet and data analysis purposes. However, I can provide you with a basic outline of how you can structure a simplified version of a Facebook database using Excel.

Here's an example of how you can create a basic Facebook database structure using Excel:

1. User Table:	
	• Create a new worksheet and name it "Users." • Create columns such as User ID, First Name, Last Name, Email, Password, Date of Birth, Gender, and any other relevant user information. • Each row represents a user, and the columns store their corresponding attributes.
2. Friends Table:	
	• Create another worksheet and name it "Friends." • Create columns such as User ID, Friend ID, and Friendship Date. • Each row represents a friendship connection between two users. The User ID and Friend ID columns store the respective user IDs, and the Friendship Date column stores the date the friendship was established.
3. Posts Table:	
	• Create another worksheet and name it "Posts." • Create columns such as Post ID, User ID, Content, Date/Time, Likes, and any other relevant post information. • Each row represents a post made by a user. The User ID column stores the ID of the user who made the post, and the Content column stores the actual

	content of the post.
4. Comments Table:	
	• Create another worksheet and name it "Comments." • Create columns such as Comment ID, User ID, Post ID, Content, Date/Time, and any other relevant comment information. • Each row represents a comment made by a user on a post. The User ID column stores the ID of the user who made the comment, the Post ID column stores the ID of the post the comment belongs to, and the Content column stores the actual content of the comment.
5. Likes Table:	
	• Create another worksheet and name it "Likes." • Create columns such as Like ID, User ID, Post ID, and Date/Time. • Each row represents a "like" action performed by a user on a post. The User ID column stores the ID of the user who liked the post, and the Post ID column stores the ID of the post that was liked.