


# **Excel-Schulungsmaterial als Word-Dokument zum Ausdrucken und fürs Intranet**


Aus technischen Gründen wurde in dieser Musterunterlage dieses Deckblatt zusätzlich eingefügt, und anders als im Original-Worddokument haben wir das Inhaltsverzeichnis am Ende platziert. Darüber hinaus entsprechen hier auch die Kopf- und Fußzeilen nicht dem Original.

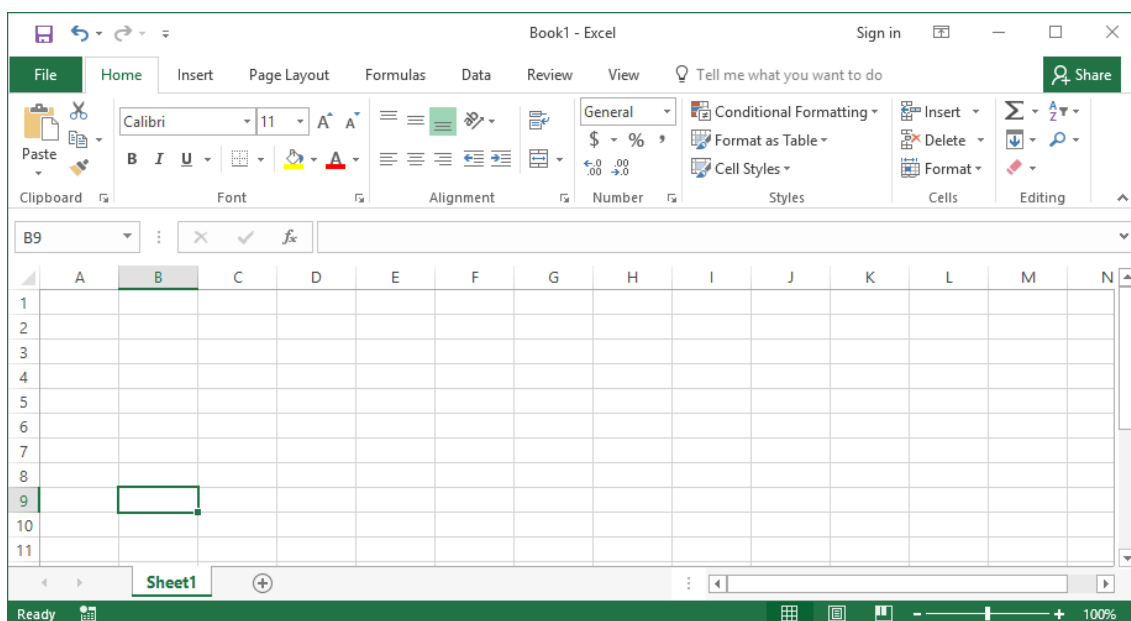
## 4 Workbook

Once you have started Excel, you will see a workbook with *one* sheet (spreadsheet). In the Excel versions up to 2010 there were several sheets. If the windows are not displayed on the full area of the screen, maximize the Excel program window to full screen mode. To do this, left-click the **Maximize** icon . In this course document, the Excel windows are restored down for reasons of space.



The **X** icon closes windows!

One sheet is divided into 16,384 columns (A to XFD) and 1,048,576 rows (1 to 1,048,576). You can enter contents into each cell - the interface between rows and columns. The cell cursor  is moved around in the sheet using the mouse or the arrow (cursor movement) keys. Each cell can be activated.



The workbook

The active cell address, i.e. the position of the cell cursor, is displayed in the top left-hand corner in the **name field**. If, for example, you move the cell cursor into column B, row 9, the active cell address will be **B 9**.



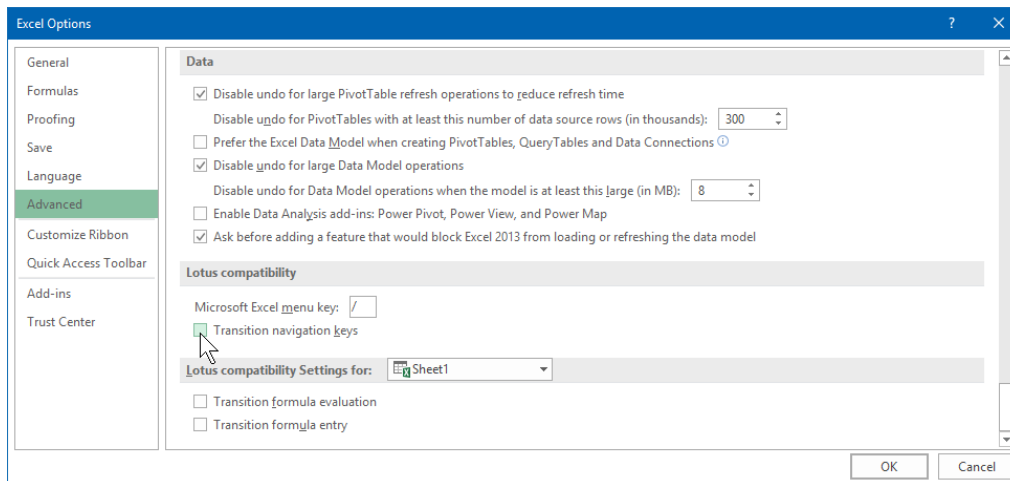
### 4.1 Moving within the sheet

To move efficiently around a sheet with 17 billion cells, you can use either the mouse or the following keys and shortcuts.



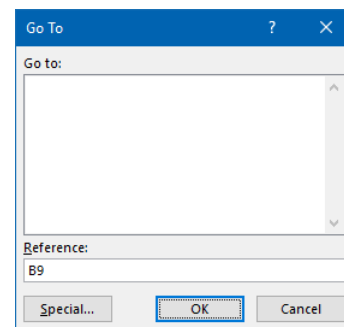
The  **Transition navigation keys** control box in **Excel Options** has to be deactivated first: Select the **File** tab (**File** menu), **Options, Advanced** and then the **Lotus Compatibility** category:

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Excel options, Advanced page

	Cell cursor 1 cell to the right
	Cell cursor 1 cell to the left
	Cell cursor 1 cell down
	Cell cursor 1 cell up
	Cell cursor to the start of row
	Cell cursor to the end of row (only with sheets containing data)
+	Cell cursor to the start of sheet
+	Cell cursor to the end of sheet (only with sheets containing data)
	1 screen page down
	1 screen page up
+	1 screen page to the right
+	1 screen page to the left
+	Next sheet
+	Previous sheet
address	The "Go To" key  opens up a dialog box. Enter the cell address, e.g. B9, and press the  key or click .



The Go To window

The shortcuts with the key send the cell cursor to the end:


**It is necessary to differentiate between 2 scenarios:**

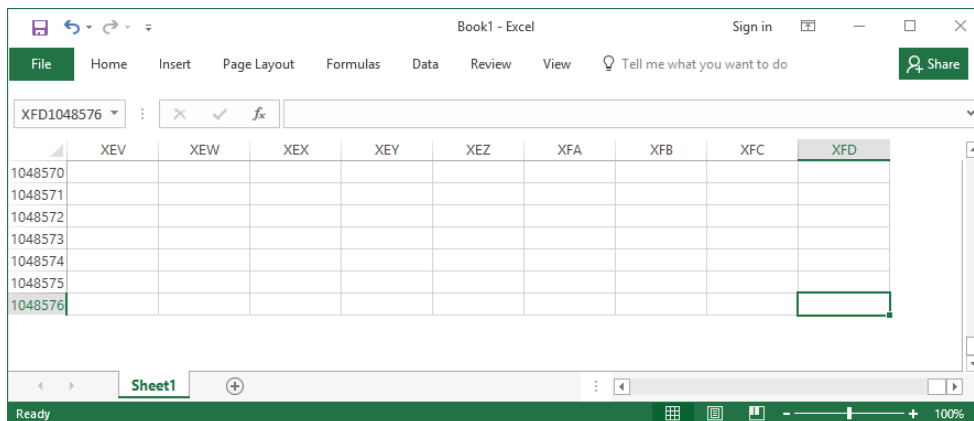
- Cell cursor is in a cell with an entry:  
The cell cursor jumps in the direction of the arrow to the last cell with an entry or to the end of the sheet.
- Cell cursor is in a cell without an entry:  
The cell cursor jumps in the direction of the arrow to the first cell with an entry or to the start of the sheet.

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Notes on the keys **Ctrl** and **End**:

**Ctrl** + Hold down the **Ctrl** key while pressing another button.

**End** Briefly press the **End** key and then release. **End Mode** then appears on the status bar. Now press the other key.



Jump to the lower right cell with the **End** key and the arrow keys **↓** **→**



If you press the cursor control keys, e.g. **→**, **↓**, **Home**, **End**, in the numeric keypad (number pad) on the right, the numeric entry must be switched off. In that case, the NumLock light above the keypad is off. To switch, press the NumLock key (**Num**) in the keypad. There may be differences with laptops.

## Scrolling with the wheel mouse

With the wheel mouse, also known as the scroll mouse or IntelliMouse, there is a wheel positioned between the two mouse buttons. You can use it to scroll quickly through large sheets. The Intellimouse wheel features several options, e.g.:

- Move the mouse pointer to the sheet and turn the wheel *without* pressing it. Turn the wheel forwards or backwards to scroll up or down respectively.
- Point the mouse pointer to the sheet and *briefly* press the wheel. The mouse pointer changes its appearance, e.g. four small triangles with one dot. Its appearance depends on the connected mouse or mouse program. The same symbol in gray is displayed in the background. Move the black pointer **↓** above or below the gray background symbol to scroll up or down in the Excel sheet. If the mouse pointer **▶** is on the right or left of the gray symbol, you can shift to the right or left. The more distance between the gray background symbol and the black mouse symbol, the faster you can scroll through the sheet. Click the wheel or a button to close the scroll function.



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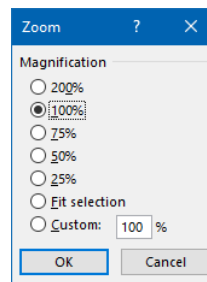
## 4.2 Zoom

You can use the wheel mouse to zoom the sheet between 10% and 400%: Move the mouse pointer to the sheet, hold down the **Ctrl** key and push the wheel forwards to zoom in and backwards to zoom out.

You can also zoom in and out without using the wheel mouse:



Zooming function on the status bar



Select or enter the percentage

- Click the percentage at the bottom right on the status bar to open the **Zoom** dialog box and select the new zoom size  or enter the percentage in the **Custom** box. Close the box by clicking .
- Or you can zoom the view by holding down the left mouse button and moving the  slider or clicking the  plus and  minus buttons on the status bar.

## 4.3 Entering data

In the following table, the names of five employees are entered that made suggestions for improvements last year. The figures show the employee savings amounts:

	A	B	C	D	E	F	G	H	I	J	K
1		1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Totals					
2	Heintz	29407	38070.12	31000	50340						
3	Taylor	20956	30704	61078.34	41000						
4	Young	77000	51929	48035	22692.4						
5	Brown	43189.67	24000	52718	68491						
6	Sander	32831	63117	19047	39162						
7											
8											
9											

Entering data

Move the cell cursor to cell **A2** and enter the name **Heintz**. As soon as the first letter is entered, notice what happens to the mode display at the bottom left of the screen: The mode switches from **Ready** to **Enter**.

## 4.4 Saving entries

A cell entry can be completed in various ways:

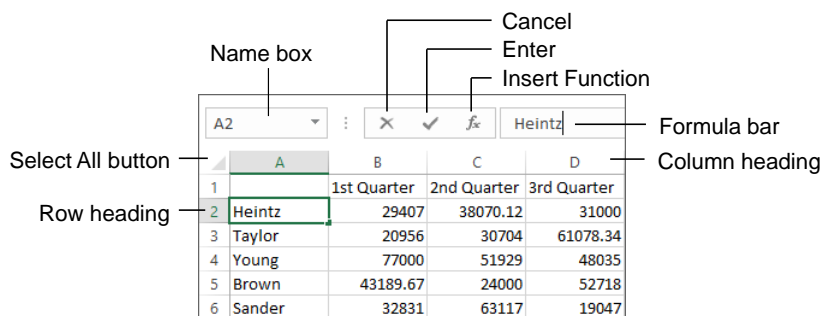
- with the  key or
- with an arrow key:     or
- with a click on the  **Enter** icon (check mark) to the left of the **formula bar** (see following image).

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Completing an entry with an arrow key (without **Enter**) is convenient if other data has to be entered in an adjacent cell as in the example.

## 4.5 Canceling entries

As long as the data is *not* entered, you can cancel the entry with the **Esc** key or by clicking the **Cancel** icon (cross) to the left of the formula bar:



Important parts of a workbook (here: in Edit mode)

## 4.6 Changing entries

If you discover an error in a cell *after* you have entered the data, there are several options to change the entry. Requirement: Excel is in **Ready** mode! Position the cell cursor in the cell to be edited:

- Overwrite the old entry. When entering data it is not important whether the cell contains data or is empty.
- If you just want to change a part of the cell entry or expand the entry, press the **F2** key. The mode display in the bottom left of the status bar switches to **Edit**. Click in the formula bar or double-click the cell to switch to **Edit** mode. You can make the changes directly in the cell or in the formula bar at the top.

### The following keys are activated in Edit mode

<b>←</b> <b>→</b>	Moves the flashing cursor sideways.
<b>Home</b>	Moves the cursor in front of the first characters.
<b>End</b>	Moves the cursor behind the last character.
<b>Bksp</b>	Deletes the character to the left of the cursor or the selected characters.
<b>Del</b>	Deletes the character to the right of the cursor or the selected characters.
<b>Insert</b>	Switches between <b>Insert</b> and <b>Overtyp</b> mode. In <b>Overtyp</b> mode, <b>Overtyp</b> can appear at the bottom left on the status bar.
<b>Alt</b> + <b>Enter</b>	Inserts a line break within the cell at the cursor position (new line).
<b>Esc</b>	Cancels <b>Edit</b> mode and returns to <b>Ready</b> mode. Changes are ignored.
Mouse click	on the <b>Cancel</b> icon to abort editing <b>✗</b> .
<b>Enter</b>	Closes editing.
Mouse click	on the <b>Enter</b> icon to confirm and complete editing <b>✓</b> .

### Selecting individual characters

You can only select cell contents in **Edit** mode. You can select data directly in the cell or in the formula bar at the top. Besides deleting the selected characters, you can also change the format

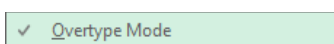
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of text within a cell, e.g. font, size, color (font on page 59 onwards). Select the characters you want using the mouse or the keyboard:

- Move the mouse pointer in front of the first character you want to select. Keep the left mouse button pressed and drag the mouse over the characters.
- Or move the cursor in front of the first character. Keep the **Shift** key pressed down and select the characters using an arrow key, e.g. **→**.

## Insert or overwrite mode

You can check in **Edit** mode whether you are working in **Insert** or **Overtype** mode by activating a button on the status bar. *Right-click* the status bar as described on page 135. Activate the following line in the configuration menu:



Show this line

Experience shows that users mostly work in **Insert** mode. However, it often happens that the **Insert** key is unintentionally pressed and the computer switches to **Overtype** mode.

## Your task

Enter all the data from the spreadsheet on page 26.



Please do not use the lower or upper case letter O (for Oscar) to replace the digit 0 (zero). Excel recognizes these as 3 different characters.

## 4.7 Calculating sums

Once you have entered the figures from the 1st to the 4th quarter for all five names, you can now calculate the annual sums of the individual employees.

For the first time, the benefits of spreadsheet calculations are clearly visible. Before Excel, data had to be collected using the typewriter.

You need the annual sum from the employee Heintz in cell F2. The 4 figures are entered in cells B2, C2, D2, and E2. Now, all you have to do is link all four cells together using a formula:  $=B2+C2+D2+E2$ .

There are several methods for entering this formula:

1. Move the cell cursor to cell **F2** and enter:

**$=B2+C2+D2+E2$**

Save the entry with the **Enter** key. The first character is the important equals sign **=**. Every formula or calculation in Excel has to start with this sign.

2. In cell **F3**, enter the equals sign **=** only. Now, move the arrow key **←** to cell B3. The mode display in the bottom left-hand corner switches to **Point**.  $=B3$  is now displayed in the formula bar at the top. Enter **+**, the cell cursor jumps to F3. Now, move to cell C3. Then enter **+** again and move to cell D3; again enter **+** and move to cell E3. The following formula appears in the formula bar:

**$=B3+C3+D3+E3$**

The data is now entered. No more plus signs are added. Press **Enter** to complete the entry.

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The second method might seem complicated but you will soon be working in **Point** mode in Excel quite often in the future.

## The Sum icon

Another option to calculate sums in Excel is the **AutoSum** icon on the **Home** tab in the **Editing** group. The cell cursor is in cell **F4**. Click the *left* part of the icon. Excel adds the **SUM** function to the cell. Now click cell B4, hold down the left mouse button and select **B4:E4**. By doing this, you create a flashing frame. In addition, an info box appears under the function.



77000	51929	48035	22692.4	=SUM(B4:E4)
43189.67	24000	52718	68491	SUM(number1, [number2], ...)

Sum function with info box

Press the  key to enter.

In **AutoSum**, Excel now selects the next adjacent cell above or on the left. You can change the cell using the mouse or the arrow keys.

## Difference between the screen display and the cell contents

Click cell **F4** again. The sum: 199656.4 appears in the spreadsheet where the cell cursor is located. In contrast, the actual cell content is displayed in the formula bar at the top:

**= SUM(B4:E4)**

These functions will be described in more detail from page 49 onwards.

The sums in cells F5 and F6 are still missing. Leave these cells empty for the time being. The missing formulas will be copied into these cells. The next step is to save your work.



## 13 Filling Data

To fill a data series, Excel provides the **Fill** command. The range has to be selected before you open the menu of the **Fill** button. However, you do not always know the exact range or final value (stop value) before you start. It's important to select a large range for unknown series.

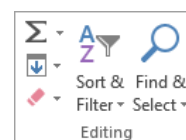
With a negative step value (**increment**), it's important to remember that the end value must be *smaller* than the start value.

### An example:

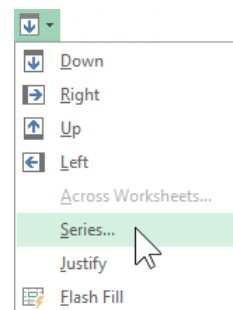
In a new, blank worksheet, a row of numbers should start with 25% and end at 3 % a step value (increment) of 0.5%. The stop value is smaller than the start value, this is why the step value has to have a *negative* suffix.

1. Create a new workbook by clicking **File** menu, **New, Blank workbook** or press the **Ctrl+N** keyboard shortcut.
2. Enter the value **25%** in cell **B1** and close the entry.
3. The range is not yet known so select a very large area:  
Select the range **B1:B100**
4. Open the **Home** tab and click the **Fill button** in the **Editing** group and select **Series...**
5. In this dialog box, select the following:

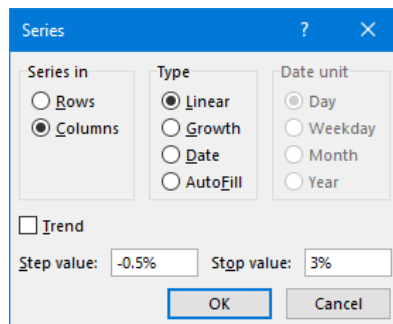
Series in:  Columns  
Type:  Linear  
Trend:  no check mark!  
Step value: -0.5%  
Stop value: 3%



Editing group



Fill button submenu



Filling the series



With percentage values, e.g. 3%, the percentage sign % must also be entered otherwise it equals 300%!

6. Click **OK**.
7. Format the number series in the percentage format with one decimal place.

## 13.1 Filling in date values



Date values can also be entered as the step and stop values. In the series type, select  **Date** and as a date unit you can select:

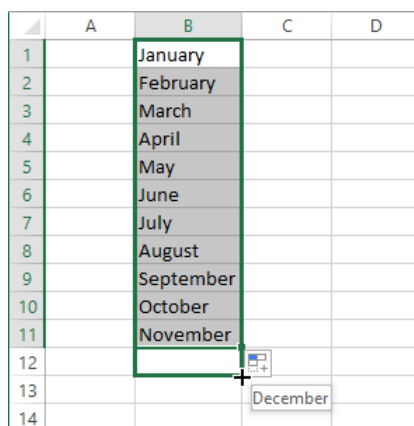
- Day
- Weekday
- Month
- Year.

A date or time format may also have to be specified for the range.

## 13.2 Autofill using the mouse

**Autofill** using the mouse can also facilitate work greatly. Here's an example:

1. Write the word **January** into cell B1 and close the entry.
2. Return the cell cursor to cell **B1**.
3. Point the mouse to the fill box  (page 45) in the bottom right-hand corner of the cell cursor. The mouse cross turns black: .
4. Hold down the left mouse button and expand the selection until you reach the range or the month name you want. A ScreenTip of the month name appears to the right of the mouse cross:



	A	B	C	D
1		January		
2		February		
3		March		
4		April		
5		May		
6		June		
7		July		
8		August		
9		September		
10		October		
11		November		
12				
13				
14				

Autofill of month name

5. The context icon  that appears features different options to change the insert later.



If you need the same month name several times below or next to each other, hold down the **[Ctrl]** key while performing step 4.

## 13.3 Flash Fill

The feature called **Flash Fill** can be used to fill data in your worksheet. As soon as Excel recognizes a pattern in your procedure, Flash Fill provides a list with suggested data. Press the **[Enter]** key and Excel enters the data according to this list. Or you use the **Flash Fill** button.

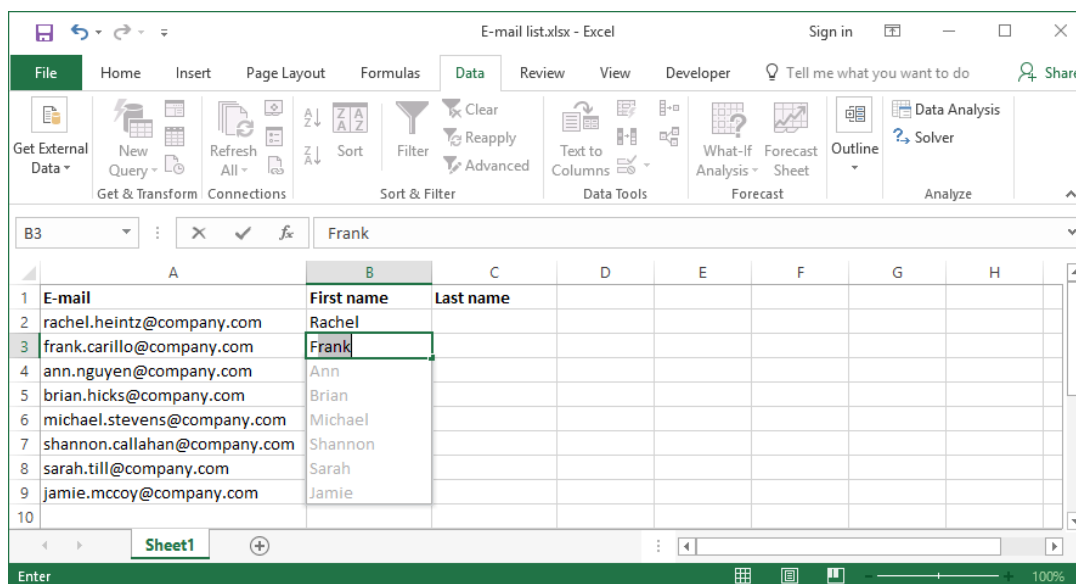
Assumed, all email addresses in your company are structured like this

**FirstName.LastName@company.com**


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and you want to display the first and last names in separate columns. We have prepared such a list for you with the **E-mail list.xlsx** file. Below, we want to try out both versions of flash fill: the suggestion list and the **Flash Fill** button.

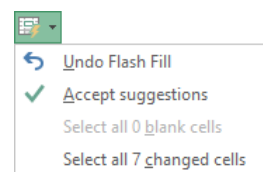
In cell B2, enter the first name from cell A2 (in this case **Rachel**) and complete the entry with the **Enter** key. In cell B3, start typing the first name from cell A3. Now, flash fill provides a list with all first names from the A column. Press the **Enter** key to accept the suggestions.



Flash fill list

If the data is entered with flash fill, the **Flash Fill Options** context icon  appears beside it with which you can undo the automatic data entry.

Now, type the last name from cell A2 (**Heintz**) into cell C2 and complete the entry by clicking the **Enter** key. In cell C3, click the **Flash Fill** button on the **Data** tab in the **Data Tools** group. Excel automatically fills the C column with the other last names.



Flash Fill options



## 14 Database

In principle, the term database means nothing new. You most probably have access to databases at home or at work even if they are not referred to as such.

Just visualize a database like a large card box with lots of index cards. Let's assume you had to create and maintain a list of suppliers in your office. This involves following many standard procedures. Compare the computer database procedure with the index card system in the table below. You will notice that the basic principle of a computer database shares a lot of the same features with a paper database.

Index card box	Database
Install an index card system.	Create a new database.
Open an existing card box.	Open an existing database.
Complete new index cards for new suppliers and add cards to the box.	Add new addresses.
Delete those suppliers with whom we no longer do business.	Delete addresses we no longer require.
Search for the relevant supplier for orders orders.	Search for specific suppliers.
Change the address if a supplier moves to new premises.	Change addresses.
Close the card box once you have completed your work.	Close the database and exit the program.

All index card activities have their equivalent in the database. The structure of the index card is also mirrored in the database. Index cards often have pre-printed segments or boxes where you fill in the relevant information.

The screenshot shows an Access database sheet titled 'Suppliers'. The table has the following data:

Number	LastName	Street	PostalCode	City	State	Telephone	Click to Add
18491	Grant	12 Virginia Ave.	89116	Las Vegas	NV	(702) 459-5921	
3635	Tanaka	1020 Broadway	94612	Oakland	CA	(510) 398-4986	
4627	Chang	28 W. 10th Street	27044	San Francisco	CA	(415) 439-5983	
27171	Jones	1155 Peachtree St.	30367	Atlanta	GA	(404) 249-2691	
18868	Stewart	12 Oak Street	60657	Chicago	IL	(312) 885-1548	
3156	Cooper	520 Michigan Ave.	60611	Chicago	IL	(312) 649-2873	
1638	Mendez	3814 NW 82nd Ave.	33166	Miami	FL	(305) 336-4097	
6172	Manuel	1947 Park Ave.	80206	Denver	CO	(303) 320-8465	
4824	Roth	113 Prospect Ave.	44115	Cleveland	OH	(216) 593-5882	
13645	Lavalle	319 Laurel Ave.	90048	Los Angeles	CA	(213) 836-4406	
*	0		0				

The interface includes a 'Navigation Pane' on the left, a status bar at the bottom showing 'Record: 10 of 10', and a 'Datasheet View' indicator at the bottom left.

An Access database sheet

The computer database saves the addresses in a list. The columns are referred to as **fields** or better **data fields** and the rows as **data sets**. Data fields are identified by their names, the **field names**.

## 14.1 Preliminary considerations - new database

Before you create a new database, you first have to consider its structure, i.e. what it should look like. If you take your time with it now, you may save a lot of time later.

The first consideration:

- "What information do you require?"
- "Which data do you need access to later?"
- "Which data has to be sorted?"

If you want to access last names, it is practical to create two separate data fields, one designated to the first name and one to the last name. On the other hand, the street number can be saved in the same field as the street name; it is very unusual to sort the database by the house number. However, it is advisable to create two separate fields for the zip code (postal code) and town/city.



If you're unsure, it is better to save items in separate data fields.

## 14.2 Database ranges

A complete database in Excel comprises 3 ranges:

- **List range**  
The data sets are contained here.
- **Criteria range**  
To filter certain data sets, enter the conditions here.
- **Output range**  
The data sets that fulfill the search criteria (conditions) can be copied to the output area.

Create a new, blank workbook by selecting **File, New, Blank Workbook** or press the **Ctrl+N** keyboard shortcut. Save the book as **Customer Database**

### List range

Leave the first 8 rows blank to insert the criteria. Therefore, start with row 9, and enter the field names in range **A9:G9** in separate cells:

FIRST NAME    LAST NAME    CITY    STATE    ZIP CODE    DATE OF BIRTH    SALES

Now select these field names, i.e. range A9:G9, and define the name **Database** for this range as described on page 75.

### Data form

You can type data directly into cells as you have already been doing. However, Excel enables you to enter data in a form. To do this, the **Form** icon has to be on the Quick Access Toolbar. Find out on page 134 how to add an icon to the toolbar.



Quick Access Toolbar with the Form icon

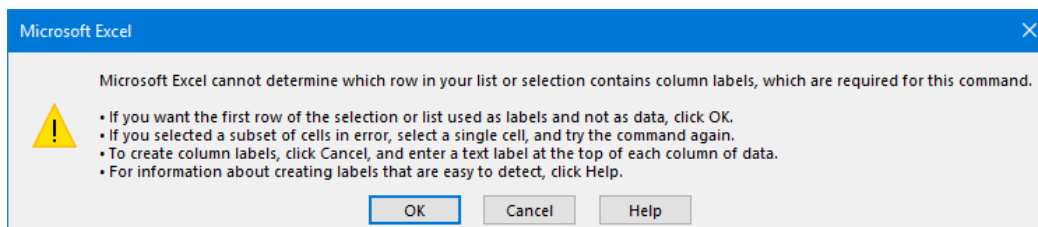
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Select range A9:G9 (**Database**) and click the **Form** icon. A blank data form appears on the screen.

A blank data form



If the following message appears, range A9:G9 has not been named. Click **OK** and the entry mask will appear nonetheless.



To specify the column heading, click **OK**.

Now fill in the individual fields. Enter the data from the following screen. To switch to the next entry field in the form, press the

**Tab** key.

If a data set is filled in, press the **Enter** key to open a new, blank form for the next set.



	A	B	C	D	E	F	G	H	I	J	K
6											
7					List range:						
8											
9	FIRST NAME	LAST NAME	CITY	STATE	ZIP CODE	DATE OF BIRTH	SALES				
10	Bill	Green	Chicago	IL	60611	6/15/1959	2000.00				
11	Malin	Gibson	Los Angeles	CA	90086	12/7/1956	12300.00				
12	Samuel	Clinton	Barre	VT	05641	5/12/1955	450.00				
13	Monica	Cooper	New York	NY	10012	9/24/1970	345678.00				
14	Lee	Rose	Miami	FL	33101	8/10/1968	3000.00				
15	Brenda	Major	Chicago	IL	60607	3/21/1972	4000.00				
16	Abigail	O'Conner	Sacramento	CA	95814	4/30/1986	83000.00				
17	John	Brewer	Chicago	IL	60657	12/10/1973	1340.00				
18	Andrew	Johnson	Seattle	WA	98101	9/14/1958	1999.00				
19	Michael	Stevens	Hartford	C	06103	2/29/1968	1200.00				
20											

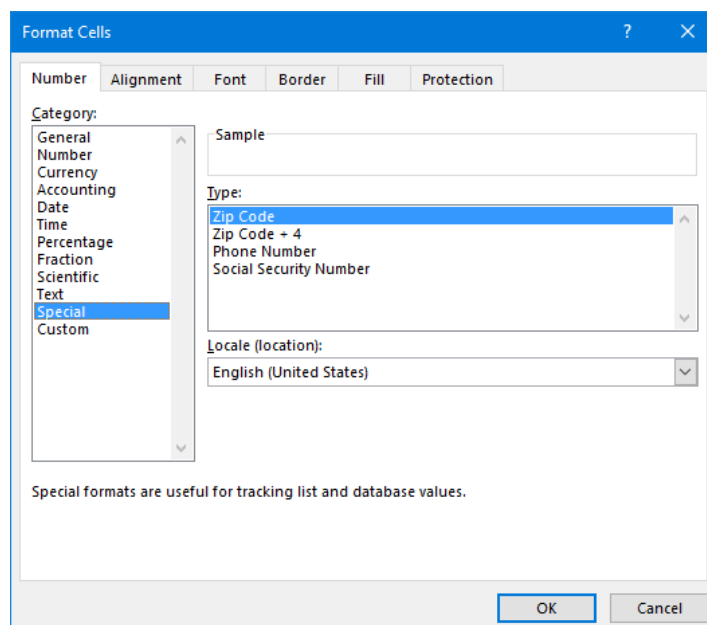
Database list with small green triangles in E12 and E19 and a context symbol

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However, a problem arises if you need to enter numbers: If the number starts with 0 (zero), Excel will omit the zero. This is obviously not acceptable with certain zip codes (Barre and Hartford in our example).

For zip codes, Excel offers two solutions to this problem, but for telephone area codes and similar types of numbers, there is only one:

- When entering a zip code or another number starting with 0 in the data form, enter an **apostrophe '**  as the first character. An example is shown in the previous image in cell **E19** displayed in the formular bar at the top. Or before opening the data form, select the range for the zip codes (**E10:E19**) and format the cells as text using the **Format Cells** dialog box (page 54). Nonetheless, after completing the entry of cells **E12** and **E19**, you will see a small green triangle  in each case and a context symbol  for the current cell. You can ignore this error message or click the context symbol and select the **Ignore Error** command (image page 72).
- An alternative for 5-digit zip codes *only*: Before opening the input screen, select the entire zip code range (**E10:E19**) or the entire column, open the **Format Cells** dialog box and select the **Special** format **Zip Code**:



Special format

Once you have entered the last data set in the form, click .

The data form with the 10th data set


## 14.3 Filters

You don't often work with all the data sets in the list. Frequently, you have to access specific information. Excel offers you very convenient ways of filtering data:

- Autofilter
- Advanced filter.

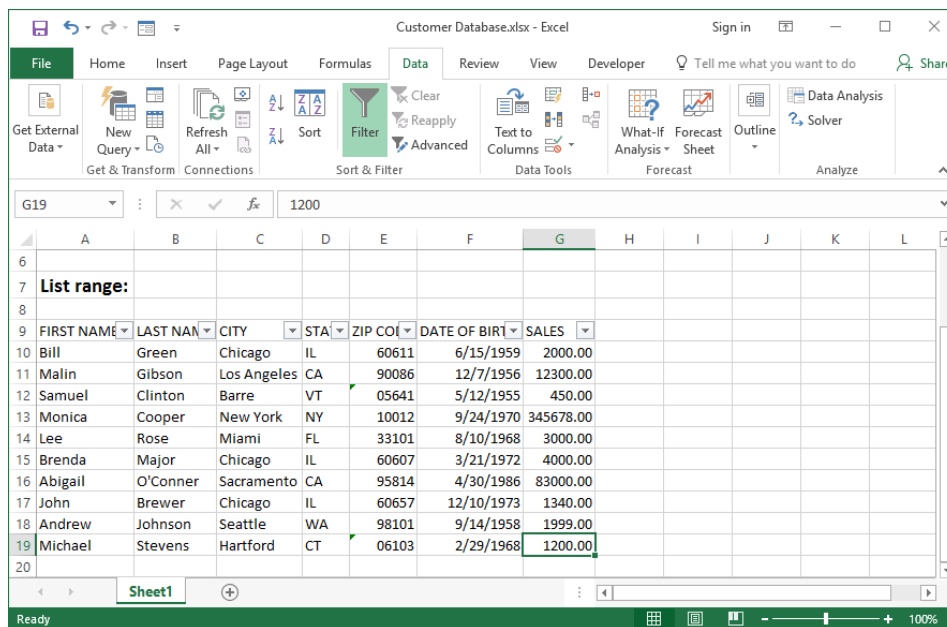
### Autofilter

The **Autofilter** function allows you to access specific data sets extremely quickly:




1. Move the cell cursor to the first field name, to FIRST NAME.
2. Select: **Data, Sort & Filter group, Filter icon.**
3. Now, a drop-down arrow  appears next to every field name.

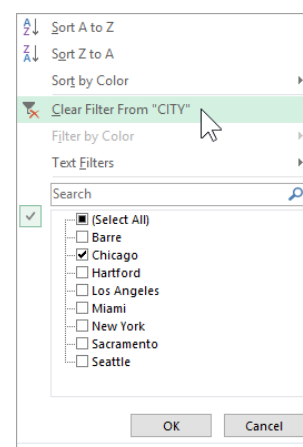


Data tab,  
Sort & Filter group



Autofilter with drop-down arrows  next to the field names

4. Click the arrow  next to the CITY field and select **Chicago** as the filter. In order to do this deactivate the  (**Select All**) check box and activate  **Chicago**. Click .
5. In the list range, you will now see the filtered data sets only. The down arrow  next to CITY has also changed to indicate that the filter has been activated for this field.
6. To show all data sets again, open the CITY filter list  and select **Clear Filter**.



Clearing the filter

### Advanced filter

The advanced filter offers you extended filtering options. However, you have to set up a **criteria range** first in which you enter the filter conditions, i.e. the criteria.



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## Criteria range

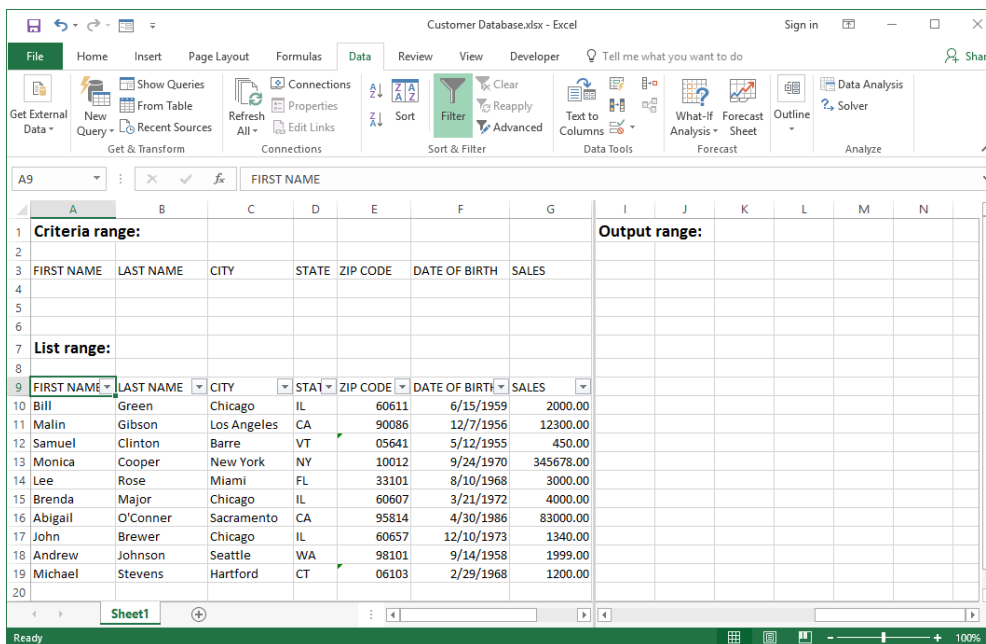
For the **Criteria range**, you need a row with the field names and for now only *one* blank row below it. Copy the range with the field names (A9:G9) and paste it into cell A3.

## Output range

The data sets which meet the criteria (conditions) can be copied by Excel (including the row with the field names) and inserted into the **output range**, e.g. I3:O3.



No other data must be contained in the entire range below the output range (up to and including the last row). They will otherwise be deleted!



The 3 ranges in the vertically split window

## 14.4 Entering criteria

To access certain information, type the criteria into the **criteria range** below the relevant field name. Criteria are also referred to as conditions or filters.

Below the CITY field name, in the **criteria range**, enter the filter **Chicago** in cell C4. Then move the cell cursor to the top left cell A9 in the **list range**, i.e. FIRST NAME the field name. Now select

	A	B	C	D	E	F	G
1	<b>Criteria range:</b>						
2							
3	FIRST NAME	LAST NAME	CITY	STATE	ZIP CODE	DATE OF BIRTH	SALES
4			Chicago				


Entry in criteria range

Data tab, Sort & Filter group, Advanced

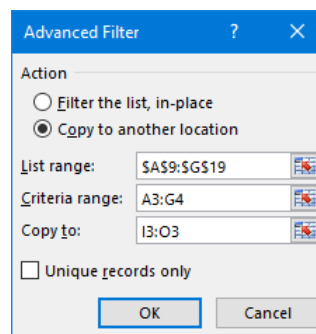
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Select and enter:

1.  **Copy to another location.**
2. The list range **\$A\$9:\$G\$19** is already entered.
3. Criteria range: **A3:G4**
4. Copy to: **I3:O3**

If you apply the ranges in **Point** mode , the addressing is absolute. When typing, you can omit the sheet name and the \$ sign.

Criteria range:	Sheet1!\$A\$3:\$G\$4
Copy to:	Sheet1!\$I\$3:\$O\$3



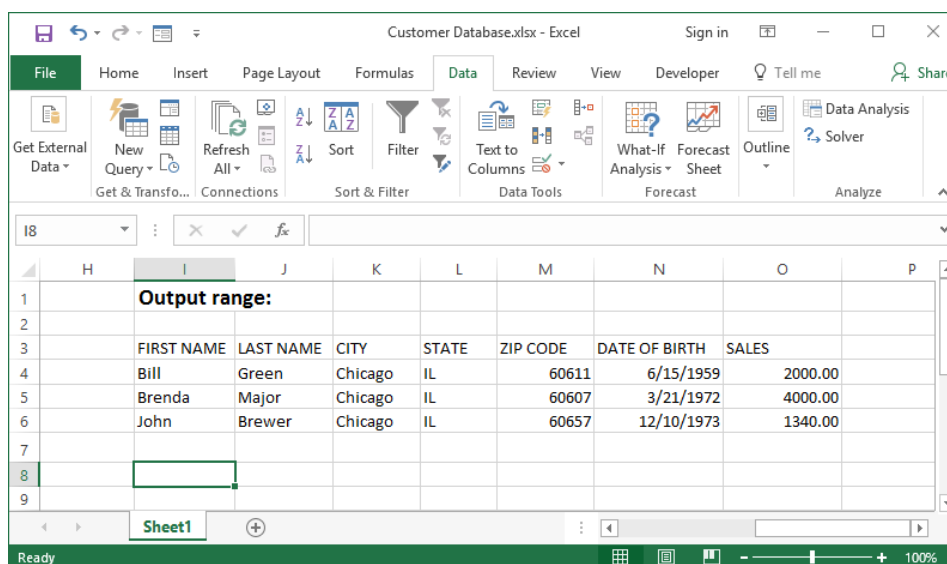
Advanced Filter dialog box showing the following settings:

- Action:  Copy to another location
- List range: \$A\$9:\$G\$19
- Criteria range: A3:G4
- Copy to: I3:O3
- Unique records only:

A special filter

5. Click .

The data sets with the CITY **Chicago** were copied to the **output range**:



Excel screenshot showing the output of an advanced filter. The output range is I3:O3, and the data is copied to the range I4:O6. The data is as follows:

	H	I	J	K	L	M	N	O	P
1		<b>Output range:</b>							
2									
3		FIRST NAME	LAST NAME	CITY	STATE	ZIP CODE	DATE OF BIRTH	SALES	
4		Bill	Green	Chicago	IL	60611	6/15/1959	2000.00	
5		Brenda	Major	Chicago	IL	60607	3/21/1972	4000.00	
6		John	Brewer	Chicago	IL	60657	12/10/1973	1340.00	
7									
8									
9									

Output with advanced filter

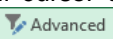
## Filtering with an operator

1. Please delete the filter **Chicago** in cell **C4**.
2. Now, let's only display data sets which contain a higher number than **60000** in the ZIP CODE field:

**> 60000**

Enter this condition in the **criteria range** in the ZIP CODE column (field) in cell **E4** and then copy the data sets to the **output range**.



Caution: First move the cell cursor to the top left cell **A9** in the **list range** (FIRST NAME) before you click the  icon.

3. Clear the filter in the ZIP CODE field. Now, select the data sets with an amount below **5000** in the SALES field:

**< 5000**

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## Filter with multiple conditions

For queries with more than one condition, there are two different possibilities:

- **AND link**  
The filtered data sets have to meet *all* conditions. To do this, enter the conditions into *one* row in the criteria range.  
You may have to define the criteria range again: it includes the row with the field names plus *one* row.
- **OR link**  
The filtered data sets only have to meet *one* of the conditions. To do this, type the conditions into rows one below the other in the criteria range.  
You may have to define the criteria range again: it includes the row with the field names and all rows which contain one of the search criteria.

## The zip code problem

The **Special** format **Zip Code** (Postal code) has already been introduced on page 119. A deliberate choice has been made not to recommend using the **Zip Code** format in this example. The reason is that the following problem occurs for other numbers beginning with a zero as well, such as article and invoice numbers, and the **Zip Code** special format cannot be used for these numbers.

If you want to filter out all data sets with a ZIP CODE less than **60000**, the data sets of Barre and Hartford will not be copied. These zip codes start with a 0 (zero) and are in the **Text** type.

To solve this problem, insert another OR link in cell **E5**: **>0\*** The asterisk \* sign acts as a joker and you may recognize this character from the search function in the Windows file explorer.

Now that the **criteria range** has changed, you'll have to enlarge it by one row in the **Advanced Filter** dialog box: **A3:G5**.

Criteria range:							Output range:						
FIRST NAME	LAST NAME	CITY	STATE	ZIP CODE	DATE OF BIRTH	SALES	FIRST NAME	LAST NAME	CITY	STATE	ZIP CODE	DATE OF BIRTH	SALES
				<60000			Samuel	Clinton	Barre	VT	05641	5/12/1955	450.00
				>0*			Monica	Cooper	New York	NY	10012	9/24/1970	345678.00
							Lee	Rose	Miami	FL	33101	8/10/1968	3000.00
							Michael	Stevens	Hartford	CT	06103	2/29/1968	1200.00

Zipcodes under 60000

## 14.5 Exercise

1. Filter out all data sets with a **zip code above 40000** and **sales above 5000**:

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	I	J	K	L	M	N	O
<b>Output range:</b>							
FIRST NAME	LAST NAME	CITY	STATE	ZIP CODE	DATE OF BIRTH	SALES	
Malin	Gibson	Los Angeles	CA	90086	12/7/1956	12300.00	
Abigail	O'Conner	Sacramento	CA	95814	4/30/1986	83000.00	

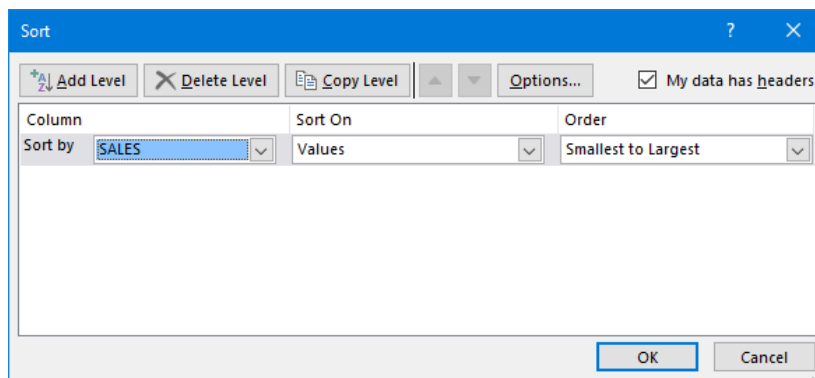
Zip code above 40000 and sales above 5000

2. Save the workbook.

## 14.6 Sorting

Although the **Sort** command can also be found on the **Data** tab, it can be used on any range. Now let's sort our database by SALES. Excel can automatically recognize a list:

1. Move the cell cursor to the SALES field name in the list range.
2. On the **Data** tab, in the **Sort & Filter** group, click the **Sort** button.
3. In the **Sort** dialog box, select:
  - **Sort by:** SALES.
  - **My data has headers** (to prevent the sorting of field names).



Sort by SALES

4. Click .

For simple sorting tasks, you can also use the icons on the right: **From A to Z** or **From Z to A**.



## 14.7 Summary: database

### Preliminary considerations - new database

Before you create a new database, you first have to think about the layout with the field names.

### Database ranges

A complete database in Excel comprises three ranges: **list range**, **criteria range**, **output range**.

### List range

The field names are entered side by side in separate cells in the first row of the list range.

### Criteria range and output range

Copy the range with the field names from the list range and paste it into two separate ranges in the worksheet. There should be no data below the output range.

### Filter

If you want to access specific data only, you can use the autofilter or advanced filter.

### Autofilter

Move the cell cursor to the first field name and click **Filter** (**Data** tab, **Sort & Filter** group). You can now select a filter for each field name from a list.

### Advanced filter

1. Enter the criteria (condition) in the criteria range under the relevant field name, e.g. for the CITY field the word Chicago.
2. On the **Data** tab, in the **Sort & Filter** group, click the **Advanced** button.
3. In the dialog box, select or enter:  **Copy to another location**, **List range**, **Criteria range**, **Output range** (= Copy to).

### AND link

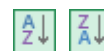
The filtered data sets have to meet *all* conditions. To do this, you are required to enter the conditions into *one* row in the criteria range.

### OR link

The filtered data sets must meet just *one* of the conditions. To do this, you are required to enter the criteria into *rows one below the other* in the criteria range.

### Sorting

To sort a list, move the cell cursor to the column by which the rows are to be sorted. On the **Data** tab, in the **Sort & Filter** group, click the **Sort** button, or click the icons **From A to Z** or **From Z to A**.



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