1. Managing Information in Table

Spreadsheets are great for making lists (such as phone lists, client lists). The researchers discovered that not only was list management the number one spreadsheet activity, but also that a lot of users did nothing but create and maintain lists of various sorts.

1.1 Building and Maintaining a Table

When you create a table, you can manage and analyze the data in that table independently of data outside the table. For example, you can filter table columns, add a row for totals, apply table formatting, and publish a table to a server that is running SharePoint.

If you do not want to work with your data in a table, you can convert the table to a regular range while keeping any table style formatting that you applied. When you no longer need a table, you can delete it.

1. On a worksheet, select the range of cells that you want to include in the table. The cells can be empty or can contain data.

2. On the **Insert** tab, in the **Tables** group, click **Table**.

3. If the selected range contains data that you want to display as table headers, select the **My table has headers** check box.

4. Table headers display default names if you do not select the My table has headers check box. You can change the default names by typing the text that you want.

2. Handle Duplicate Row

2.1 Remove Duplicate

Microsoft has made it quicker to remove duplicate rows in Excel, all it takes now is two simple steps. The best part is that you don't need to select any specific row before removing the duplicate rows, the build-in Remove Duplicate feature takes care of it.

1. Sort the record in ascending order
2. Select the table, and then select **Data Tab**, then select **Remove Duplicates**
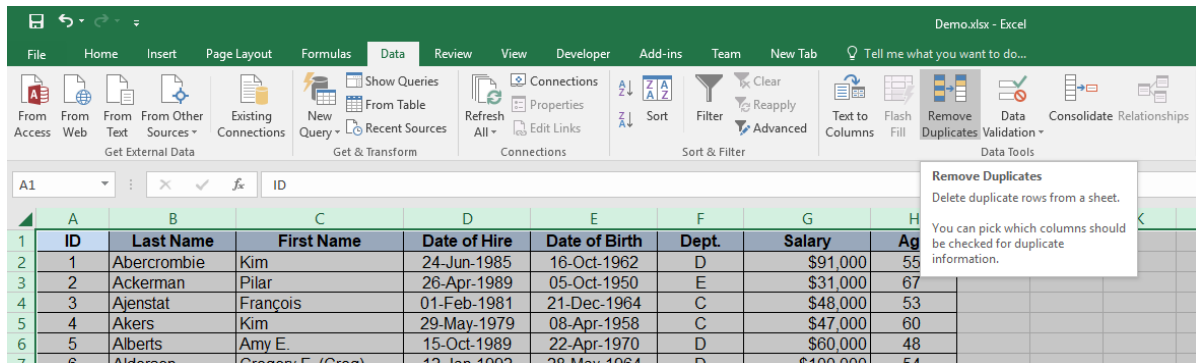
3. Select the column for duplicate checking and press [OK]
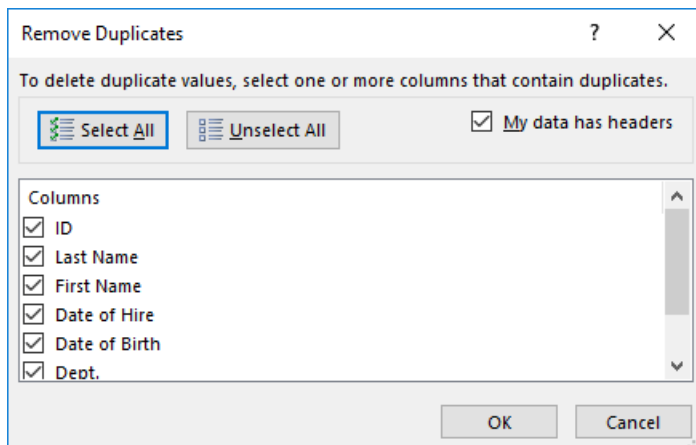
4. Duplicate row will be removed, and the number of row will be returned.

2.2 Highlight Duplicate

1. Select the table column that you want to check for duplicate values. For example, you could select the Product ID column to look for products that have the same ID value. Note: You can highlight more than one column, but if you do, Excel highlights identical values that appear in more than one column. For example, if the same number appears in the Product ID column and in the Price column, Excel highlights it even though it isn't really a duplicate.

2. Choose Home➜Styles➜Conditional Formatting➜Highlight Cells Rules➜Duplicate Values.

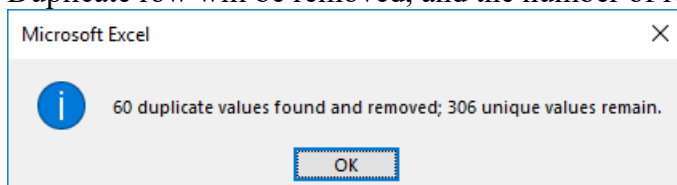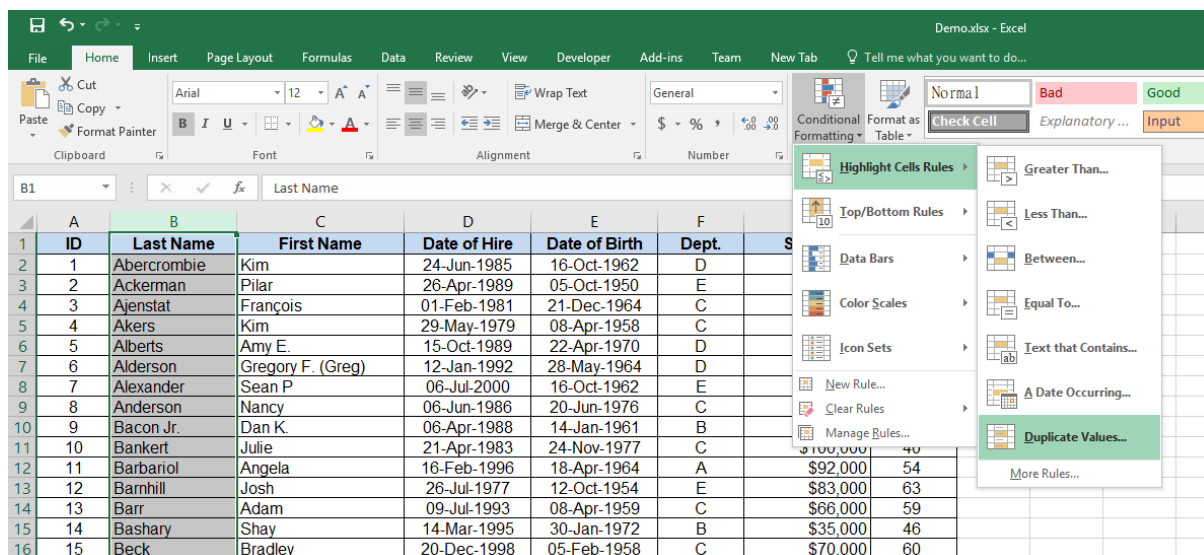3. When the Duplicate Values dialog box appears, choose the type of formatting you'd like to use to highlight repeated values. People often choose to change the background color.
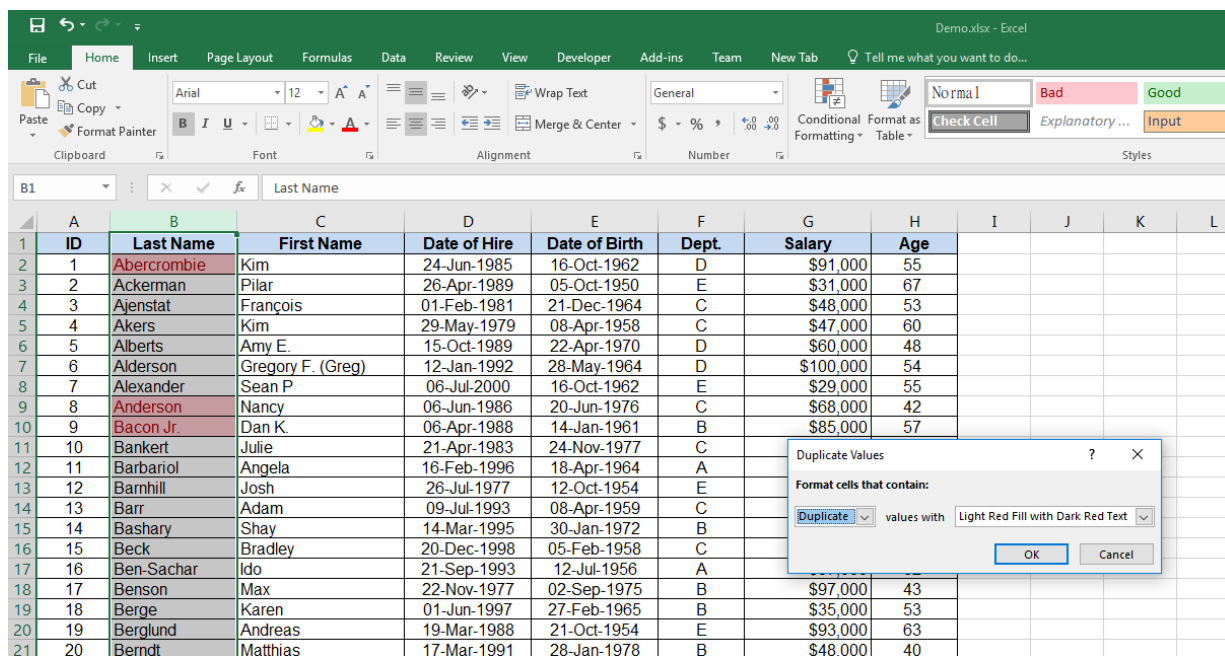
4. Click **[OK]**. Excel changes the background color of all values that appear more than once in the selected column. Conditional formatting keeps working even after you've applied it. So, if you add a new record that duplicates the value of an existing record in the column you're checking, Excel immediately highlights it. It's like having a duplicate value cop around at all times.

3. Filtering

Filtering is a quick and easy way to find and work with a subset of data in a range. A filtered range displays only the rows that meet the criteria you specify for a column. Excel provides two commands for filtering ranges: AutoFilter and Advanced Filter.

Unlike sorting, filtering does not rearrange a range. Filtering temporarily hides rows you do not want displayed. When Excel filters rows, you can edit, format, chart, and print your range subset without rearranging or moving it.

3.1 Use AutoFilter for Simple Criteria and to Filter by Selection

Using AutoFilter, you can create three types of filters: by a list values, by a format, or by criteria. Each of these filter types is mutually exclusive for each range of cells or column table. For example, you can filter by cell color or by a list of numbers, but not by both; you can filter by icon or by a custom filter, but not by both.

3.1.1 Make sure the data type is the same in each column:

In your worksheet, the top row of each column should have a heading that describes the contents of the column, such as "Last Name" and "Age". The data in each column should all be the same type. For instance, do not mix text in a column with numbers, or numbers in a column with dates.

	A	B	C	D	E	F	G	H
1	ID	Last Name	First Name	Date of Hire	Date of Birth	Dept.	Salary	Age
2	1	Abercrombie	Kim	24-Jun-1985	16-Oct-1962	D	$91,000	55
3	2	Ackerman	Pilar	26-Apr-1989	05-Oct-1950	E	$31,000	67
4	3	Ajenstat	François	01-Feb-1981	21-Dec-1964	C	$48,000	53
5	4	Akers	Kim	29-May-1979	08-Apr-1958	C	$47,000	60

3.1.2 Activate the AutoFilter

Activate the AutoFilter by select **Data** Tab, then **Filter**. The AutoFilter arrows now appear to the right of each column heading. If you select an entire column instead of a single cell before clicking the Filter command, an AutoFilter arrow will appear only on the selected column, not on all columns of the data.
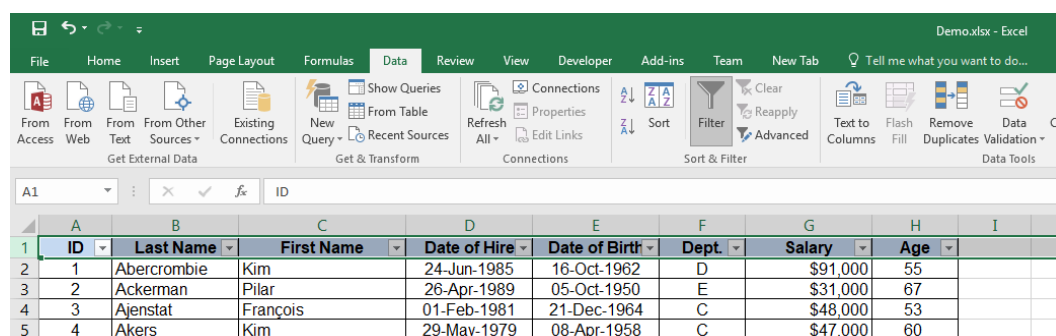
3.1.3 Start Filtering Data

Suppose your worksheet contains customer sales data. Each customer entry includes information about the customer's location, products they purchase, purchase dates, and revenues and profits from each purchase. Perhaps you want to view sales activity only for those customers located in the West region. Excel can help you do this.

3.1.4 Apply Additional Filters

If you want to focus on even more specific information, you can filter again on another column, and then again on another column, and so on. You can click the arrow next to any heading in any column to apply a filter.

3.1.5 Turn Off Filtering

How you remove filters depends on how many filters you have applied, and from how many columns you wish to remove filters.

• To remove a filter from one column, click the AutoFilter arrow next to that column, and then click **All**. That command will display the rows hidden by that filter.

• To turn off AutoFilter, click select **Data** tab, then click **Filter** again.

3.2 Use Advanced Filtering Techniques

Excel enables you to perform more intricate types of filtering. Two particularly useful types are:

• Top 10 Filter

• Custom Filtering.

When you apply a filter to a column, the only filters available for other columns are the values visible in the currently filtered range. Only the first 1000 unique entries in a list appear when you click the arrow

3.2.1 Finding the Top 10 (or Bottom 10) in a Column

You can use the **Top 10** filter on columns of numbers or dates. With Top 10 you can find either the top items or the bottom items (the smallest or largest numbers or dates). And you're not limited to finding the top 10 items or the bottom 10 items. You can choose how many items you want to see: only 1 or as many as 500. You can use Top 10 to find the highest-priced or lowest-priced products, to identify employees with the most recent hire dates, or to see the top or bottom student grades.

To use Top 10 on a column of data, click on a data cell in the column and then click the column's AutoFilter arrow. Select **(Top 10…)** near the top of the drop down list. The **Top 10 AutoFilter** dialog box opens. In the dialog box, select either **Top** or **Bottom**. Then select a number. Finally, select either **Items** or **Percent**.

You can filter columns in any order you choose. The filters are applied progressively, in the order you apply them. Each filter limits the data to which you can apply the next filter.
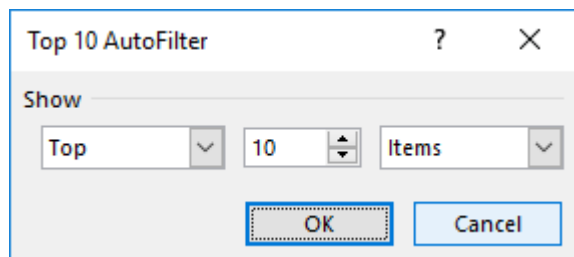
3.2.1.1 Filter for the Smallest or Largest Number

1. Click the arrow ▼ in the column that contains the numbers, and click **(Top 10...)**.
2. In the box on the left, click **Top**, or **Bottom**.
3. In the box in the middle, enter a number.
4. In the box on the right, click **Items**.

3.2.1.2 Filter for the Top or Bottom Numbers by Percent

1. Click the arrow ▼ in the column that contains the numbers, and click **(Top 10...)**.
2. In the box on the left, click **Top** or **Bottom**.
3. In the box in the middle, enter a number.
4. In the box on the right, click **Percent**.

3.2.2 Using Custom Filters

When you filter by choosing from the AutoFilter drop-down list, you hide everything except your single choice. If you want to see more than one selection in a column, you can create custom filters. To create a custom filter, click **(Custom…)** near the top of the drop down list. The **Custom AutoFilter** dialog box opens. You can now enter two filtering requirements for the column of data.

3.2.2.1 Filter a Range for Rows that Contain Specific Text

1. Click the arrow ⏷ in the column that contains the numbers, and click **(Custom)**.
2. In the box on the left, click **equals**, or **does not equal**, **contains**, or **does not contain**.
3. In the box on the right, enter the text you want. If you need to find text values that share some characters but not others, use a wildcard character.
4. To add another criteria, click **And** or **Or**, and repeat the previous step.

3.2.2.2 Filter for Blank or Nonblank Cells

Click the arrow ⏷ in the column that contains the numbers, then click **(Blanks)** or **(NonBlanks)**. The **Blanks** and **NonBlanks** options are available only if the column you want to filter contains a blank cell.

3.2.2.3 Filter for Numbers Greater than or Less than Another Number

1. Click the arrow ⏷ in the column that contains the numbers, and click **(Custom)**.
2. In the box on the left, click **is greater than**, **is less than**, **is greater than or equal to**, or **is less than or equal to**.
3. In the box on the right, enter a number.
4. To add another criteria, click **And** or **Or**, and repeat the previous step.

3.2.2.4 Filter for a Number Equal to or Not Equal to Another Number

1. Click the arrow ⏷ in the column that contains the numbers, and click **(Custom)**.
2. In the box on the left, click **equals**, or **does not equal**.
3. In the box on the right, enter a number.
4. To add another criteria, click **And** or **Or**, and repeat the previous step.

3.2.2.5 Filter for the beginning or end of a text string

1. Click the arrow ▾ in the column that contains the numbers, and click **(Custom)**.
2. In the box on the left, click **begins with**, or **does not begin with**, or **ends with**, or **does not end with**.
3. In the box on the right, enter the text you want. If you need to find text values that share some characters but not others, use a wildcard character.
4. To add another criteria, click **And** or **Or**, and repeat the previous step.

4. Sorting

Excel provides numerous ways to sort worksheet ranges. You can sort by columns or rows, in ascending or descending order, and with capitalization considered or ignored. You can even define custom sorting sequences so that, for example, your company's division names always appear in a particular order, regardless of their alphabetic sequence.

4.1 Default Sort Orders

After sorting a list of Excel figures, are some of the numbers not in the order you expect? A common reason for this problem is that some numbers may be formatted and stored as text instead of as numbers. When you sort data that includes values formatted and stored as text and as numbers, Excel sorts the text values separately from the number values. For example, the sales value for Tennis is formatted as text, and there were no sales for Soccer. When you sort this data by the Sales column in ascending order, you will get the following result:

	A	B
1	**Sport**	**Sales**
2	Golf	5,500
3	Safari	10,000
4	Soccer	
5	Tennis	1,000
6	Windsurfing	1,850

	A	B
1	**Sport**	**Sales**
2	Windsurfing	1,850
3	Golf	5,500
4	Safari	10,000
5	Tennis	1,000
6	Soccer	

In an ascending sort, Microsoft Excel uses the following order. In a descending sort, this sort order is reversed except for blank cells, which are always placed last.

|	
Numbers	Numbers are sorted from the smallest negative number to the largest positive number.
Dates	Dates are sorted from the earliest date to the latest date.
Alphanumeric sort	When you sort alphanumeric text, Excel sorts left to right, character by character. For example, if a cell contains the text "A100," Excel places the cell after a cell that contains the entry "A1" and before a cell that contains the entry "A11."
	Text and text that includes numbers are sorted in the following order:
	0 1 2 3 4 5 6 7 8 9 (space) ! " # $ % & ( ) * , . / : ; ? @ [\ ] ^ _ ` {	} ~ + < = > A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
	Apostrophes (') and hyphens (-) are ignored, with one exception: If two text strings are the same except for a hyphen, the text with the hyphen is sorted last.
Logical values	In logical values, FALSE is placed before TRUE.
Error values	All error values are equal.
Blanks	Blanks are always placed last.

4.2 Sorting on Column (by Row)

You can sort on as many as three columns at once.

1. Select a column of alphanumeric data in a range of cells, or make sure that the active cell is in a table column containing alphanumeric data.

2. On the **Data** tab, in the **Sort & Filter** group, do one of the following:
   - To sort in ascending alphanumeric order, click ![A to Z icon] **Sort A to Z**.
   - To sort in descending alphanumeric order, click ![Z to A icon] **Sort Z to A**.

3. Optionally, you can do a case-sensitive sort.
   - In the **Sort** dialog box, click **Options**.
   - In the **Sort Options** dialog box, select **Case sensitive**.
   - Click **OK** twice.

4. To reapply a sort after you change the data, click a cell in the range or table, and then on the Data tab, in the Sort & Filter group, click Reapply.
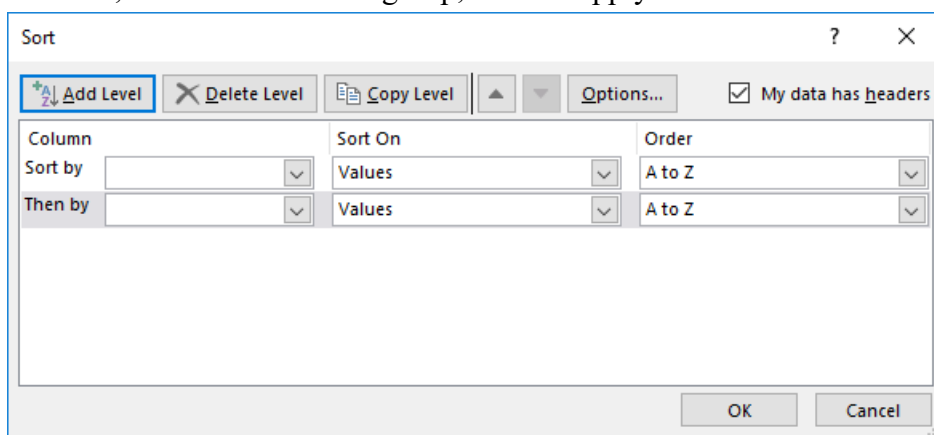
4.3 Sorting by Columns
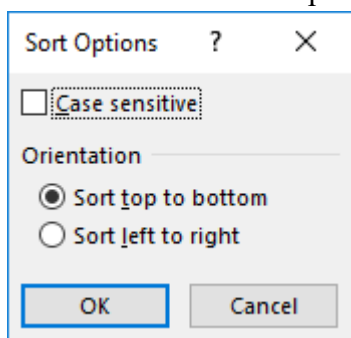
To sort by columns, follow these steps:

1. Select a column of alphanumeric data in a range of cells, or make sure that the active cell is in a table column containing alphanumeric data.

2. In the **Sort** dialog box, click **Options**.

3. In the **Sort Options** dialog box, select **Sort left to right**.

4. Click **OK** twice.

5. Fill out the boxes and option buttons in the **Sort** dialog box, and click **[OK]**.

4.4 Sorting Months, Weekdays, or Custom Lists

Excel normally sorts text in alphabetical order, but it can sort on the basis of any of its custom lists if you want it to. The program includes four custom lists by default

- Sun, Mon, Tues, …
- Sunday, Monday, Tuesday, …
- Jan, Feb, Mar, …
- January, February, March, …

If you have a column consisting of these day or month labels, you can sort them in their proper chronological order. If you've created other custom lists, you can sort text fields in the order of those lists as well.
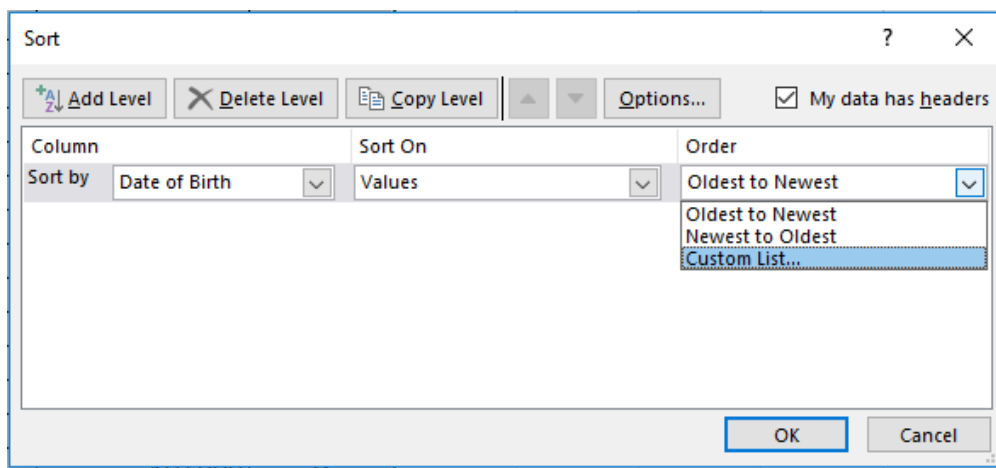
To sort on the basis of a custom list, click **Order** in the **Sort** dialog box, and then select **Custom List…**. The four default custom lists will appear there, along with any others that you have created.
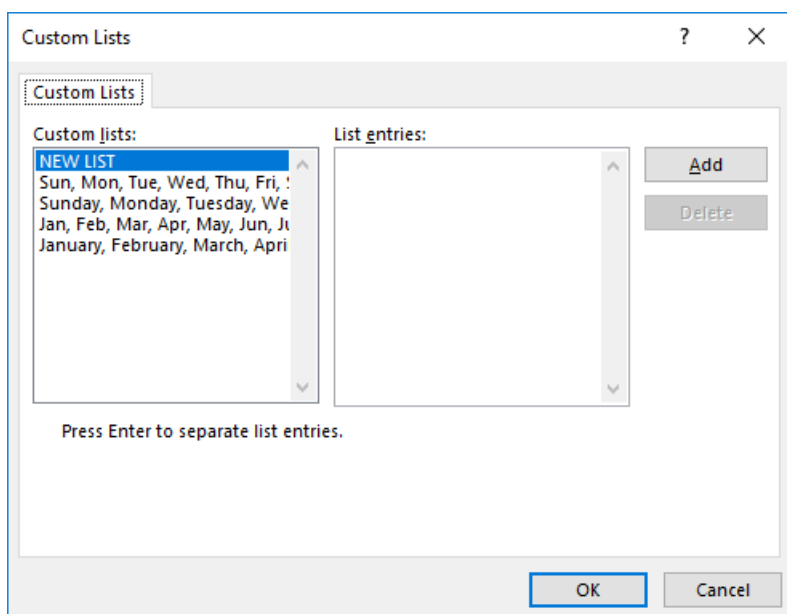
4.5 Sorting Cells that Contain Formulas

You need to exercise caution when sorting cells that contain formulas with cell references. If you sort by row, references to other cells in the same row will be correct after the sort, but references to cells in other rows of the list will no longer be correct.

Similarly, if you sort by column, references to other cells in the same columns will be correct after the sort, but references to cells in other columns will be broken. With either kind of sort, relative references to cells outside the list will be broken by the sort.

To avoid the problems associated with sorting ranges containing formulas, observe the following rules:

- In formulas that reference cells outside the sort range, use only absolute references.
- When sorting by row, avoid formulas that reference cells in other rows. If you must use such formulas, reference cells by name, not by address.
- When sorting by column, avoid formulas that reference cells in other columns. If you must use such formulas, reference cells by name, not by address.

5. Using Subtotals to Analyst a List

Microsoft Excel can automatically calculate subtotal and grand total values in a list. When you insert automatic subtotals, Excel outlines the list so that you can display and hide the detail rows for each subtotal.

To insert subtotals, you first sort your list so that the rows you want to subtotal are grouped together. You can then calculate subtotals for any column that contains numbers by selecting **Data** tab, and click **Subtotal**.
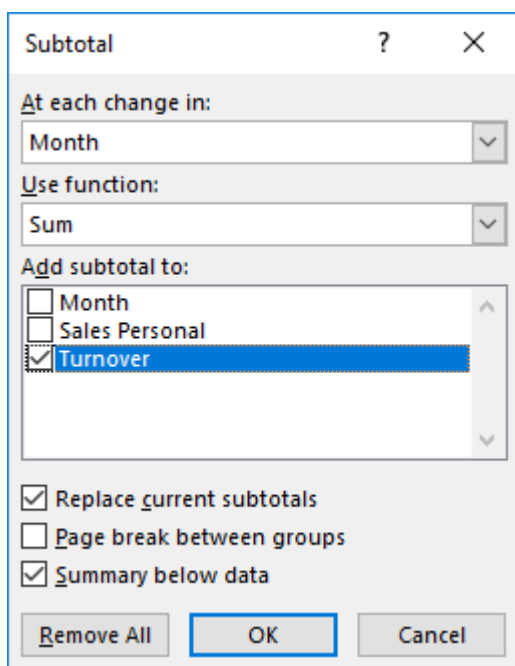
5.1 How Subtotals are Calculated
5.1.1 Subtotals

Excel calculates subtotal values with a summary function, such as Sum or Average. You can display subtotals in a list with more than one type of calculation at a time.

5.1.2 Grand Totals

Grand total values are derived from detail data, not from the values in the subtotal rows. For example, if you use the Average summary function, the grand total row displays an average of all detail rows in the list, not an average of the values in the subtotal rows.

5.1.3 Automatic Recalculation

Excel recalculates subtotal and grand total values automatically as you edit the detail data.

5.2 Create Summary Reports

1. Sort the column you wish to perform subtotal.

2. Select **Data** tab, and then click **Subtotals** to popup the **Subtotal** dialog box

3. In the **At each change in** box, click the column to subtotal.

4. In the **Use function** box, click the summary function that you want to use to calculate the subtotals. In the example above, you would select **Sum**.

5. In the **Add subtotal to** box, select the check box for each column that contains values that you want to subtotal. By default, Excel offers to subtotal the last column of your data.

6. If you want an automatic page break following each subtotal, select the **Page break between groups** check box.

7. To specify a summary row above the details row, clear the **Summary below data** check box. To specify a summary row below the details row, select the Summary below data check box. In the example above, you would clear the check box.

8. Optionally, you can use the Subtotals command again by repeating steps one through seven to add more subtotals with different summary functions. To avoid overwriting the existing subtotals, clear the **Replace current subtotals** check box.

9. Click **[OK]** to confirm. Excel inserts a new row at each change of column and calculates a subtotal. After you have the subtotals in, you will see small 1, 2, and 3 buttons appear below the name box. Click the 2 button to see just one line per account with the totals. Click the 3 button to see all lines.

6. Validating Data Entry

Data validation is an Excel feature that you can use to define restrictions on what data can or should be entered in a cell. You can configure data validation to prevent users from entering data that is not valid. If you prefer, you can allow users to enter invalid data but warn them when they try to type it in the cell. You can also provide messages to define what input you expect for the cell, and instructions to help users correct any errors. When data is entered that doesn't meet your requirements, Excel displays a message with instructions you provide.
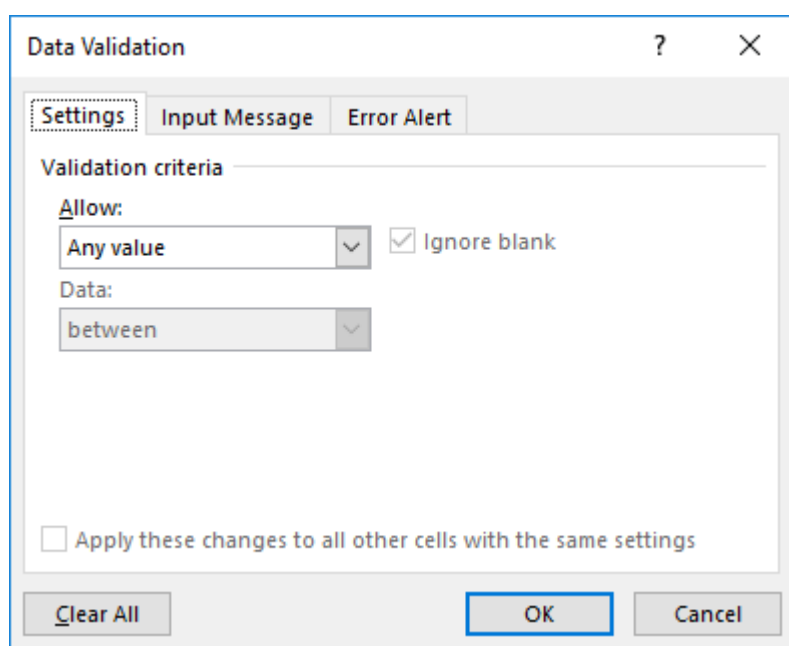
6.1 Types of data you can validate

Excel lets you designate the following types of valid data for a cell:

Numbers: Specify that the entry in a cell must be a whole number or a decimal number. You can set a minimum or maximum, exclude a certain number or range, or use a formula to calculate whether a number is valid.

Dates and Times: Set a minimum or maximum, exclude certain dates or times, or use a formula to calculate whether a date or time is valid

Length: Limit how many characters can be typed in a cell, or require a minimum number of characters.

List of Values: Make a list of the choices for a cell — such as small, medium, large — and allow only those values in the cell. You can display a dropdown arrow when a user clicks the cell to make it easy to pick from your list.

6.2 Types of messages you can display

For each cell you validate, you can display two different messages: one that appears before the user enters data, and one that appears after the user tries to enter data that doesn't meet your requirements. If users have the Office Assistant turned on, the Assistant displays the messages.
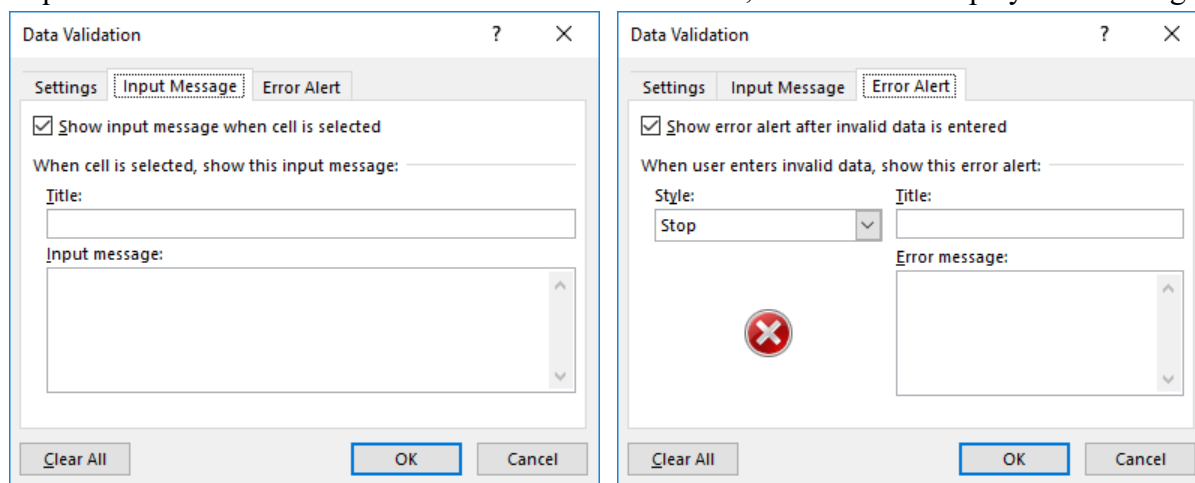
6.2.1 Input Message

This type of message appears as soon as a user clicks the validated cell. You can use it to provide instructions about the type of data you want entered in the cell.

6.2.2 Error Alert

This type of message appears only when the user types data that isn't valid and presses **[Enter]**. You can choose from three types of error messages. If you don't specify any messages, Excel flags whether the data a user enters is valid so that you can check for it later, but does not notify the user when an entry is invalid

Information Message: This message does not prevent entry of invalid data. In addition to the text you provide, it has an information icon, an OK button, which enters the invalid data in the cell, and a Cancel button, which restores the previous value to the cell.

Warning Message: This message does not prevent entry of invalid data. It has the text you provide, a warning icon, and three buttons: Yes enters the invalid data in the cell, No returns to the cell for further editing, and Cancel restores the previous value to the cell.

Stop Message: This message won't allow invalid data to be entered. It has text you provide, a stop icon, and two buttons: Retry returns to the cell for further editing, and Cancel restores the previous value to the cell. Note that this message isn't intended as a security measure: although users can't enter invalid data by typing and pressing **[Enter]**, they can circumvent the validation by copying and pasting or filling data in the cell.

6.3 Setting up Data Validation

Once you know what validation you want to use on a worksheet, you can use select the **Data tab,** and then select **Data Validation** to set it up. Here's a general overview of the process:

1. **Set up your worksheet** – Start by entering the data and formulas on your worksheet. If you're using a list of valid choices, enter and name your list.

2. **Define the settings for a cell –** Beginning with the first cell you want to validate, use the Data Validation dialog box to designate the type of validation you want, an input message if you want one, and an error message if you want one.

3. **Set up validation for other cells –** You can often save time by copying the validation settings from the first cell to other cells and then modifying the settings.

4. **Test your validation rules –** Try entering both valid and invalid data in the cells to make sure your settings are working as you intended and your messages are appearing when you expect. Use the Validation command to make any changes to the settings. If you make changes to the validation in one cell, you can automatically apply your changes to all other cells that have the same settings.

5. **Set up your lists of valid choices –** If you used a list of valid choices and don't want users to be able to find and change the list, you can put the list on another worksheet, set up the validation, hide the worksheet that contains the list, and then help protect the workbook with a password. The workbook password will help guard the worksheet that contains the list from others.

6. **Apply protection, if desired –** If you're planning to protect the worksheet or workbook, do that after you're finished setting up validation. Make sure you unlock any validated cells before protecting the worksheet, otherwise users won't be able to type in the cells.

7. **Share the workbook, if desired –** If you're planning to share the workbook, do that after you're finished setting up validation and protection. After you share a workbook, you won't be able to change the validation settings unless you stop sharing, but Excel will continue to validate the cells you've designated while the workbook is shared.

8. **Check the results for invalid data –** After users enter data in the worksheet, you can check for invalid data.

6.4 Entering data in validated cells

Here's what the process of entering data is like for users. You can use input and error messages to provide the instructions users need to understand how you've set up the worksheet to ensure correct data.

6.4.1 Viewing your input message

When a user clicks a validated cell or uses the arrow keys to move into the cell, your input message appears either in an Assistant balloon or a separate message box. If you provided a dropdown list for the cell, the dropdown arrow appears to the right of the cell.

6.4.2 Typing data

As the user types data or clicks the dropdown arrow to select a value from your list, the input message stays on the screen (the dropdown list may cover part of your message).

6.4.3 Entering valid data

If the user types valid data and presses **[Enter]**, the data is entered in the cell and nothing special happens.
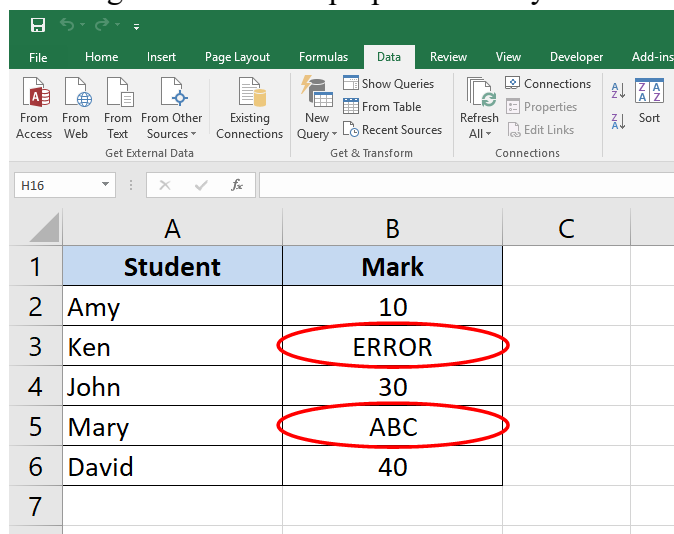
6.4.4 Entering invalid data

If the user types data that doesn't meet your criteria, and you specified an error message for invalid data, your message appears either in an Assistant balloon or a separate message window. The user can then read the message and decide what to do.

- For an information message, the user can click **[OK]** to enter the invalid data, or click **[Cancel]** to start over.

- For a warning message, the user can click **[Yes]** to enter the invalid data, **[No]** to edit the cell some more, or **[Cancel]** to start over.

- For a stop message, the user can't enter the invalid data, and can either click **[Retry]** to edit the cell or **[Cancel]** to start over.

If you don't provide messages, entering data in validated cells is the same for users as regular Excel data entry. However, Excel does flag any cells that have invalid entries so you can easily find those entries.

6.5 Checking a Worksheet for Invalid Entries

When you receive worksheets back from users who may have entered invalid data, you can have Excel display red circles around any data that didn't meet your criteria, making it easy to scan the worksheet for errors. Use the **[Circle Invalid Data]** and **[Clear Validation Circles]** buttons on the Auditing toolbar for this purpose. When you correct the data within the cell, the circle disappears.