Analysing data using PivotTables in Excel 2010

What is a PivotTable?

A PivotTable provides ways of summarising and sorting lists of data stored on a worksheet. It enables you to see trends and patterns within the data by allowing you to perform a large number of calculations simultaneously.

PivotTables give you a way to answer questions on complex data. They are dynamic and can be updated easily.

Understanding the terminology

The categories of information in a PivotTable are called fields. There are four types of fields:

Page
The page field allows you to filter the entire PivotTable report to display data for a single item or all the items. For example, all students, or a specific student.

Row
The row field displays the items in the field as row labels.

Column
The column field displays the items in the field as column labels.

Data
Data fields contain the summarised data. They are usually numeric, but can also contain text.

Creating a PivotTable

First, make sure that the range you are using has column headings, or that headers are displayed in the table, and that there are no blank rows in the range or table.

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To create the PivotTable:

- Place your cursor anywhere in the data apart from in the headings, then click on the Insert tab and on PivotTable in the Tables group. The Create PivotTable dialogue box appears.

- Under Choose the data that you want to analyse, Excel automatically determines the range for the PivotTable report, but you can replace it with a range of your choice.

- Under Choose where you want the PivotTable report to be placed, choose either the existing worksheet, or a new worksheet. Then click OK.

- Next drag the fields you want from the PivotTable Field List into the relevant area. In the example below we dragged Semester to Row Labels, Subject to Column Labels, Mark to \( \Sigma \) Values and Student to Report Filter.

When the Mark field is dragged to the \( \Sigma \) Values area, the PivotTable sums all the marks by Student and Subject.

If you drop a field in the wrong area, drag it back up to the PivotTable Field List. When you drag a field back up to the top half of the pane notice that the tick next to the field has gone.

You can reorganise your report by removing fields and adding them to different areas in the PivotTable Field List box. This is ‘pivoting’ the data.

You can also use the filters on the column and row headings to display data for specific items. Select and deselect the options as required.

PivotTables include a drill-down feature. When you double-click on a data item, Excel creates a new worksheet which shows the records that have been used to create that summarised item.

If the field list has disappeared from view and you wish to use it again right click on the PivotTable and choose ‘Show Field List’ from the menu.

Note: You cannot change the data in a PivotTable directly. You must change the source data and then refresh the PivotTable. Do this by clicking on the PivotTable and then the PivotTable Tools, Options tab, then click Refresh in the Data group.
Grouping data

A useful feature of PivotTables is the ability to group data. Move the fields into position in the lower half of the PivotTable Field list to arrange rows into groups and sub-groups.

In this example we have moved Student from the Report Filter box to the Row Labels box to group via Semester.

To hide the sub-group data left click the box to the left of the header whose sub-group detail you wish to hide. To show the detail again click the box again.

Formatting PivotTables and using slicers

Formatting the design

To make sections of your PivotTable report more prominent, click in the table and use the PivotTable Tools, Design tab on the ribbon to format the design.

For banded rows or columns use the Design tab, and tick the box to the right of either banded rows or columns in the PivotTable Style Option section. Then, in the next section choose a design from the drop down list of PivotTable Styles.
Formatting the data

PivotTable data can be displayed in various ways. By default PivotTables summarise total data. However the data can also be summarised in various ways, including:

- to count records in a list
- to calculate the average or
- to find the maximum or minimum value

Other functions shown in the Value Field Settings screen shot can also be used.

In the example we want to find out the average mark for each subject.

Ensure that the cursor is within the PivotTable and the context sensitive PivotTable Tools, Options tab is activated. Click on Field Settings from the Active Field group. Choose Average as the type of calculation that you want use.

Using slicers

Slicers are graphic objects containing a set of buttons that enable you to quickly filter the data in a PivotTable report. They provide another way of filtering in PivotTables without the need to open drop-down lists.

Slicers are typically associated with the PivotTable in which they are created. They clearly label the filter that is applied and provide details so that you can understand the data displayed in the filtered PivotTable report. You can have more than one slicer associated with your report.

To create a slicer, ensure your cursor is within the PivotTable and choose Insert, Slicer (Filter group). From the Insert Slicers dialog box tick the field you wish to see as a slicer and click OK.
To view filtered results using the slicer, click on a category in the slicer dialog box. The filtered results will appear in the PivotTable. To remove the filter click the remove filter symbol.

Creating calculated fields

You can use the PivotTable’s Calculations group and Calculated Field feature to create additional calculated fields that will show up in your PivotTable

To create a calculated field:

- Under PivotTable Tools, Options click the down arrow next to Fields, Items and Sets in the Calculations group.
- Choose Calculated Field from the list.

- Enter a Name for the field; this will appear as the data header. It should follow normal field name conventions and contain no spaces.
- Type in the formula in the Formula box
- In the example shown we want to add two marks together. To do this

Type the following in the formula box

=’Mark A’+’Mark B’

Note: You can use the Fields list to insert field names.

The new field is added as an additional data item on the PivotTable.

Note: Formulas for calculated fields operate on the underlying data, not on each individual item.