



## WASP (write a scientific paper) using Excel – 2: Pivot tables

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### ABSTRACT

Data analysis at the descriptive stage and the eventual presentation of results requires the tabulation and summarisation of data. This exercise should always precede inferential statistics. Pivot tables and pivot charts are one of Excel's most powerful and underutilised features, with tabulation functions that immensely facilitate descriptive statistics. Pivot tables permit users to dynamically summarise and cross-tabulate data, create tables in several dimensions, offer a range of summary statistics and can be modified interactively with instant outputs. Large and detailed datasets are thereby easily manipulated making pivot tables arguably the best way to explore, summarise and present data from many different angles. This second paper in the WASP series in *Early Human Development* provides pointers for pivot table manipulation in Excel™.

### 1. Pivot tables

Data analysis and eventual presentation requires the tabulation of data. Pivot tables are one of Excel's most powerful and underutilised features, tabulation functions that immensely facilitate descriptive statistics. Pivot tables permit users to summarise and cross-tabulate data, create tables in several dimensions, offer a range of summary statistics, and can be modified interactively with instant outputs. Large and detailed datasets are easily manipulated making pivot tables arguably the best way to explore, summarise and present data from diverse angles.

For example, the dataset described in the first paper in this series (United States live births for 2007–2013 by state, gender, and month and year of birth) [1] can be conveniently manipulated as a pivot table. This is done by clicking anywhere in the dataset and then clicking the Insert tab – Pivot Table. Dragging the Pivot Table Fields on the right hand side from the top to the desired area below will generate a table as shown in the figure (Fig. 1). Fields can also be nested, e.g. adding Gender under Year in the ROWS section (bottom right of Fig. 2).

A useful additional option is the possibility to change what is displayed from the default (Sum of Births in this case) to others such as mean, standard deviation or percentage and so on by clicking on Sum of Births – Value Field Settings. These tables can also be used to count the number of unique values in a field.

### 2. Calculations

Right clicking in the spreadsheet displays a Show Values option that opens a window permitting additional calculations instead of the sum

of births (Fig. 3). This function is useful, for example, in order to check whether the data is all present and accounted for.

### 3. Filters

It is also possible to filter data so as to view only selected parts of the dataset. This may be done in the raw data or in pivot tables. For the former, the option is by clicking the Data tab – Filter. Drop-downs appear next to each header (Fig. 4) and these allow filtering options. The same drop-down options are available at the top left hand side of pivot tables and these drop-downs also permit other useful functions such as sorting.

### 4. Grouping

It may be useful to group data and this may be done for the raw data by selecting it, click the Data tab, Group. It is also possible to do this in pivot tables. In the births sheet, click on any year, click group and the following dialog box allows the user, for example, to group in two year intervals (Figs. 5 and 6). It is also possible to select just a range within the values being studied by using the control key while selecting, prior to grouping.

### 5. Field renaming

A pivot table will generate new results that will be “Sum of” or “Count of”. These can be overwritten with new names for ease of use and reference.

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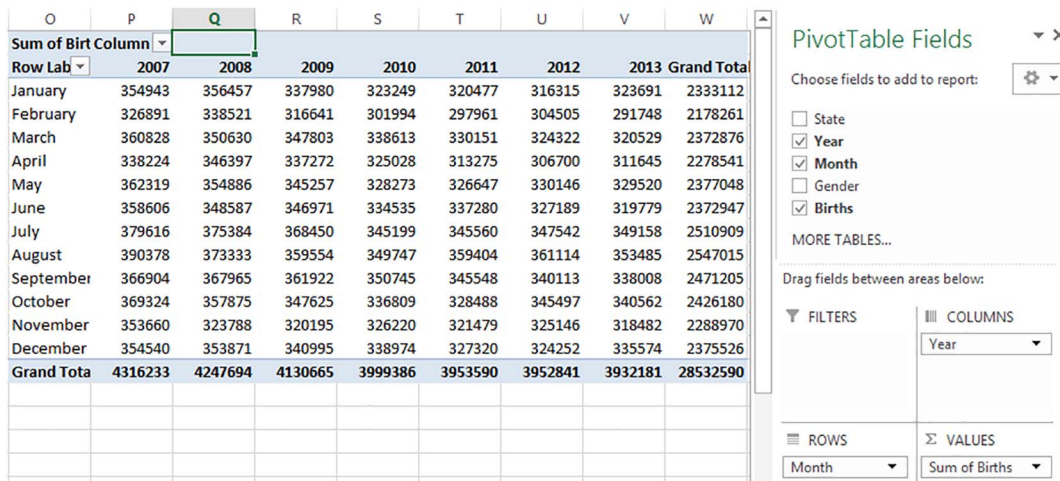


Fig. 1. Creating a Pivot Table.

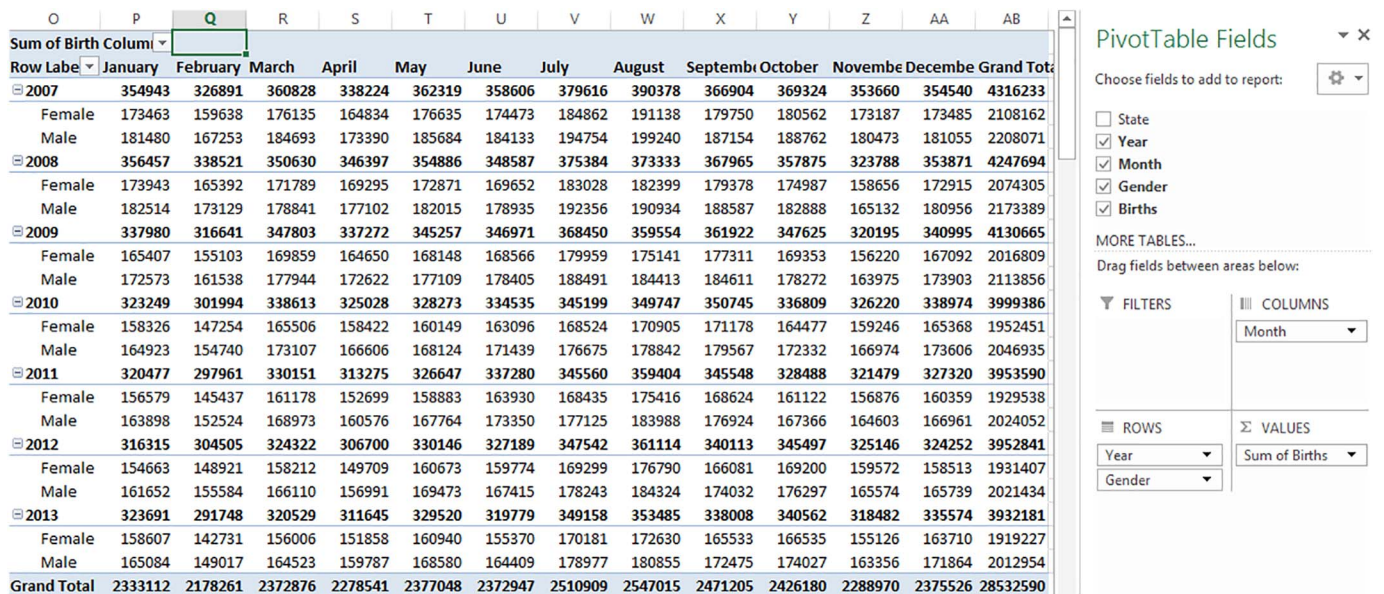


Fig. 2. Nesting variables in a Pivot Table.

6. Same field twice

It is possible to add the same field to a pivot table twice, for example, to count unique occurrences of a variable in a field.

7. Pivot table cloning

Pivot tables can be cloned so as to create different tables without altering extant ones. A pivot table can be simply copied and pasted and then modified as needed.

8. Eliminating totals and subtotals

By default, pivot tables show totals for both rows and columns. These can be eliminated via the Design tab using the totals and subtotal buttons options.

9. Empty cells

By default, empty cells will display nothing. To set your own character instead, right-click inside the pivot table and select Pivot Table options. Find the “Empty cells as:”, check it and enter the desired

replacement character, such as the symbol “-”.

10. Autofit

By default, each time that a pivot table changes, the columns that contain data are adjusted automatically to best fit the data displayed. This will change the size of cells and graphs along the entire column length. In order to disable this feature, right-click inside the pivot table, choose PivotTable Options and uncheck “AutoFit Column Widths on Update”.

11. Self-contained pivot tables

Pivot tables have a pivot cache, a repository of the data used to create the pivot table, so a pivot table will continue to function even if the original data is deleted in the spreadsheet.

12. Pivot charts

These may be created using the steps as invoking a pivot chart but in addition to creating tables, Excel also instantaneously plots the resulting pivot table as a chart. This greatly facilitates visual data

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