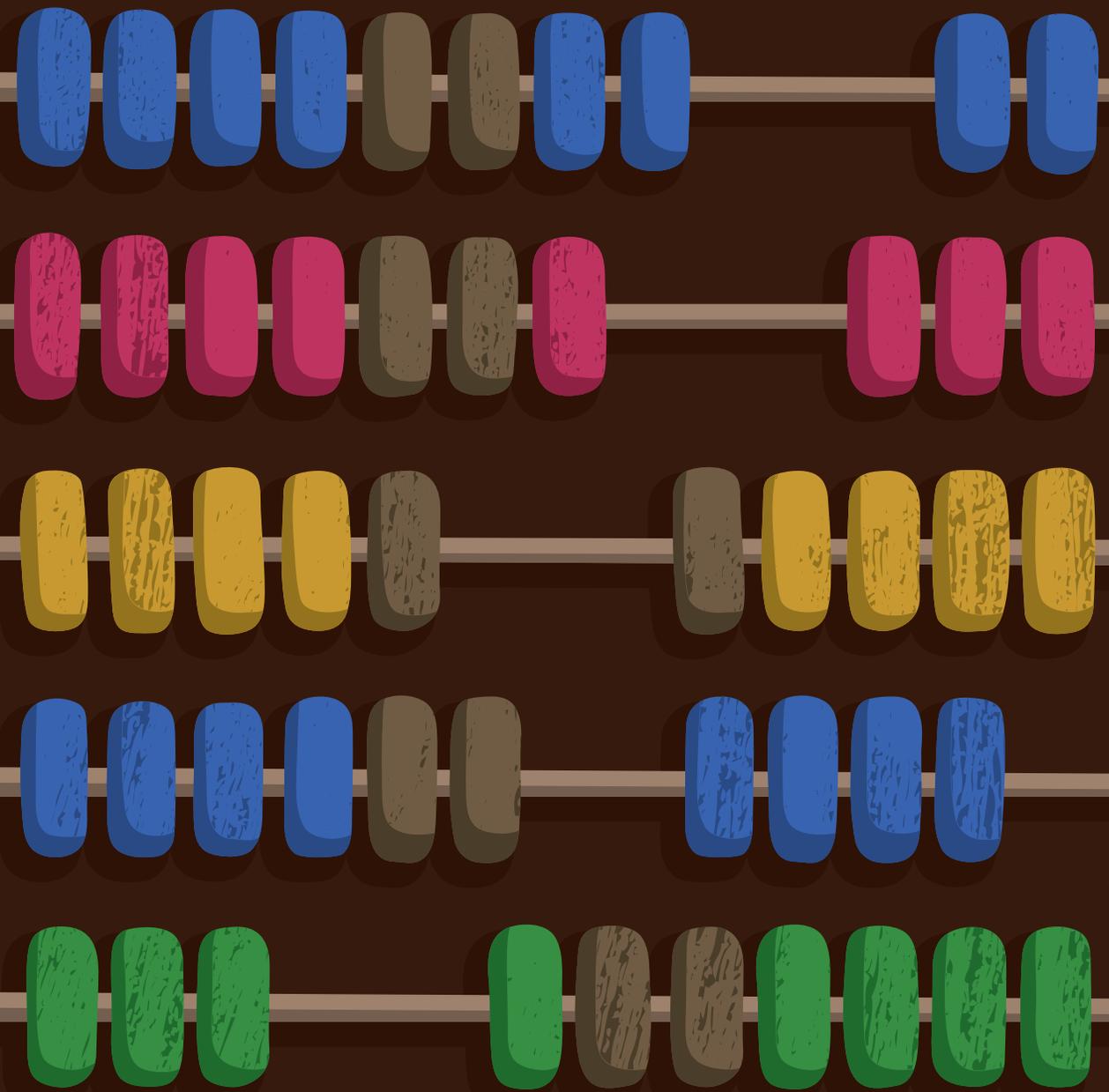


# CALCULATING SALARIES IN

# GOOOOGLE DOCS

BY ILYA  
CASCO 2012



# Calculating Salaries in Google Docs

## Description

This guide includes tips on using Google Spreadsheets for calculating salaries of a small tech support group consisting of five to thirty people. You will learn about formulas that are most frequently used while working with spreadsheets. This guide also looks at basic formatting features in Google Spreadsheets and is recommended for beginners who only know the basics of Microsoft Excel (or alternative software) and are involved in financial accounting.

**Link to results workbook:** [click here.](#)

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# 1. Task Statement

Let’s analyze a hypothetical situation in a virtual office:

- 1 The employees of a department, such as Support, answer clients’ letters.
- 2 At the end of the day, those who deal with client letters submit their statistics to some sort of report system, such as inquiry forms or using the services of project management software like [Basecamp](#).
- 3 On a daily basis, after checking the quality of the answers, the managers record the statistics in Google Spreadsheets.
- 4 The payment to each employee is calculated based on the number of answered letters at

the end of the current month or at the beginning of the next month.

Using Google Spreadsheets you will be able to calculate the following:

- › Total number of answered letters;
- › Reasonably rounded salaries for the benefit of the employee;
- › Performance bonuses and penalties for failing to meet the requirements. Bonuses are given more often; however, penalties also happen from time to time.

# 2. Organizing Data in the Document

The first step to working with spreadsheets is the creation of **columns and rows**: simply plan where you’d like them to be. Now, write the types of data that will be used in the table in which **you calculate the salaries**:

- › First and last names;
- › Date, in **MM/DD/YYYY** (month, day, year) format;

- › Number of replied letters per day;
- › Total number of answered letters ( for the work interval: as a rule, it will be from a month up to a year);
- › Employee’s salary in reference units.

Next you will need to determine which format of data location is more convenient: names of employees placed horizontally (*by columns*) or vertically (*by rows*). The most important thing is to group the data as compactly as possible. In the sample below you can see names arranged by columns, meaning the dates will be put into rows. The number of answered letters are the figures which have to be typed in by the managers of the Support department. These numbers are listed in the sample table at the intersection of dates and names.

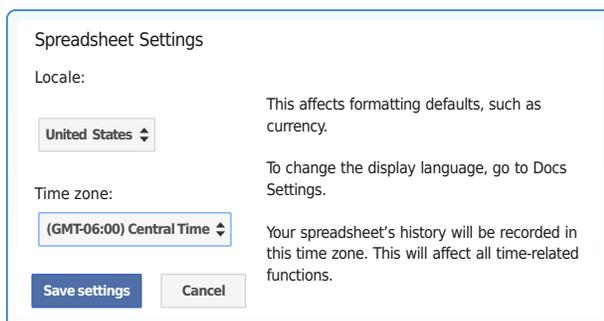


Figure 1. File — Spreadsheet settings.

In the sample, the data won't be grouped afterwards (for instance, a grouping based on Support departments), so it won't be necessary to allocate too much space for names. If there's a need to introduce a new unit - like hours - it will be easy to split each column into two.

This justifies arranging the names horizontally.

**Tip:** It is easier to scroll the page up and down rather than from left to right, as you may like to continue this table the next month.

This advice is based on **real life experience:**

for 12 months in a row we thought the vertical arrangement of names to be more convenient.

However, this complicated statistics maintenance, and **questions arose:**

what will happen to the table in half a year?

In order to add a new month in statistics, should we just copy the tab and begin everything from scratch?

	A	B	C	D	E	F	G	H	I	J	K	L	M
1		01.12	02.12	05.12	06.12	07.12	08.12	09.12	12.12	13.12	14.12	15.12	16.12
15	Josh Smith												
16	Email	2.5	4.5	5	4.25	5	4	2.75	4	1	6	2	2
17	Time	2.5	2.5	2	2.75	2	1.5	1.25	4	1	6	2	2
19	Email adv.			1	4			5	10		8	6	
20	Templates		5	9	9	6	11				2	1	
21	Time sort		2	3	1.5	3	2.5	1.5					
22	Sort		20	66		89	54						
23	Review	38		32					6	26			13
24	Bonus												

Figure 2. Vertical arrangement of names.

E	F	G	H
Mark Doe	Bruce Elliott	Paul Golshtein	Nick Burton
119	0	0	0
117	0	0	0
116	0	0	0
127	0	0	0
113	0	0	0
107	0	0	0
\$ 187.68	\$ 0	\$ 16.68	\$ 0.00
		\$ 60.00	
\$ 3.00			
\$ 10.00			
\$ 194.68	\$ 0.00	-\$ 43.32	\$ 0.00

Figure 3. Horizontal arrangement of names.

2	15	
12	12	
13	9	
4	12	
9	15	
12	12	
13	4	
4	11	
15	13	
12	4	
2	15	
12	12	

Figure 4. Horizontal scroll-bar. It just begs to be removed.

So, the cells are filled with statistical data:

	A	B	C	D	E
	Date/Name	Josh Smith	Mark Doe	Paul Golshtein	Nick Burton
	01.12.2011	12	9	15	
	02.12.2011	2	15	12	
	05.12.2011	12	12	12	
	06.12.2011	13	4	2	
	07.12.2011	4	9	12	
	08.12.2011	15	13	13	
	09.12.2011	12	12	4	
	12.12.2011	4	2	15	
	13.12.2011	11	12	12	
	14.12.2011	13	13	9	
	15.12.2011	16	4	12	
	16.12.2011	12	9	15	
	19.12.2011	15	12	12	
	20.12.2011	12	13	4	
	21.12.2011	4	4	11	
	22.12.2011	11	15	13	
	23.12.2011	19	12	4	
	26.12.2011	12	2	15	

**Figure 5.** The arrangement of data in the table.

Next, let's use formulas in Google Spreadsheets. We need to sum up the number of answers for each employee in order to see how many letters were answered in the course of a month at the end of the reporting period. In order to do this, apply the SUM formula.

**Note:** For the description of formulas in Google Spreadsheets click [Help > Function](#)

**Google spreadsheets function list**

Google Spreadsheets supports cell formulas typically found in most desktop spreadsheet packages. These formulas can be used to create functions that manipulate data and calculate strings and numbers.

Here's a list of all the functions available in each category. When using them, don't forget to add quotation marks around all function components made of alphabetic characters that aren't referring to cells or columns.

All  Note: Click on any of the column headers to sort the table by that column.

TYPE	NAME	SYNTAX	DESCRIPTION	Learn More
Array	EXPAND	EXPAND(enabled_array_expression)	Forces expansion of the <a href="#">array expression</a> output. In any spreadsheet created after May 15, 2008, this will be the default behavior.	
Array	FREQUENCY	FREQUENCY(data, classes)	Calculates the frequency distribution in a one-column-array. The default value supply and the number of intervals or classes are used to count how many values are omitted on the single intervals. Data is the array of, or reference to, the set of values to be counted. Classes is the array of the class set. <a href="#">View an example of frequency distribution.</a>	
Array	GROWTH	GROWTH(data_Y, data_X, new_data_X, function_type)	Calculates the points of an exponential trend in an array. Data_Y is the Y Data array. Data_X (optional) is the X Data array. New_Data_X (optional) is the X data array, in which the values are recalculated. Function_type is optional. If function_type = 0, functions in the form $y = m^x$ are calculated. Otherwise, $y = b * m^x$ functions are	

**Figure 6.** List of Google Spreadsheet formulas with description.

# 3. SUM Function

Type **'Per month'** into the cell below the last date. In the same row, column B, **enter the formula :**

`=SUM(B2:B23)`

in which the range value is B2:B23.

To apply the same formula to other employees click on the square situated at the bottom right of the cell and drag it right to the last column, including future values as well.

23	30.12.2011	4	12
24	Per month	211	
25			

**Figure 7.** Applying the formula to adjacent rows.

As a result, the formula is applied to all cells in the row. We should point out that it is the **formula** that is copied (*taking into account the offset of the data range in it*) and not the **value** of the cell. Otherwise, we'd get the same result in each cell.

Here's an example of offset data.

**Horizontally:**

`=SUM(B2:B23)`

`=SUM(C2:C23)`

`=SUM(D2:D23)`

**Vertically:**

`=SUM(B2:B23)`

`=SUM(B3:B24)`

`=SUM(B4:B25)`

# 4. DOLLAR Function

In order to calculate the salary automatically, create a new row in column A, called **'Price'**, one position below the row **'Per Month'**. In column B of this row add the formula :

`=B24*0,55`

Here B24 is the total number of letters written by the first employee and 0.55 is the price for the answer to one letter. In order to display the number in dollars, you can use the menu option **Format Number** and choose a currency format. Keep in mind there's a feature in Google Docs where the national currency is defined automatically, so if you indicate a currency unit that is different from the regional one the **Format** menu, click **Number** and choose **More currencies**,

it will later be possible to round it off only by a formula, which isn't always convenient.

A more reliable option is to apply the DOLLAR function (*with rounding*) to the result of the **'Price'** already obtained.

Rounding is set in the last parameter after the semicolon:

`=DOLLAR(B24*0.55;0)`

0 is the desired number of symbols after the decimal point in the result. Due to the fact that the result of the formula is correct and it appears with a dollar sign, you don't have to change anything in the formula. So, simply apply it to the adjacent cells by dragging it over them.

# 5. Linking to Data in the Document

As you might see, you've already set the price (\$0.55) in each formula. But what do you do if the price changes? First find the formulas with 0.55 in them; second, change each of the formulas. However, this isn't a very convenient way to use a formula, there's a more rational method: create a new row and name it **'Per 1 email'**. Indicate the value - 0.55 - in column B of this row.

Return to the first tab of the document. In the **'Price'** row, column B, change

```
=DOLLAR(B24*0.55;0)
to
=DOLLAR(B24*B28;0)
```

What happens if you apply this formula to the adjacent rows?

All results will display 0.

Why?

The way the table operates is that if the link (*in our case B28*) is moved, its number and letter changes (*you've already read about this in the description of the SUM function*). In order to avoid this, you have to set the value range used in the formula in a certain direction. To do this, change **the formula as follows:**

```
=DOLLAR(B24*$B28;0)
```

The symbol '\$' in front of the address \$B28 means that if moved horizontally, the range won't shift. Apply the formula to the rest of the cells. If the values stay the same as in the old formula, then the updated formula is working correctly.

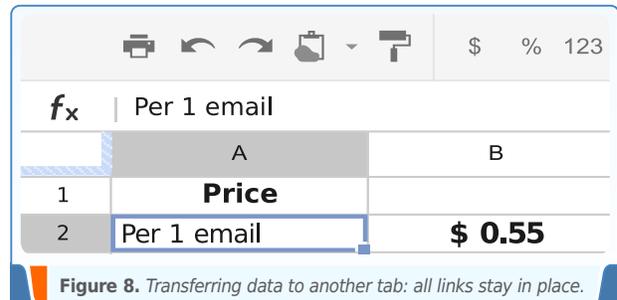


Figure 8. Transferring data to another tab: all links stay in place.

Create a new tab in the document and move it to the new table using shortcuts

Ctrl + X and Ctrl + V .

Name the table **Prices**. Google Spreadsheets keeps track of each row and automatically changes the matches in the formulas. As a result, the values in the first tab (**renamed to Work**) are unchanged, while the addresses in the formulas have shifted.

Also note that you can change the names of the tabs without damaging the formulas.

## 6. ROUND Function

Instead of the DOLLAR function, which can round off the values and add a dollar symbol, you can use the ROUND function.

Using ROUND makes a lot of sense if the dollar is set as a default national currency (*otherwise use DOLLAR*).

Check your settings in the menu **Format — Number**: in which format **Currency** is presented.

The ROUND function can be also applied for rounding all numeric formats. Unlike the rounding by means of the menu **Format — Number**, the result of the ROUND function is a value, while the rounding via **Format — Number** is visual (*the result is still not a rounded number*).

Consider the **following** example:

You already have a table with prices in the second tab. You don't want to see **0.55** there, so you would like to round it.

Choose **Format — Number — Custom Decimals**

Indicate one digit after the decimal point. As a result, your figure is rounded off to **0.6**.

Did it affect the monthly salaries (*first tab*)? No.

We only see **0.6** in the cell, while **0.55** remains in the formula.

Use the ROUND function.

```
=ROUND(0.55;1)
```

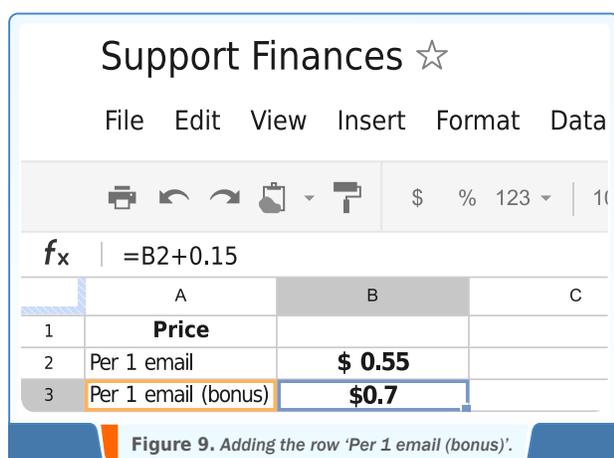
The result is **0.60**. All salaries have changed.

Thus, never round off the numbers of values which are used in other formulas. You can only round off final results.

# 7. SUMIF Function

Consider a **new task**: employees who answer more than 15 letters a day, get a bonus - for each letter answered on this day the payment is \$0.15 higher than the standard pay.

Create a new row in the second tab called **'Per 1 email (bonus)'**.



Price formula (*tied to the main rates*).

`=B2+0.15`

Now you need to determine on which days the payment is to be increased (\$0.7) and on which it stays standard (\$0.55). You will then add up all the cells with the value more than 15 separately from the ones where the figure is lower than 15. Next, add both of the results.

`=DOLLAR(((SUMIF(B2:B23;>=<=15))*Prices!$B2+(SUMIF(B2:B23;>>15))*Prices!$B3);0)`

**Note.** Here you insert the 15 directly into the formula in order to achieve speed and clarity. Later, it would be more convenient to introduce these values in a separate tab near the rates in order to avoid changing the formulas every time.

The formula is quite complicated to write and read, therefore, you can first create a formula to count regular letters and then one to count bonus letters. Add them up afterwards.

## 8. Adding Text to Formula Results

You can also add a row to offer more information, one for the number of **bonus/regular** letters for example. Do this by slightly modifying the formula mentioned above.

```
=((SUMIF(B2:B23;»<=15»)))&» /
«&((SUMIF(B2:B23;»>15»)))
```

 Note the **&»** / **«&**. If you use text in the formula, always use the operator **&**, then indicate the text in quotes and add the operator **&** once more.

Stand / Bonus	199 / 35	213 / 0	244 / 0	218 / 0	239 / 0
Per month	234	213	244	218	239
Price	<b>\$134</b>	<b>\$117</b>	<b>\$134</b>	<b>\$120</b>	<b>\$131</b>

Figure 10. Adding text to formulas.

## 9. COUNTIF Function

You might want to know how many days an employee didn't keep up with the quota and how often his performance went beyond expectations. This system helps the company issue penalties and bonuses.

Add parameters **Min** (*value of 5*) and **Max** (*value of 15*) to the table Price, tab Price.

Using the formula **COUNTIF** calculate the number of **penalty/bonus** days and apply a \$0.15 bonus or a \$0.15 penalty.

```
=-(COUNTIF(B2:B23;»<5»)*0.15)+COUNTIF(B2:
:B23;»>15»)*0.15
```

# 10. Text Formatting

When you've just inserted all the data, you'll find that your table looks raw and unreadable, so it needs to be formatted. The information should be perceived easily without your eyes getting tired of searching.

- ▶ Pay attention to the font size: it shouldn't be inconsistent throughout the document. One typeface is enough in nearly all cases.
- ▶ The optimal size for normal text is 9-10 point (pt); for non-essential data, it's 8 pt; and for headers, it's 11-12 pt.
- ▶ Bold case should be used sparingly and only when appropriate. Never make the entire text within the document bold, or parts of it where an emphasis is not needed.
- ▶ Aligning rows is left to your own discretion, but if the data presented in the cell have similar width or with minimal difference (for example, two-digit figures), it's better to align it center for a more attractive look.

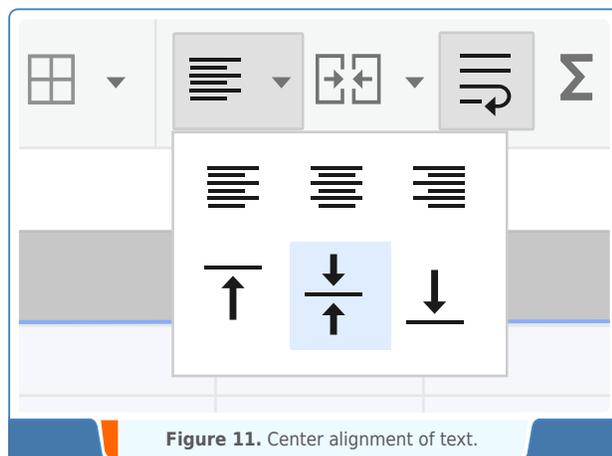


Figure 11. Center alignment of text.

In addition to the above recommendations:

- ▶ Center align all data - both by length and width.
- ▶ Put in bold case the entire first row, as well as rows 'Per month' and 'Price'.
- ▶ Set the font size of 'Price' to 12 pt.

Support Finances ☆

File Edit View Insert Format Data

fx | \$ % 123 | 1

	A	B	C
1	<b>Price</b>		
2	Per 1 email	<b>\$ 0.55</b>	
3	Per 1 email (bonus)	<b>\$0.7</b>	
4	Min	<b>5</b>	
5	Max	<b>15</b>	
6			
7			

Figure 12. General view of the 'Prices' tab.

# 11. Column Operations

The size of columns should be justified. 60px should be enough for the values of answered letters (*extra space included*). Narrow down columns **B-F**.

Don't resize manually, it's easier to select the required columns and choose **'Resize columns'** in the context menu.

B	C	D	E	F
<b>Josh Smit</b>	<b>Mark Doe</b>	<b>Paul Golshtein</b>	<b>Nick Burton</b>	<b>Bruce Elliott</b>
13	13	9	13	12
16	4	12	4	13
12	9	15	12	4

**Figure 13.** 30px: not a good column size as it's impossible to read.

At the same time, keep in mind that they should be wide enough for the row with headers to be completely visible when offsetting it in two lines.

B	C	D	E	F
<b>Josh Smith</b>	<b>Mark Doe</b>	<b>Paul Golshtein</b>	<b>Nick Burton</b>	<b>Bruce Elliott</b>
12	9	15	13	12
2	15	12	4	15
12	12	12	15	12
13	4	2	12	4
4	9	12	8	11

**Figure 14.** 40px: ok, readable enough.

B	C	D	E	F
<b>Josh Smith</b>	<b>Mark Doe</b>	<b>Paul Golshtein</b>	<b>Nick Burton</b>	<b>Bruce Elliott</b>
12	9	15	13	12
2	15	12	4	15
12	12	12	15	12
13	4	2	12	4
4	9	12	8	11
15	13	13	12	12
12	12	4	4	13

**Figure 15.** 60px: good, readable.

You can delete the columns which don't contain any data. If you do that, the horizontal scroll bar won't be visible and the document will look more compact.

# 12. Colors and Formatting

To change text and background colors in Google Spreadsheets, use the same titled menu options that you can find in the toolbar. Make the fixed first row grey, so it doesn't merge with other data.

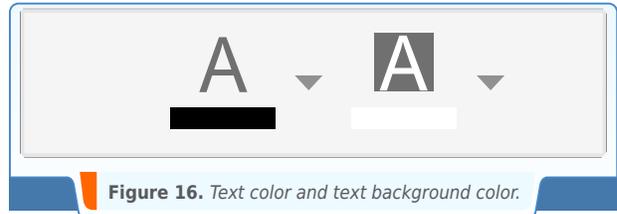


Figure 16. Text color and text background color.

	A	B	C	D	E	F
1	Date/Name	Josh Smith	Mark Doe	Paul Golshtein	Nick Burton	Bruce Elliott
2	12/1/2011	12	9	15	13	12
3	12/2/2011	2	15	12	4	15
4	12/5/2011	12	12	12	15	12

Figure 17. A paragon of perfect formatting.

	A	B	C	D	E	F
1	<b>Date/Name</b>	<b>Josh Smith</b>	<b>Mark Doe</b>	<b>Paul Golshtein</b>	<b>Nick Burton</b>	<b>Bruce Elliott</b>
2	12/1/2011	12	9	15	13	12
3	12/2/2011	2	15	12	4	15
4	12/5/2011	12	12	12	15	12

Figure 18. Not bad, but somewhat di? cult on the eyes.

	A	B	C	D	E	F
1	Date/Name	Josh Smith	Mark Doe	Paul Golshtein	Nick Burton	Bruce Elliott
2	12/1/2011	12	9	15	13	12
3	12/2/2011	2	15	12	4	15
4	12/5/2011	12	12	12	15	12

Figure 19. Disgusting! Extremely hard on the eyes and difficult to read.

A **fixed row** is a row that's always visible and fixed to the same place while scrolling through

the document. It's convenient, because you'll know which column to edit if **needed**.

# 13. Conditional Formatting

**Consider the following task:** depending on the number of answered letters per day, the cell color should change. In order to do this easily there's an instrument in Google Docs, just like in Microsoft Excel, which is called conditional formatting.

1 Select the rows with values to which you want to apply conditional formatting.

- 2 Choose **Format > Conditional** formatting.
- 3 Choose the condition Between from the dropdown menu and define the ranges.
- 4 For each range, set a color in the menu Color and Background.
- 5 Save the rules.

<i>fx</i>	Date/Name					
	A	B	C	D	E	F
1	Date/Name	Josh Smith	Mark Doe	Paul Golshtein	Nick Burton	Bruce Elliott
19	12/26/2011	12	2	15	12	4
20	12/27/2011	15	12	12	12	15
21	12/28/2011	12	13	15	15	9
22	12/29/2011	4	4	12	12	15
23	12/30/2011	4	12	13	4	15
24	Stand / Bonus	199 / 0	216 / 0	244 / 0	218 / 0	239 / 0
25	Per month	234	213	244	218	239
26	<b>Price</b>	<b>\$134</b>	<b>\$117</b>	<b>\$134</b>	<b>\$120</b>	<b>%131</b>

Figure 20. General view of the table; 'Work' tab.

## 14. About the Author

**Ilya Kasko** is a volunteer author of IT publications and a geek. Ilya popularises the usage of Google Docs in the Ephemeral Office. He is famous for being an MS Excel illiteracy eradicator.

**Ecaterina Albu, Rhonda Callow:**

proofreading and editing.

**Kirill Belyaev:** cover design.

**Aleksandr Goncharov:** layout.

## Colophon

The booklet is set in: [DejaVu Sans Condensed](#).

Headlines are set in: [League Gothic](#).

The cover is set in: Novito, by [ENDY design agency](#).

## About Web Hosting Geeks

Making the right choice when it comes to choosing a webhosting is never an easy task, either for a rookie, or for a pro. Our concise guides revolve around the all-encompassing topic of webhosting, providing solutions and points of view that you might not think of. We strive to boldly go where few dared to venture in matters of detail and perspective. Our geek mission is to highlight these solutions and serve them to you, for whatever site you build – a tiny personal blog, an important volunteer project or a sizeable business.