

# The King's Coffers: Using Functions in Microsoft Excel

## Introduction:

Once upon a time there lived a king whose greed knew no bounds. The only thing that even came close was his contempt for those who couldn't pay his taxes. While the king already had much more money than any person could ever have use for, no amount was ever enough. Each and every year the king would send his tax collectors out into the countryside to collect the king's bounty.

When figuring out each person's taxes the tax collectors would come up with an amount they considered fair, and then *double* it. Those who could not pay were thrown into jail until they could pay off their debt (and being in jail wasn't a paying job).

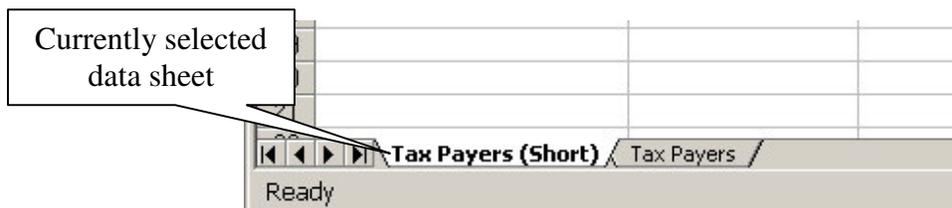
Today you will have access to the king's records. We will find out how much money the king has made collecting taxes. We also determine the answers to questions pertaining to the number of people who paid (and haven't paid) their taxes.

You will be provided with an excel spreadsheet containing the tax collector's records.

## Instructions:

Microsoft Excel makes it easy to perform a number of calculations on data you have entered into a spreadsheet.

1. Open up the file "**KingsCoffers.XLS**". Here you will note that the very first sheet, denoted by the title "Tax Payers (short)", is already selected for you. The data presented in this sheet presents only a few of the hundreds of taxpayers. This will present us with a very manageable test dataset to learn from.

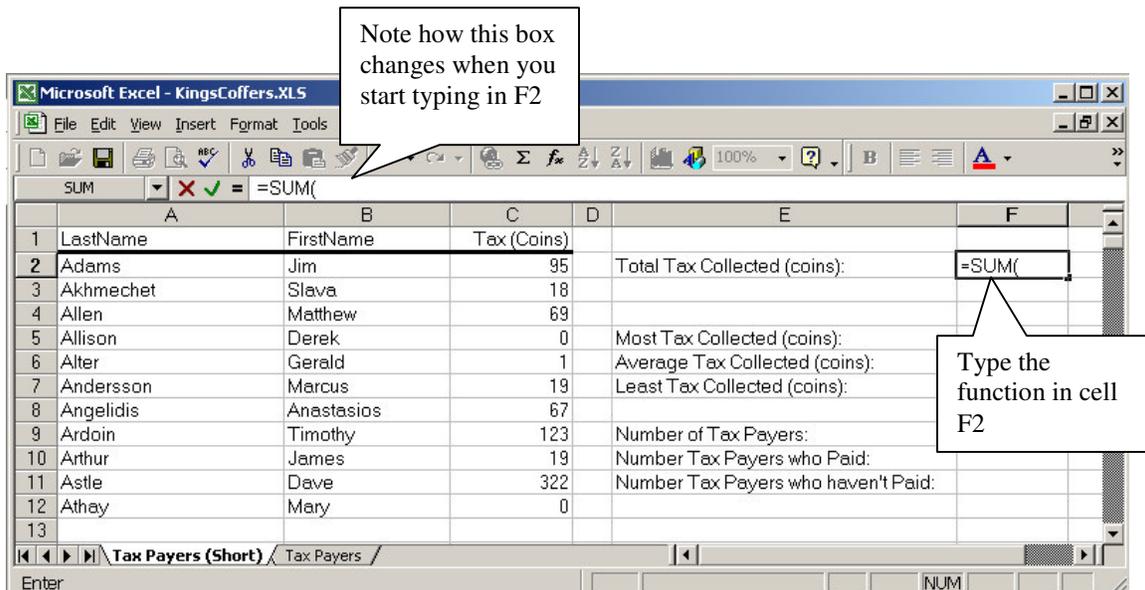


2. Let's calculate the total tax collected first. The total tax that was collected is really just the sum of all the coins each tax payer paid to the king.

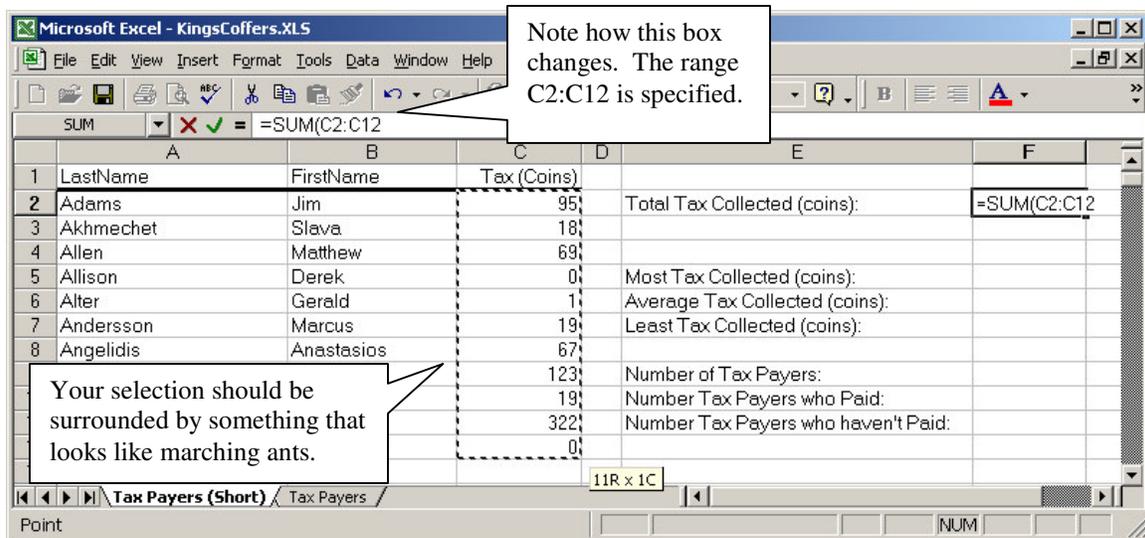
We can accomplish this task by using the SUM function.

Any time you use a function in a cell, you must start out by typing the equals sign in a cell. Click on the F2 cell as denoted in the picture below and type "=SUM(" in the

box. It is important that you do not press enter, or you will get an error and will have to start over.



- In order to perform the SUM on a set of data you will next need to define a range. You can do this by clicking on the C2 column, and while holding down the mouse button, drag the mouse cursor until you are over top of the C12 column.



- In order for this function to work, you need to end the statement entered into F2 by typing the right parentheses. The function should look like this:

=SUM(C2:C12)

- If done correctly, the number 733 should appear in column F2. The C2:C12 means that you are taking the SUM over the range of rows starting with row 2 in column C and continuing on to row 12 of column C.

|    | A         | B          | C           | D                                   | E   | F |
|----|-----------|------------|-------------|-------------------------------------|-----|---|
| 1  | LastName  | FirstName  | Tax (Coins) |                                     |     |   |
| 2  | Adams     | Jim        | 95          | Total Tax Collected (coins):        | 733 |   |
| 3  | Akhmechet | Slava      | 18          |                                     |     |   |
| 4  | Allen     | Matthew    | 69          |                                     |     |   |
| 5  | Allison   | Derek      | 0           | Most Tax Collected (coins):         |     |   |
| 6  | Alter     | Gerald     | 1           | Average Tax Collected (coins):      |     |   |
| 7  | Andersson | Marcus     | 19          | Least Tax Collected (coins):        |     |   |
| 8  | Angelidis | Anastasios | 67          |                                     |     |   |
| 9  | Ardoin    | Timothy    | 123         | Number of Tax Payers:               |     |   |
| 10 | Arthur    | James      | 19          | Number Tax Payers who Paid:         |     |   |
| 11 | Astle     | Dave       | 322         | Number Tax Payers who haven't Paid: |     |   |
| 12 | Athay     | Mary       | 0           |                                     |     |   |
| 13 |           |            |             |                                     |     |   |

Now that you understand how to use a function on a set of data it is time to introduce a few more functions to try on your own. Each of these functions uses the range of data that you previously worked with (C2 to C12). Don't forget to prefix each function with an equals sign when entering it into a column!

- |                      |  |
|----------------------|--|
| MAX (C2:C12)         | Computes the highest value for the provided range of data  |
| AVERAGE (C2:C12)     | Computes the average value for the provided range of data  |
| MIN (C2:C12)         | Computes the lowest value for the provided range of data   |
| COUNT (C2:C12)       | Counts the number of data items in the provided range of data  |
| COUNTIF(C2:C12,">0") | Counts the number of data items in the provided range of data as long as a given data item is ">0" (greater than zero). You may also use "=0" to find the number of data items in the provided range of data |

Try testing out these functions on your own. The spreadsheet contains the answers to each of the requested items in column E entered into column G. See if you can match those answers on your own. If you get stuck, click on the answer in column G to find out where your answer differs.

## Ready for the real challenge?

## The King's Coffers: Using Functions in Microsoft Excel Worksheet

### Instructions:

In the Excel spreadsheet provided, select the sheet entitled "Tax Payers". This sheet contains tax payment records for all households under jurisdiction of the king. Answer each of the questions below using the results you obtained by applying the previously learned formulas to the larger data set.

1. What was the total number of coins collected in the form of taxes?
2. What was the greatest number of coins collected from any one individual tax payer?
3. What was the average number of coins collected from any one individual tax payer?
4. What was the least number of coins collected from any one individual tax payer?
5. How many people are tax payers?
6. How many people actually paid their taxes?
7. How many people will be sent to jail for not paying their taxes?