
Spreadsheet Case 2

Athena Beauty Products

Problem:	Evaluate the effectiveness of an e-commerce company's Web site and advertising sites
Management skills:	Analyzing Organizing
Excel skills:	Formulas Absolute and Relative Addressing Formatting Printing
File:	ATHENABEAUTY_Q.xlsx

Athena Beauty, headquartered in Macon, Georgia, manufactures and sells trendy, inexpensive cosmetics. They have been in business since 2001 and have 13 store locations in the south-eastern United States. Annual revenue from all the stores has been increasing each year, with 2008 revenues totaling \$9,750,000. Lillian Castleman, President of Athena Beauty, recognized the potential market in online sales two years ago and had an outside Web development firm create an e-commerce site for her company. The site has had moderate success, but Castleman would like to increase its effectiveness by turning more visitors into shoppers and decreasing the number of attempted buyers.

The company has been attempting to increase the number of on-line customers by placing advertising for their Web site on other Web sites. When users click on these ads, they are automatically transported to Athena Beauty's Web site. Data on Athena Beauty's Web advertising campaign is summarized in the weekly Marketing Trends Reports (MTR) produced by their Web site analysis software, which appears in the ATHENABEAUTY_Q.xlsx file.

5. *Visitors* are the number of people who visited Athena Beauty's Web site by clicking on an ad for their site that was placed on an affiliated Web site.
6. *Shoppers* are the number of visitors referred by ads who reached a page in their Web site designated as a shopping page.
7. *Attempted buyers* are the number of potential buyers referred by ads who reached a Web site designated as a page for summarizing and paying for purchases.

8. *Buyers* are the number of buyers referred by ads who actually placed an order from their Web site.
9. *Source* indicates the specific Web site from which visitors came to Athena Beauty's Web site.

In trying to increase the number of on-line customers, Castleman must determine the Web site's success in converting visitors to actual buyers. She must also look at the abandonment rate—the percentage of attempted buyers who abandon the Web site just as they were about to make a purchase. Low conversion rates and high abandonment rates are indicators that a Web site is not very effective and needs work.

Castleman also wants to increase the effectiveness of her advertising dollars by increasing the size of the Athena Beauty ads on the sites where it advertises. .

Tasks

There are five tasks in this problem:

1. Create new columns for the percentage of visitors who became shoppers, the percentage of shoppers who became attempted buyers, and the percentage of attempted buyers who became buyers. Also, create a column that shows the percentage of visitors from each advertising source. Create meaningful headings and display them wrapped above the columns and in bold.
2. Create formulas to total each column so you can determine the total number of Visitors, Shoppers, Attempted Buyers, and Buyers, as well as the Percentage of Visitors from each Source.
3. Create formulas to calculate the percentage of visitors who became shoppers, shoppers who became attempted buyers, and attempted buyers who became buyers. Calculate the percentages on the totals of these categories as well. Calculate the percentage of total visitors who came from each source, utilizing absolute addressing so that the results of the formulas can easily be copied down each column.
4. Format the spreadsheet so the percentages are displayed with the percent sign.
5. Print the spreadsheet with the data *centered* both horizontally and vertically on a single page, and include a centered header with Castleman's name. Include your name and today's date in the footer.

Excel Tutorial for Spreadsheet Case 2

This case draws upon all of the skills acquired in Spreadsheet Case 1, plus new skills for using formulas, formatting, and absolute and relative addressing. You will once again use COURSE.xlsx for this tutorial.

Suppose you want to expand your worksheet by including each student's final grade. You must add an extra column and label for FINAL GRADE, and you must calculate the final grade for each student. The final exam counts for 50% of the final grade, the midterm for 35%, and the quiz for 15%.

Formulas

To compute the final grade, you must use a formula. A *formula* tells Excel what manipulations to perform on specific cell contents. The cells are specified using their cell references (e.g. A11, C3). Mathematical operators specify arithmetic operations. They are:

^	Exponentiation
*, /	Multiplication, Division
+, -	Addition, Subtraction
%	Percent (i.e. 75% represents 0.75)

Operations are always performed left to right within a formula in their order of precedence. The order of precedence in Excel corresponds to the order of the above list. Exponentiation will always be performed first, followed by multiplication and division, and then addition and subtraction. Percent amounts are evaluated when they are encountered.

Parentheses can be used to override the order of precedence. Operations inside parentheses will be performed before those outside the parentheses. The order of operations remains the same within the parentheses. When multiple sets of parentheses are employed, the operations within the innermost set of parentheses will be performed before those within the next set.

Thus, the formula for Heather Smith's final grade would be:

=C9*.15+D14*35+E9*.5

Note that the first character in the formula is preceded by an = sign. To be treated as a formula rather than a label, a formula must begin with an equals [=] sign. (The reason for the \$ symbol and use of these cells is explained below.) Thus, a formula to add the contents of cells A6 and B6 must be expressed as =A6+B6. If you try to type this formula as A6+B6, it will be treated as a label.

Formula Errors

If you try to enter a formula with a logical or mathematical error, Excel will display a message box stating what error has occurred. To proceed, you must click the *OK* button. If you want further information on the error, you can select the *Help* button, which will provide a broader explanation of the error. Once the problem is corrected, you can continue.

Another common problem is the circular reference, which is a formula that directly or indirectly refers back to the same cell in which it resides. For example, if you try to enter the formula =A12+B12 into cell B12, an error box will appear stating a circular reference has occurred. This is because cell B12 is an operand in the operation, as well as the cell that holds the result of the calculation.

Absolute and Relative Addressing

Suppose we want to make our worksheet more flexible for future changes. The professor may decide that the quiz should only contribute 10% toward the final grade and the midterm will not count for 50%. In that case, the formula for the final grade must be adjusted to change the percentage weight applied to the midterm and the quiz.

You could, of course, re-enter the new formulas, but an easier way to keep track of the percentage weight assigned to each grade would be to list the percentages assigned to each grade in an unused portion of the spreadsheet. Formulas would reference the cell addresses where these percentages reside rather than the percentages themselves.

Set up an Assumptions section in the upper left-hand corner of your worksheet. First, move the course list down so that the column labels are in Row 14. Then, enter the label "ASSUMPTIONS" in cell A7, and format cell A8 in the same manner as cells A15:E14. Below the underlining, in cells A9 through A11, enter the labels "Quiz," "Midterm," and "Final Exam."

In cells B9 through B11, enter the percentage weights for each of these grades: .15, .35, and .5.

Develop a formula for a student's final grade to reference the cells where these percentages reside. It is never good practice to use the percentages themselves in a formula; always use a cell reference. Enter the formula for Heather Smith's grades into cell F16.

=C16*\$B\$9+D16*\$B\$10+E16*\$B\$11

The \$ designates an absolute address. An *absolute address* is one that will not change when that address is copied. Excel's default is to treat an address as a *relative address*, meaning that when you copy or move a formula, the addresses of the cells in the formula will be automatically adjusted to fit the new location. A relative address has no \$ symbols. Any formula with multiple cell references can have absolute, relative, and mixed addresses (see the next section) all in the one formula.

Relative addressing means that you can copy the formula in cell F14 for Heather's grade to cell F15 for Lois, and the formula will automatically adjust to add the proper cell addresses (the addresses without the \$ sign) for Lois's grade. The formula bar will show the formula in F15 to be =C17*\$B\$9+D17*\$B\$10+E17*\$B\$11.

Mixed Addressing

There will be certain situations where you will want to combine relative and absolute addressing; that is, you will want to create a cell reference that is part relative and part absolute. Either the column letter or the row number remains constant.

For example, an address of \$B21 means that absolute addressing will be used on the column portion of the address, but relative addressing will be used on the row portion. Conversely, an address of B\$21 means that absolute addressing will be used on the row portion of the address, and relative addressing on the column portion. You will need to use relative, absolute, and mixed addressing throughout your *Solve it!* Spreadsheet Cases.


Formatting

Suppose you want to express the percentages in your Assumptions section as 50% rather than .5. You can change the format in which numeric information appears by using Excel's *Format Cells* commands.

First, select the cells you want to change by selecting the range *B9:B11*.

On the Home tab of the Ribbon, click Format and then click Format Cells to open the Format Cells dialog box. This box has six formatting tabs: *Number*, *Alignment*, *Font*, *Border*, *Fill*, and *Protection*. To change the format of numbers, select the Number tab. The *Category* list box displays the different types of numerical formats. Select *Percentage* in the *Category* list box. Type 0 into the *Decimal places* spin box, and click the *OK* button.

You should see the effects of this formatting on the three figures in the Assumptions area of the worksheet. They will be displayed as percentage figures: 15%, 35%, and 50%. Excel often provides shortcuts to frequently used commands and operations by allocating buttons on the

Ribbon. In this case, Excel has a *Percent Style* button  in the Number group on the Home tab. To format selected cell(s) with a percent style, you can simply press the *Percent Style* button:

The different Number categories listed on the Numbers tab of the Format Cells dialog box are:

10. **General** format is the default format for all new worksheets. With the General format, the values are displayed in their natural state. No suppression or compression of formatting is permitted. Scientific notation will be used to display numbers that are too large or too small to be displayed normally. The General format displays up to 11 digits.
11. **Number** format displays a fixed number of decimal places, negative values in red, negative values in brackets, and combinations of these characteristics.
12. **Currency** format places a dollar sign before each number and uses commas to separate hundreds from thousands, etc. There are options for zero or two decimal places, and for red or black negative values.
13. **Accounting** format displays four accounting formats, keeping the dollar sign to the left of the cell, showing negative values in brackets, and displaying zero values as hyphens.
14. **Date** format displays dates in a variety of different ways and can be used by Excel in mathematical calculations. Default date formats include:

d/mm/yy

(Example 2/02/80)

d-mmm-yy	(Example 2-Feb-80)
d-mmm	(Example 2-Feb)
mmm-yy	(Example Feb-80)

To use date and time formats, you must use one of the Excel date and time functions (such as =DATE, =DATEVALUE, =TIME, =TIMEVALUE, or =NOW) to enter dates and times into your worksheet. Excel date functions will be treated in more detail in Spreadsheet Case 8. A date can also be entered as a label if it is not involved in any calculations.

15. **Time** formats can represent times in a number of formats where they can be used by Excel time functions in mathematical calculations.
16. **Percentage** format displays numbers as percentages. The default decimal places are zero and two.
17. **Fraction** format displays numbers as fractions, separating whole numbers and the fractional parts.
18. **Scientific** format displays data in exponential scientific notation.
19. **Text** format displays the values as labels rather than values.
20. **Special** format displays zip codes, zip codes + 4, phone numbers, and social security numbers.
21. **Custom** format can be used to create custom formats for numbers such as product codes.

Copy the final grade formula to the rest of the student entries. Add a column heading “FINAL GRADE” to cell F14, and match the formatting of cell F15 to the other cells in the row. Your worksheet should look like Figure 3-3.

Totaling the Values in a Range

This case requires totals of gross pay, net pay, and all deductions for the payroll register so that the employer can determine the total amount paid out for each of these categories during a particular pay period. The =SUM function of your spreadsheet software can help you do this. The =SUM function calculates the sum of all of the values in a specified range. The form of the =SUM function is:

=SUM(range)

For example, if you want to total the percentages in the Assumptions section of your sample worksheet to make sure they add up to 100 percent, you could use the =SUM function instead of the formula =B9+B10+B11. The values in range B9:B11 can be totalled much more easily by entering in cell B12:

=SUM(B9:B11)

Excel provides a shortcut for this formula: the *Sum Function* button .

This button appears in the Editing group on the Home tab, and if clicked, the =SUM function will be placed in the current cell and a sample range will be assumed, typically above or to the left of the current cell. All you have to do is press [Enter] to complete the operation. Try the button as well as entering the function yourself. When entering the function, select the range to sum using the cursor keys or the mouse rather than typing the range. This tends to be easier and more accurate; typing is more prone to error.

Save COURSE.xlsx with the changes you made during this tutorial session. You will need it for subsequent Spreadsheet Cases.

Figure 3-3

