Mini Lesson: Weighted Average

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Weighted average is an average in which each quantity to be averaged is assigned a weight. These weightings determine the relative importance of each quantity on the average (Investopedia).

For example, suppose Jenny is in a class where exams count as 90% of the class grade and participation counts as 10%. On three of her exams, she received a score of 90, 82, and 88 and her participation grade is a 95. Since exams count as 90% and there were three exams, the weight of each exam is 30%.

How to calculate weighted average

Method 1:

In order to calculate weighted average, identify each score and how much the weight for each score is. The sum of the product of the score and its weight will equal to the final grade. So to calculate the final grade, the formula that should be entered in Cell K7 should be as follows:

- In cell K7 enter, =(K3*L3)+(K4*L4)+(K5*L5)+(K6*L6)

This is the same as,

- Final Grade = (90*30%)+(82*30%)+(88*30%)+(95*10%)

Method 2:

Weighted average can be simplified even more if there were an additional column for product. First calculate the product for each score and weight, and then sum the product at the end.

- In cell M11 enter, =K11*L11
- Drag and drop from Cell M11 to cell M14.
- In cell K15 enter, =SUM(M11:M14)

Method 3:

An even much simpler technique to calculate weighted average is using the SUMPRODUCT function. To find weighted average using SUMPRODUCT, the formula should be as follows:

- In cell K23 enter, =SUMPRODUCT(K19:K22, L19:L22)/SUM(L19:L22)

Activity 1: Determining Weighted Average using Goal Seek

Mia receives a nice gift from her parents each time she earns a 90 or higher in a class. She received a score of 100, 89, 95, and 92 in the past four homework assignments, a score of 65, 92, and 83 in the past three exams, and 100 in class participation. Homework assignments count as 25% of her grade, exams count as 50%, and participation counts as 25%. What would she need to get on her fourth exam in order to get a 90 in the class? (Use Goal Seek).

Directions:

a. Create a copy of the current worksheet and rename the new worksheet "Activity 1 Solution."
b. Type in the grades for each assignment in cells C3:C13.
c. Type in the weight of each assignment in cells D3:D13.
d. Enter formula that will calculate weighted average in cell C14.
e. Use goal seek to determine the score needed for Exam 4 in order for Mia to get a final grade of 90.
f. Use thick box borders for cells B3:D14, B3:D3, B4, C4, D4, and B4:B14.
g. Merge and center cells B3:D3.
h. Center align cells B4:D4.
i. Bold, font size 13, and fill color to Red, Accent 2, Lighter 40% for cell B3.
j. Use thick box border for cells B14:D14.
k. Fill color to Red, Accent 2, Lighter 60% for cells B14:D14.
l. Use right border for cells C5:C14.
m. Set column widths for column A to 15 and columns B and C to 10.
n. Save file as Weighted Average XX, where XX are your initials.