

Economics 250 Weighted Mean

Suppose that you receive numerical grades on ten assignments in a university course. Then specifically suppose that you receive 5 grades of 70, three grades of 75, and two grades of 80.

You could calculate your average grade by listing ten numbers, adding them up, and dividing by 10. But it is much faster to recognize that the total will be :

$$(5 \times 70) + (3 \times 75) + (2 \times 80).$$

That implies that the average will be:

$$\frac{(5 \times 70) + (3 \times 75) + (2 \times 80)}{10}.$$

Notice that you then could write your calculations this way:

$$(0.5 \times 70) + (0.3 \times 75) + (0.2 \times 80).$$

The weights are the frequencies with which the three grades occur in your sample. This is a weighted mean or weighted average.

Later on in the course, when we study the expected value of a random variable, you will recognize it as a weighted mean where the weights are probabilities.

Incidentally, we also could deduce a fast way to calculate the standard deviation of the grades in this example. By the end of the course, the formula for that should be obvious to you.