# U4D2 Weighted Mean

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Unit 4
lesson 2 ...

## Unit 4 Lesson 2 – Weighted Mean

**Weighted Mean** is a mean (average) in which each component has a different weighting factor.

To calculate a final **percent for weighted factors**, use formula:

$$\text{Percent} = \frac{\text{sum of (percent mark} \times \text{weighting factor for each category)}}{\text{sum of weightings}}$$

Ex.1 A college teacher uses a weighted mean to calculate her students' marks. Tom's and Steve's marks are shown along with the weighting factors (category weights).

Quiz – 25%
Test – 40%
Summative Project – 15%
Final Exam – 20%

| Component | Tom's Mark | Steve's Mark |
|---|---|---|
| Quiz (out of 30) | 26 | 20 |
| Test (out of 80) | 70 | 64 |
| Summative Project (out of 120) | 112 | 110 |
| Final Exam (out of 100) | 85 | 90 |

sum of weightings 100% ← does not always sum to 100

1. Convert the scores/marks to percents.

| Tom | | Steve | |
|---|---|---|---|
| Quiz | $\frac{26}{30} \doteq 87\%$ | Quiz | $\frac{20}{30} \doteq 67\%$ |
| Test | $\frac{70}{80} = 88\%$ | Test | $\frac{64}{80} = 80\%$ |
| Summ.Proj. | $\frac{112}{120} = 93\%$ | Summ.Proj. | $\frac{110}{120} \doteq 92\%$ |
| Final Exam | $\frac{85}{100} = 85\%$ | Final Exam | 90%. |

20÷30x100%

2. For each student, multiply each percent by the weighting factor, find the sum of all the category weights, and then divide this sum by the sum of the weights.

$$\text{Tom's Percent} = \frac{87\times25+88\times40+93\times15+85\times20}{25+40+15+20}$$

$$= \frac{8790}{100}$$

$$\doteq 87.9\%$$

Steve's = $\frac{(67\times25+80\times40+92\times15+90\times20)}{25+40+15+20}$
=8055/100
=80.6%

3. Who had the better overall mark as a percent and by how much?

Tom's mark is 7.3% higher than Steve's.

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