

## Quantitative Tools - level I

Fall 2015

### Introduction, Changes and Percentages - RESULTS

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#### Exercise 1 - Variables (\*)

1.
  - quantitative, continuous
  - qualitative, nominal
  - quantitative, discrete
  - qualitative, ordinal
  - qualitative, nominal
  - qualitative, ordinal
  - quantitative, discrete
  - quantitative, discrete
  - qualitative, nominal
  - quantitative, discrete

#### Exercise 2 - Relative change and percentages (\*)

1. The absolute change of Alice income is \$5,000. The relative change is  $\frac{100}{7} \approx 14.3\%$
2. Alice's bonus is \$3,500
3. The annual automatic pay was last year \$1,500, being 4.3% of Alice's income. The annual automatic pay is in percentages the same each year. So, Alice's income is now  $\$40,000 * 1.043 = \$41,714$
4. Alice's income is now  $\$41,714 * 0.85 = \$35,457$
5. Alice should ask an increase by  $\frac{\$41,714 - \$35,457}{\$41,714} = 17.6\%$

#### Exercise 3 - Relative change and percentages (\*\*)

1. The first pair of jeans costs \$42, the second \$45. The first one is cheaper.
2. The final price of the pair of jeans is  $150 * 0.8 * 0.9 = \$108$ . Bob unfortunately cannot afford this pair of jeans.
3. The initial price was  $\frac{80}{1-0.3} = 114.30$
4. The initial price of the t-shirt was  $\frac{20}{0.8} = 25\$$ . Bob saved  $\$14.30 + \$5 = \$19.30$

**Exercise 4 - Average growth rate (\*\*\*)**

1. cf. Table

Days	Abs. change	Rel. change in %
Tuesday	1	+20%
Wednesday	-2	-33.3%
Thursday	3	+75%
Friday	2	28.6%
Saturday	-1	-11.1%

Table 1: Absolute change and relative change of Santiago and Manolin's catch

2. The aggregate change (in percentages) for the whole week is

$$\left(\frac{6}{5} * \frac{2}{3} * \frac{7}{4} * \frac{9}{7} * \frac{8}{9} - 1\right) * 100 = 60\%$$

3.

$$\left(\sqrt{\left(1.75 * \frac{9}{7}\right)} - 1\right) * 100 = 50\%$$

4. The average growth rate for the whole week is (we use the result of question 2.) :

$$\left(1.6^{\frac{1}{5}} - 1\right) * 100 = 9.86\%$$