

Lab-session 5

- 1) The body mass index is a quantity which indicates whether a person has normal weight, overweight etc. It is computed as

$$\text{body mass index} = \frac{\text{weight in kilograms}}{(\text{height in meters})^2} = \frac{\text{weight in pounds}}{(\text{height in inches})^2} \times 703.$$

The last equality is obtained from 1m=39.3700787inches and 1kg=2.20462262pounds.

- a) Write a user-defined function which computes the body mass index employing the above formula using as input the weight of a person in pounds and its height in inches. Write two types of functions: i) one using the function ROUND giving an answer to a precision of 1 digit and ii) one returning an integer value. Declare all your variables!
- b) Write a user-defined function with several IF-structures which gives a meaningful interpretation for the body mass index according to the table

male	<20	20-24.9	25-29.9	30-39.9	≥ 40
female	<19	19-23.9	24-28.9	29-38.9	≥ 39
	underweight	normal weight	overweight	obese	extreme obese

The function should have as input variables the body mass index and the gender. Produce an error message such as "Specify gender!" when the input is not "male" or "female". Declare all your variables!

- c) Modify the table in b) such that it can be used as an HLOOKUP table in a user defined function which equals the function as in b).
- d) The ideal body mass index is 21 and 22 for female and male, respectively. Given the height of a person in inches and the gender write a user defined function which computes the ideal weight in pounds to a precision of one digit. Declare all your variables!
- e) Produce a table which labels columns by heights from 60 to 76 inches in steps of 2 inches and rows by weights from 110 to 200 pounds in steps of 10 pounds. In each intersection of the table compute the corresponding body mass index. (Use extensively the autofill function to produce this table!) Write then a user defined function which uses this table as an HLOOKUP table to determine the body mass index from a given height and weight. Declare all your variables!
- f) Produce two tables in which columns and rows are labeled the same way as in e). In each intersection of the table compute the meaning of the body mass index, i.e. "normal weight", "overweight" etc. Make one table for male and one for female. Write then a user defined function which uses either of these tables, depending on the gender input, as a VLOOKUP table to determine meaning of the body mass index from a gives height, weight and gender.