Exercise 1: Part 1

BMI

Python Programming Bootcamp by Dr Rohitash Chandra
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Introduction

The goal of this assignment is to help you practice   programming – with arrays and functions.

Description

 Body Mass Index (BMI) is a simple index of weight-for-height that is commonly used to classify underweight, overweight and obesity in adults. It is defined as the weight in kilograms divided by the square of the height in meters (kg/m^2). For example, an adult who weighs 70kg and whose height is 1.75m will have a BMI of 22.9.

   BMI = 70 kg / $(1.75$ m$)^2$ = 70 / 3.0625 = 22.9

Therefore the formula is:

   BMI = mass (kg) / height $(m)^2$

The following table shows the International Classification by the World Health Organisation of **adult** underweight, overweight and obesity according to BMI (see [1]).

Classifcation	BMI (kg/m)
Underweight	<18.50
Severe thinness	<16.00
Moderate thinness	16.00 – 16.99
Mild thinness	17.00 – 18.49
Normal Range	18.50 – 24.99
Overweight	>=25.00
Pre-obese	25.00 – 29.99
Obese	>=30.00
Obese class I	30.00 – 34.99
Obese class II	35.00 – 39.99
Obese class III	>=40.00

BMI is also used as a screening tool to identify possible weight problems for **children**, also known as BMI-for-age. Although BMI-for-age value is calculated with the same formula, the classification is different. The following table shows an example classification.

Classifcation	BMI (kg/m)
Underweight	<19.99
Healthy weight	20.00 – 28.00
Overweight	29.00 – 31.00
Obese	>=32.00

Based on these classifications, if the BMI for a user is calculated as 22.9, then if the user is an adult then she would be classified as "Normal range". However, if the user is a child (younger than 18), then she would be classified as "Healthy weight".

Programming Requirements

For this project, you need to write a program that calculates BMI and also provides appropriate classification based on the age of the user.

Your program first needs to collect some information about the user:
- Date of birth (you can decide about the format of the date);
- Your program should allow the user to enter their height either in meters, inches and feet. The user should be asked to specify whether they are entering their height in meters, or in inches and feet. If the user chooses to enter their height in inches and feet then your program has to make the appropriate conversion to meters. For example, the user can enter their height in meters, for example 1.70 m, or the user can enter the height as inch or feet, for example 5 feet 7 inches, so you need to make the appropriate conversion. Remember 1 inch = 0.0254 meters and 1 foot = 0.3048 meters:
- Weight in kg, for example 53 kg;
- Your program should then display the BMI value and also should show how the user would be classified by WHO (e.g., overweight). If the user is adult or a child (younger than 18) then make sure that you use the correct classification;
- Your program should continue to run and calculate BMI as many times as the user would like, and the program should exit when the user explicitly specifies so.

Grading

Your program will be graded as follows:

Grading Point	Marks
Data collection (birthday, weight, height)	10
Correct type conversion between inch and meter	20
BMI value calculation	20
Classification	20
Classification distinction for adult and children	10
Menu loop	10
Code quality (e.g., variable names, formulation of selection statements and loops, etc)	10

Resources:

1. Python Tutorial: http://www.tutorialspoint.com/python/
2. Python Examples: http://sandbox.mc.edu/~bennet/python/code/

Acknowledgment

The assignment is adapted from initial exercise designed by Prof. Christian Omlin