Algorithms & Data Structures

Week 2 -Control-flow structures

# Exercise 1:

A fruit company sells bananas for £3.00 a kilogram plus £4.99 per order for postage and packaging. If an order is over £50.00, the P&P is reduced by £1.50. Write a script that requests the user to enter the number of kilo of bananas and print the cost of the order in pence.

# Exercise 2:

Write a script that takes the age (int) and rate (the heart rate as an int) from the user and prints a description of a person's training zone based on his or her age and training heart rate, rate. The zone is determined by comparing rate with the person's maximum heart rate m:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Interval range | | | | | Training Zone |
| rate | ≥ | 0.9 m |  |  | Interval training |
| 0.7 m | ≤ | rate | < | 0.9 m | Threshold training |
| 0.5 m | ≤ | rate | < | 0.7 m | Aerobic training |
| rate | < | 0.5 m |  |  | Couch potato |

 The maximum heart rate m in beats per minute is given by the formula:

# Exercise 3:

Write a program that asks the user to guess a number between 1 and 10. The program should keep asking until the user guesses the correct number. After each attempt, the program should display a message indicating if the guess is too low or too high.

To generate a random number between two whole numbers you need to use the following two statements:

import random

number\_to\_guess = random.randint(1, 10)

# Exercise 4:

Create a program that asks the user to enter a password. The program should keep asking until the user enters a password that meets the following criteria:

1. at least 8 characters long,
2. contains both uppercase and lowercase letters,
3. and includes at least one number

# Exercise 5:

1. Write a script that takes a sentence from the user without any punctuation and prints the sentence without any white spaces. Note a white space is represented by ' ', and an empty string is represented by ''. For example:

>>> enter a sentence: this is a SHORT sentence

thisisaSHORTsentence

>>>

1. Same as above except that each word in the output should start with an uppercase letter and all other letters should be lowercase (also known as CamelCase). For example:

>>> enter a sentence: this is a SHORT sentence

ThisIsAShortSentence

>>>

1. Write a script that takes a sentence from a user written in CamelCase (without any blank spaces), creates the list of words from that sentence, and then prints that list. The CamelCase notation write a series of words without spaces, but each word starts with a capital letter. For example:

>>> enter a sentence in CamelCase: ThisIsAShortSentence

['This','Is','A','Short','Sentence']