sOFTWARE 1 PRACTICAL

## Loops & Functions

Week 3 – Practical 4

Exercise 1: *(from seminar)*

Write a **function** sum\_digits(number) to calculate and return the sum of digits of a given whole number (int) given as parameter. For example,

>>> print(sum\_digits(1234))

10

Exercise 2: *(from seminar)*

Write a **function** pairwise\_digits(number\_a, number\_b) that take two integer as parameters and a binary string where a character 1 is used if the digits at the same index are the same, a 0 otherwise. Examples are given in the table below.

|  |  |  |
| --- | --- | --- |
| Input A | Input B | Output |
| 1213 | 2113 | ‘0011’ |
| 1213 | 10435 | ‘10010’ |
| 1213 | 121 | ‘1110’ |

Exercise 3: *(from seminar)*

Write a **function** to\_base10(binary) that take a binary number (base 2), convert it into a decimal number (base 10) and return the base 10 value. To compute such a value, we need to understand what a binary number is.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Index | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| Binary | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| Decimal  139 |  |  |  |  |  |  |  |  |
| 128 | 0 | 0 | 0 | 8 | 0 | 2 | 1 |

The binary number 10001011 represents the number 137, whereas the number 11111111 represents 255.

Exercise 4: *(from seminar)*

Write a python script to print the Floyd’s Triangle. For example:

>>> Input number of rows: 5

1  
01  
101  
0101  
10101

Exercise 5: *Where’s that bug!*

You have just started your placement, and you are given a piece of code to correct. The aim of the script is to take a 2D list (that is a list of lists) and print a list containing the sum of each list. For example, given the list in data, the output should be [6, 2, 10].

Modify the code below such that it gives the right result. In addition, you have been asked to refactor the script into a function sum\_lists(list\_2D) that returns the list containing the sums of each sub-list.

data = [[1,2,3], [2], [1, 2, 3, 4]]

output =[]

total = 0

for row in data:

for val in row:

total += val

output.append(total)

print(output)

Exercise 6:

Write a python script to make such a pattern like right angle triangle with number increased by 1. The script should request the user to input the number of rows in the triangle. Note that the alignment in each column should be preserved.

>>> Input number of rows: 4

1

2 3

4 5 6

7 8 9 10

11 12 13 14 15

Exercise 7:

Write a python script to display the pattern like pyramid using the alphabet

>>> Input the number of Letters (less than 26) in the Pyramid: 5

A

A B A

A B C B A

A B C D C B A

A B C D E D C B A