sOFTWARE 1 PRACTICAL

## Functions

Week 4 – Practical 3

### Exercise 1:

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

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

10

### Exercise 2:

Write a **function** pairwise\_digits(number\_a, number\_b) that takes two integers as parameters and returns 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:

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 139, whereas the number 11111111 represents 255.

### Exercise 4:

Write a python script to print a right angle triangle composed of alternating 0s and 1s.. 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)