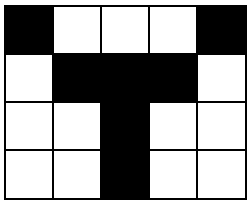
C2- S8 SIZING

Q1

How **many BITS do need** to display a BLACK/WHITE image of 5 pixels width and 4 pixels heights?

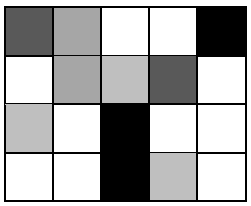


Correction:

Number of pixels	5 * 4 = 20
Pixels encoding	• Value 0 => white • Value 1 => black
Number of bit for each pixel	1
Total image size	20 * 1 = 20 bits

Q2

Now we want to manage more than BLACK and WHITE: level of grays



0	
1	
2	
3	
4	
5	
6	
7	

How **many BITS do we need** to display a LEVEL OF GRAY image of 5 pixels width and 4 pixels heights?

Correction:

Number of pixels	5 * 4 = 20
Pixels encoding	8 values to represent the levels of grey (see table)
Number of bit for each pixel	3 *(because 2^3 = 8 values)*
Total image size	20 * 3 = 60 bits

Q3

We want to send a message

The message is always 4 characters, and each character can be either

- A lower case letters (a, b, c…)
- An upper case letters (A, B, C…)
- A number (1, 2, 3…)

What will be the size (in bits) of your message?

Correction:

Number of characters	4
Characters encoding	We have 62 values - 26 values for lower cases - 26 values for upper cases - 10 values for numbers
Number of bit for each pixel	6 *(because 2^6 = 64 values)*
Total image size	6 * 4 = 24 bits