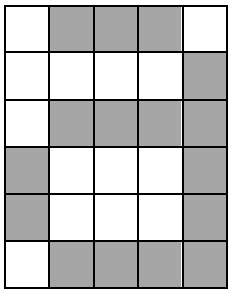
Digital pictures

Computers have to use numbers for everything they do. In order to store and transmit pictures, computers use numbers to code them. Digital cameras, smart phones, and other electronic gadgets do it, too.

Computer screens are divided into a grid of small dots called **pixels**. "Pixel" comes from *pic*ture *el*ements. To keep things simple, think about a black and white picture, so each pixel is either black or white.

Example: a small letter "a"



1, 3, 1
4, 1
1, 4
0, 1, 3, 1
0, 1, 3, 1
1, 4

Note that the first number always is about white pixels, so *if the first pixel is black, we need to start with 0* !

[In colour? A separate number is used to store that information.]

How would a computer code this?

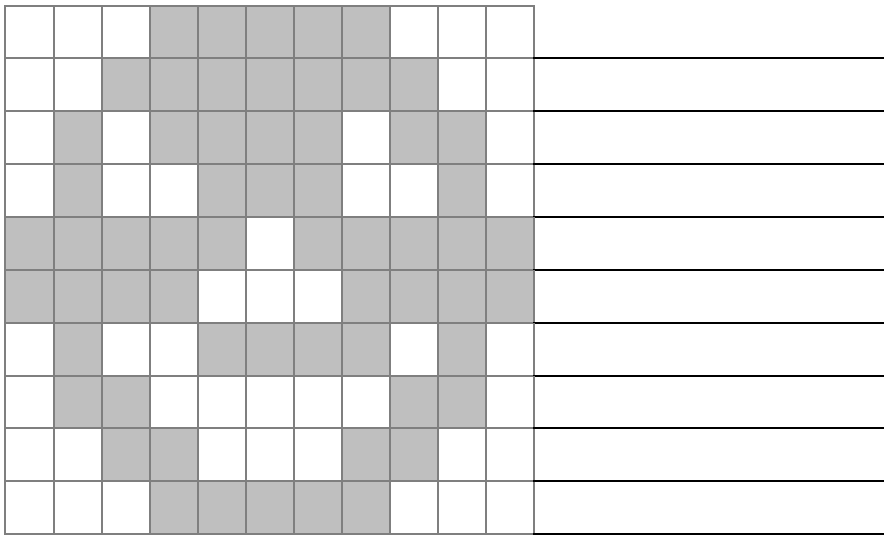
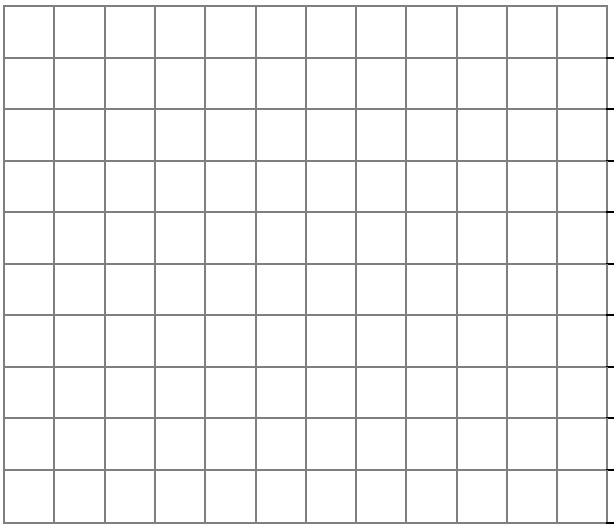
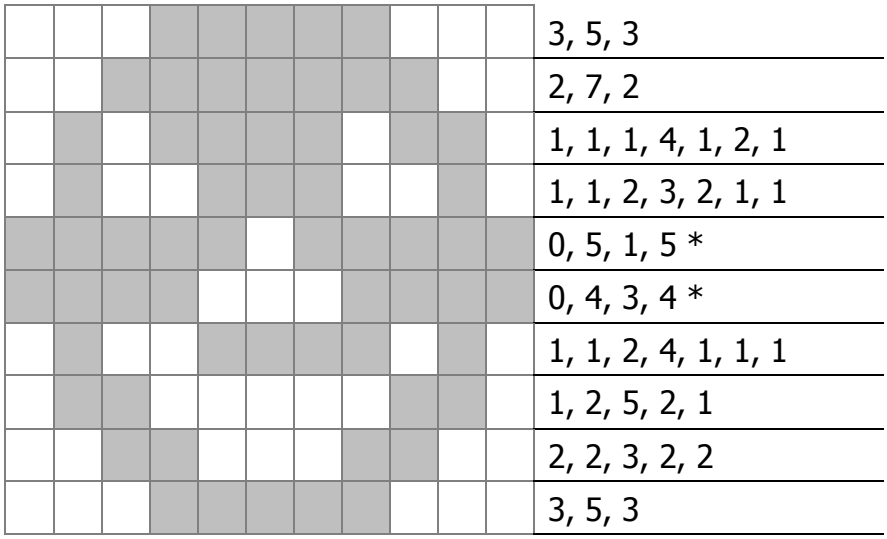


Figure out this picture:



3, 1, 8
2, 1, 9
1, 3, 6, 1, 1
0, 2, 1, 1, 7, 1
0, 4, 7, 1
2, 9, 1
2, 8, 2
2, 8, 2
2, 1, 6, 1, 2
1, 2, 5, 2, 2

Happy face code



3, 5, 3	
2, 7, 2	
1, 1, 1, 4, 1, 2, 1	
1, 1, 2, 3, 2, 1, 1	
0, 5, 1, 5 *	
0, 4, 3, 4 *	
1, 1, 2, 4, 1, 1, 1	
1, 2, 5, 2, 1	
2, 2, 3, 2, 2	
3, 5, 3	

*Remember: the first number is <u>always</u> about white pixels,
so if the first pixel is black, we need to start with 0.

Make your own digital picture puzzle

Draw a picture, write down the code (double-check!), then give just the code to a friend.