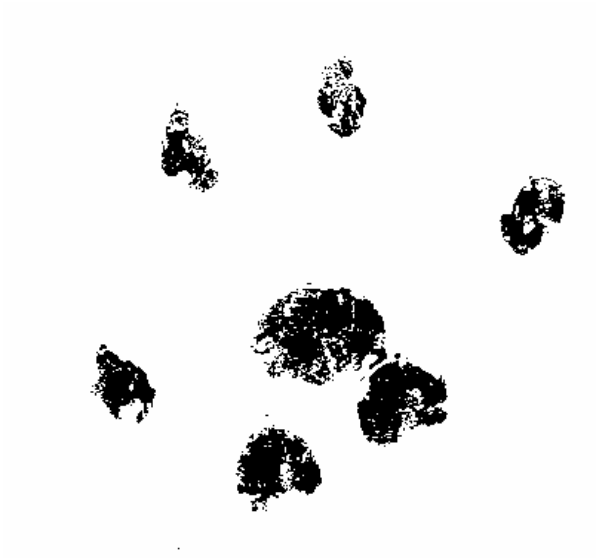
Exercise 2.2

The program is implemented in C#. To build it, open the project in Visual Studio.net and press F5. Exercise 2.2 is on the second tab. Click the open button to select an image. Supported file types are bmp, tiff, and jpeg. The histogram is displayed below the image, and you can set the threshold value by moving the slide below the histogram. To colorize the different regions, press the "threshold" button.
To colour the different regions, I have implemented a flood fill algorithm. Each separate object region is given a random colour. To choose whether to treat white or black pixels as object pixels, choose one of the options on the toolbar.

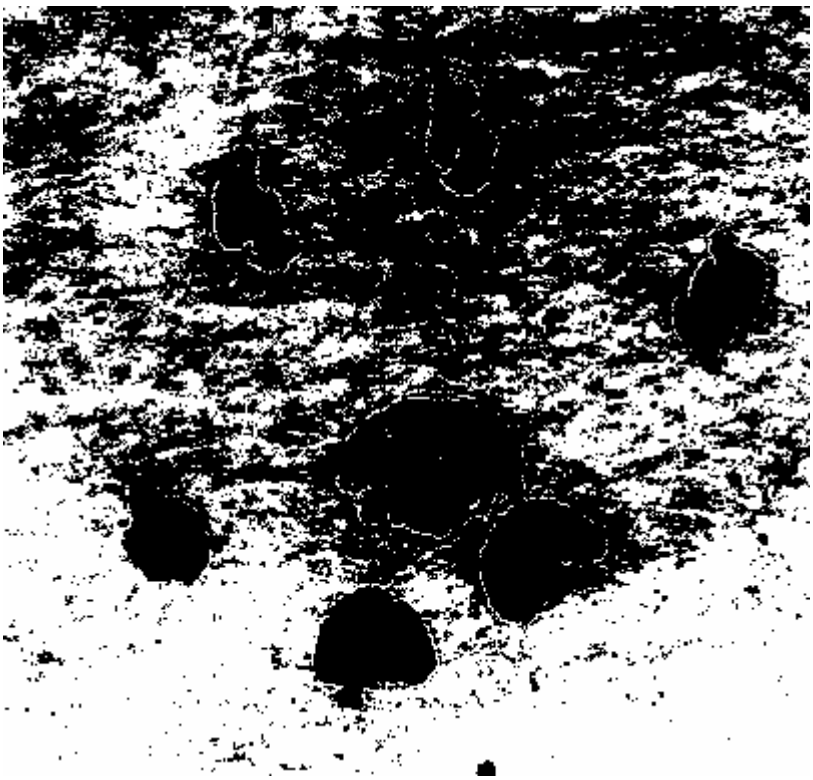
I have included a sample image (1.bmp) of a rat footprint which gives a bipolar histogram, and when thresholding this, object-pixels are value 0, and non-object-pixels are G_{max} (255).

It is sensible to take a threshold value between the two peaks, as in this example (T = 160)

If a lower threshold is chosen, parts of the object start to be merged with the background as in this example (T = 80)



If the threshold value is too high, background pixels start to be merged with object pixels as in this example (T = 245)



It follows that a threshold value of 255 will give a picture which consists entirely of object pixels, and a threshold value of 0 will give a picture which consists entirely of background pixels.