Goals

- Learn how to use the FPGA to display an image on a VGA monitor.
- Learn general principles behind storing and retrieving images and processing them using an FPGA.
- Learn how to apply Filtering technique (LPF) on stored images.

Raw Image Format

Figure 1

The dimensions of the image are 256x256 pixels.

Each pixel in the provided gray-scale image is represented by one byte. Thus, the value of a pixel in the image varies from 0 (0000_0000) through 255 (1111_1111). The total memory required to store the image can be easily calculated as 256*256 = 65535 bytes.

Displaying the Image

- You can re-use the existing modules for the VGA driver, the keyboard, and etc.
- Filtering should be repeatedly applied whenever the button is pressed. Therefore, you should consider how to store the filtered image again in the BlockRAM while displaying the image on the screen continuously.
- The LPF coefficients are:
  - LPF: 1/9 [1 1 1; 1 1 1; 1 1 1];