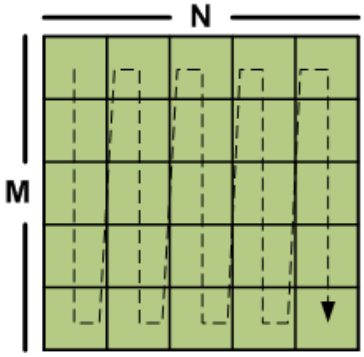
SRAM Image Initialization Readme

This tutorial provides a quick tutorial on the modules in the SRAM Initialization folder. The main hardware involved are the DE2-115 development board and TRDB-D5M camera. The project's top module is **DE2_115_CAMERA.v** which was modified from Terasic's D5M camera's project for the DE2-115 board. This project involves three modules.

The image is initialized and loaded onto memory unit called **image_init_unit.v** module using initial statement (refer to line 44 of the code). In other words, at compilation, the memory module is created and initialized with the pixel data. The size of the memory is 131,072 bits (8-bit/pixels x (128 x 128) pixels). The data width is 8-bit or 1 byte, enough for one grayscale pixel (0x00 to 0xFF OR 0 to 255). Since there are 128 x 128 max words, the address width is 14-bit (2^{14} = 128 x 128). The images are read are column major, meaning top-bottom. The pixel data can be accessed by addressing their position (given by VGA controller) according to column major arrangement.



The images are stored as memfile.dat files. memfile1 and memfile3 are 64x64 images. memfile2 and memfile4 are 128x128 images. The Lena images (128, 64 version) are in memfile2 and memfile4, respectively. The other ones are the Cameraman picture.

To display the images, each pixel is passed through the VGA controller module (**VGA_Ctrl**) which handles control signals of the VGA component of the DE2-115 board. The controller also outputs the required pixel positon (x & y coordinates) which is used in the image initialization unit to determine the position of any given pixel needed to be displayed.