A gray valued image is simply an \( m \times n \) matrix. Each entry in the matrix is called a pixel; note then that there are \( mn \) pixels. Thus a gray valued image of height 1000 and width 1000 would have a 1000000 pixels, that is, it would be a 1 megapixel image.

In matlab, we can view a matrix as an image using the `imagesc` command (also: `image`, `imshow`). The `imagesc` command scales a colormap (that is, an assignment mapping real numbers to a colorspace) to the maximum and minimum entries in your matrix. The default matlab colormap is red to blue, with blue representing the smallest entries in the matrix, and red the largest. This is not always the best thing for grayscale images—so you often want to change the colormap, so that white is the largest values, and black is the smallest. So, for example, navigate to the directory where you have downloaded the data files. Enter into the command window:

```matlab
>> load train_data_left
>> load train_data_right
>> a=[squeeze(train_data_left(:,:,5)) squeeze(train_data_right(:,:,5))];%extracts the 5th image from the stack; note that each image is 64 × 64.
>> figure(1);imagesc(a)% this will give you a red to blue image
>> figure(2):imagesc(a);colormap(gray)% this gives you a gray level image.
```

\(^1\)Oftentimes, the numbers lie between 0 and 255, but this need not be the case; when stored as unsigned 8 bit integers, this is a good example of “fixed point” numbers, as opposed to the floating point numbers that we usually use. Don’t worry about any of this, though, as far as you are concerned, you are just given a matrix with the same sort of values you usually use.