Explanation

These all function are in function.h File.

Convolution:

There are two ways of finding convolution of image matrix

1. Using basic convolution def.:
   We have made function name convolution(arg1,arg2) which take two matrix as its arguments. and compute their convolution using def as given in slide. but with one deference that is it multiply without inverting the input matrix.
2. Using matrix multiplication method:
   We have made a function name mux(arg1,arg2); Which take two arguments of matrix input and kernel and then do its computation as given in piazza link.

Padding:

It is the method of maintaining the order of input matrix after convolution. Generally we got less pixel

After convolution. To maintain image pixel use padding

We have made a function padding(arg1,int p)

Which take int value by which we have to do padding.

Rectangular unit:

It is simple function named relu(arg);

Which changes the value of matrix to 0 if the are less then 0;

Tanh:

It is also a simple function named tanh(arg);

Which changes the value of matrix to tanh() of that value and return it;

Mult:

It is a helper function in Mux which take two matrix as arguments and multiply them as they should be and return their product matrix.

Display:

It just take a matrix as its argument and print it out on command prompt.

Sigmoid and SoftMax :

While calling the functions sigmoid and SoftMax a vector as an argument has to be passed which is being taken from the input file in the format with one entry in a line. In the function the argument vector's each element has been taken and the respective function being sigmoid or SoftMax has been applied on it and each value of the element of this argument vector has been pushed into a new vector which is being declared globally for this and at last the respective vector has been printed out which has the new values after the application of sigmoid or SoftMax functions.

Max pooling and Average pooling

Both of these functions will take a matrix of the form of a 2-D vector. The element of the matrix has been taken from

the input file with one entry in one line and going downwards through column i.e. first n lines contains n entries of n rows and

first column and so on. If the matrices are having odd number of rows and columns then a column in right side and a row at the bottom

of the matrix is being added with entry "0". Then without no overlapping the matrix has been pooled by 2x2 matrix and corresponding maximum or average value

has been stored in another 2-D vector matrix for the corresponding 2x2 part of the given matrix. If we are provided with a n*n matrix then the resulted matrix after pooling will be a n/2 X n/2 matrix.