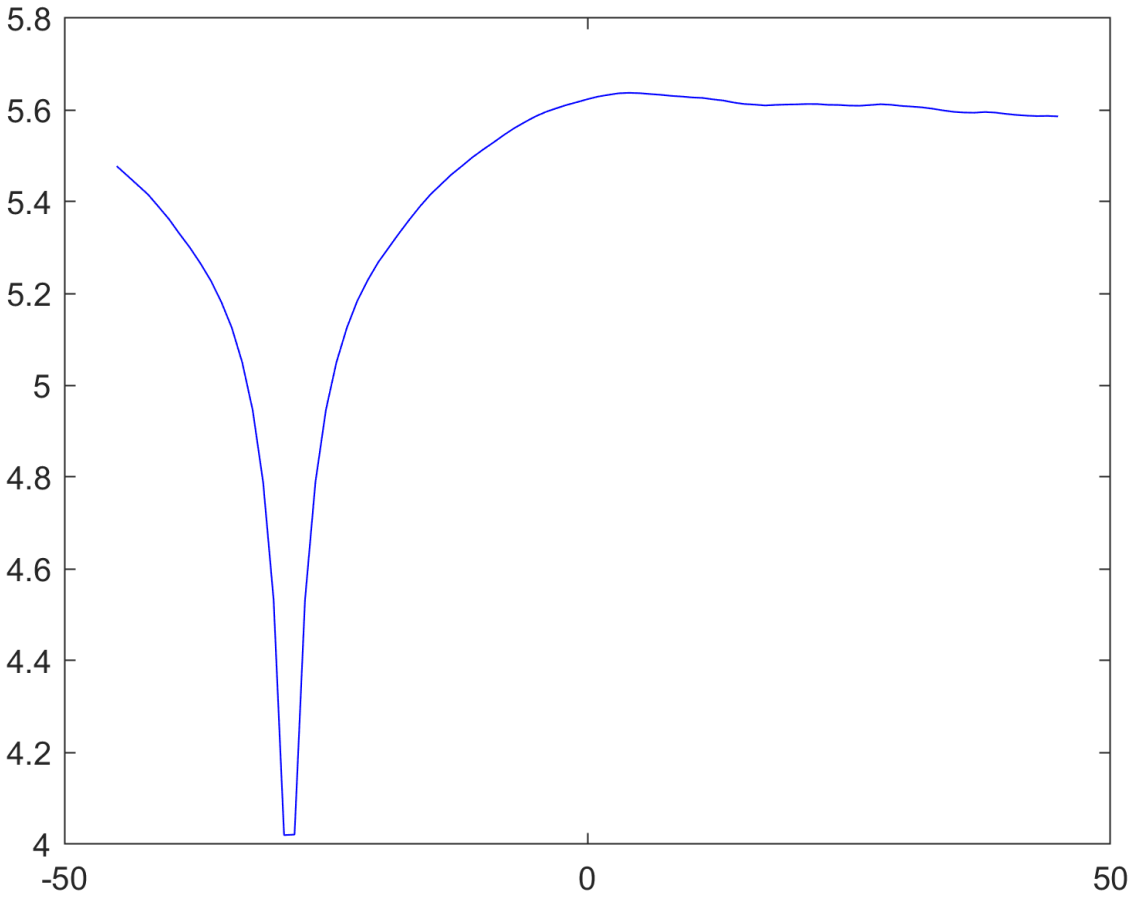
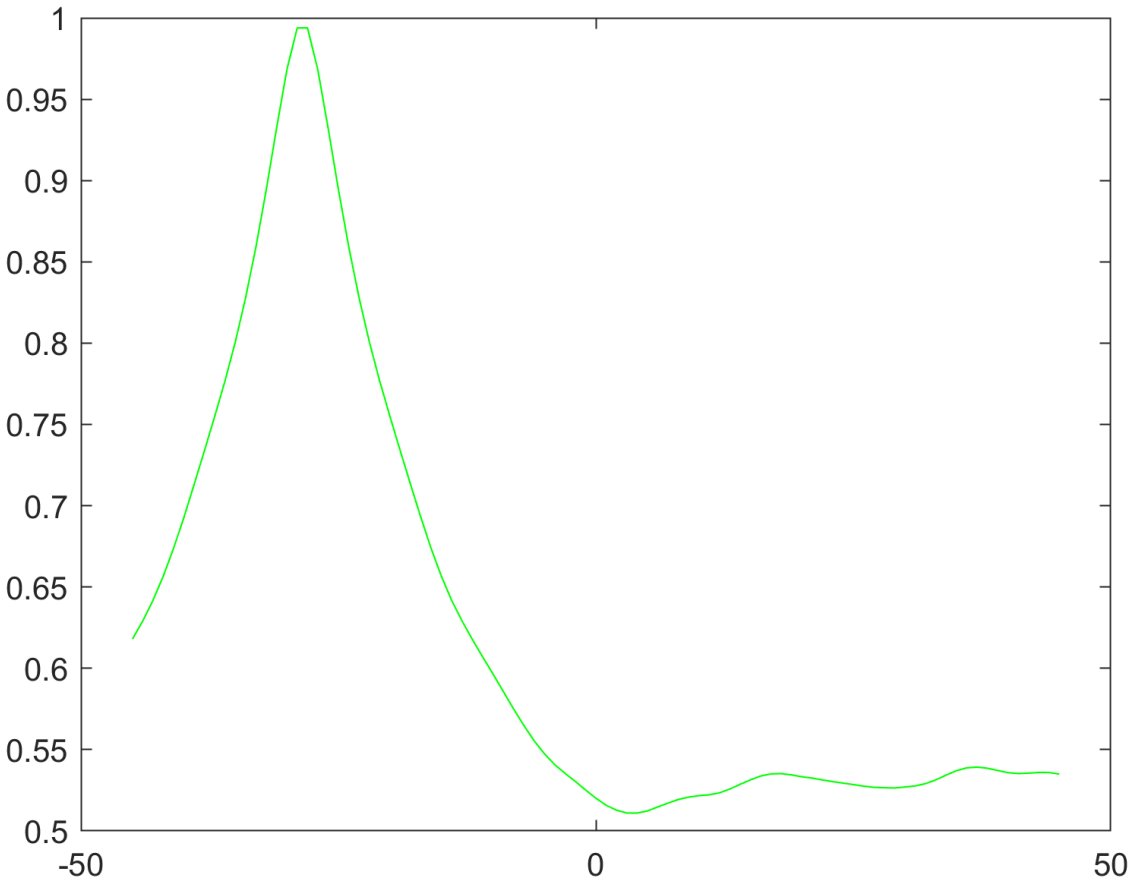
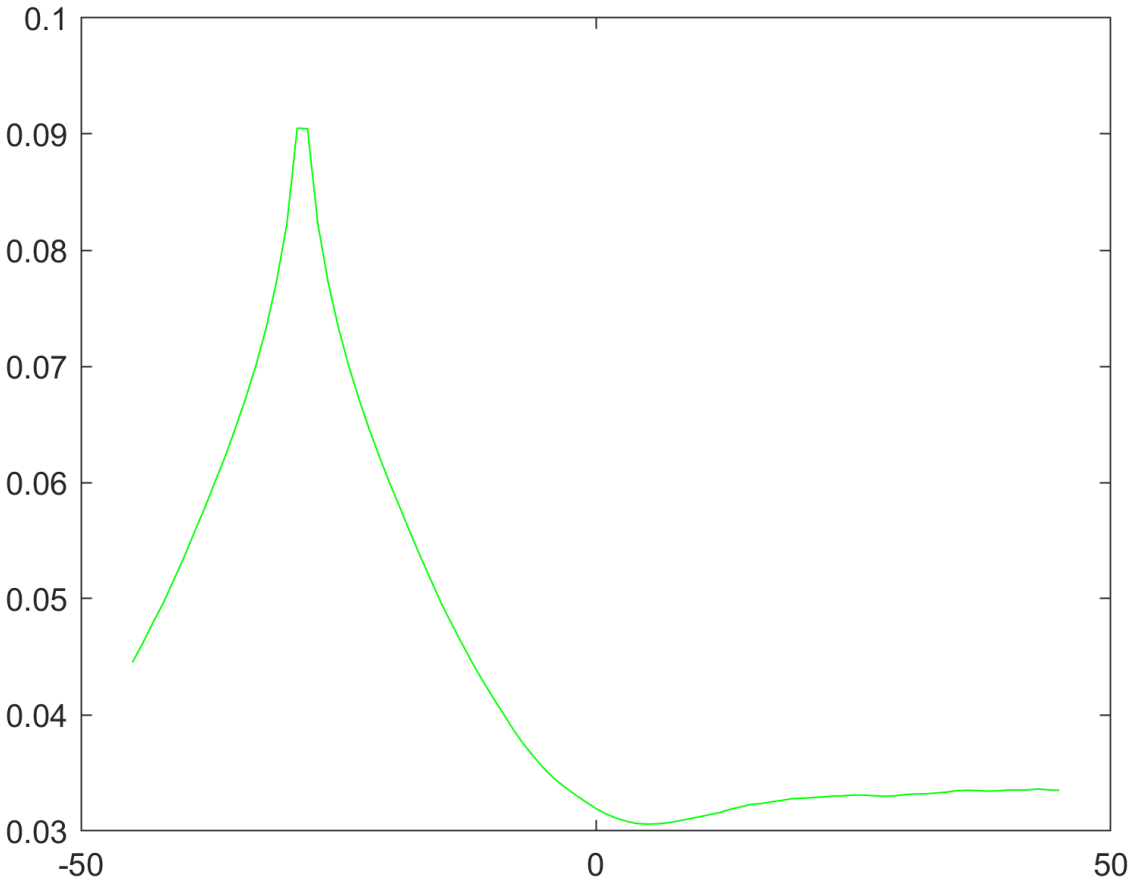
0.1 Q4

0.1.1 Part c)




1
0.95
0.9
0.85
0.8
0.75
0.7
0.65
0.6
0.55
0.5
-50
0
50



0.1.2 Part d)

From the plot of rotation vs joint entropy (JE), we know that when both the images are identical, a minima will occur.

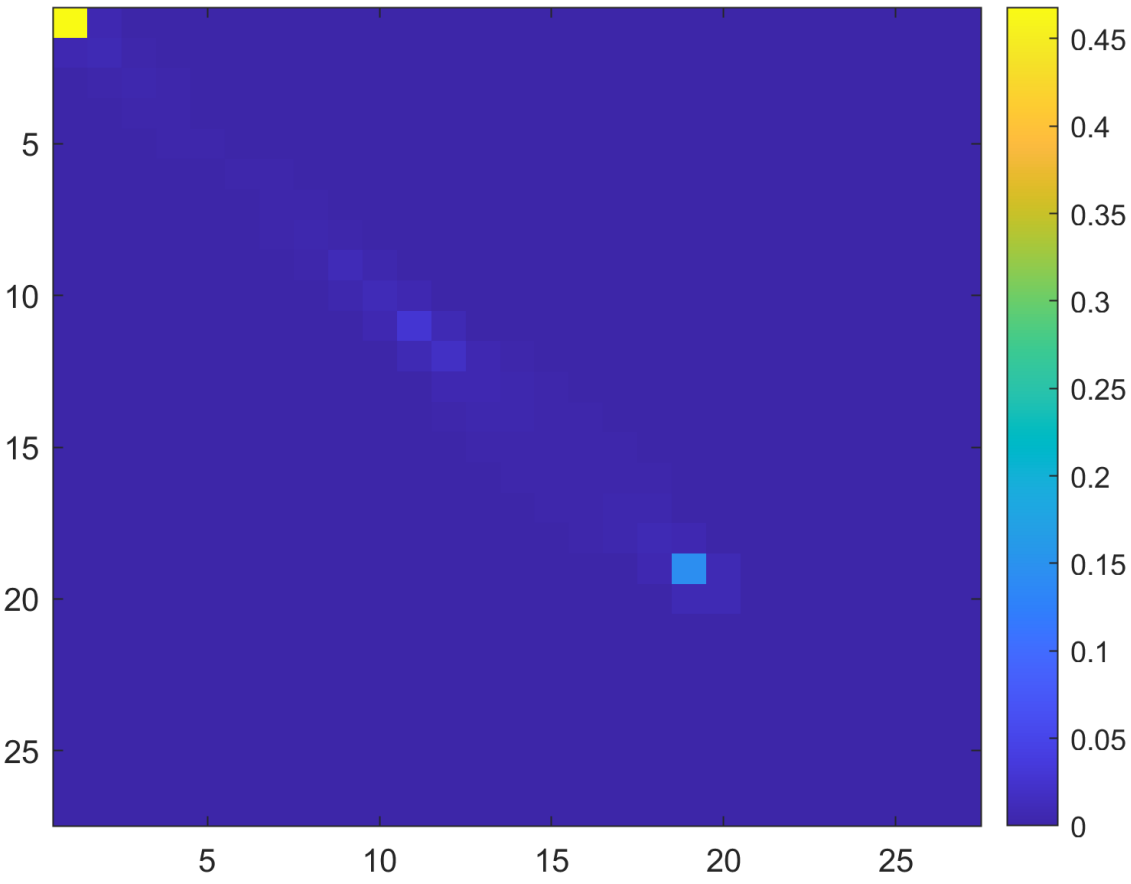
From the plot of rotation vs normalized cross-correlation (NCC), we know that when the images are identical a maxima occurs. This happens at $\theta \in [-29, -28]$ degrees.

From the plot of rotation vs quadratic mutual information(QMI), we know that when the images are identical a maxima occurs.

We see that all of the above can observed when $\theta \in [-29, -28]$ degrees. Thus the optimal rotation must lie in this range.

0.1.3 Part e)

Assuming the optimal rotation to be -29 degrees, we get the following joint histogram between J1 & J2



0.1.4 Part f)

Quadratic mutual information (MI) of two random variables is a measure of the mutual dependence between the two variables. It is maximum when the images are aligned