Ashutosh Sharma (190100027)
Kritti Sharma (180100060)
Shreyas Chandgothia (180260037)

Exercise-5

Part (a), (b)

Implemented directly in the code.

Part (c)

Figure 1: Nearest-neighbour interpolation for image warping.

Part (d)

Figure 2: Bilinear interpolation for image warping.

Part (e)

We have 6 unknown variables in the affine transformation matrix. All collinear points will imply we have only taken into account 2 degrees of freedom. This is because using all collinear points will effectively provide us with only 2 linearly independent equations. However, we need a minimum of at least 6 linearly independent equations to determine the unknown variables. Further, if we want our calculations to be robust to noise, we must ideally use much more than 6 independent equations. Thus, the solution obtained using all collinear points would model the original transformation very poorly.