**Part A:**

Training data

FPC= 0.9438
CE= 0.2128285783717601

0.9442
0.21204192562345214

0.9444
0.2112654356163749

0.9446
0.21049883877827233

0.9452
0.20974187604607641

0.9456
0.2089942983382178

0.9458
0.20825586605927318

0.946
0.20752634863460867

0.9464
0.20680552407287423

0.947
0.20609317855438034

0.9474
0.20538910604354838

0.9474
0.20469310792377202

0.9474
0.20400499265315925

0.9476
0.20332457543974505

0.9474
0.20265167793487354

0.9476
0.20198612794355

0.9476
0.2013277591506538

0.9476
0.20067641086198557

0.9478
0.20003192775920103

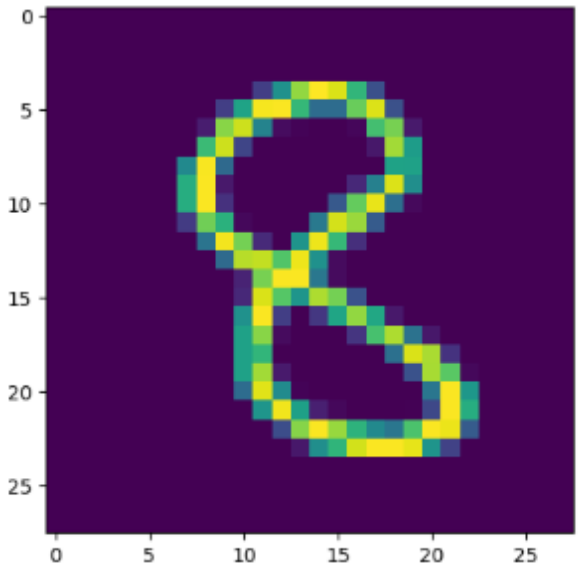
0.948
0.19939415966775081

Testing Data
FPC=0.8782
CE=0.4210996119369399

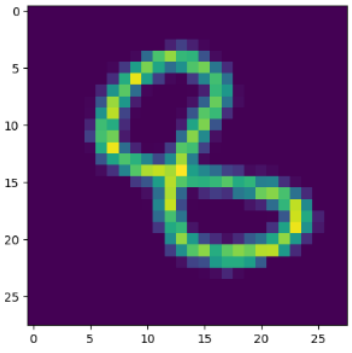
FPC= Percent correct
CE = cross entropy

**Part B:**

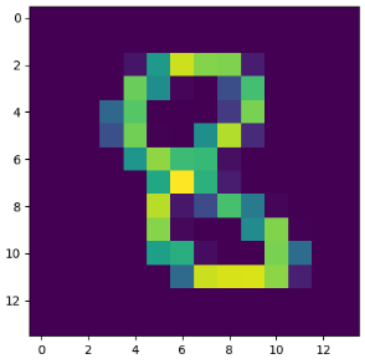
Original Image



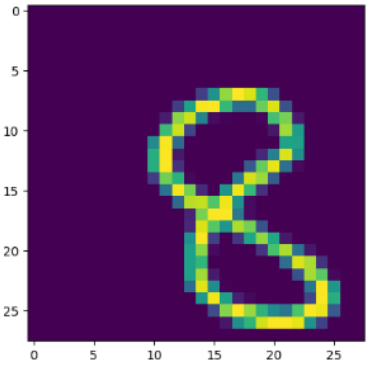
Rotate by 20 degrees



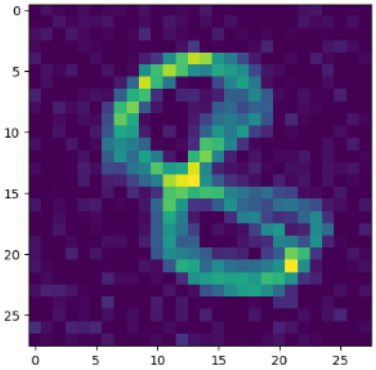
Scale by 0.5



Translate by 3



Add random noise



Transformed Data
FPC=0.8342
CE=0.5659351888956412

We augmented the data by creating a list of the translated, scaled, and rotated images. Then we applied random noise to all of the images in this list. Then we added this list to the original training image data to create our final triple sized augmented training data that we used.