Machine Learning Homework 3

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Results

Training Dataset	Testing Percent Correct	Testing Cross Entropy
Original Data	87.88	0.4203
Augmented Data	88.44	0.4018

Table 1: Accuracy

Last 20 Epochs

	Original Data		Augmented Data	
Epoch	Training PC	Training CE	Training PC	Training CE
81	94.38	0.2119	87.212	0.4528
82	94.42	0.2111	87.224	0.4523
83	94.46	0.2104	87.228	0.4518
84	94.54	0.2096	87.24	0.4513
85	94.58	0.2089	87.252	0.4508
86	94.62	0.2082	87.268	0.4503
87	94.62	0.2074	87.292	0.4498
88	94.62	0.2067	87.308	0.4493
89	94.6	0.206	87.32	0.4489
90	94.58	0.2053	87.348	0.4484
91	94.64	0.2046	87.372	0.448
92	94.64	0.204	87.396	0.4475
93	94.64	0.2033	87.404	0.4471
94	94.64	0.2026	87.404	0.4467
95	94.68	0.202	87.416	0.4463
96	94.7	0.2013	87.428	0.4458
97	94.72	0.2007	87.456	0.4454
98	94.74	0.2	87.464	0.445
99	94.78	0.1994	87.48	0.4446
100	94.78	0.1988	87.5	0.4442

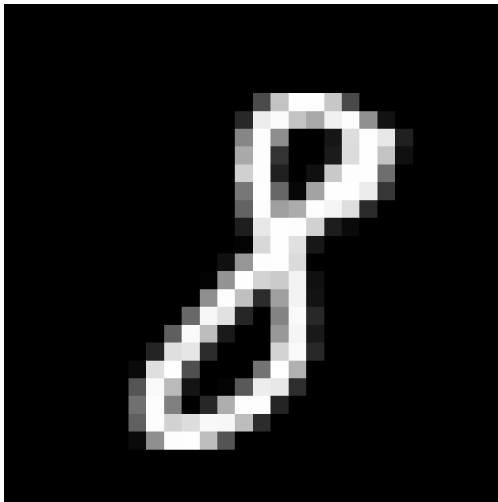Table 2: Last 20 Iterations

Augmentations
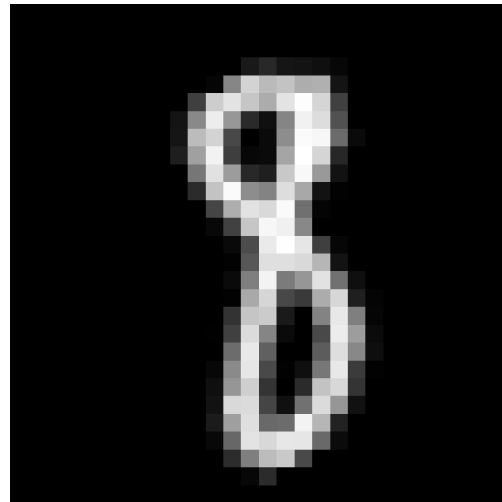
Rotation

Figure 1: Original Image
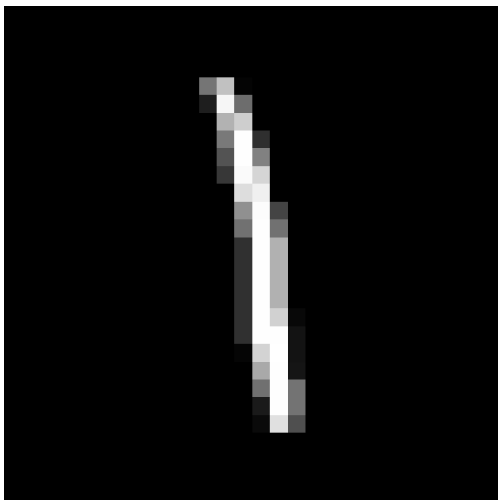

Figure 2: Rotated Image
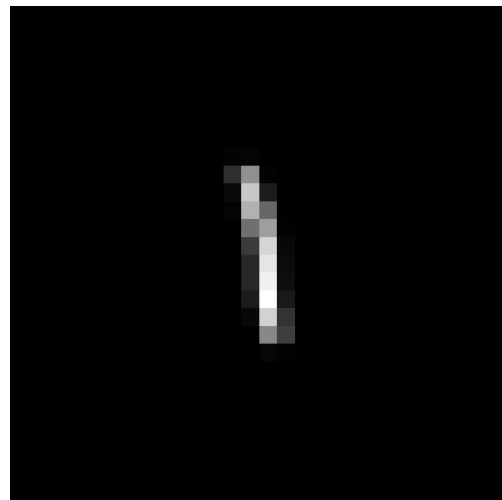
Scaling

Figure 3: Original Image

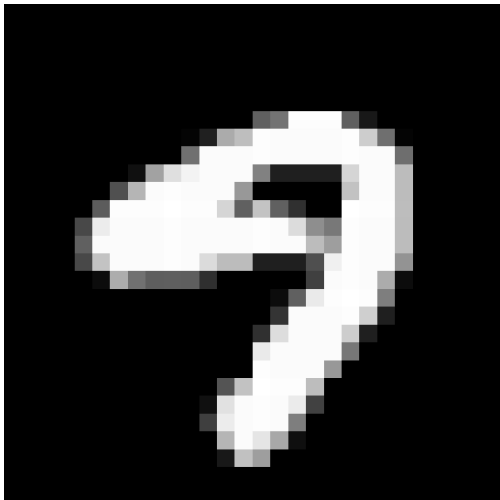Figure 4: Scaled Image

Translation

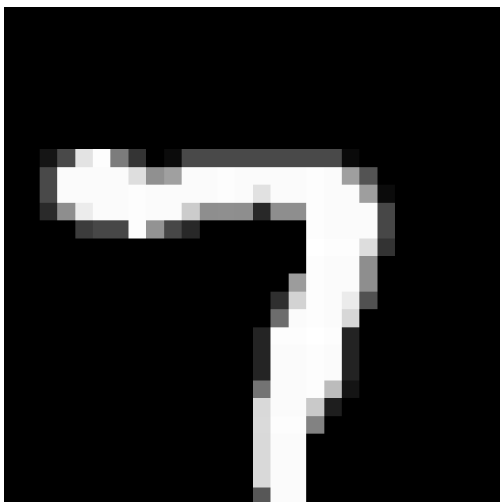Figure 5: Original Image

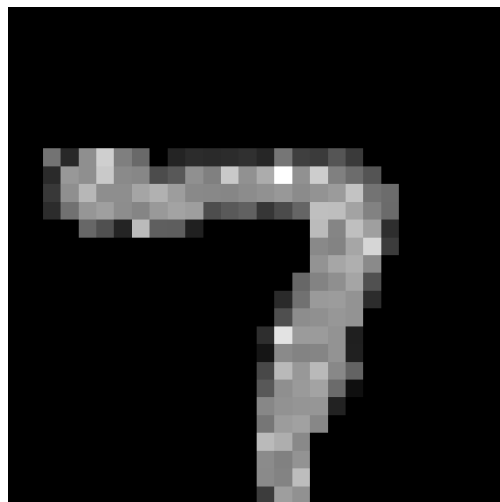Figure 6: Translated Image

Noise

Figure 7: Original Image

Figure 8: Noisey Image