Habib University
CS 416 Algorithms for Machine Learning
Fall 2018

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Assignment 02
Analysis Report
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This report contains the visual + descriptive analysis of the autoencoder architecture trained in the attached *.ipnb* file.

1 2-2 Conv-Conv Design:

This design has 2 encoder and 2 decoder layers. The analysis is divided into three parts:

· Effect of varying LR on constant batch size and epoch.

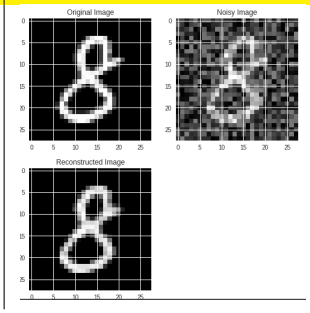
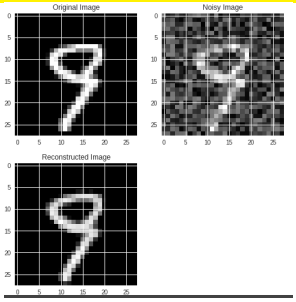
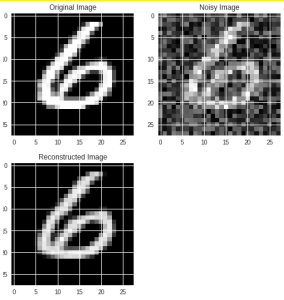
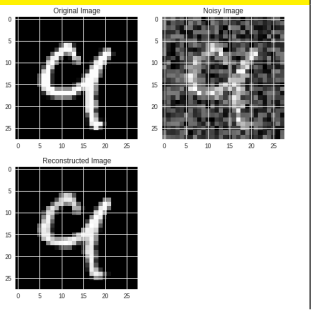
· Effect of varying batch size on constant LR and epoch.

· Effect of varying epoch on constant LR and batch size.

1.1 Varying LR:

· Batch size = 32 and Epochs = 10.

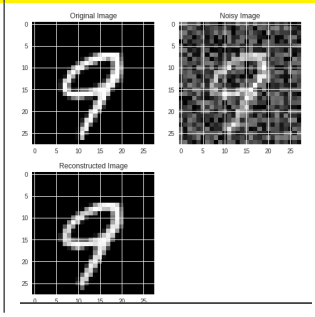
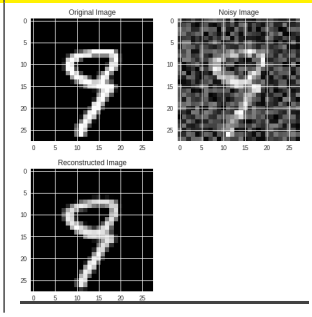
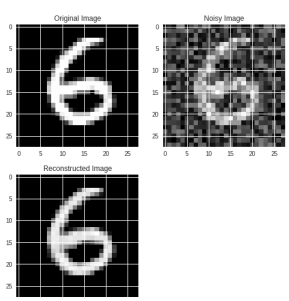
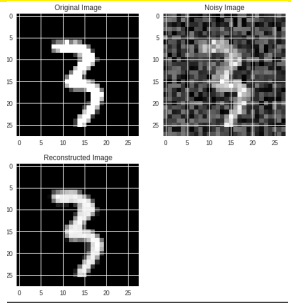
Table 1:

Epoch	M.S.E. @ LR=0.1	M.S.E. @ LR=0.01	M.S.E. @ LR=0.001	M.S.E. @ LR=0.0001
1	0.005940	0.008400	0.014045	0.045864
2	0.004542	0.006082	0.008670	0.017278
3	0.004184	0.005550	0.007915	0.013715
4	0.003933	0.005290	0.007434	0.012317
5	0.003759	0.005113	0.007090	0.011503
6	0.003614	0.004989	0.006821	0.010939
7	0.003496	0.004879	0.006613	0.010531
8	0.003392	0.004793	0.006440	0.010204
9	0.003308	0.004709	0.006283	0.009932
10	0.003232	0.004640	0.006153	0.009696
				

1.2 Varying Batch Size:

· LR = 0.1 and Epochs = 10.

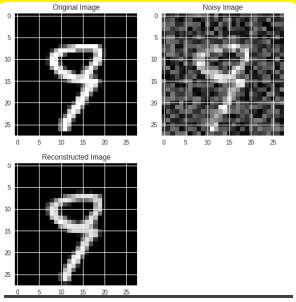
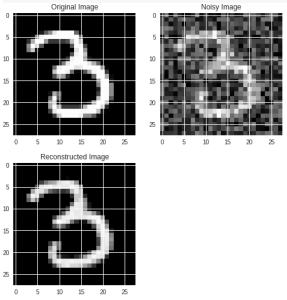
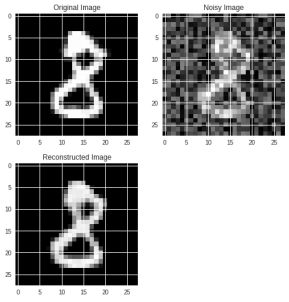
Table 2:

Epoch	M.S.E. @ BS=16	M.S.E. @ BS=32	M.S.E. @ BS=64	M.S.E. @ BS=128
1	0.005940	0.008400	0.014045	0.045864
2	0.004542	0.006082	0.008670	0.017278
3	0.004184	0.005550	0.007915	0.013715
4	0.003933	0.005290	0.007434	0.012317
5	0.003759	0.005113	0.007090	0.011503
6	0.003614	0.004989	0.006821	0.010939
7	0.003496	0.004879	0.006613	0.010531
8	0.003392	0.004793	0.006440	0.010204
9	0.003308	0.004709	0.006283	0.009932
10	0.003232	0.004640	0.006153	0.009696
				

1.3 Varying Epochs:

· LR = 0.1 and Batch Size = 32.

Table 3:

Epoch	M.S.E. @ Epoch=10	M.S.E. @ BS=100	M.S.E. @ BS=500
1	0.005940	0.	0.
2	0.004542	0.	0.
3	0.004184	0.	0.
4	0.003933	0.	0.
5	0.003759	0.	0.
6	0.003614	0.	0.
7	0.003496	0.	0.
8	0.003392	0.	0.
9	0.003308	0.	0.
10	0.003232	0.	0.
			
...		...	...
100		0.002229	0.002193
			
...			...
500			0.001136
			

The trained architecture is inspired from here.