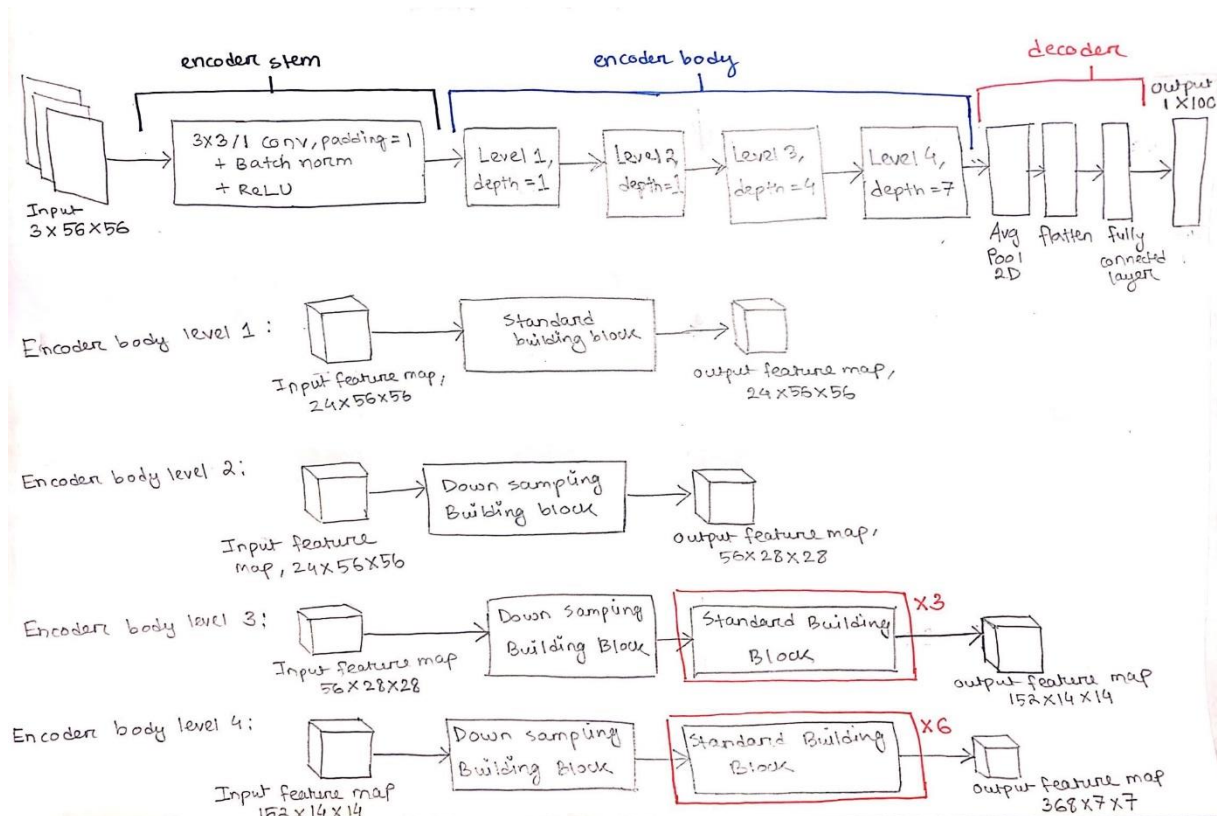


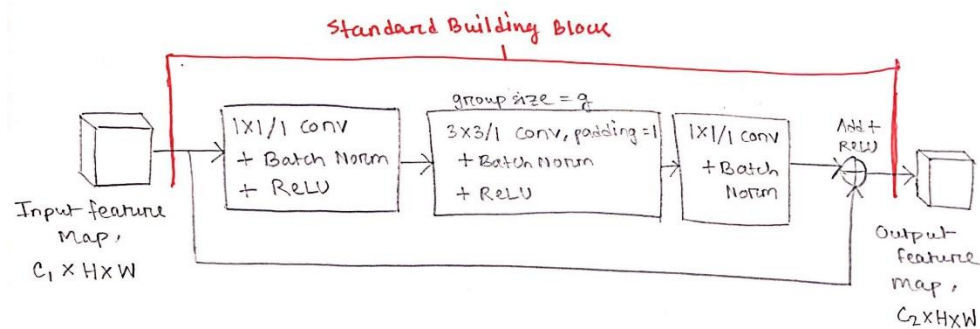
Project 02 - Networks

Section 1 - Design

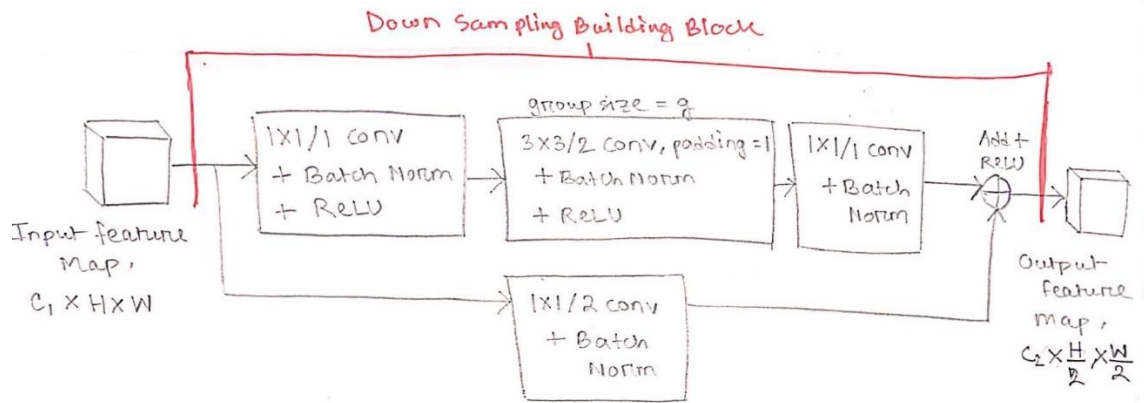
Network Structure:



Network standard building block:



Network down sampling building block:



Network section	Building block type	Number of repeats	Bottleneck ratio	Number of input channels	Number of output channels	Group size	No. of groups per 3x3 conv
Encoder stem	Encoder stem block	1	--	3	24	--	--
Encoder body level 1	Standard building block	1	1	24	24	8	3
Encoder body level 2	Down sampling building block	1	1	24	56	8	3
Encoder body level 3	Down sampling building block	1	1	56	152	8	7
	Standard building block	3	1	152	152	8	19
Encoder body level 4	Down sampling building block	1	1	152	368	8	19
	Standard building block	6	1	368	368	8	46
Decoder	Decoder block	1	--	368	1 (1 channel with 100 data points)	--	--

Section 2 – Training

Number of epochs = 125

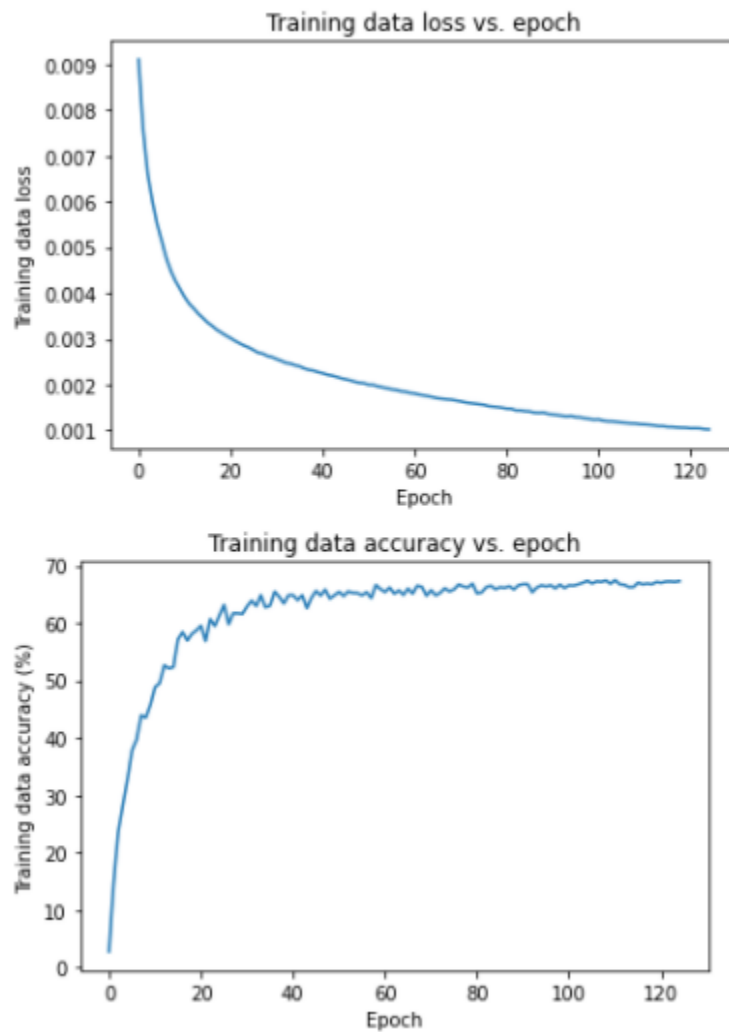
Batch size = 512

Learning rate = linear warmup for 5 epochs followed by cosine decay for 120 epochs

Error criterion = softmax cross entropy

Optimizer = Adam

Weight decay (l_2 norm) = 0



Final accuracy = 67.32 %

Section 3 – Implementation

Network Section	CNN Style 2D Convolution ($F_r \times F_c/S$ conv)	Input feature map channels (N_i)	Output feature map dimensions ($N_o \times M_r \times M_c$)	Number of repeats (K)	No. of groups (G)	No. of MACs ($F_r F_c N_i N_o M_r M_c K/G$)	No. of parameters ($F_r F_c N_i N_o K$)
Encoder stem	3x3/1 conv	3	24x56x56	1	1	2,032,128	648
Encoder body level 1	1x1/1 conv	24	24x56x56	1	1	1,806,336	576
	3x3/1 conv	24	24x56x56	1	3	5,419,008	1728
	1x1/1 conv	24	24x56x56	1	1	1,806,336	576
Encoder body level 2	1x1/2 conv	24	56x28x28	1	1	1,053,696	1344
	1x1/1 conv	24	24x56x56	1	1	1,806,336	576
	3x3/2 conv	24	24x28x28	1	3	1,354,752	1728
	1x1/1 conv	24	56x28x28	1	1	1,053,696	1344
Encoder body level 3	1x1/2 conv	56	152x14x14	1	1	1,668,352	8512
	1x1/1 conv	56	56x28x28	1	1	2,458,624	3136
	3x3/2 conv	56	56x14x14	1	7	790,272	4032
	1x1/1 conv	56	152x14x14	1	1	1,668,352	8512
	1x1/1 conv	152	152x14x14	3	1	13,585,152	69,312
	3x3/1 conv	152	152x14x14	3	19	6,435,072	32,832
	1x1/1 conv	152	152x14x14	3	1	13,585,152	69,312
	1x1/2 conv	152	368x7x7	1	1	2,740,864	55,936
Encoder body level 4	1x1/1 conv	152	152x14x14	1	1	4,528,384	23,104
	3x3/2 conv	152	152x7x7	1	19	536,256	10,944
	1x1/1 conv	152	368x7x7	1	1	2,740,864	55,936
	1x1/1 conv	368	368x7x7	6	1	39,814,656	812,544
	3x3/1 conv	368	368x7x7	6	46	7,789,824	158,976
	1x1/1 conv	368	368x7x7	6	1	39,814,656	812,544
						Total no. of MACs = 154,488,768	Total no. of MACs = 2,134,152