National University of Computer and Emerging Sciences, Lahore Campus

Course Name:	Data Analysis and Visualization	Course Code:	DL 3001
Program:	BS (Data Science)	Semester:	Fall 2023
Duration:	30 minutes	Total Marks:	15
Date:	30-October-2023	Section	5D

Student Name Roll No. Section:

Q1. Input image is given, you are required to pass it through forward pass of CNN model with 1 conv layer consists of 2 filters, stride = 1, padding = 1 and then apply mean pooling layer with filter size 2 and stride = 2, apply flattening then and pass it through an mlp with one hidden layer of size 6 and and output layer of size 3. Activation function for hidden layer will be tanh and for output layer softmax. Weight matrices are given for conv layer. For all the weights and bias between flattened layer and hidden layer use value 0.3 and between hidden layer and output layer use value 0.4.

58	36	5	30	37	62	7	81
42	31	9	11	14	51	62	52
23	90	71	29	10	71	49	55
28	82	30	7	70	55	52	19
52	47	90	29	53	28	96	8
85	45	95	95	9	32	54	48
49	71	26	75	41	50	17	15
63	29	49	77	18	28	40	51

F1					b1
3	2	1	-1	1	0.5
0	5	2	3	0	
-1	1	-2	-3	-1	
5	2	0	1	0	
4	2	1	0	-2	
F2					b2
1	2	3	4	5	0.8
0	9	8	7	6	
3	2	1	0	4	
9	8	7	6	5	
-1	0	-2	4	8	

$$S(y)_i = \frac{\exp(y_i)}{\sum_{j=1}^{n} \exp(y_j)} \qquad tanh(x) = \frac{2}{1+e^{-2x}} - 1$$