

## Homework 2

### Deep Learning

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The contribution of each member was as follows:

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### Question 1

1. (a)  $z$  has dimensions  $(H-M+1)*(W-N+1)$   
(b) Matriz toda fudida  
(c)
2. procurar nos slides por single head self attention layer

### Question 2

- 1.
- 2.
- 3.
4. The convolutional network was implemented and tested for 20 epochs, using Adam tuning with the following learning rate values.

	Learning Rate		
	0.00001	0.0005	0.01
Validation Accuracy	0.9559	0.9843	0.7516

The best observed configuration was the one with a learning rate of 0.0005. The plots of the training loss and validation accuracy over the number of epochs are shown below.

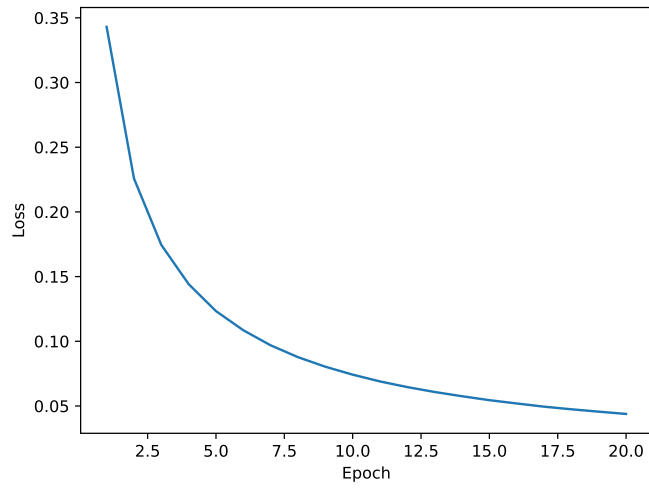


Figure 1: Training Loss over no. of epochs for  $\eta = 0.0005$

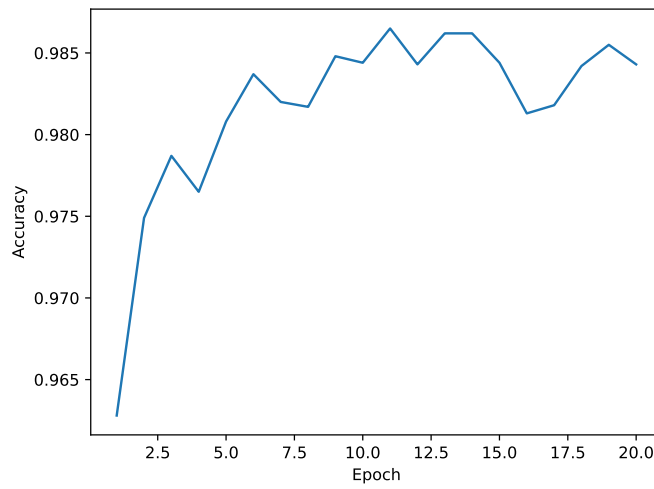


Figure 2: Validation Accuracy over no. of epochs for  $\eta = 0.0005$

## 5. The activation map

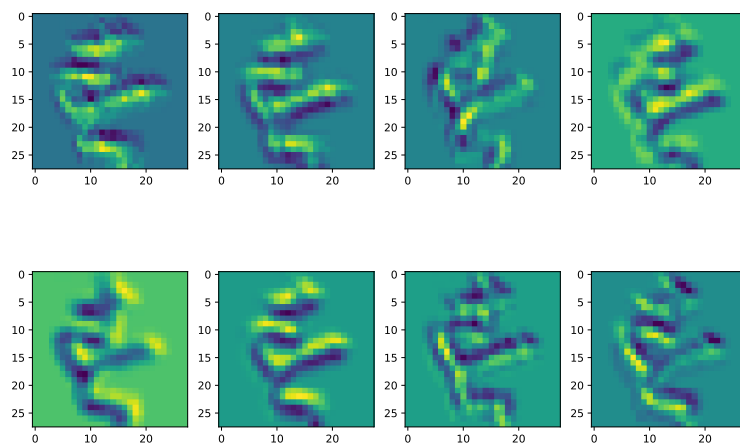


Figure 3: Activation Maps of the first convolutional layer

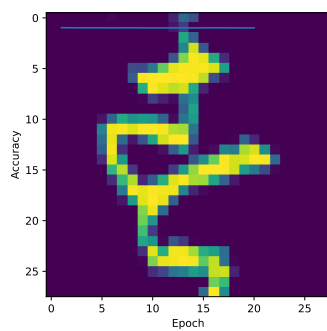


Figure 4: Original Training Image

### Question 3

1. (a)
- (b)
- (c)