Project 1

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I. DELIVERABLES

Due to constantly accidentally deleting my own trained models during debugging, without being aware of doing so, I endt up only training my GRU model for 49 epochs, reaching its highest METEOR score of 19.67 on epoch 40 and its highest BLEU-4 score of 18.5 on epoch 43. When validating the chosen image only generated a single letter, shown in figure 1.

Figure 1. Caption: a

After modifying the validate.py file to select the image with longest caption, I still endt up with only a letter long caption, as shown in figure 2. I am unsure why this happens, as I expected some gibirish at the very least, since my METOER score isn't completly bad.

In figure 3 we see the loss curve for train and validation as well as the best METEOR score on the right, both as a function of epochs. We see a steady decline in loss throughout, with it starting to slow down towards the end. There is also an anomaly in the begining where the validation loss remains stagnant and then suddenly starts to move around the same time as the METEOR score jumps up. Also the METEOR score sees a steady progression, with a much higher deviation from what appears to be a linear increase in score. This can be contributed to sets of images during certain epochs being considerably different from previous images or just difficult pictures in general.

All models were trained using the values listed in table I, except for task 4 which only had 30 epochs and task 2 which only had 49.
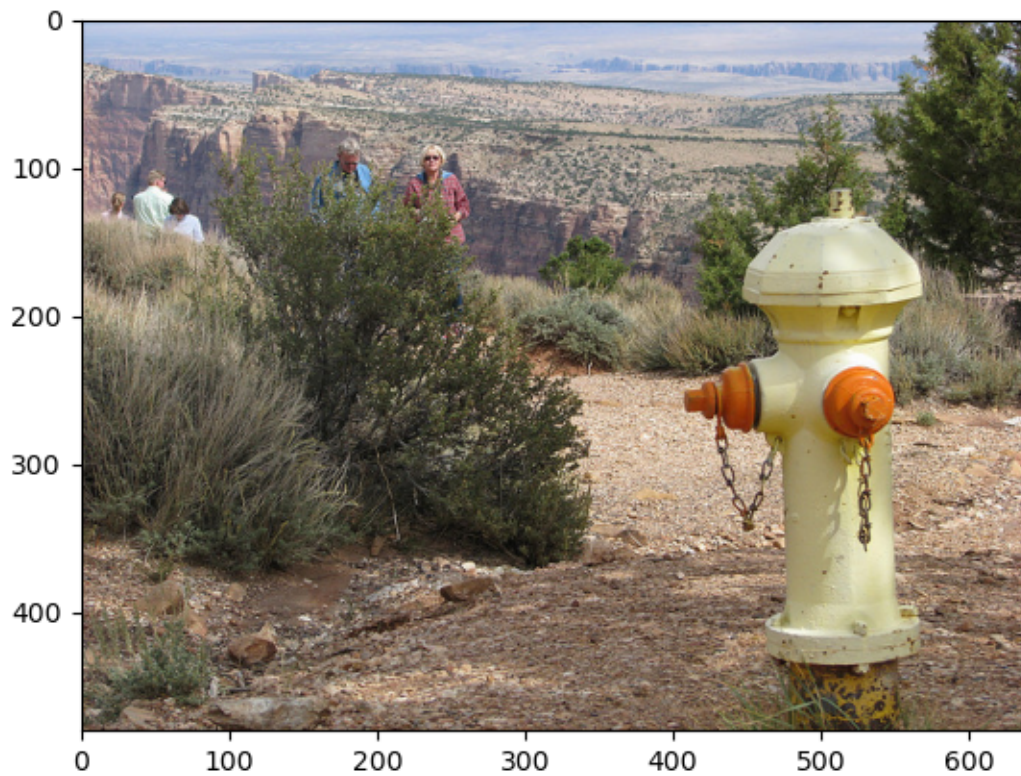
Figure 2. Caption: a

Parameter	Value
Optimizer	adamW
LearningRate	0.001
Weight decay	0.00001
Number of cnn features	2048
Embedding size	300
Vocabulary size	10000
Truncated backprop length	25
Hidden state sizes	512
Num rnn layers	2
Scheduler milestones	[75,90]
Scheduler factor	0.2
Batch size	128
Epochs	99

To run any task in particular, place the .py files in the studen_version folder and run the corresponding Exercise_Train_an_image_captioning_network_test.py file (with task 1 having no number next to it).

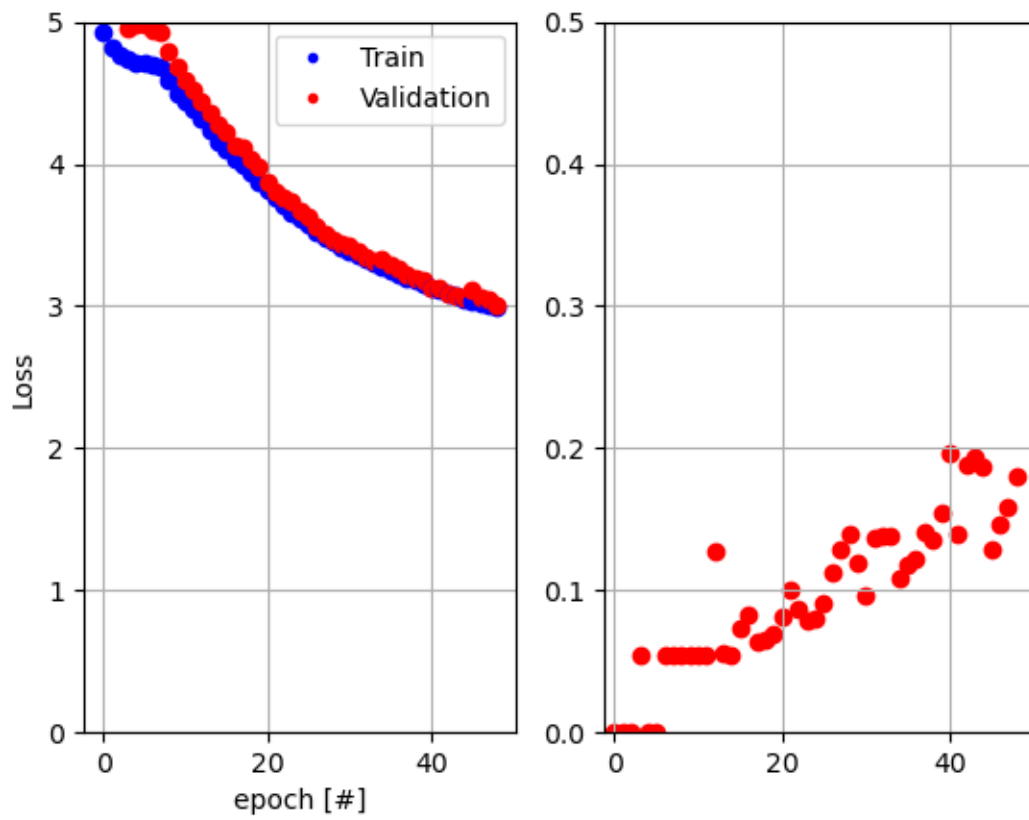Figure 3. Caption