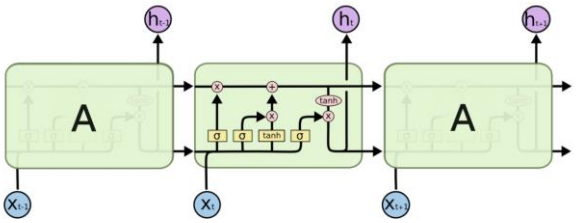
Homework IV

I. REMARK

- Describe your answer in detail for full credits!!
- The best answer will be picked, and the additional bonus point will be given for the student.

II. PROBLEM SET

1) Explain the LSTM structure and its advantage compared to standard RNN.



2) Explain why the RNN model has 4,289 trainable parameters.

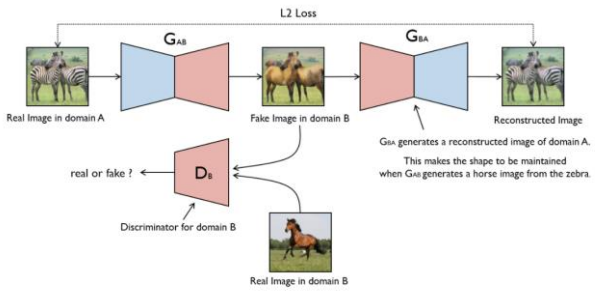
```
[ ]  from tensorflow.keras.models import Sequential
     from tensorflow.keras.layers import Dense, SimpleRNN

[ ]  model = Sequential()

     model.add(SimpleRNN(32, input_shape=(100, 100)))
     model.add(Dense(1, activation='sigmoid'))

     model.summary()
```

```
Model: "sequential"
_________________________________________________________________
Layer (type)                 Output Shape              Param #
=================================================================
simple_rnn (SimpleRNN)       (None, 32)                4256
_________________________________________________________________
dense (Dense)                (None, 1)                 33
=================================================================
Total params: 4,289
Trainable params: 4,289
Non-trainable params: 0
```

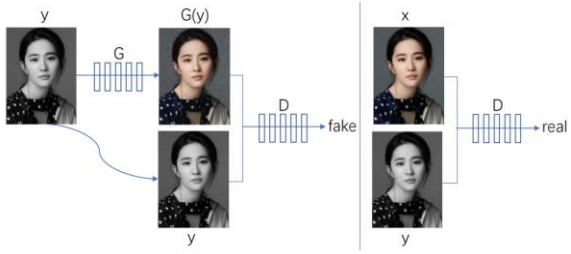
3) Explain the minmax optimization for GAN

$$\min_G \max_D V(D,G) = E_{x\sim p_{data}(x)}[\log D(x)] + E_{z\sim p_z(z)}[\log(1-D(G(z)))].$$

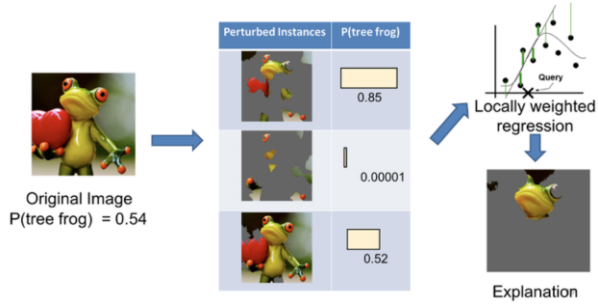
4) Explain the cycleGAN



4) The task is to generate the color image from gray image. Actually, MSE between predicted image and ground-truth image is enough for cost function. But, why GAN loss (as shown in problem 3) is additionally needed for enhancing the result?



6) Explain all LIME steps for the image application. Explain why the head part is the most important in the frog classification.



7) Compare and describe CAM and Grad-CAM