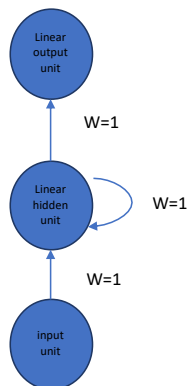**Exercise 1**

1.1 Your friend's mood dependent on the past few days as well as in the current day's weather. You've collected data for the past 365 days on the weather, which you represent as a sequence as x<1>,…,x<365>. You've also collected data on your friends's mood, which you represent as y<1>,…,y<365>. You'd like to build a model to map from x→y. Should you use a Unidirectional RNN or Bidirectional RNN for this problem?

1.2 Explain why vanishing gradients affects heavily on RNN's than in deep FNN's

Exercise 2

In this exercise we are showing several "rolled" computational graphs of RNN. For each one, you are asked to (1) draw the "unrolled" computational graphs for the input that we ask, make sure to write the values of inputs, hidden, outputs units and also weights for each time step; (2) you have to write the RNN equations and (3) you have to explain what the RNN is learning

2.1 For the following RNN, we have the following input sequence: x(t=0)=2, x(t=1)=-0.5; x(t=2)=1

2.2 For the following RNN, we have the following input sequence x(t=0)=(2,-2); x(t=1)=(0,3.5); x(t=2)=(1,2.2)
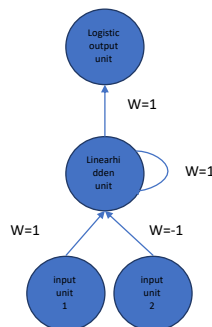
Exercise 3.

The figure shows a RNN with one input unit x, one logistic hidden unit h, and one linear output unit y. The Network parameters are Wxh=-0,1, Whh=0.5 and Why=0.25, hbias=0.4 and ybias=0.0. The input takes the values 18, 9, -8 at time steps 0,1 and 2.

y1   y2   y3

Why

Whh

h0 → h1 → h2

Wxh

x0   x1   x2

T=0   T=1   T=2
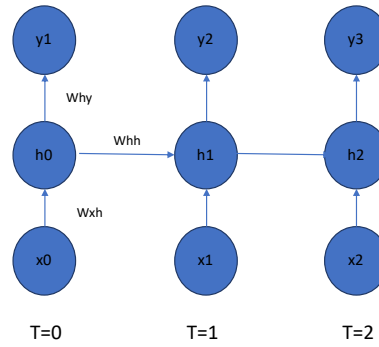
3.1-Compute the hidden value h0
3.2-Compute the output value y1
3.3-Compute the output value y2