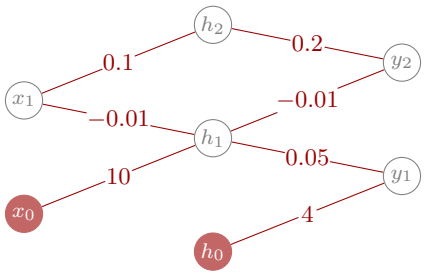
Week 8 02506
Quiz Spring 2022

Consider a classification network



with ReLU activation in the hidden layer and softmax in the last layer. We pass the input value $x_1 = 120$ through the network.

1. What is the value of y_1, i.e. the predicted probability that $x_1 = 120$ belongs to the class 1?
2. We know that $x_1 = 120$ should belong to the class 2. What is the loss for this input value? We use cross entropy loss function (with the natural logarithm).
3. We back-propagate the loss for the input $x_1 = 120$. What is the partial derivative

$$\frac{\partial L}{\partial w_{22}^{(2)}}$$

which we will need to update $w_{22}^{(2)}$? The weight $w_{22}^{(2)}$ is drawn as the edge having the value 0.2 before update.

Submit your answers in a text file with the first three lines formatted as below:

```
class_probability: 0.55
loss_value: 55
partial_derivative: 55
display_name: AndersAnd
```