Loss 损失函数

> https://towardsdatascience.com/understanding-different-loss-functions-for-neural-networks-dd1ed0274718

- 衡量神经网络的输出误差
- 损失函数对权重值的梯度，梯度用于更新神经网络的权重值；
- 不同的loss函数：
    - **Mean Squared Error (MSE)**
    - **Binary Crossentropy (BCE)**
    - **Categorical Crossentropy (CC)**
    - **Sparse Categorical Crossentropy (SCC)**

1. Mean Squared Error

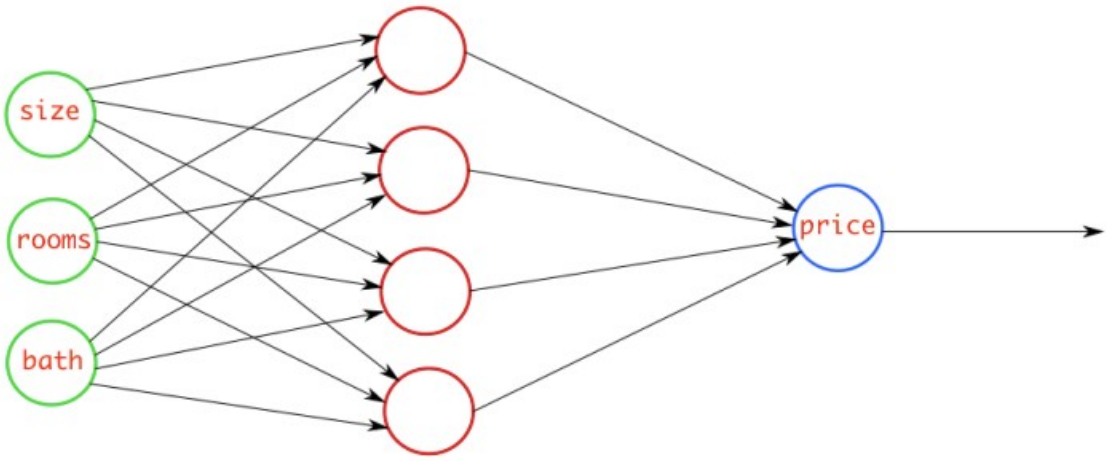
- 用于计算回归任务

CLASS `torch.nn.``MSELoss`(*size_average=None*, *reduce=None*, *reduction='mean'*)

https://pytorch.org/docs/stable/generated/torch.nn.MSELoss.html#torch.nn.MSELoss

- 预估房屋价格

For Example, we have a neural network which takes house data and predicts house price. In this case, you can use the `MSE` loss. Basically, in the case where the output is a real number, you should use this loss function.

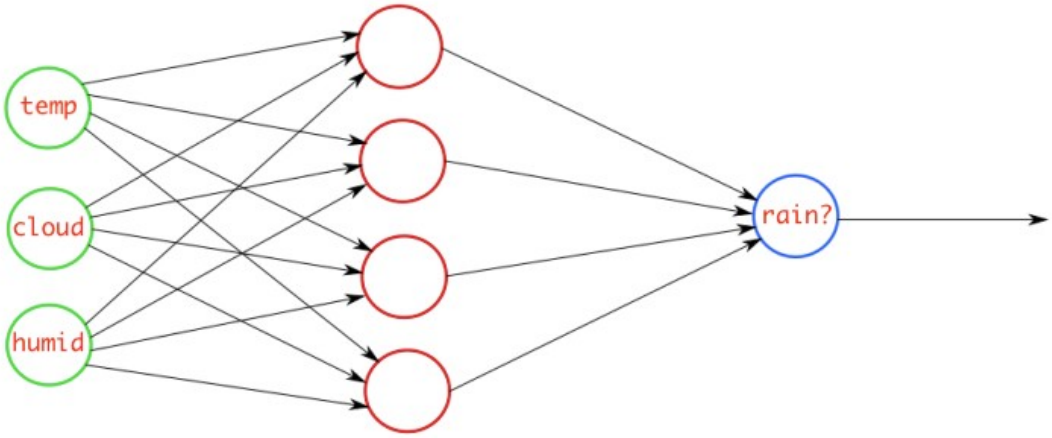


- pytorch实现

2. Binary Crossentropy

- 二分类问题
- a *sigmoid* activation function and the range of output is (0 – 1)
- 预测是否下雨

  For example, we have a neural network that takes atmosphere data and predicts whether it will rain or not. If the output is greater than 0.5, the network classifies it as `rain` and if the output is less than 0.5, the network classifies it as `not rain`. (it could be opposite depending upon how you train the network). More the probability score value, the more the chance of raining.



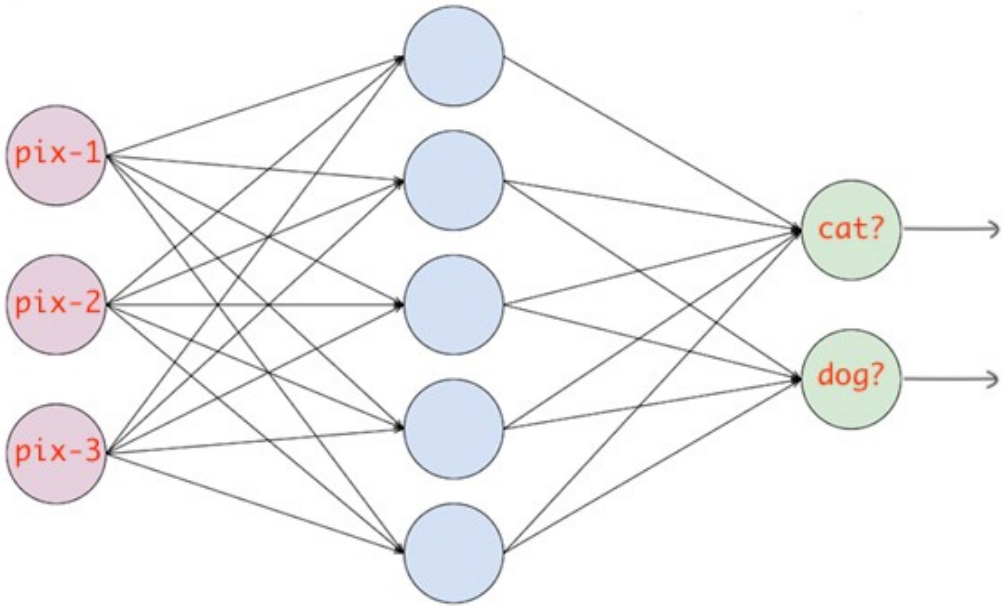
- pytorch

  https://pytorch.org/docs/stable/generated/torch.nn.BCELoss.html

3. Categorical Crossentropy

- 多分类问题
- a *softmax* activation so that each node output a probability value between (0–1)
- 图像分类

  For example, we have a neural network that takes an image and classifies it into a cat or dog. If the cat node has a high probability score then the image is classified into a cat otherwise dog. Basically, whichever class node has the highest probability score, the image is classified into that class.



- pytorch

  https://pytorch.org/docs/stable/generated/torch.nn.CrossEntropyLoss.html?highlight=crossentropy#torch.nn.CrossEntropyLoss