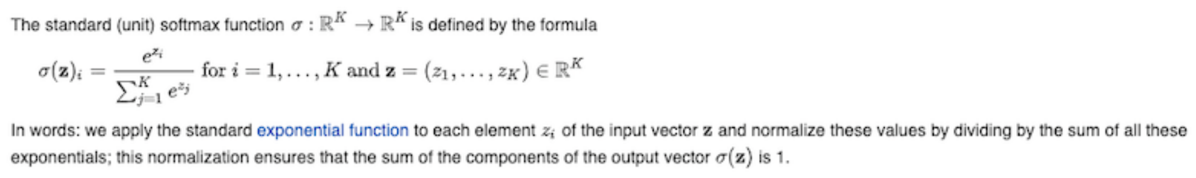
Softmax function :
===============

https://en.wikipedia.org/wiki/Softmax_function

In mathematics, the softmax function, also known as softargmax[1] or normalized exponential function,[2]:198 is a function that takes as input a vector of K real numbers, and normalizes it into a probability distribution consisting of K probabilities proportional to the exponentials of the input numbers. That is, prior to applying softmax, some vector components could be negative, or greater than one; and might not sum to 1; but after applying softmax, each component will be in the interval {\displaystyle (0,1)}(0,1), and the components will add up to 1, so that they can be interpreted as probabilities.



The standard (unit) softmax function $\sigma : \mathbb{R}^K \to \mathbb{R}^K$ is defined by the formula

$$\sigma(\mathbf{z})_i = \frac{e^{z_i}}{\sum_{j=1}^{K} e^{z_j}} \text{ for } i = 1, \dots, K \text{ and } \mathbf{z} = (z_1, \dots, z_K) \in \mathbb{R}^K$$

In words: we apply the standard exponential function to each element $z_i$ of the input vector $\mathbf{z}$ and normalize these values by dividing by the sum of all these exponentials; this normalization ensures that the sum of the components of the output vector $\sigma(\mathbf{z})$ is 1.

============================================================
==================

https://dataaspirant.com/2017/03/07/difference-between-softmax-function-and-sigmoid-function/

Softmax function calculates the probabilities distribution of the event over ‘n’ different events. In general way of saying, this function will calculate the probabilities of each target class over all possible target classes. Later the calculated probabilities will be helpful for determining the target class for the given inputs.
The main advantage of using Softmax is the output probabilities range. The range will **0 to 1**, and the sum of all the probabilities will be **equal to one**. If the softmax function used for multi-classification model it returns the probabilities of each class and the target class will have the high probability.

==========================================================
=================

```
>>> import numpy as np
>>> a = [1.0, 2.0, 3.0, 4.0, 1.0, 2.0, 3.0]
>>> np.exp(a) / np.sum(np.exp(a))
array([0.02364054, 0.06426166, 0.1746813, 0.474833, 0.02364054,
       0.06426166, 0.1746813])
```

==========================================================
=================