RNA - Atividade

Representação matemática das Funções de Ativação mais usadas

1) Criar no Google Colab o notebook: **RNA – Funções de Ativação**.ipynb

2) Importar a biblioteca matemática **numpy**.

3) Para cada função de ativação a seguir, criar:

a – uma área de texto informando em quais tipos de problemas aquela função é mais utilizada;

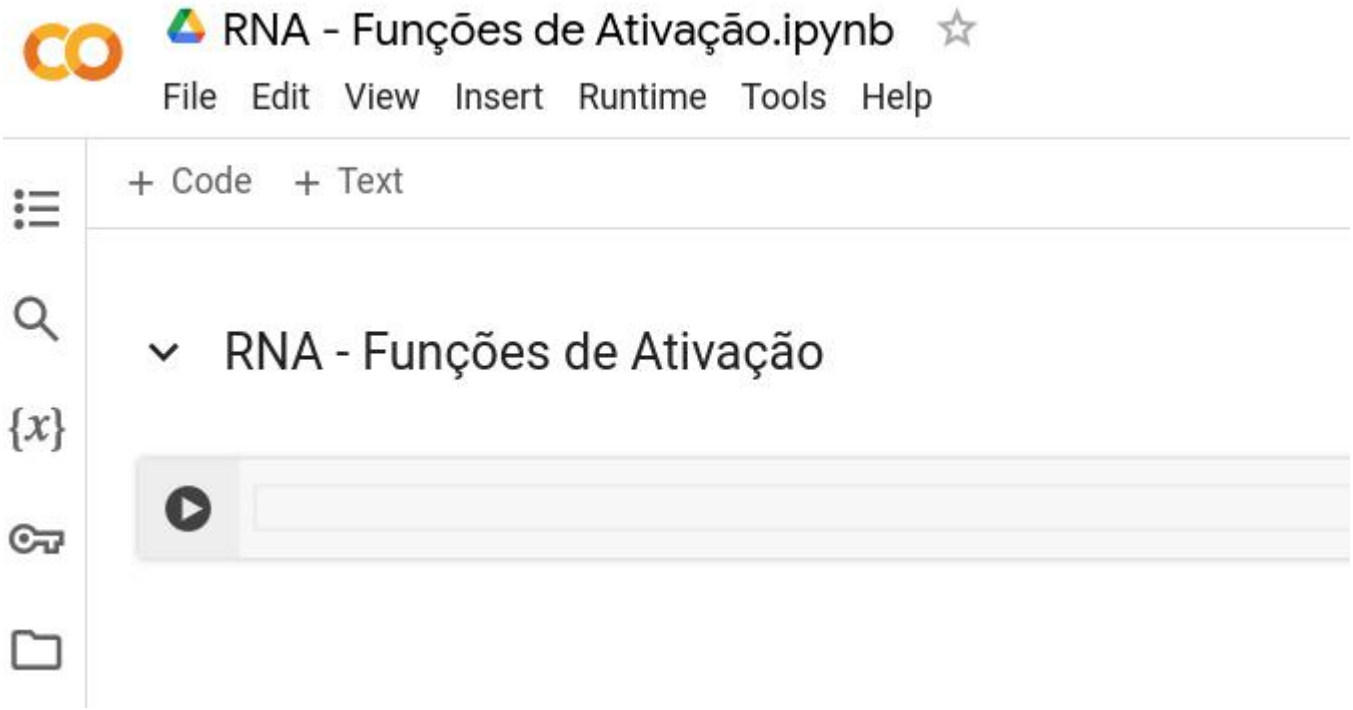
b – incluir nessa área de texto o gráfico da função (estão anexos a seguir);

c – uma célula com a representação daquela função na linguagem Python;

d – uma chamada para execução da função, com o valor do parâmetro;

e – a impressão do valor retornado pela função.

4) Enviar o link do notebook do Colab, pelo privado, até o dia 03/06.


RNA - Funções de Ativação.ipynb
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RNA - Funções de Ativação

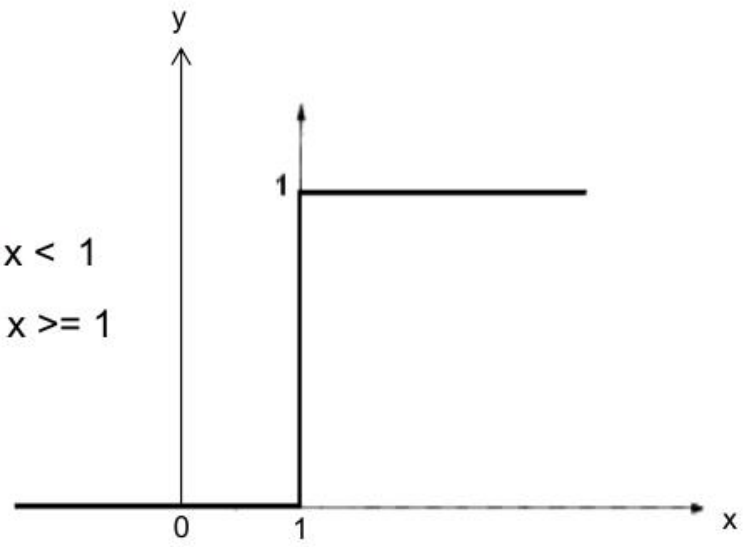
RNA - Funções de Ativação

```
# importação da biblioteca matemática
import numpy as np
```

Exemplo: função Degrau

Step - função Degrau

$$f(x) = \begin{cases} 0 \text{ if } x < 1 \\ 1 \text{ if } x >= 1 \end{cases}$$



Usada em problemas linearmente separáveis

Step - função Degrau

```
# função Degrau
def stepFunction(soma):
  if (soma >= 1):
    return 1
  return 0
```

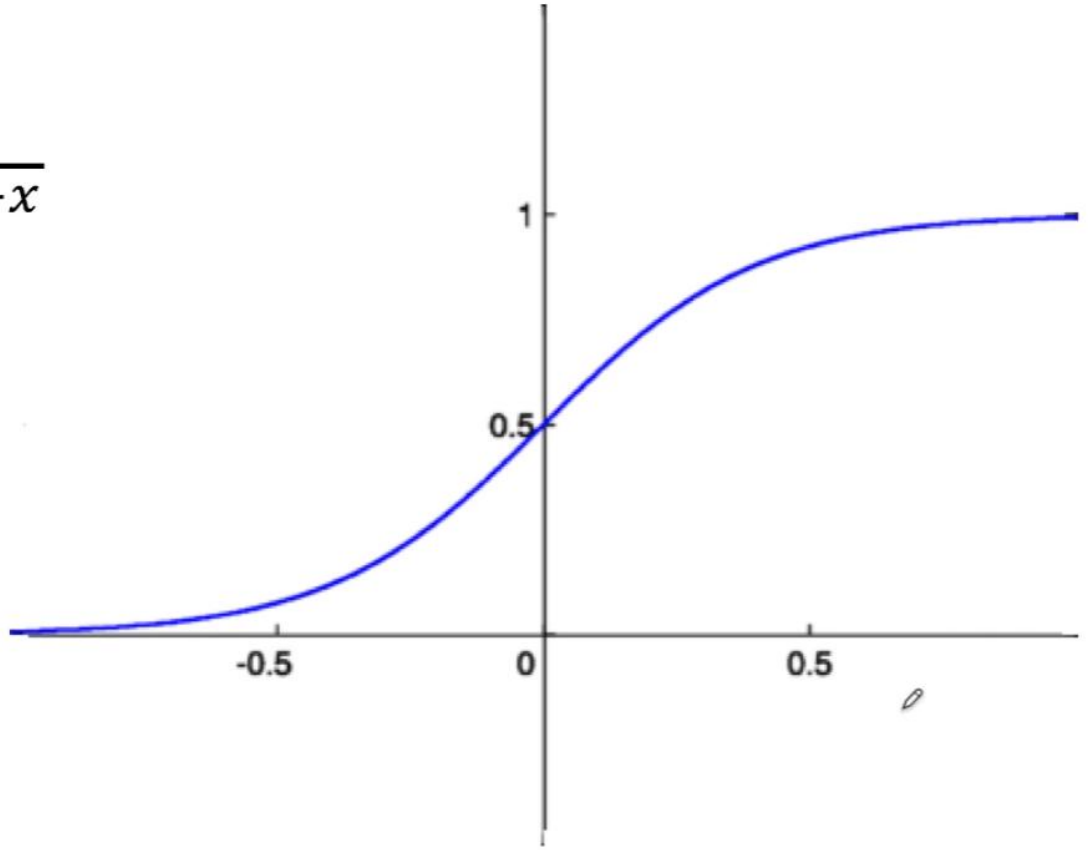
```
# chamada das funções
step = stepFunction(-1)
print(step)
```

```
0
```

Fazer para as seguintes funções de Ativação:

Sigmoid - função Sigmoide

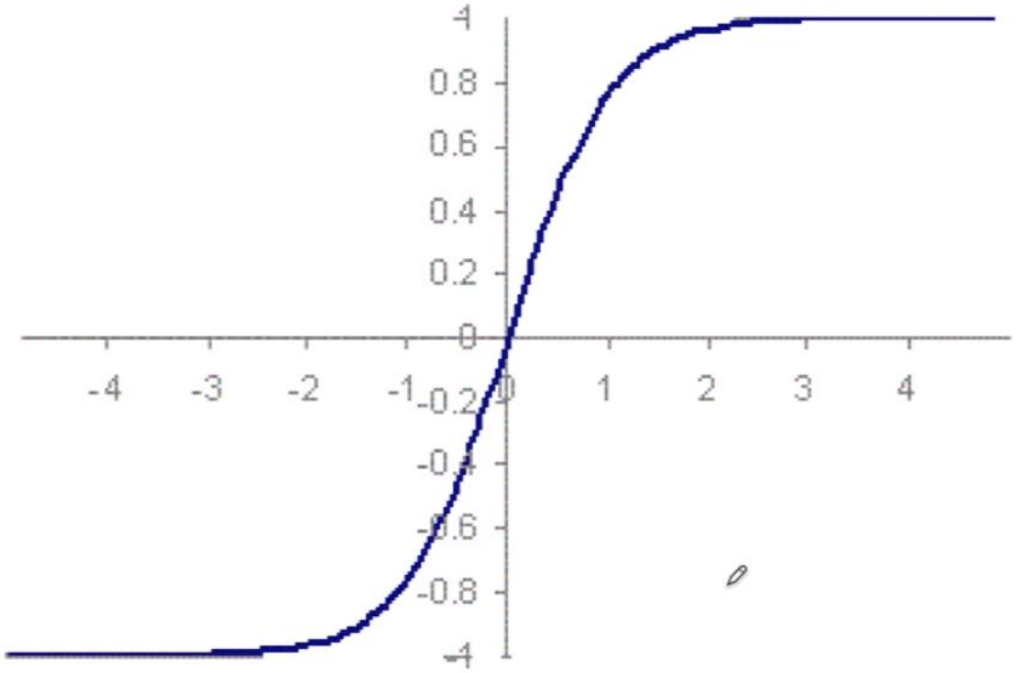
$$y = \frac{1}{1 + e^{-x}}$$



Valores entre 0 e 1

Hyperbolic tanget - função Tangente Hiperbólica

$$Y = \frac{e^{x} - e^{-x}}{e^{x} + e^{-x}}$$



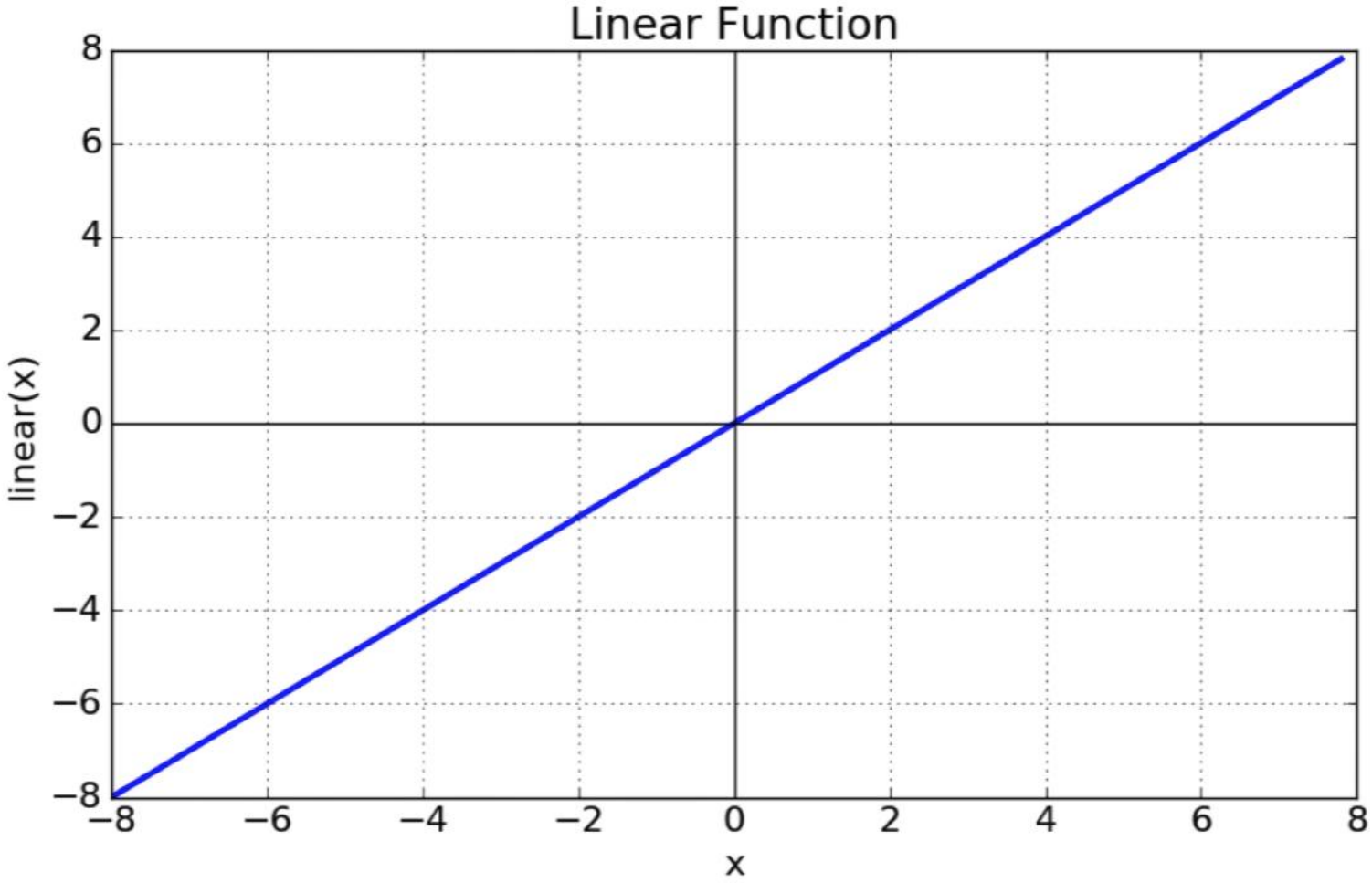
Valores entre -1 e 1

ReLU - Rectified Linear Units

$$Y = \max(0, x)$$

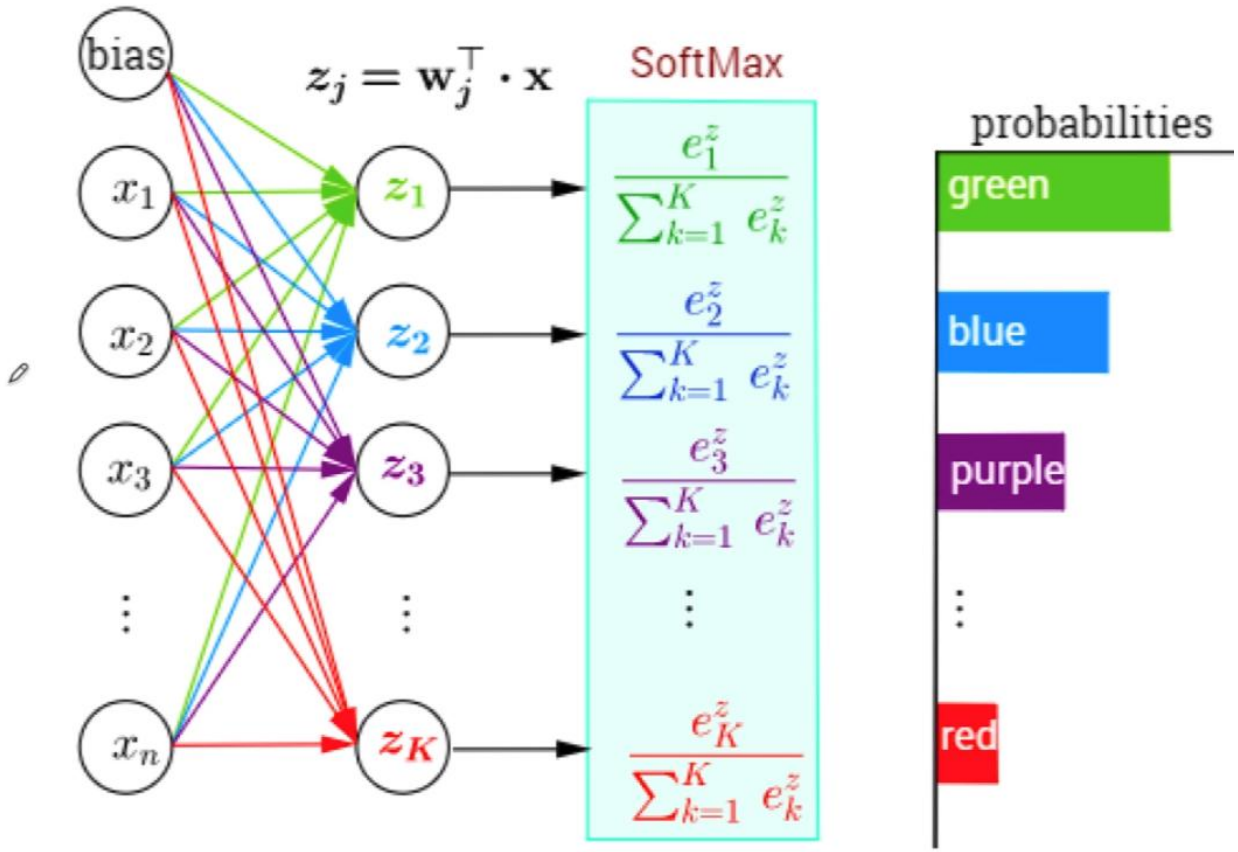
Valores >= 0 (sem valor máximo)

Linear



Softmax

$$Y = \frac{e(x)}{\sum \quad e(x)}$$



Fonte de consultas

Keras: The Python Deep Learning library

You have just found Keras.

Keras is a high-level neural networks API, written in Python and capable of running on top of TensorFlow, CNTK, or Theano. It was developed with a focus on enabling fast experimentation. *Being able to go from idea to result with the least possible delay is key to doing good research.*

Use Keras if you need a deep learning library that:

- Allows for easy and fast prototyping (through user friendliness, modularity, and extensibility).
- Supports both convolutional networks and recurrent networks, as well as combinations of the two.
- Runs seamlessly on CPU and GPU.

Read the documentation at Keras.io.

Keras is compatible with: **Python 2.7-3.6**.

Guiding principles

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Guiding principles

- **alpha**: Slope of the negative part. Defaults to zero.
- **max_value**: Maximum value for the output.

Returns

The (leaky) rectified linear unit activation: `x` if `x > 0`, `alpha * x` if `x < 0`. If `max_value` is defined, the result is truncated to this value.

---

tanh

```
tanh(x)
```

Hyperbolic tangent activation function.

---

sigmoid

```
sigmoid(x)
```

Sigmoid activation function.

---

hard_sigmoid

```
hard_sigmoid(x)
```

Hard sigmoid activation function.

Faster to compute than sigmoid activation.

Arguments

- **x**: Input tensor.