Nivelamento de programação para termodinâmica

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Parte 3: python científico

Array (`import numpy as np`)

numpy

```
import numpy as np
```

array

```
a=np.array([1.,2.,3.])
a
```

```
array([ 1.,  2.,  3.])
```

Index, slicing

```
a[0]
```

```
1.0
```

```
a[1]
```

```
2.0
```

```
a[2]
```

```
3.0
```

```
b=a[1:3]
b
```

```
array([ 12.,   3.])
```

Operações elemento-a-elemento

```
a=np.array([1,2,3])
a
```

```
array([1, 2, 3])
```

```
b=np.array([4,5,6])
b
```

```
array([4, 5, 6])
```

```
a+1
```

```
array([2, 3, 4])
```

```
a*2
```

```
array([2, 4, 6])
```

```
a+b
```

```
array([5, 7, 9])
```

```
a*b
```

```
array([ 4, 10, 18])
```

Funções matemáticas elemento-a-elemento

```
np.sin(a)
```

```
array([ 0.84147098,  0.90929743,  0.14112001])
```

arange

```
b=np.arange(0,1,.03)
b
```

```
array([ 0.  ,  0.03,  0.06,  0.09,  0.12,  0.15,  0.18,  0.21,  0.24,
        0.27,  0.3 ,  0.33,  0.36,  0.39,  0.42,  0.45,  0.48,  0.51,
        0.54,  0.57,  0.6 ,  0.63,  0.66,  0.69,  0.72,  0.75,  0.78,
        0.81,  0.84,  0.87,  0.9 ,  0.93,  0.96,  0.99])
```

linspace

```
x=np.linspace(0,10,10)
x
```

```
array([  0.        ,   1.11111111,   2.22222222,   3.33333333,
         4.44444444,   5.55555556,   6.66666667,   7.77777778,
         8.88888889,  10.        ])
```

logspace

```
c=np.logspace(1,100,10)
c
```

```
array([  1.00000000e+001,   1.00000000e+012,   1.00000000e+023,
         1.00000000e+034,   1.00000000e+045,   1.00000000e+056,
         1.00000000e+067,   1.00000000e+078,   1.00000000e+089,
         1.00000000e+100])
```

zeros

```
z=np.zeros(10)
z
```

```
array([ 0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.,  0.])
```