2.4_solutions

January 26, 2023

1 Solution

1.0.1 numpy arrays

1. Import the numpy library with the standard namespace

[2]:
```
import numpy as np
```

2. Create an array, `a`, with the numbers from 0 to 6.

[4]:
```
a = np.arange(0,7)
print(a)
print(type(a))
```

```
[0 1 2 3 4 5 6]
<class 'numpy.ndarray'>
```

3. Create another array, `b`, with all even numbers from 50 to 60 (included).

[6]:
```
b = np.arange(50, 61, 2)
print(b)
```

```
[50 52 54 56 58 60]
```

4. Create an array of length 10 with the squares of the first natural numbers, that is 1,4,9,...

[10]:
```
a=np.arange(1,11)

b =a * a
print(b)

# there are other ways of doing this
# we will see in live class
```

```
[  1   4   9  16  25  36  49  64  81 100]
```

5. Create an array of 200 elements in which the fist 100 elements are ones; and the last 100 elements are zeros

[17]:
```
a=np.ones(100)
b=np.zeros(100)
c=np.concatenate((a, b), axis=0)
```

```
print(c)

# there are other ways. We will see in live class 1
```

```
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 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
 0. 0. 0. 0. 0. 0. 0. 0.]
```

6. You have two lists of numbers that are supposed to be identical (imagine that there are thousands of elements). How could you check if the two lists are identical using numpy, and count the number of different elements if any?

[31]:
```
a = np.array([1,2,3,4,5])
b = np.array([1,2,0,4,5])  # opne different element

check = sum(a!=b) # gives number of elements that are NOT equal

equal="the lists are equal"
different="the lists are different"
s= (check>0)*different + (check==0)*equal
print ('there are',check, 'different elements')
print(s)
```

```
there are 1 different elements
the lists are different

C:\Users\victo\AppData\Local\Temp\ipykernel_11076\3252336110.py:8:
DeprecationWarning: In future, it will be an error for 'np.bool_' scalars to be
interpreted as an index
  s= (check>0)*different + (check==0)*equal
```