2347227_Lab exercise 7

September 4, 2023

[ ]:
```
import numpy as np

x = np.random.randint(0,20,size=(3, 3))
y = np.random.randint(0,20,size=(3, 3))
print(x)
print("\n",y)
p=np.prod([x,y])
print("The product is",p)

m=np.multiply(x,y)
print("The multiplication is \n",m)


d=np.dot(x,y)
print("The dot is \n",d)
```

```
[[15 16 14]
 [12 14 16]
 [14 13  6]]

 [[ 4  2 14]
 [18 18  8]
 [16 15 10]]
The product is -1879048192
The multiplication is
 [[ 60  32 196]
 [216 252 128]
 [224 195  60]]
The dot is
 [[572 528 478]
 [556 516 440]
 [386 352 360]]
```

[ ]:
```
import numpy as np

set1 = np.array([1, 2, 3, 4, 5])
set2 = np.array([3, 4, 5, 6, 7])
```

```
union = np.union1d(set1, set2)
print("Union of sets:")
print(union)

intersection = np.intersect1d(set1, set2)
print("Intersection of sets:")
print(intersection)

difference = np.setdiff1d(set1, set2)
print("Set difference of sets:")
print(difference)

xor = np.setxor1d(set1, set2)
print("XOR of sets:")
print(xor)
```

```
Union of sets:
[1 2 3 4 5 6 7]
Intersection of sets:
[3 4 5]
Set difference of sets:
[1 2]
XOR of sets:
[1 2 6 7]
```

[ ]:

```
import numpy as np

arr = np.random.randint(1, 10, 10)

print("Original array:")
print(arr)

cumsum = np.cumsum(arr)
print("Cumulative sum:")
print(cumsum)

cumprod = np.cumprod(arr)
print("Cumulative product:")
print(cumprod)

diff = np.diff(arr, n=3)
print("Discrete difference (with n=3):")
print(diff)

unique_elements = np.unique(arr)
print("Unique elements:")
print(unique_elements)
```

```
Original array:
[8 9 6 8 1 3 3 7 5 8]
Cumulative sum:
[ 8 17 23 31 32 35 38 45 50 58]
Cumulative product:
[      8      72     432    3456    3456   10368   31104  217728 1088640
 8709120]
Discrete difference (with n=3):
[  9 -14  18 -11   6 -10  11]
Unique elements:
[1 3 5 6 7 8 9]
```

[ ]:

```
import numpy as np

arr1 = np.array([1, 2, 3, 4, 5])
arr2 = np.array([6, 7, 8, 9, 10])

e = []
for i, j in zip(arr1, arr2):
  e.append(i + j)


def add_func(a, b):
  return a + b

z = np.add(arr1, arr2)
f = np.frompyfunc(add_func, 2, 1)(arr1, arr2)

print("Addition using zip():")
print(e)
print("Addition using add:")
print(z)
print("Addition using user defined function:")
print(f)
```

```
Addition using zip():
[7, 9, 11, 13, 15]
Addition using add:
[ 7  9 11 13 15]
Addition using user defined function:
[7 9 11 13 15]
```

[ ]:

```
import numpy as np

arr = np.array([10, 20, 30, 40, 50])

x = np.lcm.reduce(arr)
g = np.gcd.reduce(arr)
```

```

print("The LCM of the array elements is:", x)
print("The GCD of the array elements is:", g)
```

```
The LCM of the array elements is: 600
The GCD of the array elements is: 10
```