Juan Manuel Moreno

**Pill Numpy**

Línea horizontal

FECHA

Introduction

In this pill you’re going to solve some exercises about numpy

What are the main objectives in this project?

* Know how to create numpy arrays
* Filter array values
* Use the principal statistical functions of arrays to solve problems.
* How to use the numpy array attributes

1. General analysis

**Exercise 1**

We work for a store that has give to us the following table with the sales of different products

| Day | Bananas (quantity) | Apples (quantity) | Oranges (quantity) | Total amount |
| --- | --- | --- | --- | --- |
| Monday | 5 | 32 | 16 | ? |
| Tuesday | 8 | 25 | 14 | ? |
| Wednesday | 12 | 15 | 15 | ? |
| Thursday | 6 | 36 | 20 | ? |
| Friday | 9 | 45 | 21 | ? |
| Saturday | 4 | 22 | 25 | ? |
| Sunday | 7 | 17 | 10 | ? |

We don’t have the benefits of the store but, they give to us another table that shows the unit price for each vegetable.

| Banana | 5 |
| --- | --- |
| Apple | 3 |
| Orange | 2 |

With this, two tables try to obtain the following insights about the data:

* Get the total amount of the store multiplying each element with their own price.
* Get the total of benefits
* Get the total by each vegetable.
* Get the mean of units sold by vegetable.
* Get the mean of units sold by day.

**Exercise 2**

Generate an array of 4 rows with the following restrictions:

* The first row must contains the numbers 6, 55, 12, 32, 20, 15
* The elements of the second row must be the first row \*2
* The elements of the third row must be the second row -5
* The elements of the fourth row must be the square of the third row

After generate the array, filter it by only pair values

**Exercise 3**

Solve the following system of linear equations

x + (-7y) -z = 5

2x +y +6z = 12

-x +2y -z = 6

Linear matrix equation are solved by the function linalg, find the correct function to solve the problem <https://numpy.org/doc/stable/reference/routines.linalg.html>

**Exercise 4**

* Create a 1-dimensional NumPy array using np.array(), check the number of dimensions with ndim
* Create a 2-dimensional NumPy array using np.array(), check the number of dimensions with ndim
* Create a 3-dimensional Numpy array using np.array(), check the number of dimensions with ndim
* Create an array of shape (7, 2, 3) of only zeros
* Create an array within a range of 0 and 100 with step 3
* Explore the random functions and create the following arrays
  + Create a random array with numbers between 0 and 10 of size (7, 2)
  + Create an array of normally distributed random numbers
  + Create an array of 20 numbers of a Beta distribution with parameters 0.2 and 0.5
  + Create an array of 100 numbers of a Binomial distribution with parameters 0.5
  + Create a matrix of 3x3x3 with np.random.random

2. Project organization

You can use markdown or text comments to document the exercise.

3. Requirements

* You can do the exercise in whatever software that suppor notebook like VS code, jupyter notebook, jupyter lab, Databricks, google Colab, etc.

4. Development

All the development should be made by numpy functions in Python

5. Deliverables

* A jupyter notebook file with the 4 exercises.

6. Resources

* Random functions <https://numpy.org/doc/1.16/reference/routines.random.html>
* Linalg functions <https://numpy.org/doc/stable/reference/routines.linalg.html>