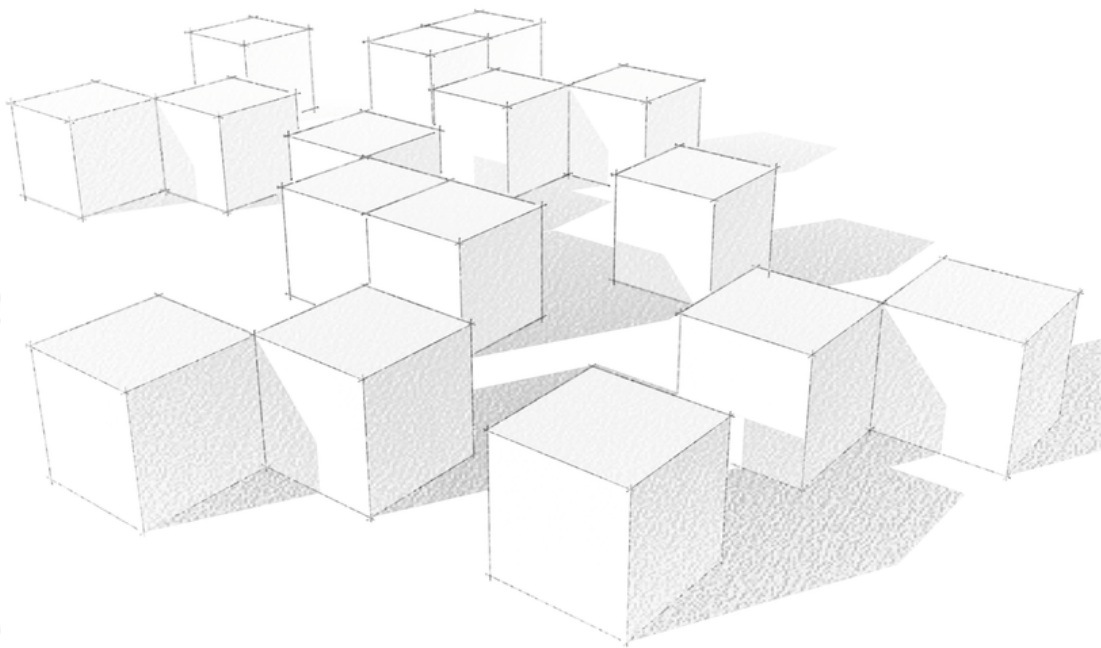# DA/AB

Fake Piscine

Week 2

"I mean, nobody wants to admit they ate nine cans of ravioli, but I did. I'm ashamed of myself. The first can doesn't count, then you get to the second and third, fourth and fifth I think I burnt with the blowtorch, and then I just kept eatin'."

INSTRUCTIONS

This week we will look at the basics of NumPy, a powerful python library, adding support for large, multi-dimensional arrays and matrices, along with a large collection of high-level mathematical functions to operate on these arrays. You will also be briefly introducted to matplotlib, a comprehensive library for creating static, animated, and interactive visualizations in Python.

First, go to Google Colab (colab.research.google.com) and create a new block notes. Here you will write and run the exercises of this project. Once you're done, just share the project with gscala(on discord or slack).

week2.ipynb

Part 1

```
import numpy as np
```

1. Create an array of ten zeros

2. Create an array of ten ones

3. Create an array of integers from 10 to 50

4. Create array of all the even integers from 10 to 50

5. Create a 3x3 identity matrix

6. Generate a random number between 0 and 1

7. Create the following matrix:

```
array([0. , 0.11111111, 0.22222222, 0.33333333, 0.44444444, 0.55555555,
       0.66666667, 0.77777778, 0.88888889, 1. ])
```

Part 2

```
import matplotlib.pyplot as plt
```

1. Create a matrix of random values of distribution of your choice
2. Create a 1-dimensional array of 12 sequential numbers and convert it to a 4x3 array.
3. Write a function that creates an incremental array of dimension (1,n) with values between 0 and 1. Use arr.shape to verify.
4. Generate a 10x12 array and extract row 0-4 of columns 8-12.
5. Using the function in Q3, get m vectors and bind them together (to have a m x n) matrix. Plot the matrix with matplotlib's imshow.
6. Multiply the resulting matrix from Q5 with the matrix of a picture of your choice. Plot the resulting matrix.

BONUS

image_filter

Filters. Image editing / processing is done by changing the values of the matrix (pixel by pixel). In this section you will code FOUR (non-grayscale) commonly used image filters. You can use libraries and approaches of your choice. Example:

Filters to choose from: • Amaro • Mayfair • Rise • Hudson • Valencia • X-Pro II • Nashville • Lo-Fi • Sierra • Earlybird • Sutro • Toaster

NEUROBONUS

neural

Implement a "simple" neural network from scratch using NumPy. Explain your project and comment every step of your code (max 30 words per step). Look at the internet for tutorials.