



Piscine Pro AI / Machine Learning

Neural network model without library

Summary: In this Module, you will learn about neural network model without library.

Version: 1.1

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Chapter I

Introduction

Greetings!



If you haven't already done so, read `en.toolkit.pdf`.

In this module, we'll dive into the world of neural networks without relying on external libraries. We'll explore the core concepts of building neural networks from scratch, gaining insights into their fundamental components, data preprocessing, forward and backward propagation, and optimization techniques.

By taking this hands-on approach, you'll not only develop a deeper understanding of neural networks but also enhance your ability to comprehend and work with neural network libraries and frameworks.

Let's begin this exciting journey into the inner workings of neural networks.

Wishing you success in your learning journey.

Chapter II


General Instructions

Unless explicitly stated otherwise, the following rules apply every day of this Piscine Pro.

- Assignments must be completed in the specified order. Subsequent assignments will only be assessed if all previous ones have been correctly completed.
- Your assignments will be reviewed by your peers.
- You must not include any files in your submission other than those explicitly requested by the assignments.
- If you have a question, ask your left neighbor first. If that doesn't help, try your right neighbor.
- Any technical information you may need can be found on the Internet.

Chapter III


Exercise 00

	Exercise 00
Data exploration	
Turn-in directory: <i>ex00/</i>	
Files to turn in: Medium02.ipynb	
Allowed functions: numpy	

For this first exercise, you'll need to load the data into colab and do some data exploration, i.e. you'll need to understand your data.

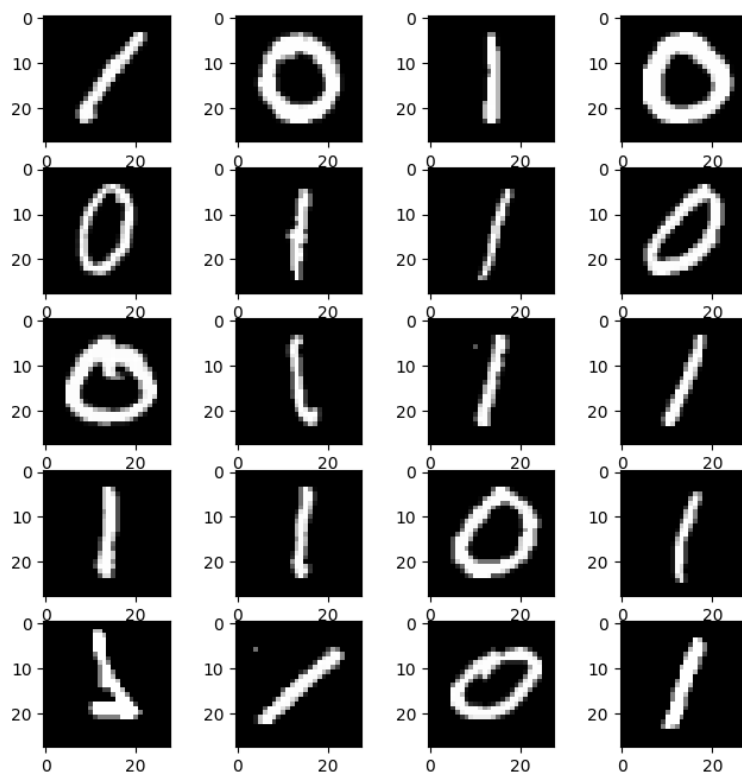
Chapter IV

Exercise 01

	Exercise 01
Data Visualisation	
Turn-in directory: <i>ex01/</i>	
Files to turn in: Advanced00.ipynb	
Allowed functions: numpy, matplotlib	


In this exercise, you need to display your data in a numpy matrix as an image.

You should have something like this:



Chapter V


Exercise 02

	Exercise 03
Models	
Turn-in directory: <i>ex03/</i>	
Files to turn in: Advanced00.ipynb	
Allowed functions: numpy, matplotlib	

Follow the ipynb document, to build your neural network, don't hesitate to do some research on the Internet to understand how it works and find the mathematical formulas.

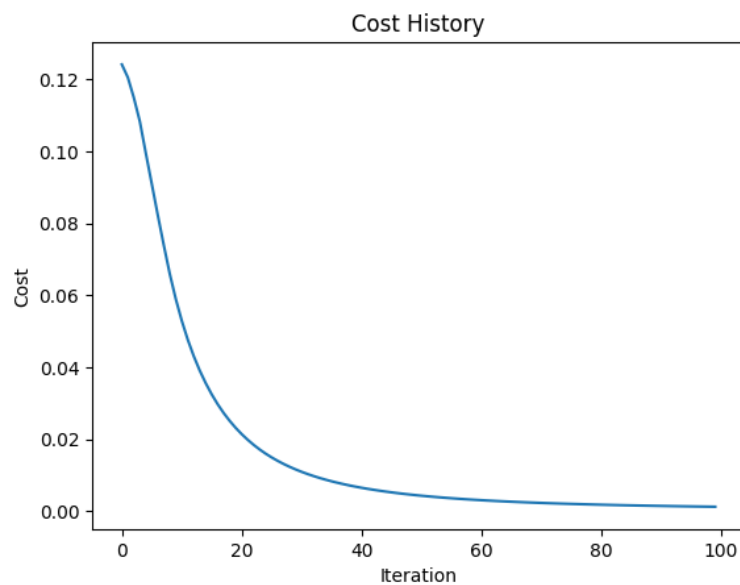
Chapter VI

Exercise 03

	Exercise 03
Results	
Turn-in directory: <i>ex03/</i>	
Files to turn in: Advanced00.ipynb	
Allowed functions: numpy, matplotlib	


You have to display the return of your cost function to get an idea of how it evolves over the iterations.

You should have something like this:



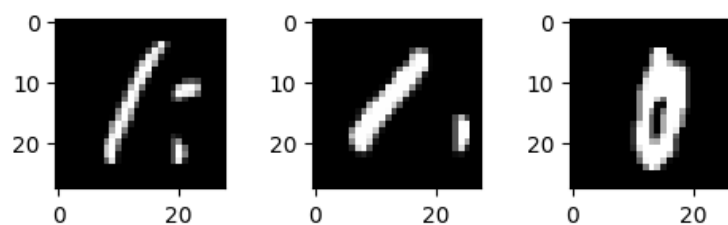
Chapter VII

Exercise 04

	Exercise 04
Predict	
Turn-in directory: <i>ex04/</i>	
Files to turn in: Advanced00.ipynb	
Allowed functions: numpy, matplotlib	

if you've made it this far, congratulations on being able to make predictions about your images, go back to exercise number 1 and display the images that are incorrectly classified.

You should have something like this:



Chapter VIII

Submission and peer-evaluation

- Create a `professional_training_advanced` folder at the root of your home, and move around in it.
- Create a new `module00` folder and navigate to it.