



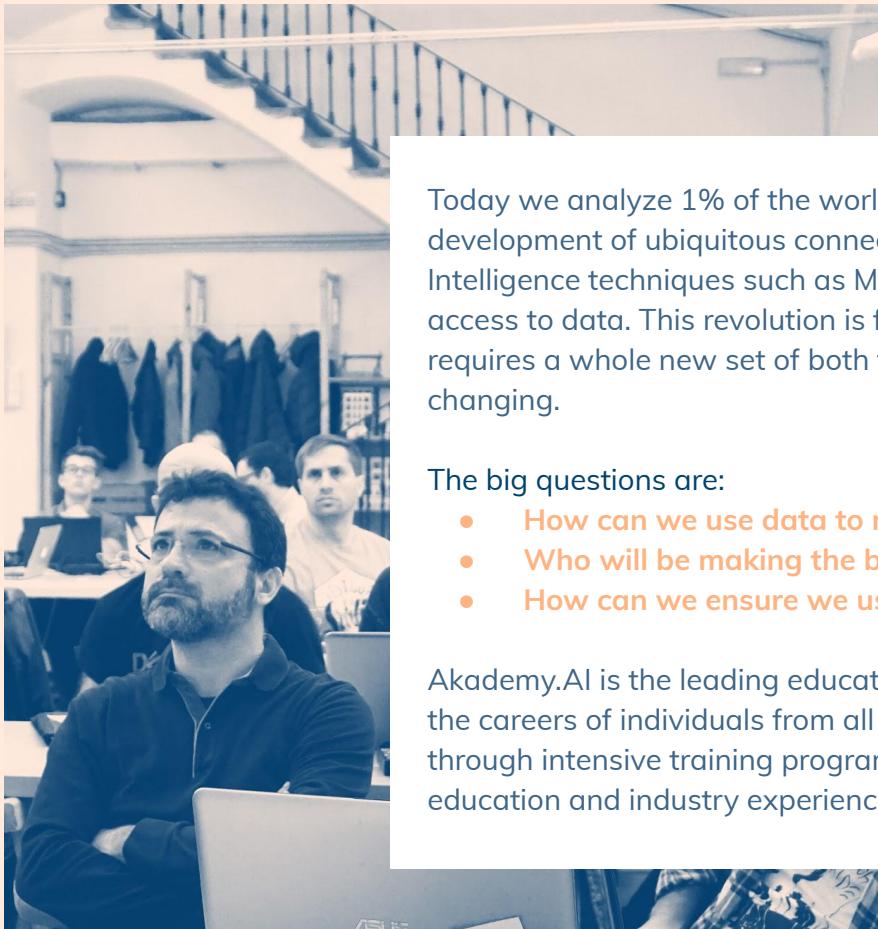
AI Engineer Bootcamp

Intensive Python Course (35h)

Welcome!



akademy.AI



About akademy.AI

Today we analyze 1% of the world's data. However the growth of computing power, the development of ubiquitous connectivity, as well the phenomenal progress of Artificial Intelligence techniques such as Machine Learning and Deep learning is opening unprecedented access to data. This revolution is fundamentally transforming society and the way we work and requires a whole new set of both technical and soft skills to understand how the world is changing.

The big questions are:

- **How can we use data to make better decisions in business and technology?**
- **Who will be making the biggest impact in science, industry and technology?**
- **How can we ensure we use data and technology in a responsible and ethical way?**

Akademy.AI is the leading education hub for Artificial Intelligence. We accelerate and transform the careers of individuals from all background by helping them master Artificial Intelligence through intensive training programs, taught by vetted professionals with years of both education and industry experience.

*Knowledge in Python required. At least four hours coding daily during the bootcamp.

Our learning methodology



Learn by doing

70% practical, 30% theory. The AI scientist mindset is forged by combining indispensable theoretical knowledge with the building of open-source projects. All students implement and test end-to-end AI projects based on real applications, based on their interest or field of expertise.



Pair-Programming

The key to the success of our courses is both our world class instructors and our motivated fellows and their ability to help each other. We match instructors and fellows according to their goals and ensure that they work together to push their projects beyond their comfort zone.



Intensive focus

In a world of distractions, we provide the right environment and incentives so our fellows can focus on learning and coding AI during intense and highly actionable work sessions, with meaningful projects being achieved as outcomes.

Curriculum overview

7 weeks

Python Overview (35 hours)

Data Science Fundamentals: Python Libraries, Probability & Statistics (80 hours)

Statistical & Machine Learning (60 hours)

Deep Learning (50 hours)

AI case study 1: **Smart Cities by Ramon Gras** (30 hours)

AI case study 2a: **NLP Module** (30 hours)

AI case study 2b: **Autonomous Driving Cars, by Aleksandar Jevtić** (30 hours)

3 weeks

Building and deploying large-scale AI systems (20 hours)

Capstone Project,

- Dataset selection
- Pipeline preparation
- Model Improvement and presentation (100 hours)

400 hours in Total

Outcome

Throughout the duration of the course, we make sure you also acquire the skills necessary to find your dream AI engineering role:

- Public presentation of your projects
- Mock interviews
- Peer review of your CV as well as linkedin and github profile

In addition, we have developed an extensive network among leading technology companies and startups, which are keen to meet and appoint new AI talent.

Our alumni have gone on to work in data science and AI roles in companies such as:



HARVARD
UNIVERSITY

Kernel
analytics



Intro to Python

One of the most fundamental steps of AI is learning the right language for it. Python has been the most used over R and C++ due to its simple syntax and inter-package cooperation & availability.

Python

- Syntax
- Functions
- Conditionals
- Strings
- Lists
- Dictionaries
- Loops
- External Libraries

Numpy

- Why use Numpy
- Accessing, Deleting, inserting...
- Slicing ndarrays
- Boolean and Arithmetic operations
- Numpy mini-project

Pandas

- Why use Pandas
- Creating pandas
- Series & Acces/Del
- Pandas dataframe
- Accessing elements in pandas df
- Nan & lead data to DF
- Panda mini-project

Anaconda and Jupyter Notebooks

- What is Anaconda
- Installing Anaconda
- Managing packages and environments
- Launching a Notebook server
- Best practices

Our teachers



Alessia Mondolo

Intro to Python & Statistics

IT Innovation Executive at Puig

Board of European Students in Technology

Master in Artificial Intelligence



Jan Carbonell

Machine & Deep Learning

Master in Artificial Intelligence

Self-taught developer

Founder of Akademy.ai, Saturdays.ai and bcn.ai



Uxue Lonzcano (tentative)

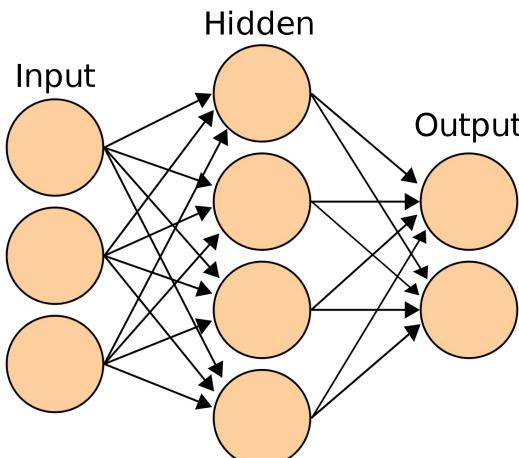
AI in Health

Data Scientist at AQuAS

Data Scientist at Hospital del Mar (IMIM)

Master in Bioinformatics

My Hidden Layers



CAREER CHOICES

```
31     self.file = None
32     self.fingerprints = set()
33     self.logdups = True
34     self.debug = debug
35     self.logger = logging.getLogger(__name__)
36     if path:
37         self.file = open(os.path.join(path, 'fingerprints'), 'a+')
38         self.file.seek(0)
39         self.fingerprints.update(a.rstrip() for a in self.file)
40
41     @classmethod
42     def from_settings(cls, settings):
43         debug = settings.getbool('WURFL_DEBUG')
44         return cls(job_dir(settings), debug)
45
46     def request_seen(self, request):
47         fp = self.request_fingerprint(request)
48         if fp in self.fingerprints:
49             return True
50         self.fingerprints.add(fp)
51         self.file.write(fp + os.linesep)
52
53     def request_fingerprint(self, request):
54         return request_fingerprint(request)
```



LISTENING

I was lucky that some people were willing to help me beyond what it was expected of them

SHORTEST PATH?

Avoid highways and shortcuts.
Make your own way.

MY DREAM

Using technology to have a positive
impact in our society

A black and white photograph of a group of runners in a marathon. In the foreground, two male runners are prominent. The runner on the left is wearing a black Under Armour shirt and shorts, with the number 50493 on his bib. He is making a peace sign with his right hand. The runner on the right is wearing a dark shirt with a red and black graphic and the number 40512 on his bib. He has his right arm raised high in the air. They are running on a paved road with a metal guardrail on the left. Other runners are visible in the background under a hazy sky.

ATTITUDE > SKILLS

You set your own limitations
Anything can be learned



WORK IN SILENCE

Ignore the noise, focus on achieving results
Don't compare yourself to others

TEAM > GOING SOLO

Surround yourself with people
that are better than you

BE PERSEVERANT

A photograph of a person climbing a rocky mountain. The climber is wearing a helmet and a harness, and is attached to a yellow safety rope. The mountain is rugged and rocky, with other peaks visible in the background under a clear sky.

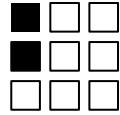
Hard work beats talent
when talent doesn't work hard



/ Intro

Introduction to the AI program, the experts and the working methodology.

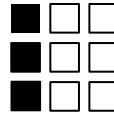
Discussing the framework for the following weeks.



/ Coding w/ Python

- **How far have you gotten with Python?**
 - Lists and Dictionaries?
 - Loops and Recursion?
 - Executing .py programs (imports)?
 - Object Oriented Programming?
- Python is essential for AI
- **What things would you like to view in + detail?**

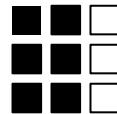




/ Python Module

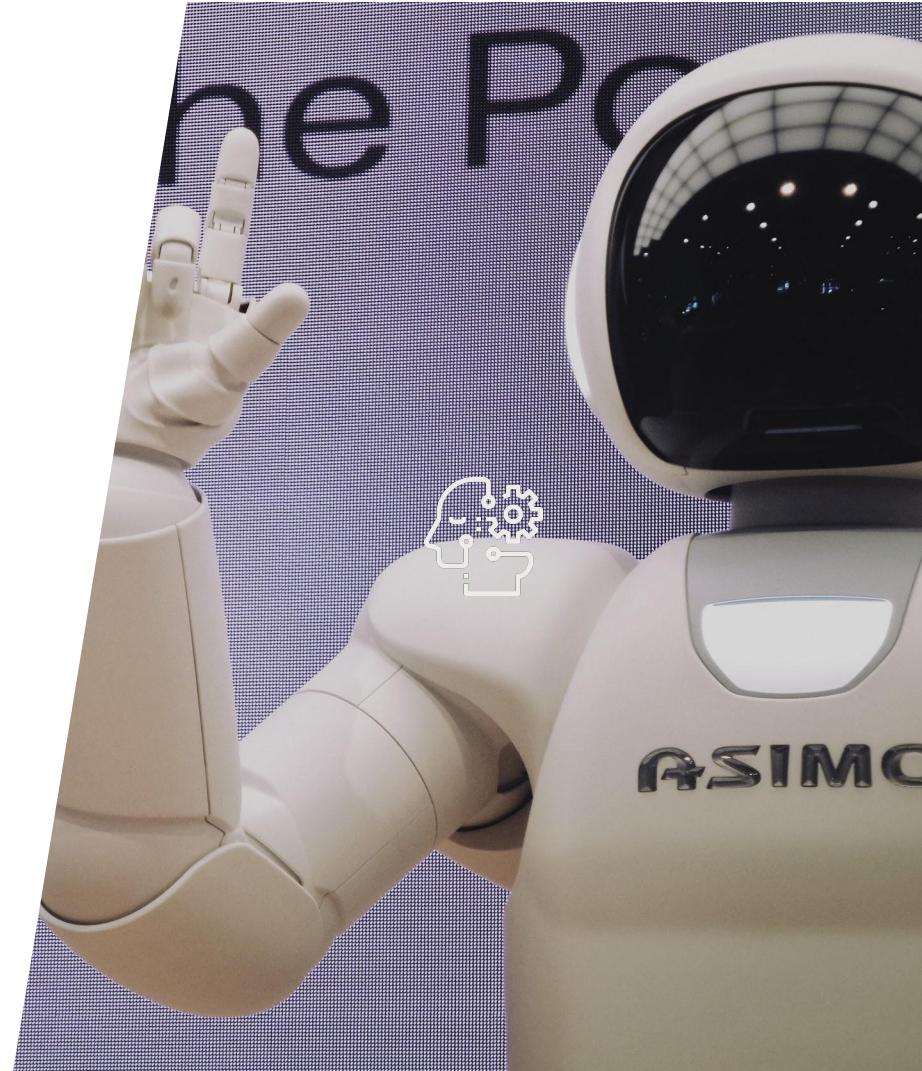
- **Introduction to Python**
 - Syntax and functions
 - Booleans and conditionals
 - Lists, strings and dictionaries
 - For, while loops
 - The <import> power of Python
- **Numpy**
- **Pandas**
- **Matplotlib and visualization**
- **Anaconda and Jupyter Notebooks**
- **Linear Algebra & Statistics**

```
self.file = None
self.fingerprints = set()
self.logdups = True
self.debug = debug
self.logger = logging.getLogger(__name__)
if path:
    self.file = open(os.path.join(path, 'fingerprint.log'), 'w')
    self.file.seek(0)
    self.fingerprints.update(fp for fp in self.read())
@classmethod
def from_settings(cls, settings):
    debug = settings.getbool('debug', False)
    return cls(job_dir(settings), debug=debug)
def request_seen(self, request):
    fp = self.request_fingerprint(request)
    if fp in self.fingerprints:
        return True
    self.fingerprints.add(fp)
    if self.file:
        self.file.write(fp + os.linesep)
def request_fingerprint(self, request):
    return request_seen(self, request)
```



/ Machine Learning

- **Math +1 if needed**
- **Intro to machine learning**
- **Launching our first Neural Network**



RULES DISCUSSION



I will not ask dumb questions

ASK (ALL) QUESTIONS



GIVE FEEDBACK



akademy.AI

LEARN!



But first... what about you?

- What is your name?
- What is your background?
- Why do you want to learn AI?
- What do you like to do on the weekends?
- Interesting fact about you
- What is your ideal job?



Let's play random slides

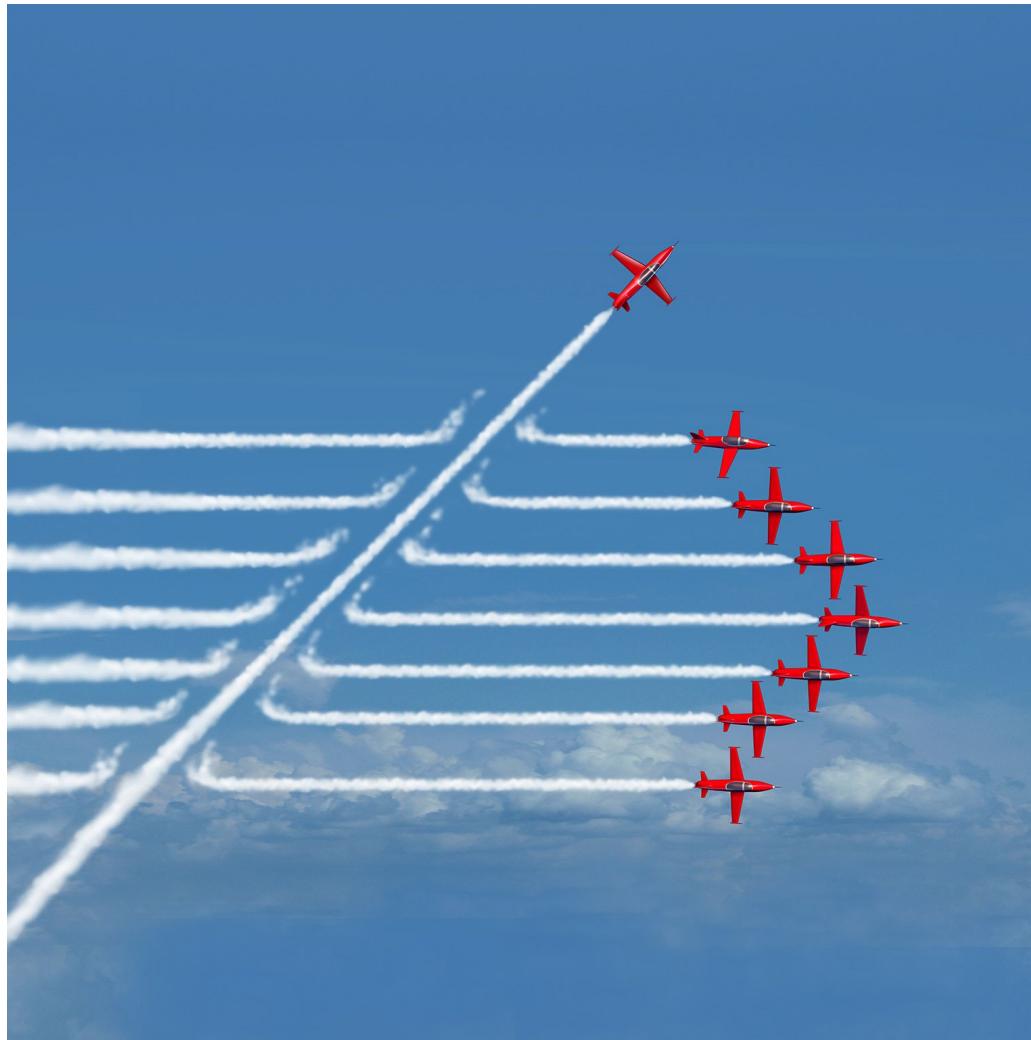








**WELL
DONE!**









**WELL
DONE!**



amer_daboul







**WELL
DONE!**

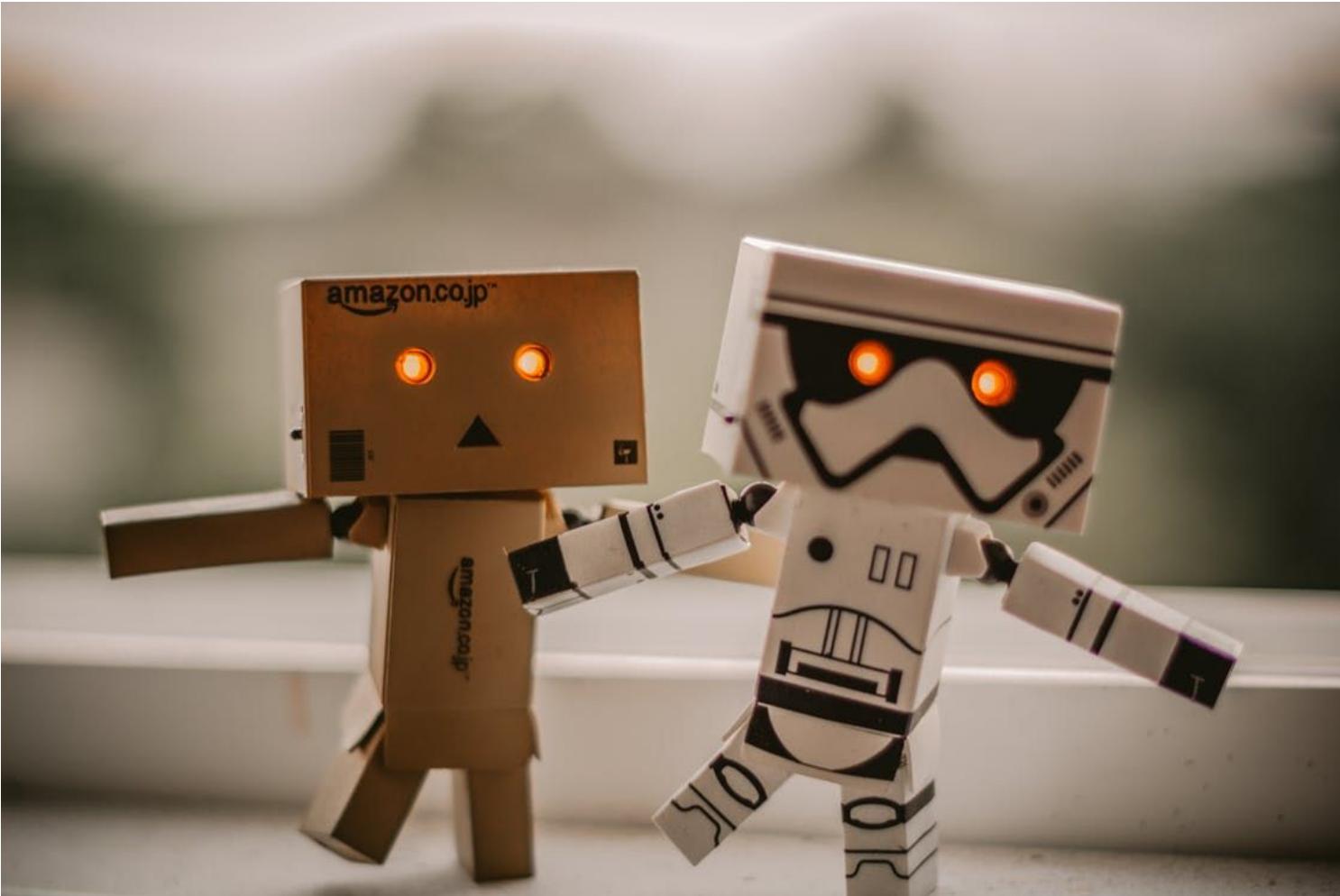








**WELL
DONE!**



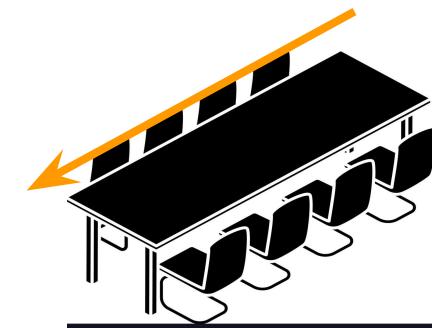






**WELL
DONE!**

Speed Meeting: 3 minutes each



Ready?



Agenda

- Context talk
- Technical requirements
- Sublime Text
- PyCharm
- Anaconda
- Jupyter Notebook
- Google Collab
- Github



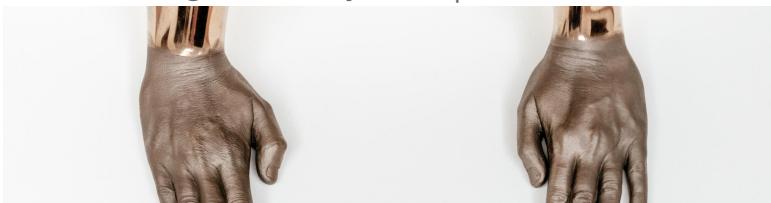
**Skip or
play
videos?**

Day to day

Lesson: We will cover the main theme of the session and the necessary resources. You can follow the course at your own rhythm. We strongly encourage teaming up in groups.



Exercises: You will complete the daily challenges based on what was explained in the lecture and whatever useful resource you can find online. The goal is for you to practice how to do this as your job.



Facilitators: Our role is to help you understand the exercises and to bounce back on potential ideas if you are stuck. We won't do the exercises for you.



Review: We will correct the exercises -which you should have finished during the day-. Most of the times, we'll bring you to the atrium to showcase your solution and work on what everyone else has done.



Preparing between sessions: No need to do extra work as you will have very little time. However, we will work on the basis that previous concepts have been well absorbed. Make sure to study them if you are not fully confident with them.

Slack as a resource

The screenshot shows a Slack interface. On the left is a sidebar with a dark purple background containing a list of channels and other sections like 'Threads' and 'Starred'. The main area has a light blue header with the channel name '#general'. Below the header, there's a message from Miguel at 5:22 PM: 'Summer reading! Recommended list of books/ presentations on tech and ethics: <https://docs.google.com/document/d/1bJepkrifNA75XaFe-WFFP1EVvetrg0KyO5TJBtkAdk/edit?usp=sharing>'. A message from Alessia Mondolo at 11:15 PM follows: 'joined #general along with 10 others.' On Tuesday, July 2nd, Jan Carbonell posted a welcome message at 4:47 PM, which includes a GIF of a woman waving. The message reads: 'Welcome everyone! We're all really happy to have you onboard for this intense 10 weeks of learning 😊'. Below this, Jan Carbonell posted about tomorrow's meeting at 4:56 PM, providing the address and a note about getting a visitor pass.

#general

17 | Années adresses à l'ensemble de l'entreprise et informations relatives au travail

Tuesday, July 2nd

Miguel 5:22 PM cool Stephan

Alessia Mondolo 11:15 PM joined #general along with 10 others.

Yesterday

Jan Carbonell 4:47 PM welcome

Posted using /giphy | GIF by T. Kyle (831 kB) ▾

Welcome everyone! We're all really happy to have you onboard for this intense 10 weeks of learning 😊

Jan Carbonell 4:56 PM About tomorrow:

- 9am at Spaces offices, Floor 27 of Torre Mapfre <https://goo.gl/maps/VG1YAgdAJVkSkbfY7>
- Say you are visiting Spaces so you can get a visitor pass (I'll be downstairs at 8:50 just in case)

Don't expect a daily email from us. **Slack is way more direct**, less intrusive than whatsapp and allows us to keep the conversations into relevant threads

WI-FI

For the moment -> 93446257

Soon -> Dedicated sign-up



Help us help you!



@akademyAI



akademy.AI



@Akademy.AI



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Technical requirements

Ideally, you will need a computer with Ubuntu or OSX install. We can walk you through the dual-boot if you have Windows. TLDR: Ubuntu or OSX unless you really like coding in Windows

Minimum requirements:

- 1.6 GHz Processor
- 4 GB RAM
- 120 GB Hard Drive

Recommended:

- 2 GHz Processor
- 8 GB RAM
- 256 GB Hard Drive (preferably solid state)

→ The power of the cloud!

<https://github.com/akademyai/setup>

Sublime vs PyCharm

SublimeText is an editor that allows you to code in several languages. PyCharm is an IDE by JetBrains that only reads python, but is able to point out mistakes in your code and “help” you more often. It is more complex and has a higher learning curve but it can be beneficial in the long term.

We will try to push for your code to be optimal but the tool you choose to write Python with is not particularly relevant.

Play with each alternative to see what you prefer, reply on slack based on your selection and we'll come help out with the installation if needed.

Anaconda Demo

- conda list
- conda info --envs
- conda create -n myenv python=3.6
- conda env create -f environment.yml
- conda create --name myclone --clone myenv
- conda activate myenv
- conda deactivate
- Conda install package
- → If that doesn't work, google it.
- → <https://anaconda.org/anaconda/repo>



Jupyter Notebook

→ Pre-Installed by default with Anaconda

Helps us code and think in sequence. Allows for a more neat intersection of text and graphs (comments look quite ugly in the code).

This is particularly relevant for Machine Learning and Deep Learning as we often follow a similar process and don't care if our program takes 2 more minutes to execute (yes for the efficiency)

Further [documentation here.](#)

Google Collab Tutorial

 Open in Colab



Introduction to Google Colab

Colaboratory is a free Jupyter notebook environment that requires no setup and runs entirely in the cloud.
Provides a free Virtual Machine with a persistance of 12h. After this period, VM will get erased.

VM specification:

- OS : linux + Python 2 & 3 + AI libraries
- CPU : Intel(R) Xeon(R) CPU @ 2.30GHz (1 core, 2 threads)
- GPU : Nvidia Tesla K80 12GB GDDR5 (2496 CUDA cores vs GTX1050 768CUDA or GTX1060 1280CUDA cores)
- TPU : Available changing runtime environment
- RAM : 12,6GB
- Disk: 33GB

([check it yourself](#))

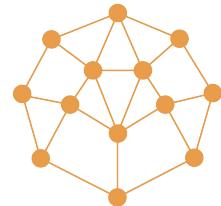
References:

[Welcome to colaboratory!](#)

[Google Colab article in Medium](#)

Access to Google Colab -> <https://colab.research.google.com/>

https://github.com/Giffy/Google_Colab_Tutorial/blob/master/Colab_tutorial.ipynb



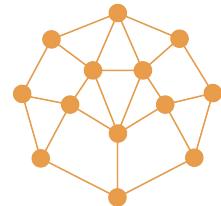
What's Google Colaboratory

Google collaboratory (Colab) is a free platform ready to use for data scientist.

Includes a Jupyter notebook environment that requires no setup, already with Python and the most common libraries for AI.

It runs entirely in the cloud and to have persistency, it can use Google Drive.

Google Colab includes 3 types of environments, CPU, GPU and TPU.



Colab Pros / Cons

PROS

Easy to start studying AI from minute one.

Easy to share notebooks.

Environment is cleaned each 8h.

Regular platform improvements (GPUs, TPUs, Disk space).

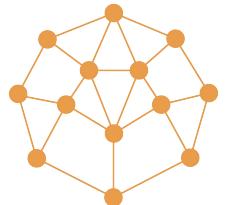
CONS

Server without persistency.

No public IP.

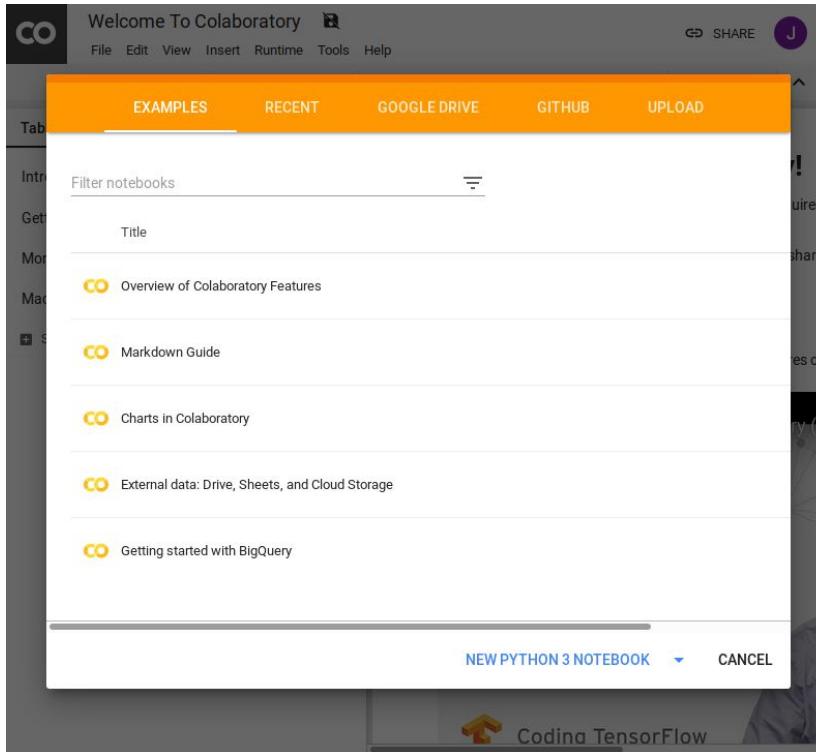
Uncontrolled updates (Soft and Hardware).

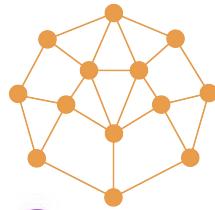
'Limited' disk space up to 350Gb.



Starting with colab

Go to : <https://colab.research.google.com/>





Colab overview

Welcome To Colaboratory 

File Edit View Insert Runtime Tools Help

SHARE 

CODE TEXT   COPY TO DRIVE  RAM  Disk EDITING

Table of contents Code snippets Files 

Introducing Colaboratory

Getting Started

More Resources

Machine Learning Examples: Seedbank

 SECTION

Getting Started

The document you are reading is a [Jupyter notebook](#), hosted in Colaboratory. It is not a static page, but an interactive environment that lets you write and execute code in Python and other languages.

For example, here is a **code cell** with a short Python script that computes a value, stores it in a variable, and prints the result:

```
[ ] seconds_in_a_day = 24 * 60 * 60  
seconds_in_a_day
```

 86400

To execute the code in the above cell, select it with a click and then either press the  button to the left of the code, or use the keyboard shortcut "%/Ctrl+Enter".

All cells modify the same global state, so variables that you define by executing a cell can be used in other cells:

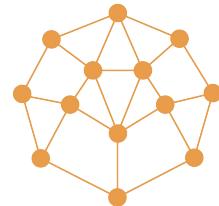
```
[ ] seconds_in_a_week = 7 * seconds_in_a_day  
seconds_in_a_week
```

 604800

For more information about working with Colaboratory notebooks, see [Overview of Colaboratory](#).

More Resources 

Learn how to make the most of Python, Jupyter, Colaboratory, and related tools with these resources:



Notebooks

Getting started with colaboratory [link](#)

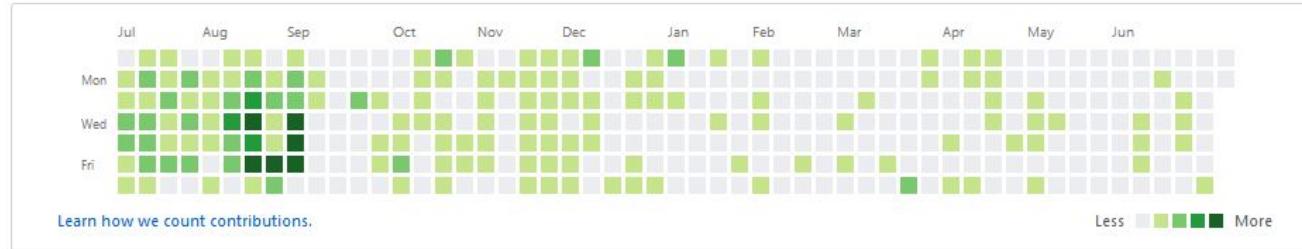
Basic tutorial [link](#)

Build your first convolutional neural network (identify cats & dogs) [link](#)

Github

1,071 contributions in the last year

Contribution settings ▾



It is the place where developers publish open-source code. Over the years, it has developed into more than that and currently, it is used in hiring. Not having it doesn't subtract anything, but having one can certainly be beneficial. **Make sure you have a profile opened by today.** We will do a more in-depth 1-to-1 tutorial with whoever of you that requires it.

One last thing...



The AI Hero Pledge

I will apply AI towards the benefit of humanity at all costs.

I will respect every human's privacy as if it was my own.

I will do everything in my power to acquire knowledge and share it with others.

I will set positive models for others to emulate.

I will consider the impact of my models and disobey unjust requests.

I will train my models again and again until I succeed.

I will consider the impact of historical and new bias in my work.

I will preserve human concerns over technological ones.

I will work to create a new set of conditions that reduce inequalities.

My AI models will be designed to prevent harm at all costs.

I will keep my word.

bit.ly/ai_pledge



akademy.AI

Thank You

