

```
3 require File.expand_path("../spec_helper", __FILE__)
4 # Prevent database truncation if the test fails
5 abort("The Rails environment is running in production mode")
6 require 'spec_helper'
7 require 'rspec/rails'

8
9 require 'capybara/rspec'
10 require 'capybara/rails'

11
12 Capybara.javascript_driver = :webkit
13 Category.delete_all; Category.create!
14 Shoulda::Matchers.configure do |config|
15   config.integrate do |with|
16     with.test_framework :rspec
17     with.library :rails
18   end
19 end
20
21 # Add additional requires below this line if you need them
22
23 # Requires supporting ruby files with custom matchers and
24 # helper methods under 'spec/support/' and its subdirectories. Examples:
25 # run as spec files by default. You can also run them
26 # in _spec.rb will both be recognized automatically.
27 # end with _spec.rb. You can specify require
28 #大臣の仕事
```

01

AI &

Python

Introduction

What is Artificial Intelligence?

- The science of making machines do work that would require intelligence if it were done by humans (Minsky, 1969).
- Machines that are capable of performing tasks where those tasks would require intelligence if performed by humans (Scherer, 2016).
- Activities aimed at making machines intelligent, and intelligence is the quality that enables something to function properly and with foresight in its environment (Nilsson, 2009).

In general, intelligence in question is always associated with "human intelligence" even though some of its applications can be in the form of jobs that are difficult for humans to do, besides that intelligence is not an exact quantity and has a very broad meaning. So that until now the definition of AI is still a challenge and there is no mutual agreement to determine an absolute definition.

History of Artificial Intelligence

1950 → 1956 → 1966 →

Alan Turing created the Turing test to find out how human a machine is.

The first description of AI as a machine that is considered smart by John McCarthy (later known as the father of AI).

Researchers started solving math problems with algorithms, and a chatbot was created by Joseph Weizenbaum.

Why is AI so interesting and special?

Because human abilities such as distinguishing objects, recognizing faces, making decisions, distinguishing sentiments, recognizing voices and so on, are simple activities for humans, but very complex for machines or computers.



Is it AI or not?

To define whether something uses AI or not, you can use two key terminologies: autonomy and adaptivity.

- Autonomy is the ability to perform tasks in a complex environment without constant guidance by the user (automation).
- Adaptivity is the ability to improve performance by learning from experience (learning).

How Does AI Look in the Future?

1972 → 1997 → 2006

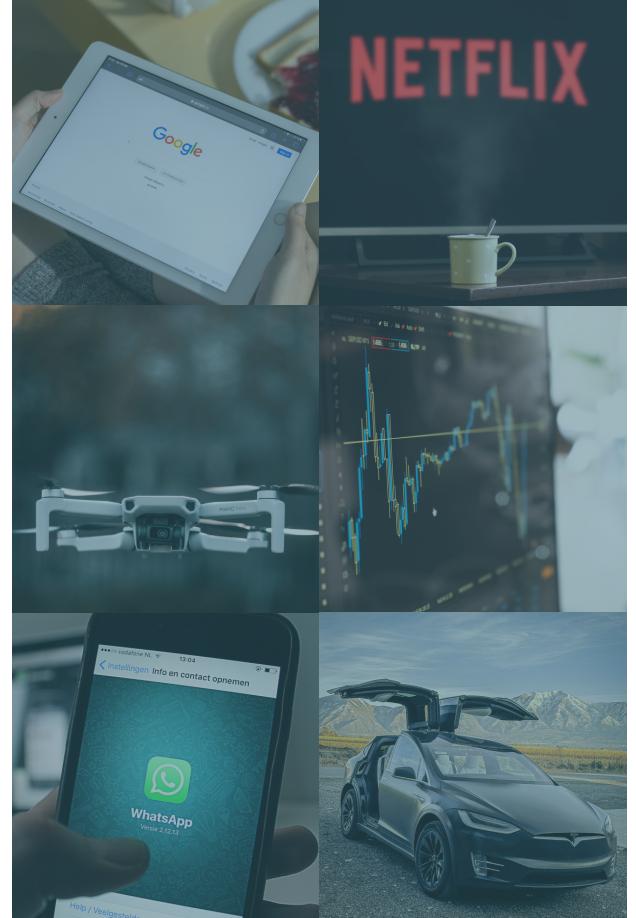
The first humanoid robot (WABOT-1) was created by Japan.

For the first time a computer (Deep Blue IBM) can defeat a world chess champion.

AI is entering the business world as well as big companies like Facebook and Google are starting to take advantage of AI.

AI examples around us

- Smart assistants (such as Siri, Google Assistant and Alexa)
- Manufacturing and drone robots
- Conversational bots for marketing and customer service
- Robo-advisors for stock trading, spam filters on e-mail
- Recommendation system (can be found in eCommerce, Netflix, Spotify, YouTube, etc.)
- Self-driving cars.



Types of AI based on capabilities

There are two ways to describe the type of AI:

3 types of AI

- Narrow AI/Weak AI: This type represents all of the currently existing AI where it is only capable of performing specific or specific tasks.
- General AI: This type is able to learn, understand, function and carry out intellectual tasks with human-like efficiency.
- Super AI: This type is able to surpass all human abilities in various aspects, such as creativity (producing better works of art), wisdom (decision making), better emotional intelligence, and problem solving.

4 types of AI

- Reactive Machine: The machine only acts on its programmed function and will always react in the same way.
- Limited Memory: This type allows AI to learn from existing data to make decisions.
- Theory of Mind: In this type, AI must be able to understand human emotions, beliefs, thinking patterns and be able to interact socially.
- Self-Aware: This type will not only be able to understand and evoke the emotions of those with whom they interact, but also have their own emotions, needs, beliefs, and desires.

Subfields of Artificial Intelligence

01

Robotics is a branch of AI, which consists of Electrical Engineering, Mechanical Engineering, and Computer Science to design, build robots that are built to carry out tasks normally performed by humans. Robots are suitable for doing human work that is heavy and repetitive, dangerous, requires high precision.

02

Data science is a multidisciplinary science that studies data with the aim of gaining insight and knowledge in making decisions.

03

Machine Learning (ML) is a data analysis method that allows systems to learn through the training process, and develop from experience without having to be explicitly programmed by humans. That way the machine is able to see patterns so it can make its own decisions.

04

Deep learning is a sub-field of machine learning whose algorithms are inspired by the structure of the human brain called Artificial Neural Networks.

Advantages and Disadvantages of AI

Multiple AI Applications

Computer Vision (CV) allows machines to derive information from images, videos and other digital visual inputs and then act and make recommendations based on that information. CV makes a machine able to 'see' and 'observe'.

Natural Language Processing (NLP) is essentially the language that humans use to communicate. NLP refers to matters relating to the analysis or acquisition of meaningful information from the human language.

- Reduction of human error
- Available 24x7
- Help with repetitive work
- Faster and more efficient decisions
- Helping new discoveries

- High cost of manufacture and maintenance
- Makes people lazy
- Increasing the unemployment rate due to the loss of several jobs

What is Python?

Python is a general purpose language, meaning it can be used to create a variety of different programs and isn't specialized for any specific problems. Python is programming language as well as scripting language and it's also called as Interpreted language.

History of Python



What is Python used for?

Python is widely used for developing websites and software, task automation, data analysis and data visualization.

Data Analysis and Machine Learning with Python

Python is used for database analysis and machine learning because it is easy to learn, has a more diverse library and has broad community support. Python has a variety of ways to display visualization data and having a variety of libraries will make data analysis and machine learning more effective.

Python was made in the late 1980s by Guido Van Rossum, a Dutch programmer. Guido van Rossum is a fan of the TV show 'Mothy Python Flying Circus', hence the name Python was created from the second word of the show's name.

Lack of Python

- Python development is quite slow to run on the iOS and Android platforms.
- Python is not suitable for carrying out intensive tasks of memory and multi-core/multi-processor work.

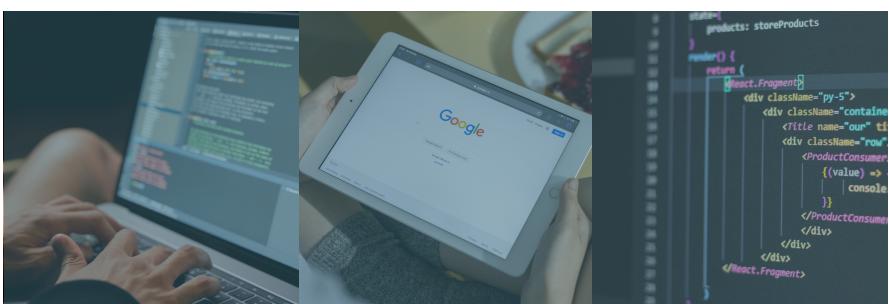
Who uses Python today?

Python is used by:
Intel, IBM, NASA, Pixar, Netflix, Facebook,
JP Morgan Chase, Spotify, and a number
of other massive companies.

Why is Phyton so Popular?

- Python language is simpler and easier to understand (simple syntax).
- Python has good community support (large and active community).
- Popular interpretive programming language related to Data science, Machine learning and IoT (Internet of Thing).
- One of the programming languages based on OOP (Object Oriented Programming).
- Python itself supports multi-platform and multi-system and has an automatic memory management system like Java.

IDE or Editor commonly used for development?

- 
- PyCharm
 - Pyder
 - IDLE
 - Google Collab
 - Jupyter
 - Visual Studio Code
 - Anaconda
 - Eclipse+PyDvy

What is Anaconda?

Anaconda is a distribution of the Python and R programming languages for scientific computing. Anaconda has many packages and tools including the python IDE in the form of Jupiter and Spyder. In Anaconda there is conda which is a package management system and environment management system. Anaconda is very suitable for python programming with machine learning needs, data science, data analysis.

Jupyter and Spyder

One of the reasons to use Anaconda is the built-in Jupyter and Spyder IDEs. Jupyter uses the Notebook Interface. Spyder is a scientific python development environment.

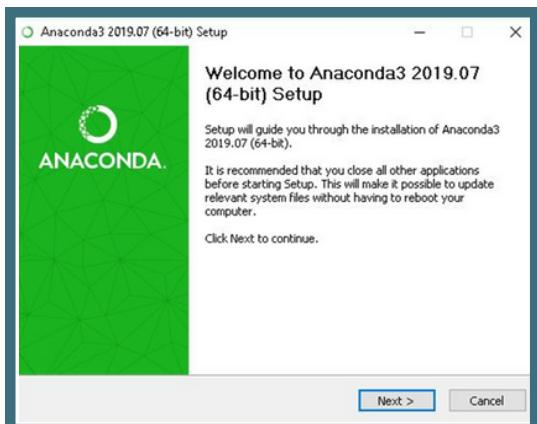
Difference between Jupyter and Spyder

Jupyter is better to use when working on a data -based project and needs to visualize the data. Spyder is better used when working on projects that have lots of scripts.

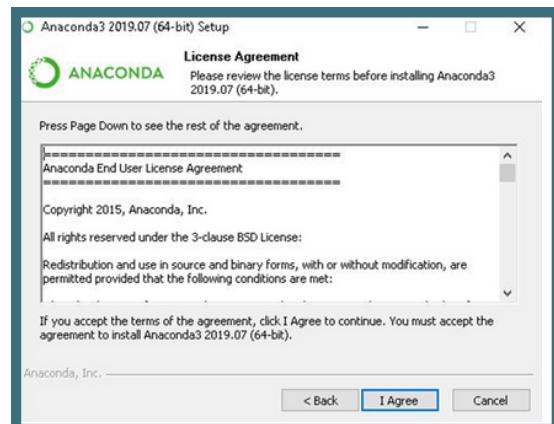
Anaconda Installer

Windows	MacOS	Linux
Python 3.9 64-Bit Graphical Installer (510 MB) 32-Bit Graphical Installer (404 MB)	Python 3.9 64-Bit Graphical Installer (515 MB) 64-Bit Command Line Installer (508 MB)	Python 3.9 64-Bit (x86) Installer (581 MB) 64-Bit (Power8 and Power9) Installer (255 MB)

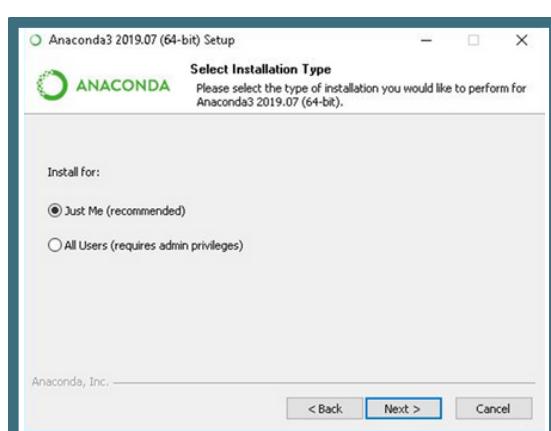
Download Anaconda on (select according to the operating system used) :
<https://www.anaconda.com/products/individual>



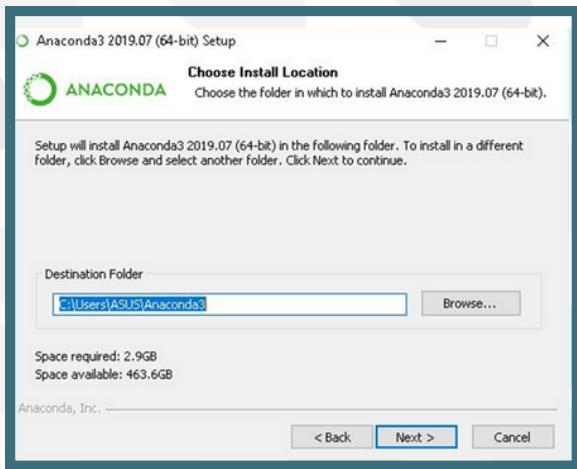
Click Next



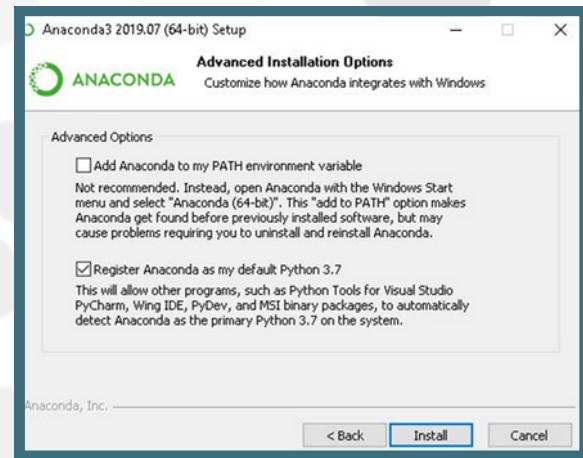
Click Agree



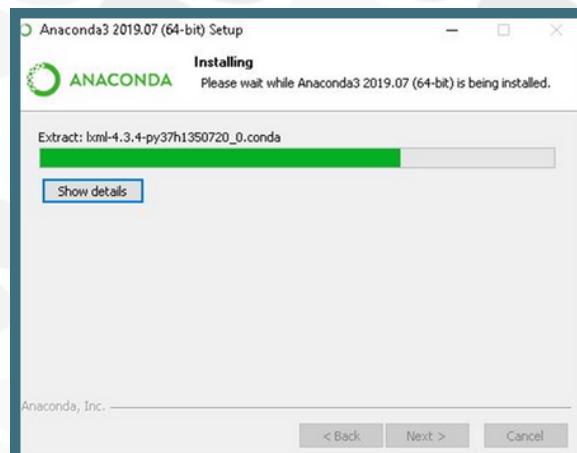
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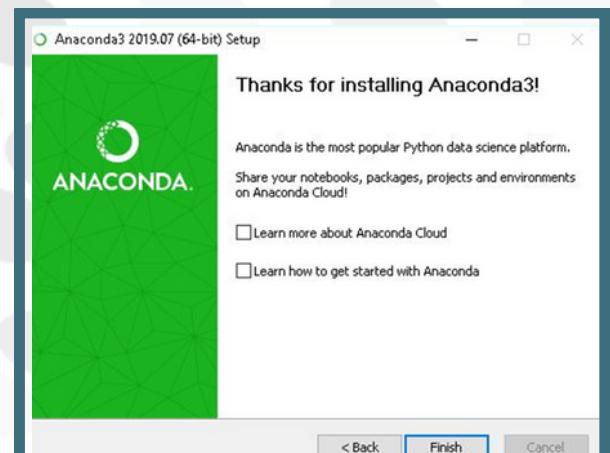
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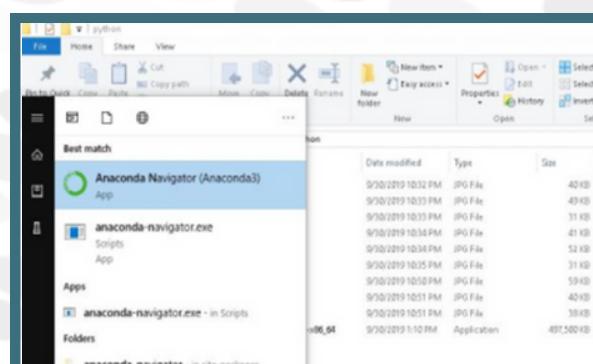
Click Install



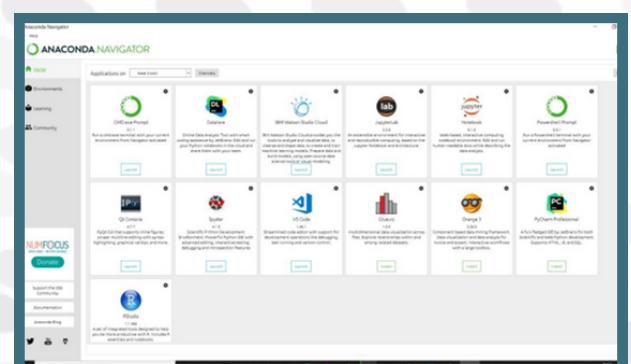
Wait for Installing



Click Finish



After success, in Windows there will be an Anaconda Navigator



Anaconda Navigator View

Google Colaboratory

Advantages

- Easy to share code using google account
- Easy version control
- Using Google Servers to run your code
- Free

Disadvantages

- Closed-Environment
- Saving & Storage Problems
- Repetitive Tasks
- Limited Space & Time
- No Live-Editing

Tips for Learning Python

1. Code everyday
2. Start with the fundamentals
3. Focus on logic over syntax
4. Let your goal guide your learning
5. Join a Python community



Jobs That Use Python

- Data analyst - \$68,583
- Backend developer - \$78,585
- Quality assurance engineer - \$85,731
- Operations automation engineer - \$88,462
- Python developer - \$95,849
- Full stack developer - \$99,106
- Data engineer - \$112,071
- Data scientist - \$116,041
- Machine learning engineer - \$129,417

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