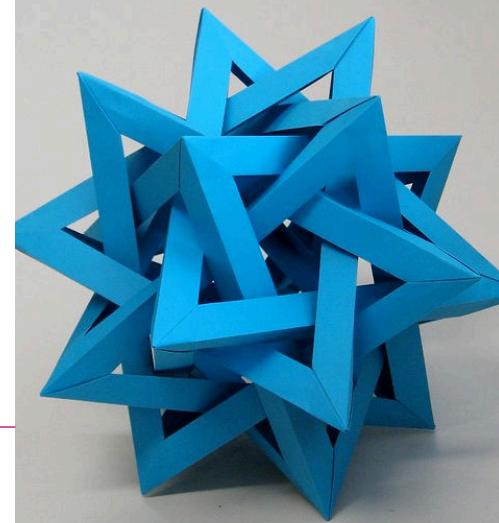


Computer Sciences

INTRODUCTION TO THE COURSE



Politecnico di Torino, 2020/21

INFOMATICA / COMPUTER SCIENCES

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2

2

If it's green
(or it wiggles)

it's biology

If it stinks

it's experimental
chemistry

If it doesn't
work

it's computer
science

Summary

- Who are we?
- Why are we here?
- How to get out of here?
- ... and some practicalities

Who are we?

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Course Language	Italian
Course degree	1st degree and Bachelor-level of the Bologna process in Aerospace Engineering - Torino 1st degree and Bachelor-level of the Bologna process in Mechanical Engineering - Torino 1st degree and Bachelor-level of the Bologna process in Automotive Engineering - Torino 1st degree and Bachelor-level of the Bologna process in Computer Engineering - Torino 1st degree and Bachelor-level of the Bologna process in Automotive Engineering - Torino 1st degree and Bachelor-level of the Bologna process in Electronic And Communications Engineering - Torino 1st degree and Bachelor-level of the Bologna process in Material Engineering - Torino 1st degree and Bachelor-level of the Bologna process in Electrical Engineering - Torino 1st degree and Bachelor-level of the Bologna process in Biomedical Engineering - Torino 1st degree and Bachelor-level of the Bologna process in Chemical And Food Engineering - Torino 1st degree and Bachelor-level of the Bologna process in Civil Engineering - Torino 1st degree and Bachelor-level of the Bologna process in Building Engineering - Torino 1st degree and Bachelor-level of the Bologna process in Energy Engineering - Torino 1st degree and Bachelor-level of the Bologna process in Mechanical Engineering - Torino 1st degree and Bachelor-level of the Bologna process in Environmental And Land Engineering - Torino 1st degree and Bachelor-level of the Bologna process in Mathematics For Engineering - Torino 1st degree and Bachelor-level of the Bologna process in Industrial Product
Course Language	Inglese
Course degree	1st degree and Bachelor-level of the Bologna process in Automotive Engineering - Torino 1st degree and Bachelor-level of the Bologna process in Mechanical Engineering - Torino 1st degree and Bachelor-level of the Bologna process in Computer Engineering - Torino 1st degree and Bachelor-level of the Bologna process in Electronic And Communications Engineering - Torino 1st degree and Bachelor-level of the Bologna process in Material Engineering - Torino 1st degree and Bachelor-level of the Bologna process in Electrical Engineering - Torino 1st degree and Bachelor-level of the Bologna process in Aerospace Engineering - Torino 1st degree and Bachelor-level of the Bologna process in Biomedical Engineering - Torino 1st degree and Bachelor-level of the Bologna process in Chemical And Food Engineering - Torino 1st degree and Bachelor-level of the Bologna process in Civil Engineering - Torino 1st degree and Bachelor-level of the Bologna process in Building Engineering - Torino 1st degree and Bachelor-level of the Bologna process in Energy Engineering - Torino 1st degree and Bachelor-level of the Bologna process in Environmental And Land Engineering - Torino 1st degree and Bachelor-level of the Bologna process in Mathematics For Engineering - Torino 1st degree and Bachelor-level of the Bologna process in Electronic Engineering - Torino 1st degree and Bachelor-level of the Bologna process in Physical Engineering - Torino 1st degree and Bachelor-level of the Bologna process in Cinema And Media Engineering - Torino 1st degree and Bachelor-level of the Bologna process in Engineering And Management - Torino 1st degree and Bachelor-level of the Bologna process in Engineering And Management - Torino

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■ **Giovanni Squillero (A-J)**

Dip. di Automatica e Informatica

E-mail: giovanni.squillero@polito.it

Telegram: @squillero



■ **Ernesto Sanchez (K-Z)**

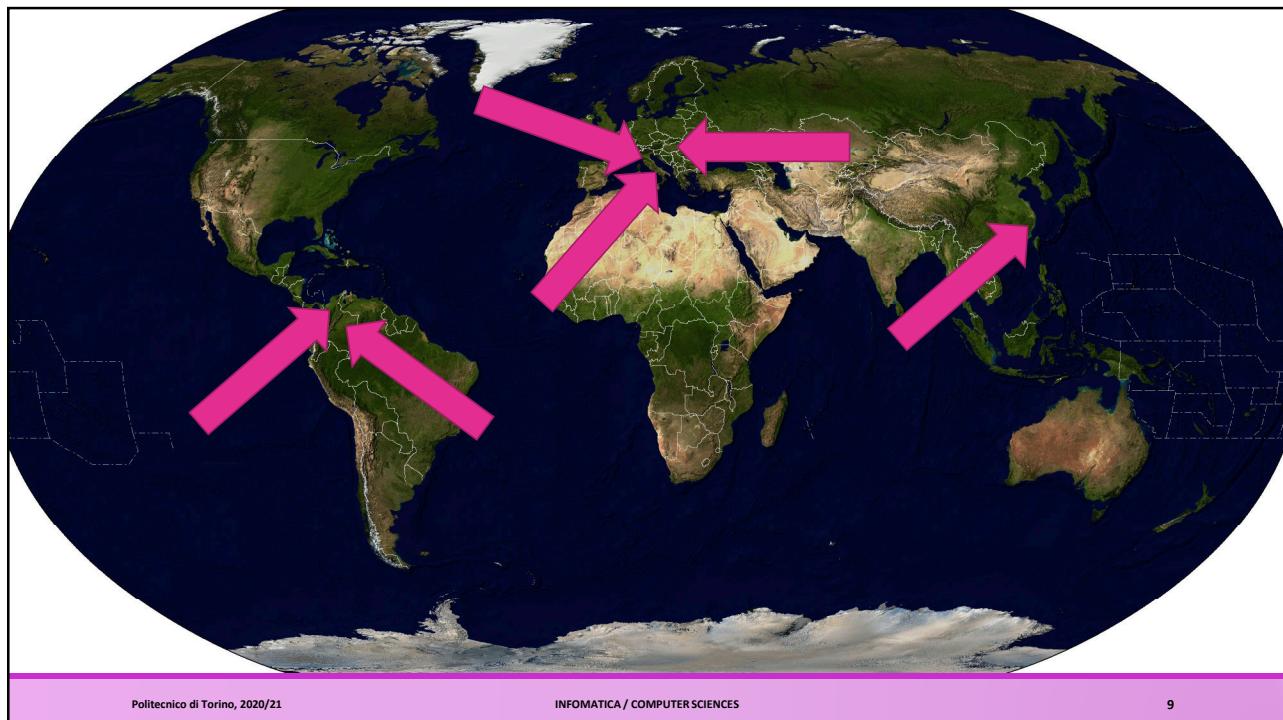
Dip. di Automatica e Informatica

E-mail: ernesto.sanchez@polito.it

Telegram: @EE_Sanchez



Sauilero	MR. Giovanni	GIOVANNI
Giovanni Squillero	Prof. Giovanni Squillero	
GIOVANNI	Giovanni Squillero	Giovanni Squillero
Giovanni Squello	Squarrello.	GIOVANI
Giovanni Squeleto	GIOVANNI SQUIRREL	Squillero
Giovanni squirella	Giovanni	GIOVANNI
	SQILLERO	Prof. SQUILLERO
OVANNI SQUILLERA		prof. GIOVANNI
SUILERO	SQUIRELLO	
		GIOVANI



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≈ 500 students

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Why are we here?

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What do we learn in this course?

- From the specification of a problem, to the realization of a solution to that problem, in the form of a computer program

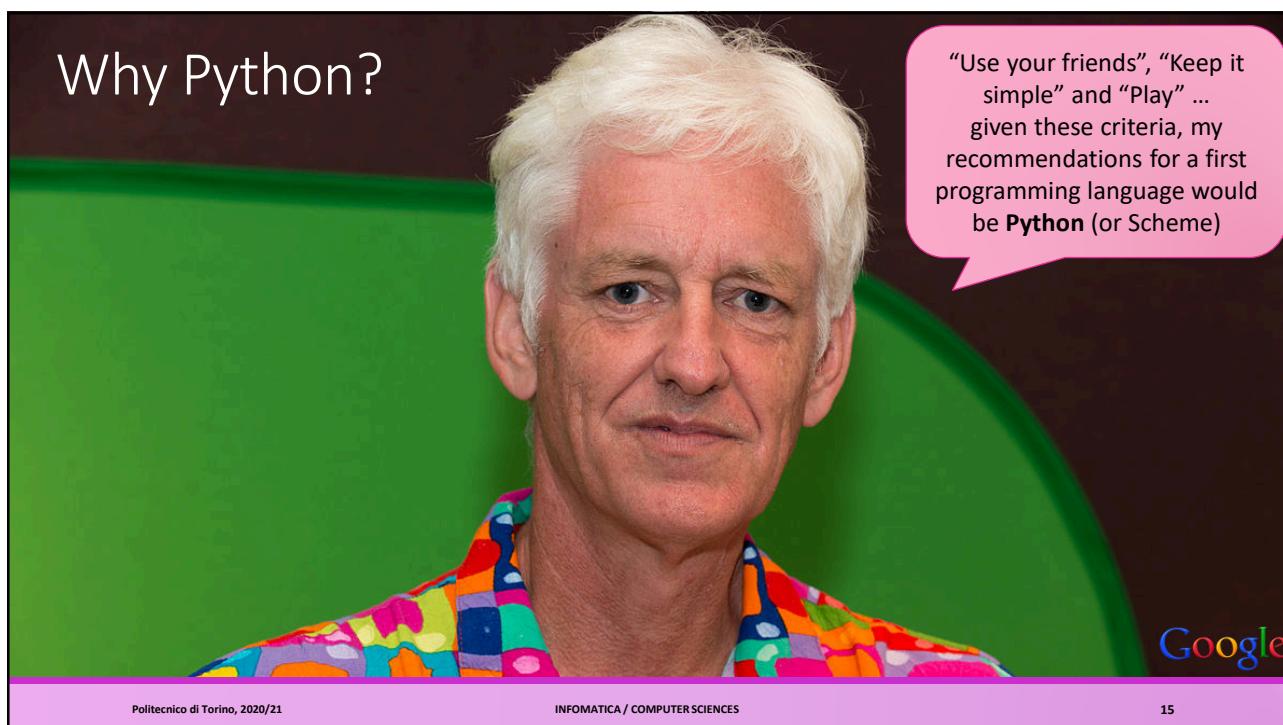


The first ENGINEERING DESIGN course at Politecnico

Computer Sciences

- Syllabus
 - Theory (9h total)
 - Problem Posing and Solving (12h total)
 - The Python programming language (41h total)
- Course organization
 - Lectures (4.5 h/w)
 - Labs (1.5 h/w)
- Learning by doing
 - Over the years: Fortran → Pascal → C → Python





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Why Python (take 2)?

Top Programming Languages 2020
What's the important language to you? Find out in our sixth annual interactive rankings of the most popular programming languages

Rank	Language	Type	Score
1	Python	🌐💻⚙️	100.0
2	Java	🌐💻⚙️	95.3
3	C	💻⚙️	94.6
4	C++	💻⚙️	87.0
5	JavaScript	🌐	79.5
6	R	💻	78.6
7	Arduino	⚙️	73.2
8	Go	🌐💻	73.1
9	Swift	💻	70.5
10	Matlab	💻	68.4

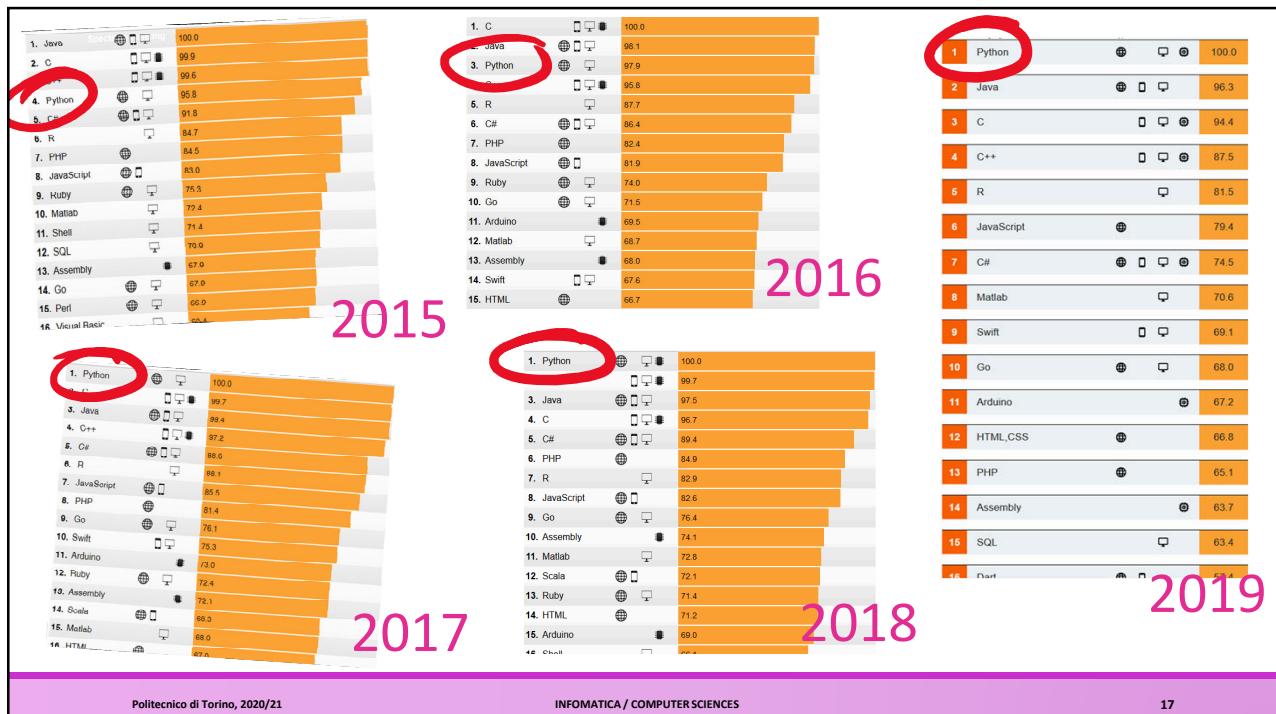
More stats:

- <https://www.tiobe.com/tiobe-index/>
- <http://pypl.github.io/PYPL.html>

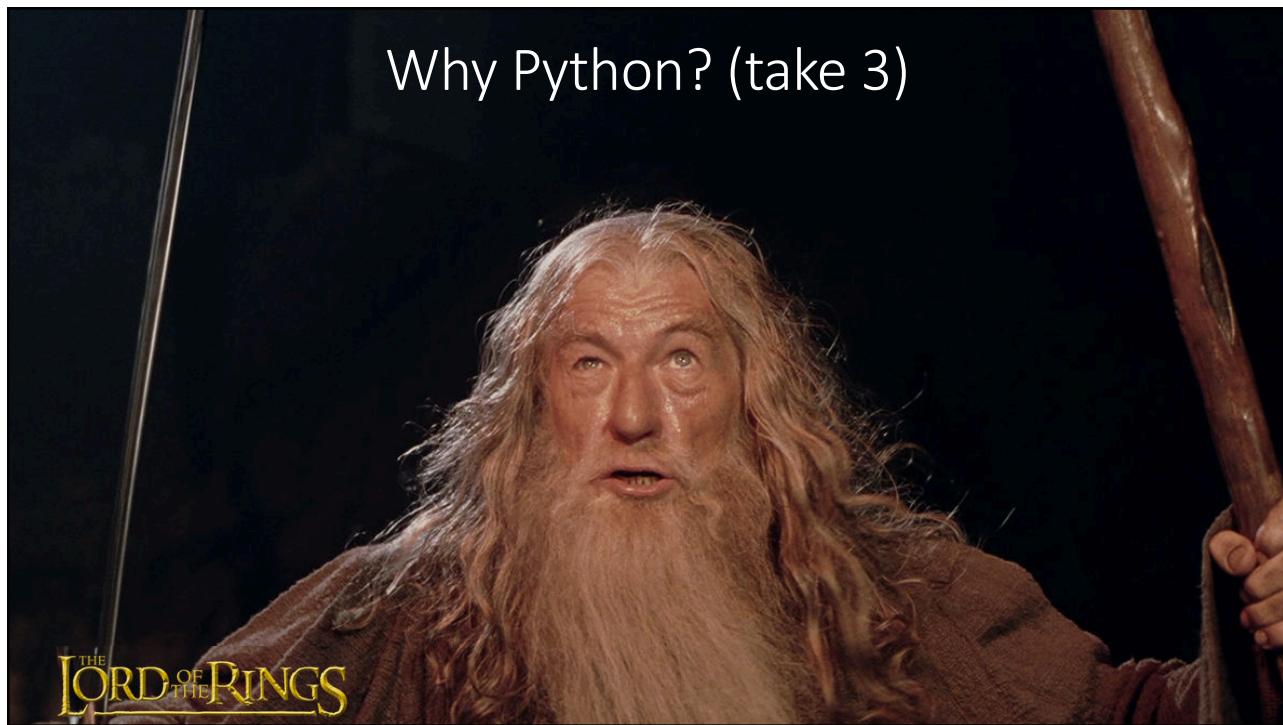
IEEE SPECTRUM

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students



squillero

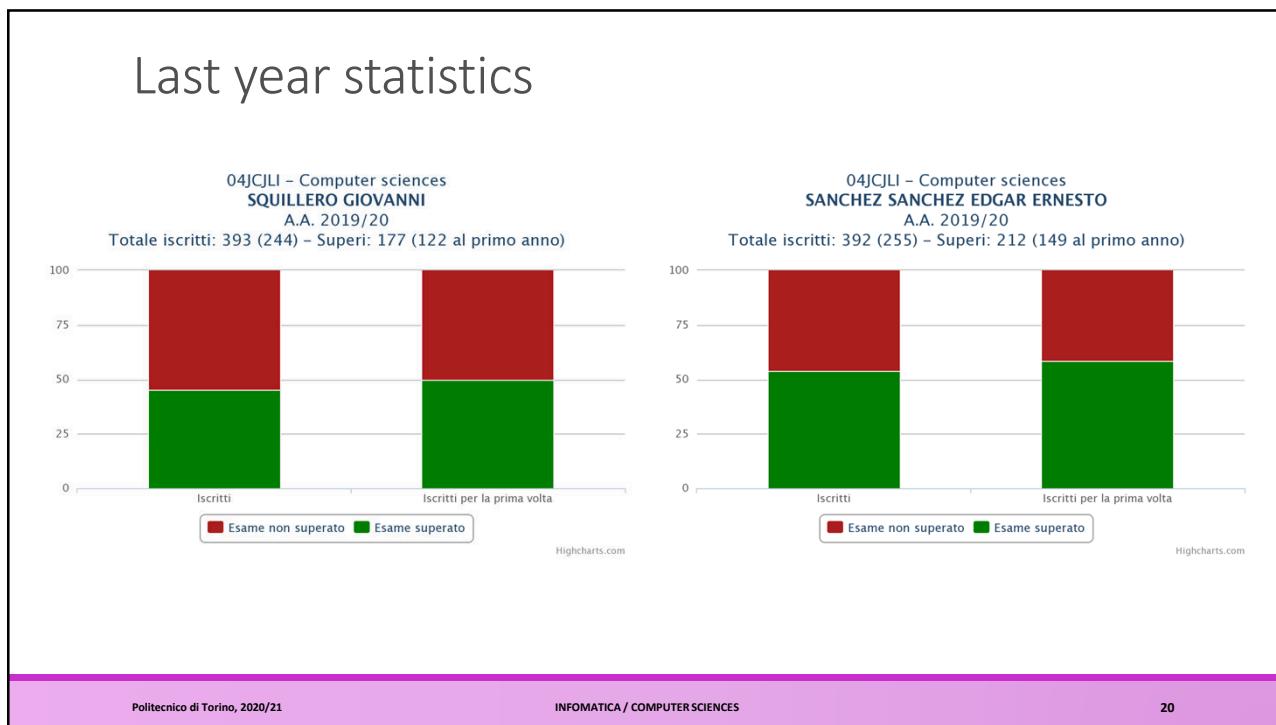


graduation



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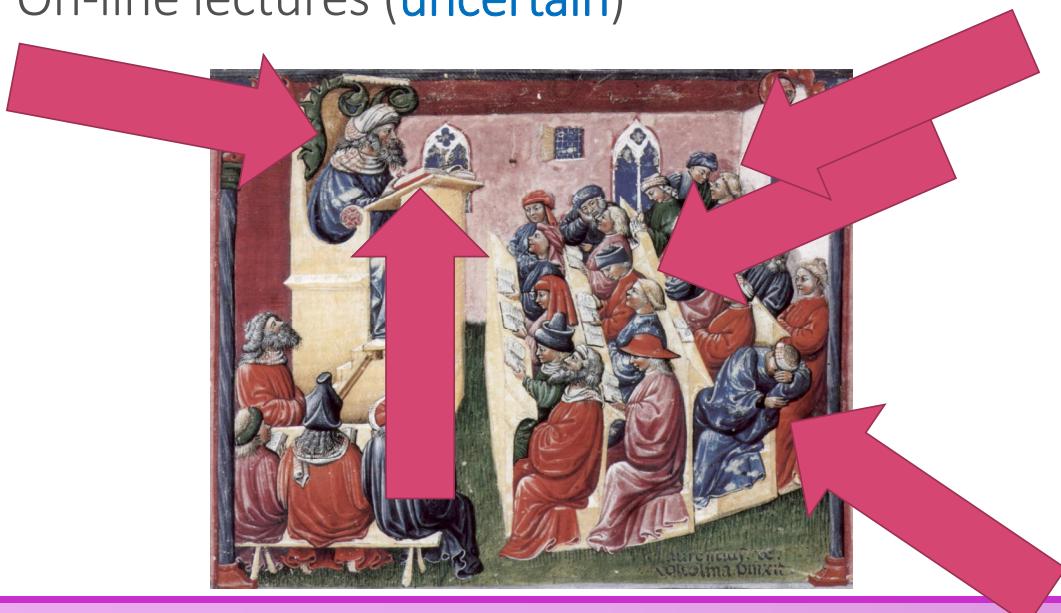


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Criticalities



On-line lectures ([uncertain](#))



Lack of appropriate stimuli (**probably true**)



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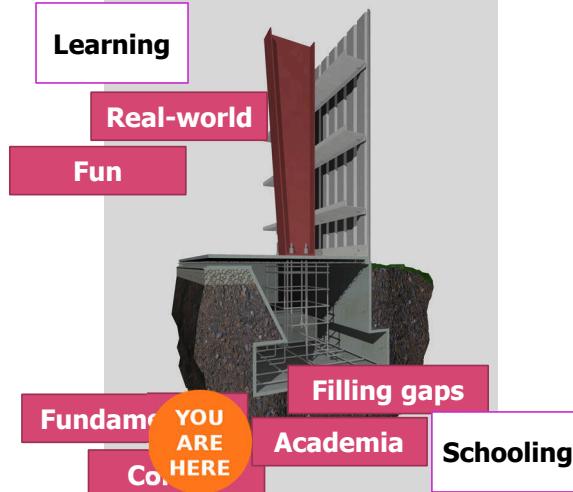
**There is a
fundamental
difference between
schooling and
*learning***

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Schooling vs. Learning



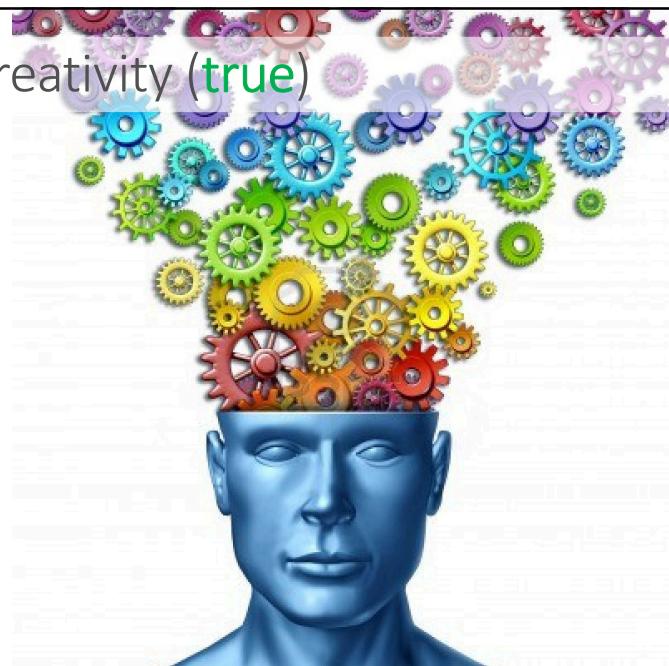
squillero@polito.it

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Lack of creativity (**true**)



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**FOSTERING AND ASSESSING CREATIVITY
AND CRITICAL THINKING IN HIGHER
EDUCATION AND TEACHER EDUCATION**

OCSE_Organizzazione per la cooperazione e lo sviluppo economico
OECD_Organisation for Economic Co-operation and Development

 **OECD**
BETTER POLICIES FOR BETTER LIVES

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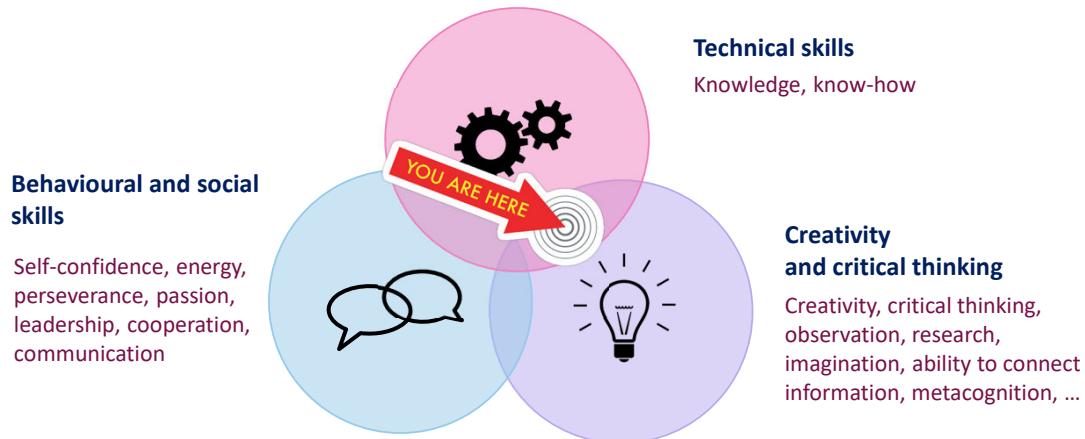
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The OECD project

- The OECD project is designed to support higher education institutions to develop pedagogical resources to innovate teaching, learning and assessment in order to equip students with creative and critical thinking skills.
- How: Using an international research protocol shared by all universities involved, adapted to the different institutions involved
- Who is involved: 27 Universities (15 countries, 4 continents)
 - The Politecnico di Torino is the only Italian university
- Who joined the project in Politecnico: 23 courses (Degree and Master's Degree) from almost all the Collegi

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What should an educational system foster?



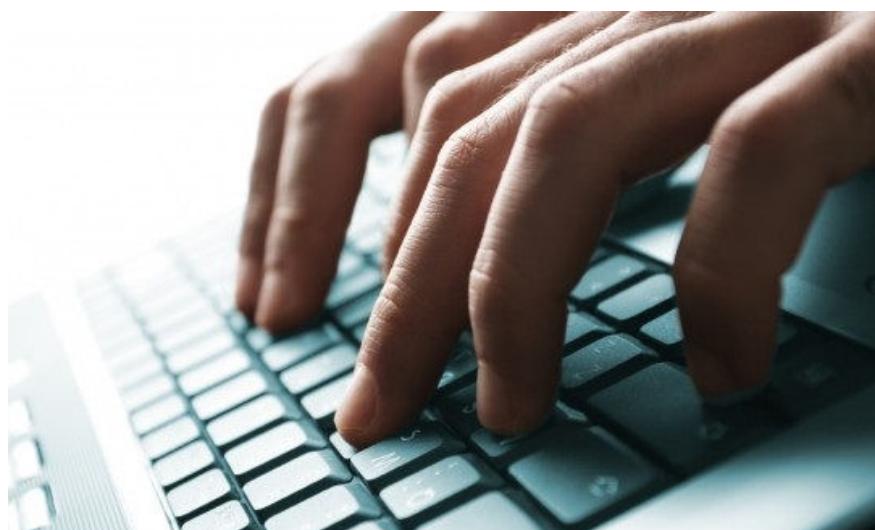
What will change in our course?

- Almost nothing:
 - The lectures will be carried out regularly
 - The exam will not be affected
 - “Creativity” will not be expressly evaluated
- ... but we will provide you some tricks that **may** help fostering creativity

Anonymous surveys

- Pre – intervention questionnaires
(third week: October 12-16 , 2020)
- Post – intervention questionnaires
(last week: January 11-15, 2021)

Lack of practice (**true**)



Lack of background knowledge (**false**)



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Material

▪ GitHub

Google search results for "squillero computer-sciences":

- 约有 18,700 項結果 (搜尋時間 : 0.39 秒)
- [squillero.com](#) > squillero > computer-sciences 翻譯這個網頁
- [squillero/computer-sciences: Code bites from ... - GitHub](#)

GitHub search results for "squillero computer-sciences":

- itc99-poli** (squillero/itc99-poli)
 - ITC99 benchmarks developed in the CAD Group at Politecnico di Torino (1997)
 - *13 · Updated 9 months ago
- computer-sciences** (squillero/computer-sciences)
 - Code bites from Computer Sciences @ Politecnico di Torino
 - *12 · Updated 17 hours ago
- microgp3** (squillero/microgp3)
 - A multi-purpose extensible self-adaptive evolutionary algorithm
 - *10 · Updated 6 months ago

Giovanni Squillero's Home Page:

- <https://staff.polito.it/giovanni.squillero/>
- Giovanni Squillero's Home Page. Giovanni Squillero. Contact info, Curriculum vitae ...

Profile picture for squillero:

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squillero / computer-sciences

README.md

Computer Sciences

This repo contains old exams, notes, and all the code fragments developed during my lectures of [Computer Sciences](#) at [Politecnico di Torino](#).

Please note that we updated the syllabus:

- Up to 2019/20 the course name starts with 04JCJ and students should refer to directory [C](#)
- Since 2020/21 the course name starts with 07JCJ and students should refer to directory [Python](#)

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Units

computer-sciences / Python / Units /

squillero Add pdfs for Units

Unit P1 - Programming.pdf
Unit P2 - Numbers and Strings.pdf
Unit P3 - Decisions.pdf
Unit P4 - Loops.pdf
Unit P5 - Functions.pdf
Unit P6 - Lists and Tables.pdf
Unit P7 - Files.pdf
Unit P8 - Complex Data Structures.pdf

Official slides

Units

Unit P1 - Programming
Unit P2 - Numbers and Strings
Unit P3 - Decisions
Unit P4 - Loops
Unit P5 - Functions
Unit P6 - Lists and Tables
Unit P7 - Files
Unit P8 - Complex Data Structures

Unit P1: Goals

- Introduction to computers and programming
- About computer hardware, software and programming
- How to write and execute your first Python program
- How to diagnose and fix programming errors
- How to use pseudocode to describe an algorithm
- Flow Charts as a support for problem solving
- Representation
- Design steps
- Introduction to Python
- Tools
- Language

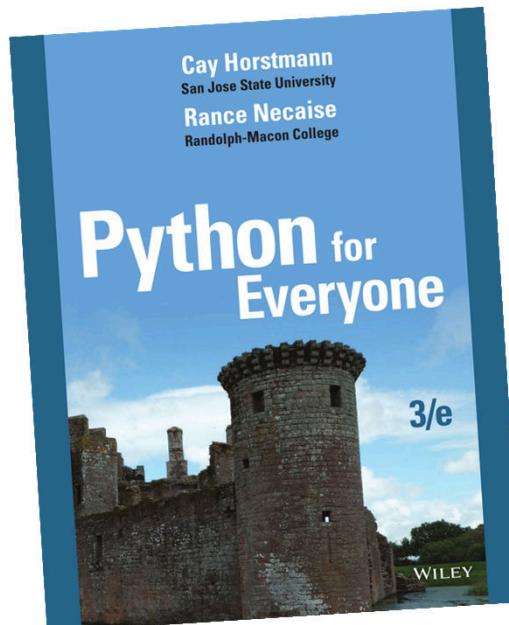
Criticalities

VS.

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Book



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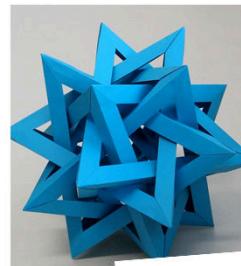
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Unit P2: Numbers and Strings

VARIABLES, VALUES, TYPES, EXPRESSIONS



Chapter 2



Arithmetics

2.2



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Suggested readings

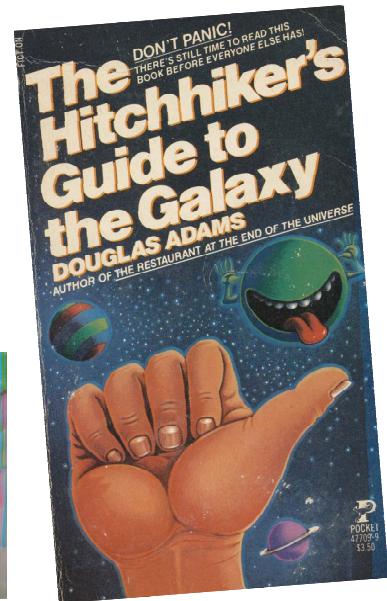
Douglas Adams

The Hitchhiker's Guide to the Galaxy

Original edition: Pan Books (1979)



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```

File Edit View Navigate Code Help pythonProject2 - main.py
Project pythonProject2 C:\Users\Johnny\...
main.py
External Libraries
Scratches and Consoles

1 # This is a sample Python script.
2
3 # Press Shift+F10 to execute it or replace it with your code.
4 # Press Double Shift to search everywhere for classes, files, tool windows, actions, and settings.
5
6
7 def print_hi(name):
8     # Use a breakpoint in the code line below to debug your script.
9     print(f'Hi, {name}') # Press Ctrl+F8 to toggle the breakpoint.
10
11
12 # Press the green button in the gutter to run the script.
13 if __name__ == '__main__':
14     print_hi('PyCharm')
15
16
17 # See PyCharm help at https://www.jetbrains.com/help/pycharm/

```

PyCharm Edu
2020.2

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Practical information

Support Group

- Friendly, COVID-safe, WhatsApp-like, almost privacy-conscious community
- All staff members are available ([@squillero](#), [@EE_Sanchez](#), [@AleD93](#), [@Annachiara](#), [@Boyang](#), [@Josie Esteban](#))

<https://t.me/joinchat/GS3RWEpSJpxTC5Y8EYUzSA>



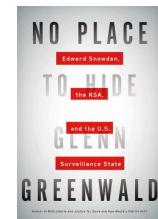
Telegram

Suggested readings

Glenn Greenwald

No Place to Hide: Edward Snowden, the NSA, and the U.S. Surveillance State

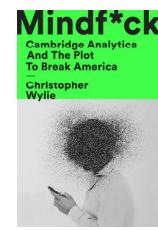
Metropolitan Books (2014)



Christopher Wylie

*Mindf*ck: Cambridge Analytica and the Plot to Break America*

Verbena Limited (2019)



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Course Schedule

	Monday	Tuesday	Wednesday	Thursday	Friday
08:30-10:00					
10:00-11:30			Lecture Virtual Classroom	Lab – Group 2 Virtual Classroom	
11:30-13:00			Lecture Virtual Classroom	Lab – Group 3 Virtual Classroom	
13:00-14:30				Lab – Group 1 Classroom 3	
14:30-16:00					
16:00-17:30	Lecture Virtual Classroom				
17:30-19:00					

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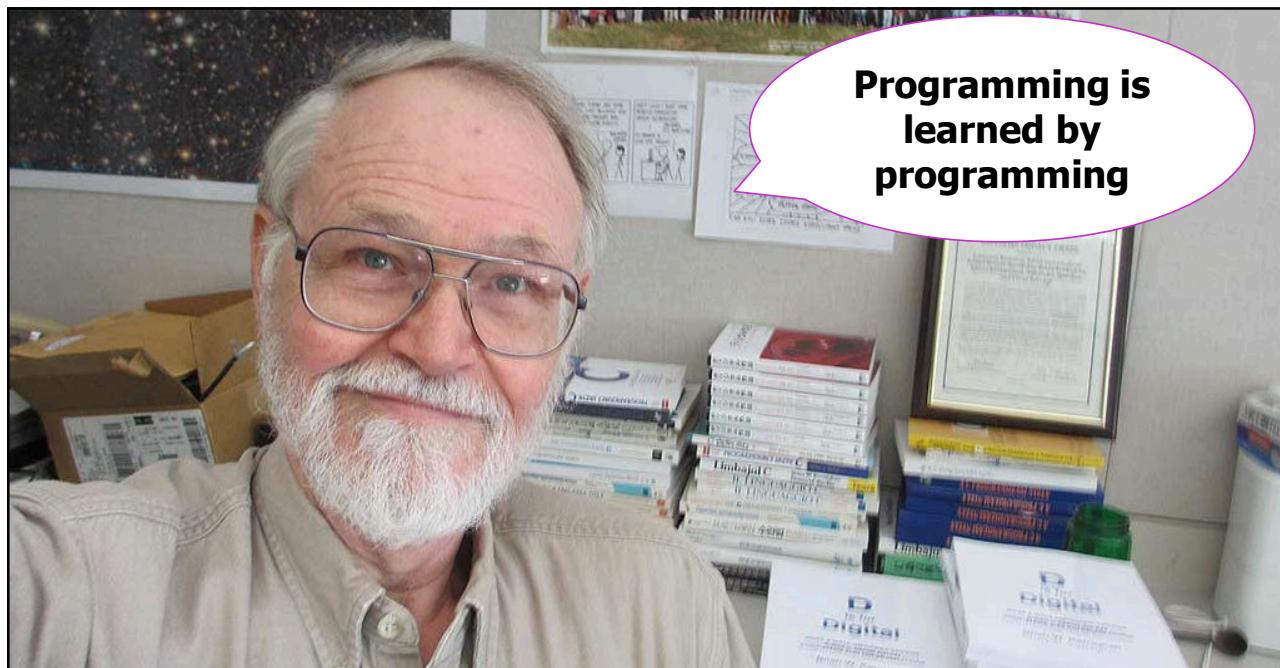
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Labs

ONLY

- The ~~best~~ way of learning is learning by doing!
 - In labs you challenge yourself, learn to solve problems and write programs
 - It is not possible to pass this exam without programming on a computer
- The class is divided in 3 groups
 - Group 1 is in-class
 - Groups 2 and 3 are on-line
- Everyone must install the required software
 - see installation instructions



Course Schedule

	Monday	Tuesday	Wednesday	Thursday	Friday
08:30-10:00					
10:00-11:30			Lecture Virtual Classroom	Lab – Group 2 Virtual Classroom	
11:30-13:00			Lecture Virtual Classroom	Lab – Group 3 Virtual Classroom	
13:00-14:				Lab – Group 1 Classroom 3	
14:30-16					
16:00-17:30	Lecture Virtual Classroom				
17:30-19:00					

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The image consists of three parts: a map of Turin with a red arrow pointing to the ITCILO location; a screenshot of the ITCILO Google My Business page showing details like address, rating, and contact information; and a photo of two people walking with Nordic poles.

ITCILO
International Training Centre of the ILO
4.5 ★★★★ (69) Training centre

Directions Saved Nearby Send to your phone Share

Verify info with this place Hours or services may differ due to COVID-19

Saved in Starred places View list

Viale Maestri del Lavoro, 10, 10127 Torino TO
Open now: Open 24 hours
itciло.org
011 693 6111
2MCC+J9 Turin, Metropolitan City of Turin

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LABs @ ICTILO ARE BYO(L)

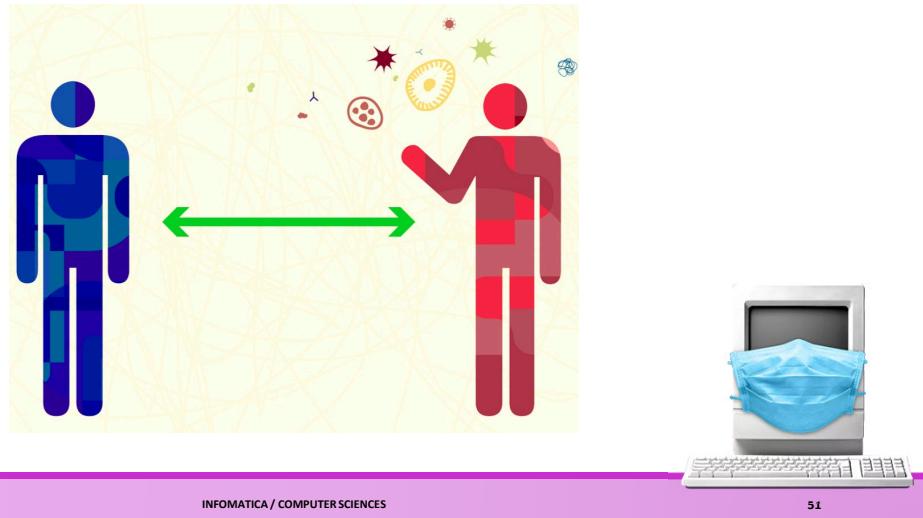
- Bring Your Own (Laptop)



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Assistance during LAB

- <https://t.me/joinchat/GS3RWEpSJpxTC5Y8EYUzSA>



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How to get out of here?

EXAM



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WARNING

- The details about the exam logistics will be defined when the pandemic situation for January 2021 will be clearer
- We guarantee the possibility of having a full-online exam
- There might be the possibility of having the exam in Politecnico's classrooms and/or labs, but this is not known at the moment
- In any case, the «online» exam and the «classroom» exam will be **absolutely equivalent**, and of the **same type**.

Exam contents

- Short questions/exercises over the theory part of the course
- Programming exercise(s)
 - May use a development environment to check the program while developing
 - Must submit the source code of the program
 - Code will be reviewed manually
- The last 2 weeks of the course we will propose exam simulations, to familiarize with the exam methods and with the type of requested knowledge



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We want your
FEEDBACK!



That's all Folks!