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Calificación automática con Jupyter, Nbgrader y Github Classroom

**1er Congreso de Innovación en la práctica y enseñanza
de las disciplinas científicas, sociales y humanas**

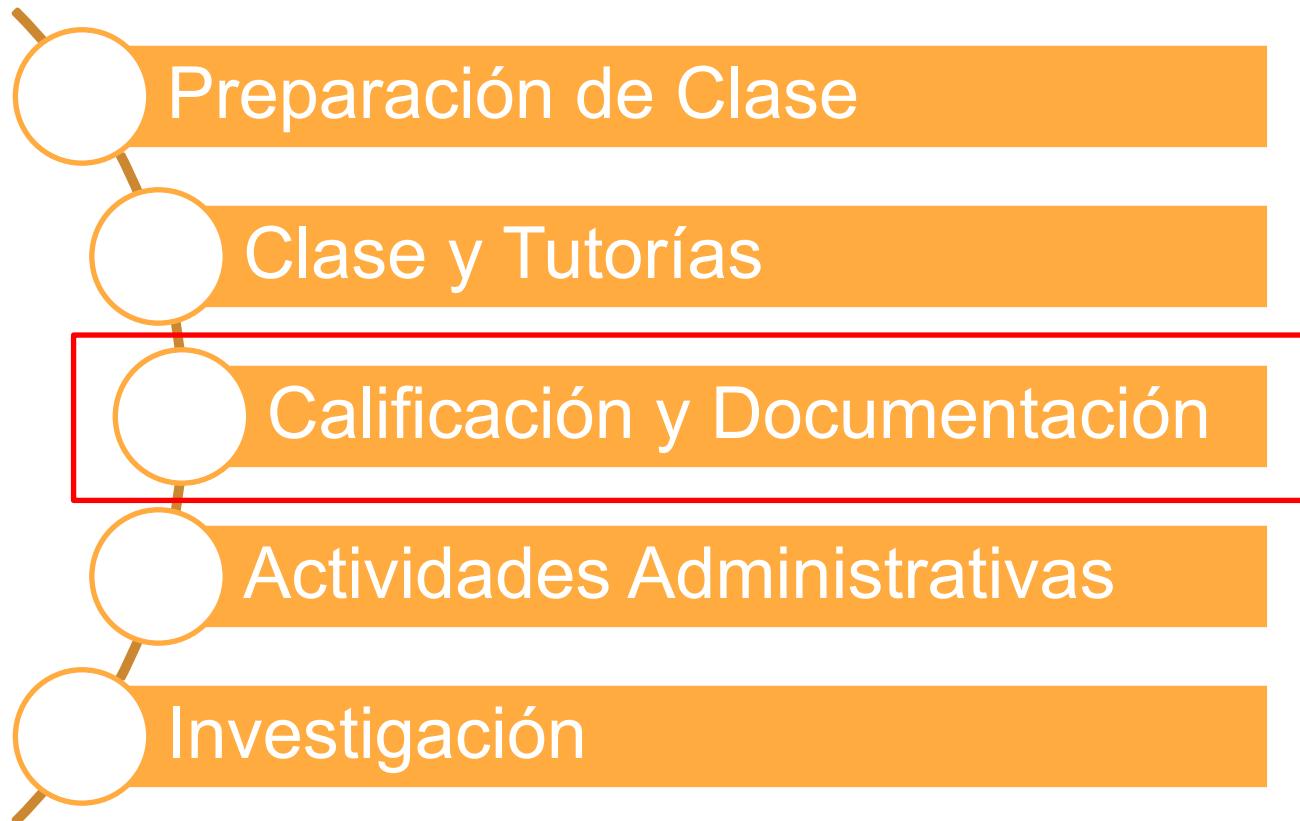
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Presentación

1. Motivación
2. Tecnologías y Flujo de Calificación
3. Demostración

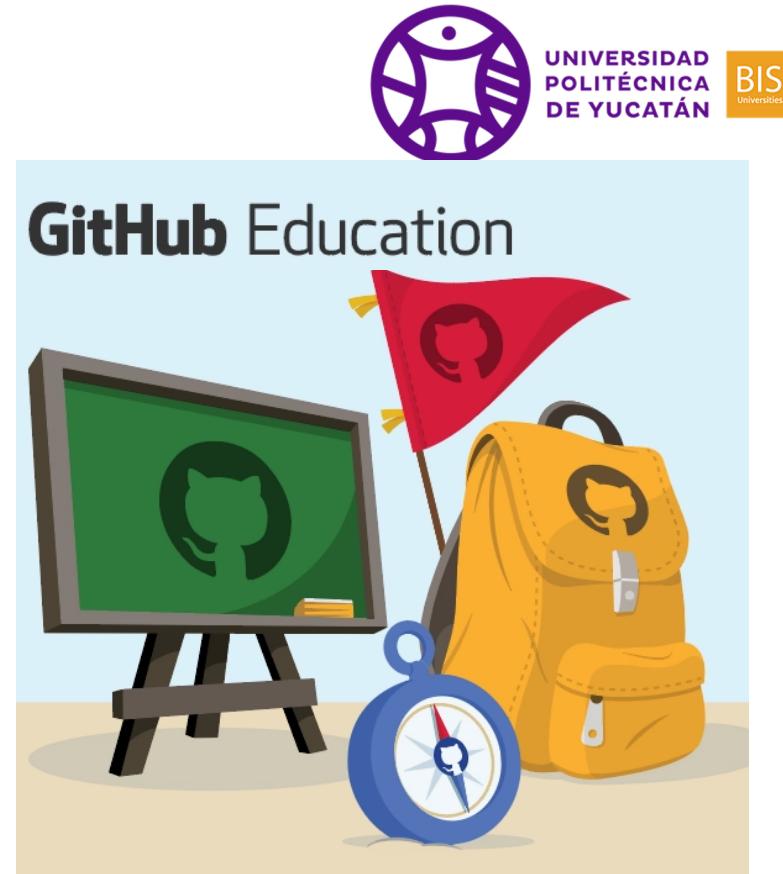
1. Motivación



2. Tecnologías



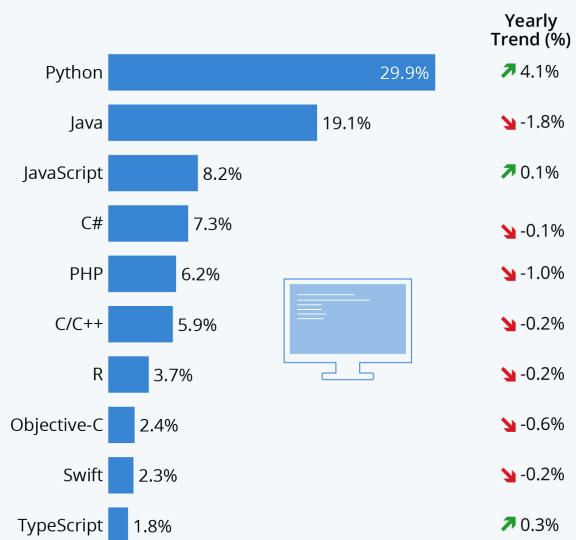
- Jupyter Notebook (<https://jupyter.org>)
- Nbgrader (<https://nbgrader.readthedocs.io/en/stable/>).
- GitHub Education (<https://education.github.com>)



Python + Jupyter Notebook

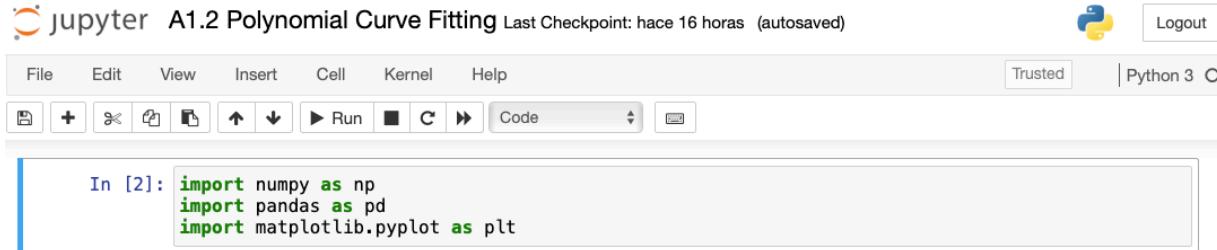
Python Remains Most Popular Programming Language

Popularity of each programming language based on share of tutorial searches in Google



Yearly trend compares percent change from Feb 2019 to Feb 2020

Sources: GitHub, Google Trends



```
jupyter A1.2 Polynomial Curve Fitting Last Checkpoint: hace 16 horas (autosaved)
File Edit View Insert Cell Kernel Help
Logout Trusted Python 3

In [2]: import numpy as np
         import pandas as pd
         import matplotlib.pyplot as plt
```

A1.2 Polynomial Curve Fitting

Introduction

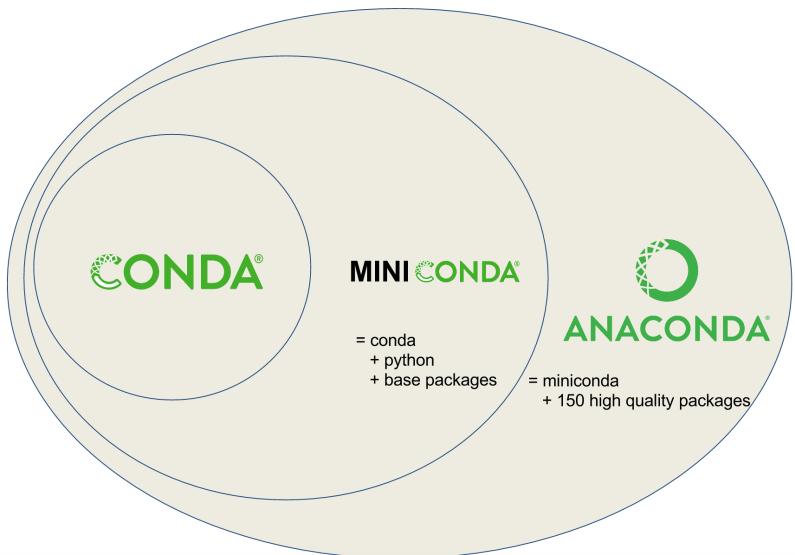
The Polynomial Curve Fitting is a regression problem, which we will be used as a Study Case in order to introduce the key concepts related to Modelling. The following Study Case is based on the book:

C. M. Bishop (2006). Pattern Recognition and Machine Learning.

The Study Case is structured as follows:

1. Problem Description
2. Polynomial Curve Fitting
3. Application

Python + Jupyter Setup



Conda es sistema de administración de paquetes libre (open source) y de ambientes.

<https://www.anaconda.com/products/individual>

Anaconda Installers

 Windows	 MacOS	 Linux
Python 3.8	Python 3.8	Python 3.8
64-Bit Graphical Installer (466 MB)	64-Bit Graphical Installer (462 MB)	64-Bit (x86) Installer (550 MB)
32-Bit Graphical Installer (397 MB)	64-Bit Command Line Installer (454 MB)	64-Bit (Power8 and Power9) Installer (290 MB)

jupyter notebook

nbgrader

Herramienta que permite facilitar la creación y calificación de actividades en Jupyter Notebooks. Permite al instructor crear libretas con actividades incluyendo ejercicios escritos y con código.

<https://nbgrader.readthedocs.io>



The screenshot shows two separate assignment sections in the nbgrader interface:

Part C (1 point)
Using LaTeX math notation, write out the equation that is implemented by your `sum_of_squares` function.

Points: 1 ID: sum_of_squares_equat Manually graded answer

$\sum_{i=1}^n i^2$

Part A (2 points)
Write a function that returns a list of numbers, such that $x_i = i^2$, for $1 \leq i \leq n$. Make sure it handles the case where $n < 1$ by raising a `ValueError`.

ID: squares Autograded answer

```
def squares(n):
    """Compute the squares of numbers from 1 to n, such that the
    ith element of the returned list equals i^2.

    """
    ### BEGIN SOLUTION
    if n < 1:
        raise ValueError("n must be greater than or equal to 1")
    return [i ** 2 for i in range(1, n + 1)]
    ### END SOLUTION
```

nbgrader setup

https://nbgrader.readthedocs.io/en/stable/user_guide/installation.html

- Anaconda

```
conda install jupyter
conda install -c conda-forge nbgrader
```

- Pip

```
pip install nbgrader
```

Github Education



GitHub Student Developer Pack

The best developer tools, free for students



GitHub Campus Experts

Training to enrich the technology community at your school



GitHub Teacher Toolbox

The best developer tools for teaching, free for academic use



GitHub Campus Advisors

Teacher training to master Git and GitHub



GitHub Classroom

The best way for teachers to distribute and collect coursework on GitHub



GitHub Campus Program

GitHub for your whole school, with everything you need to make it great



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Git. Sistema de control de version para dar seguimiento a los cambios en archivos y proyectos.

Github. Sitio web que permite alojar repositorio en línea (públicos y privados).

<https://education.github.com>

<https://classroom.github.com/>

Github Education Setup

Registro:

<https://classroom.github.com/>



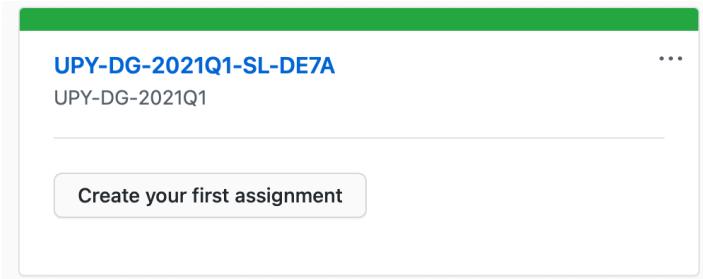
You're in!

Welcome to GitHub Classroom.

A classroom is a space where you can create assignments, collaborate with teaching assistants, and invite students in a single course.

Create your first classroom

- Organization: Cuatrimestre
 - Class: Clase por materia



¡Cuidado! Los nombres de las tareas deben ser iguales en el repositorio que la jupyter notebook.

Flujo de Calificación



1. Setup (Python, nbgrader, Github Education). 
2. Crear curso. 
3. Invitar a estudiantes al curso. 
4. Recuperar lista de estudiantes. 
5. Crear ejercicio compatible con nbgrader. 
6. Generar versión de estudiantes. 
7. Crear *assignment* en GitHub classroom. 
8. Recuperar las tareas. 
9. Calificar (manual/auto) 
10. Generar y mandar retroalimentación. 

https://github.com/gperaza/congreso_cobay_2021

1. Setup (Python, Github Education). 
2. Aceptar invitación al curso. 
3. Clonar repositorio. 
4. Responder ejercicios. 
5. Enviar respuestas. 
6. Revisar retroalimentación. 





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¡Gracias!