



PROGRAMMING WITH PYTHON

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Introduction To Python

- Python in simple words is a High-Level Dynamic Programming Language which is interpreted. Guido Van Rossum, the father of Python had simple goals in mind when he was developing it, easy looking code, readable and open source.
- Python is ranked as the 3rd most prominent language followed by JavaScript and Java in a survey held in 2018 by Stack Overflow which serves proof to it being the most growing language.

Features of Python

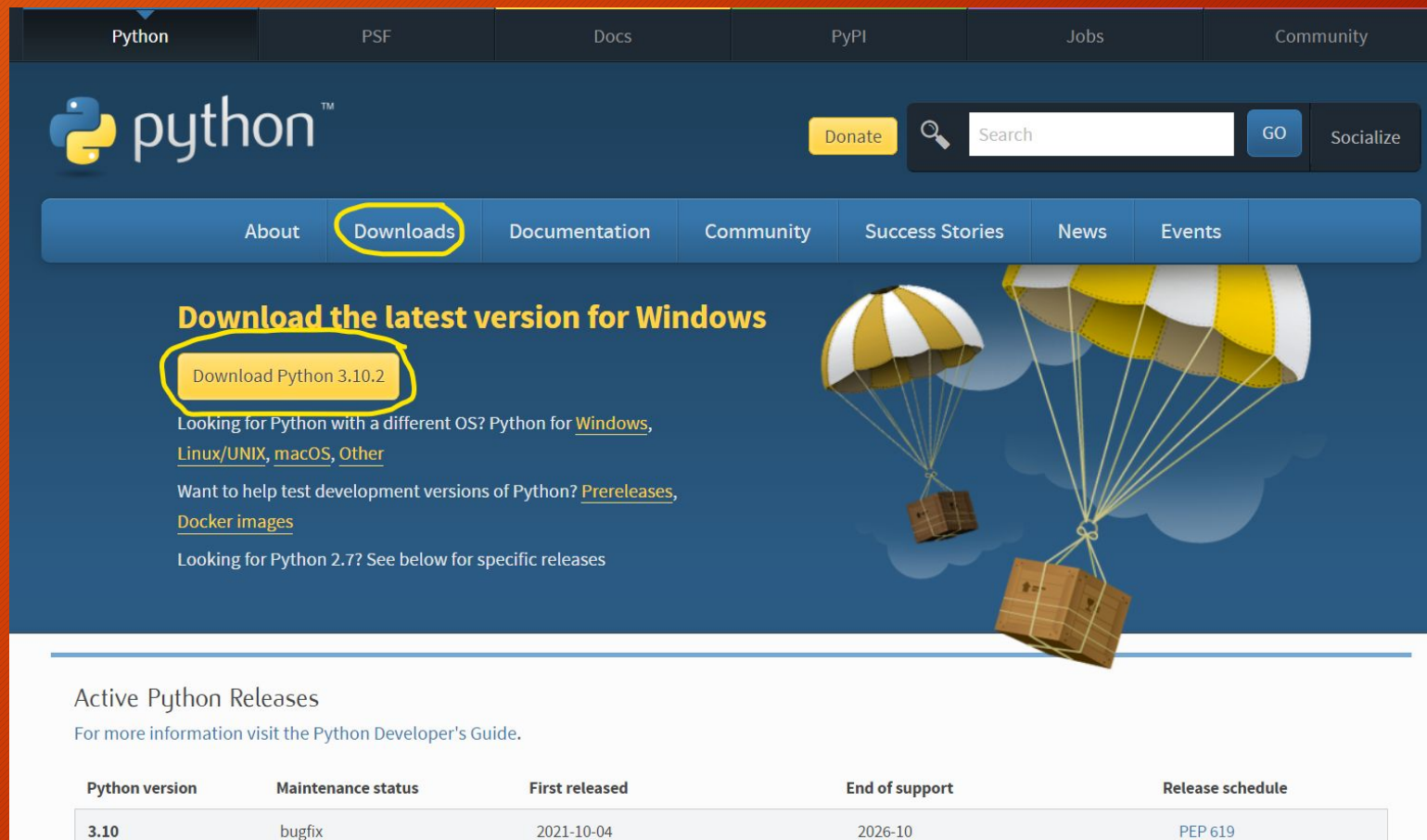
- **Simplicity**: Think less of the syntax of the language and more of the code.
- **Open Source**: A powerful language and it is free for everyone to use and alter as needed.
- **Portability**: Python code can be shared and it would work the same way it was intended to. Seamless and hassle-free.
- **Being Embeddable & Extensible**: Python can have snippets of other languages inside it to perform certain functions.
- **Being Interpreted**: The worries of large memory tasks and other heavy CPU tasks are taken care of by Python itself leaving you to worry only about coding.
- **Huge amount of libraries**: Data Science? Python has you covered. Web Development? Python still has you covered. Always.
- **Object Orientation**: Objects help breaking-down complex real-life problems into such that they can be coded and solved to obtain solutions.

Python Interpreter

- An interpreter is a computer program that directly executes, i.e. performs, instructions written in a programming or scripting language, without requiring them previously to have been compiled into a machine language program. So unlike Java, Python uses an interpreter.
- The interpreter is a program that we need to run our python code or scripts. It basically provides an interface between the code and the computer hardware to get the results of the code.
- No matter in which programming language the code is written, it goes through an interpreter when it comes to python. For example pypy is used to execute the code written in python.

Python Installation

Following are the steps to install Python
Go to www.python.org/downloads/



The screenshot shows the Python.org website. The top navigation bar includes links for Python, PSF, Docs, PyPI, Jobs, and Community. Below this is a secondary navigation bar with links for About, Downloads (highlighted with a yellow circle), Documentation, Community, Success Stories, News, and Events. The main content area features a large yellow button labeled "Download Python 3.10.2" (also highlighted with a yellow circle) under the heading "Download the latest version for Windows". To the right of this button is an illustration of two parachutes carrying boxes. Below the button, there are links for "Looking for Python with a different OS? Python for [Windows](#), [Linux/UNIX](#), [macOS](#), [Other](#)", "Want to help test development versions of Python? [Prereleases](#), [Docker images](#)", and "Looking for Python 2.7? See below for specific releases". At the bottom, there is a section titled "Active Python Releases" with a link to the "Python Developer's Guide". Below this is a table with the following data:

Python version	Maintenance status	First released	End of support	Release schedule
3.10	bugfix	2021-10-04	2026-10	PEP 619

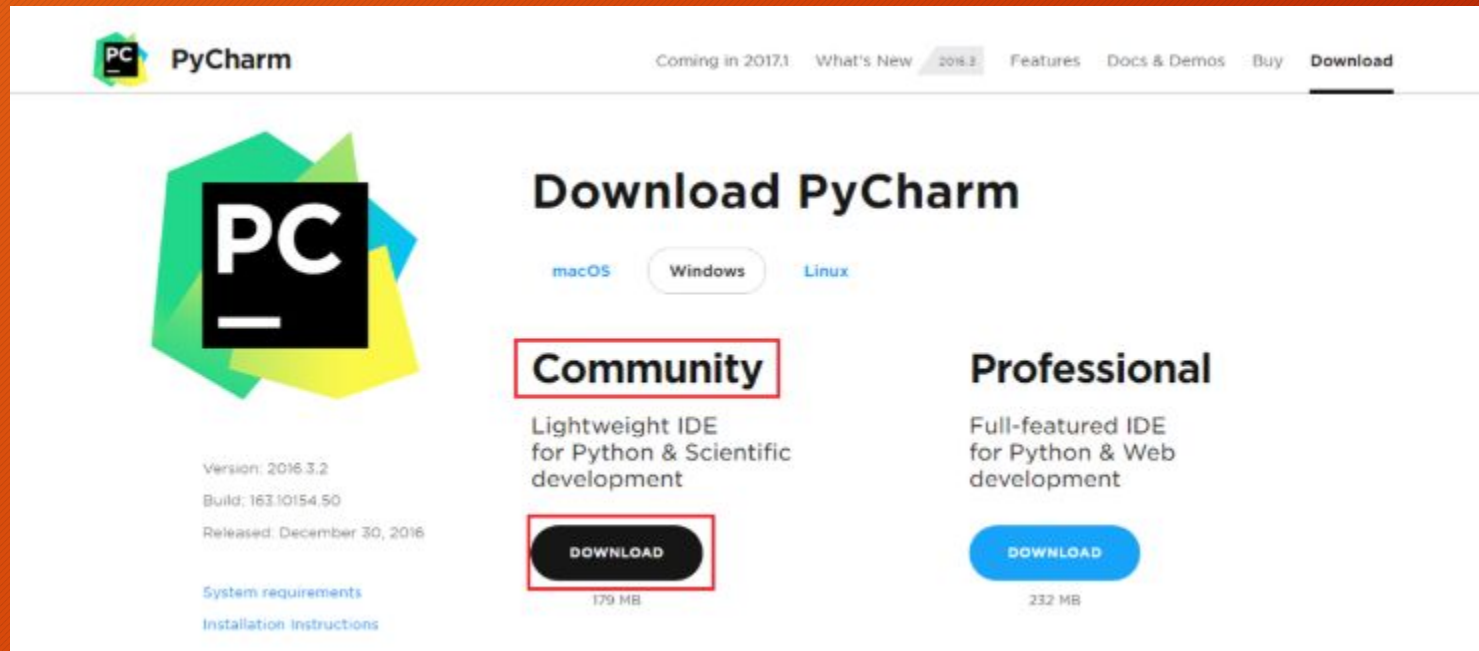
Python Installation For Windows

- Open a browser window and navigate to the Download page for Windows at python.org.
- Underneath the heading at the top that says Python Releases for Windows, click on the link for the Latest Python 3 Release - Python 3.x.x. (As of this writing, the latest version is Python 3.7.2.)
- Scroll to the bottom and select either Windows x86-64 executable installer for 64-bit or Windows x86 executable installer for 32-bit.
- But do we pick 32-bit or the 64-bit installer?
- For Windows, you can choose either the 32-bit or 64-bit installer. Here's what the difference between the two comes down to:
- If your system has a 32-bit processor, then you should choose the 32-bit installer.
- On a 64-bit system, either installer will actually work for most purposes. The 32-bit version will generally use less memory, but the 64-bit version performs better for applications with intensive computation.
- If you're unsure which version to pick, go with the 64-bit version.
- Open the installer and click on "Run".



PyCharm Download

Go to www.jetbrains.com/pycharm/download/#section=windows



The screenshot shows the PyCharm download page. At the top, there's a navigation bar with links: "Coming in 2017.1", "What's New", "2016.2", "Features", "Docs & Demos", "Buy", and "Download". The "Download" link is underlined. Below the navigation bar, on the left, is the PyCharm logo (a green hexagon with "PC" and a white bar) and version information: "Version: 2016.3.2", "Build: 163.10154.50", and "Released: December 30, 2016". Below this are links for "System requirements" and "Installation instructions". In the center, the heading "Download PyCharm" is followed by three tabs: "macOS", "Windows", and "Linux". The "Windows" tab is selected. Below the tabs, there are two columns. The left column is for the "Community" edition, described as a "Lightweight IDE for Python & Scientific development". It has a red-bordered "DOWNLOAD" button and a file size of "179 MB". The right column is for the "Professional" edition, described as a "Full-featured IDE for Python & Web development". It has a blue "DOWNLOAD" button and a file size of "232 MB".

PyCharm

Coming in 2017.1 What's New 2016.2 Features Docs & Demos Buy **Download**

Download PyCharm

macOS **Windows** Linux

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Lightweight IDE for Python & Scientific development

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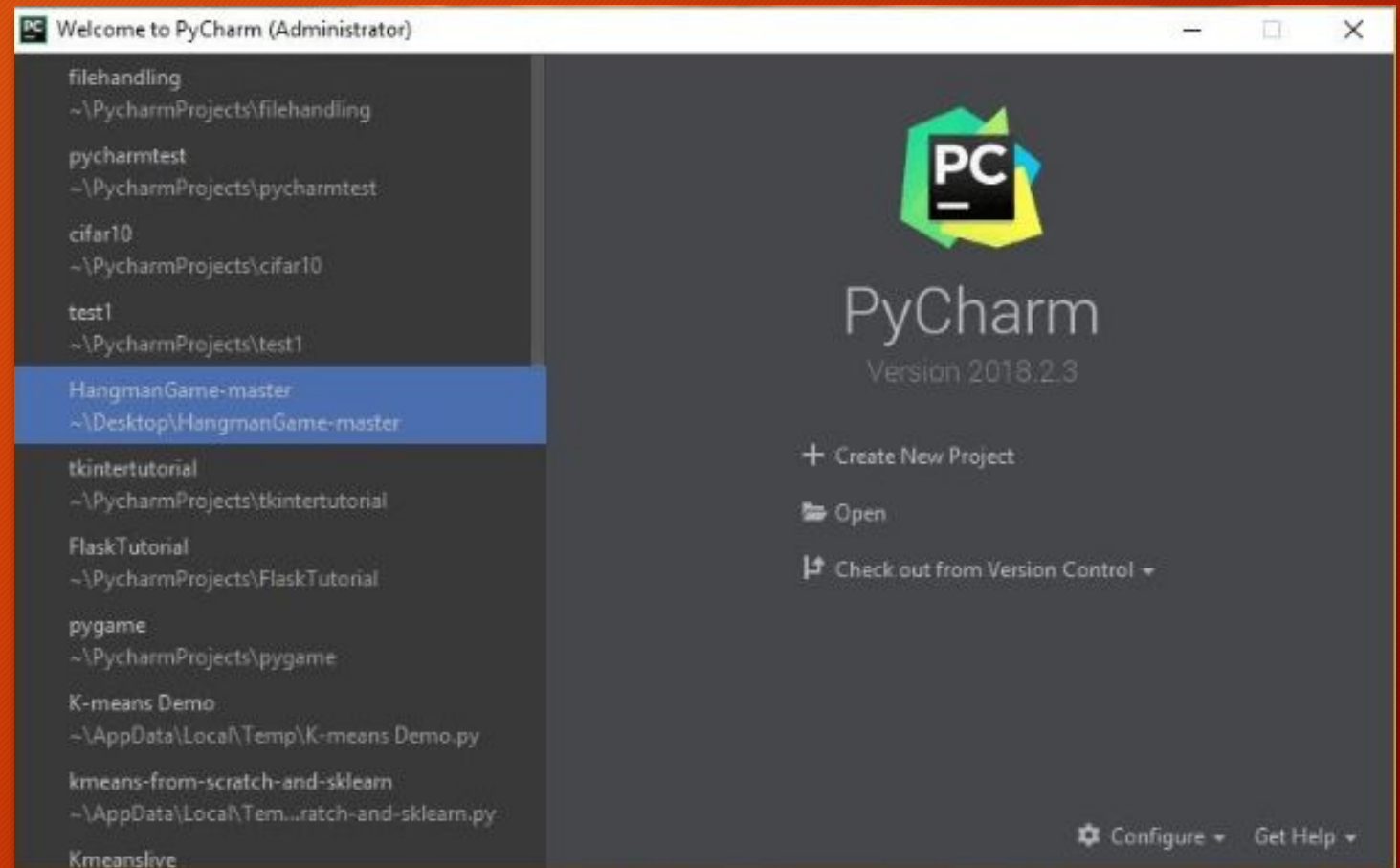
Version: 2016.3.2
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[System requirements](#)
[Installation instructions](#)

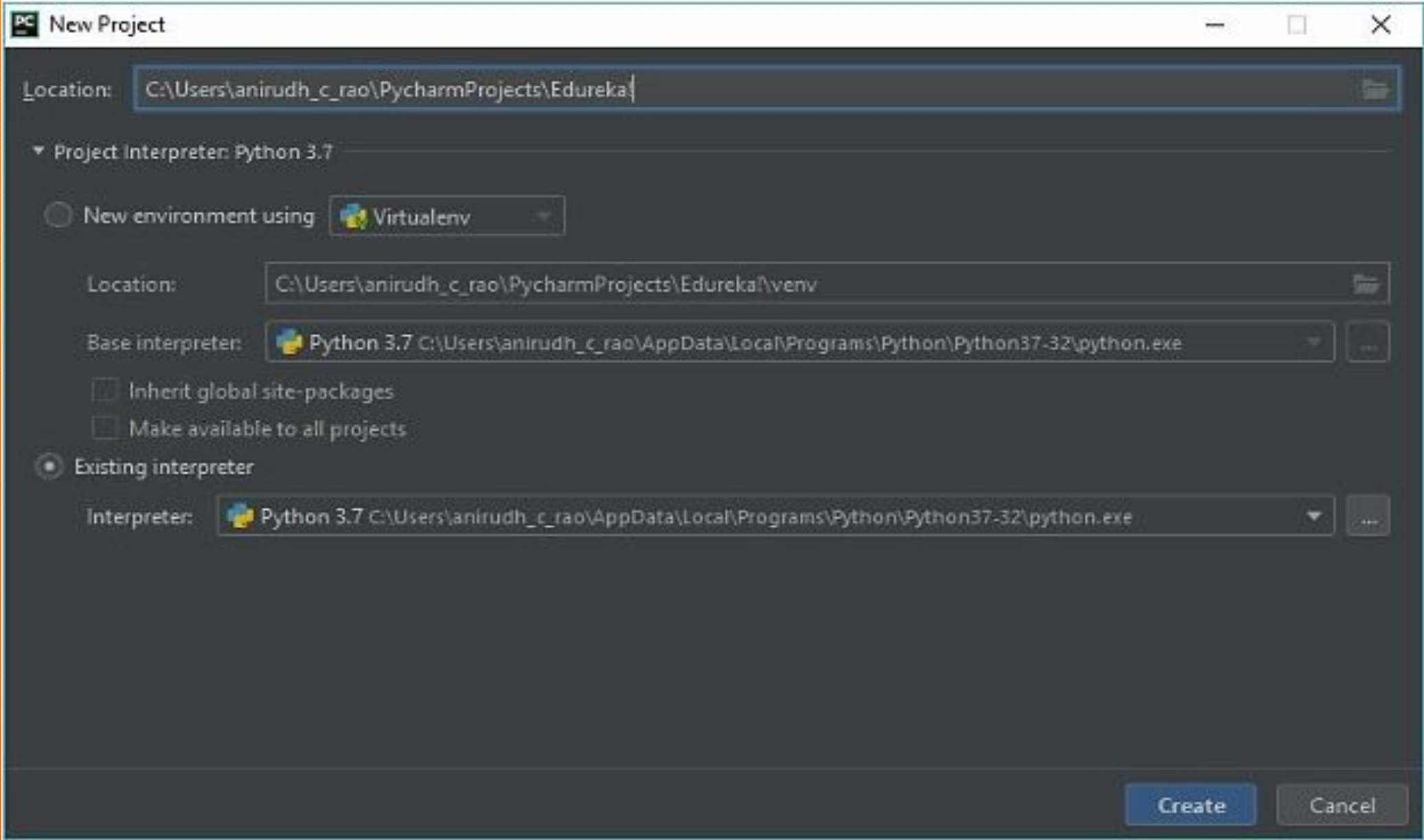
PyCharm Community Edition

- Let us begin by creating a new project. PyCharm greets you with the following image as soon as you open it:

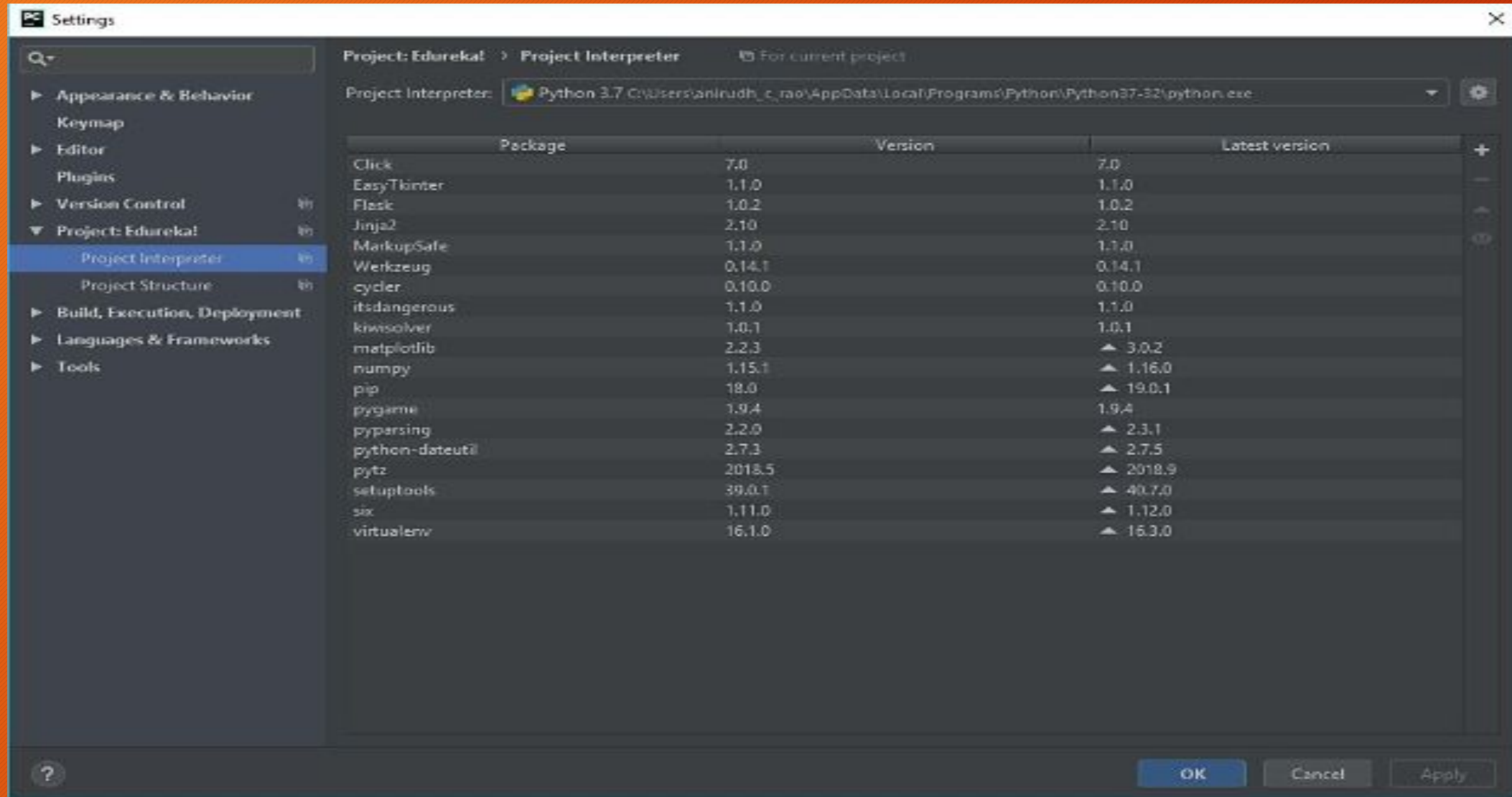
- Here, on the left, you can check out all of the recent projects that I have been working with. But if this is your first time using PyCharm, then the column on the left will not contain anything.



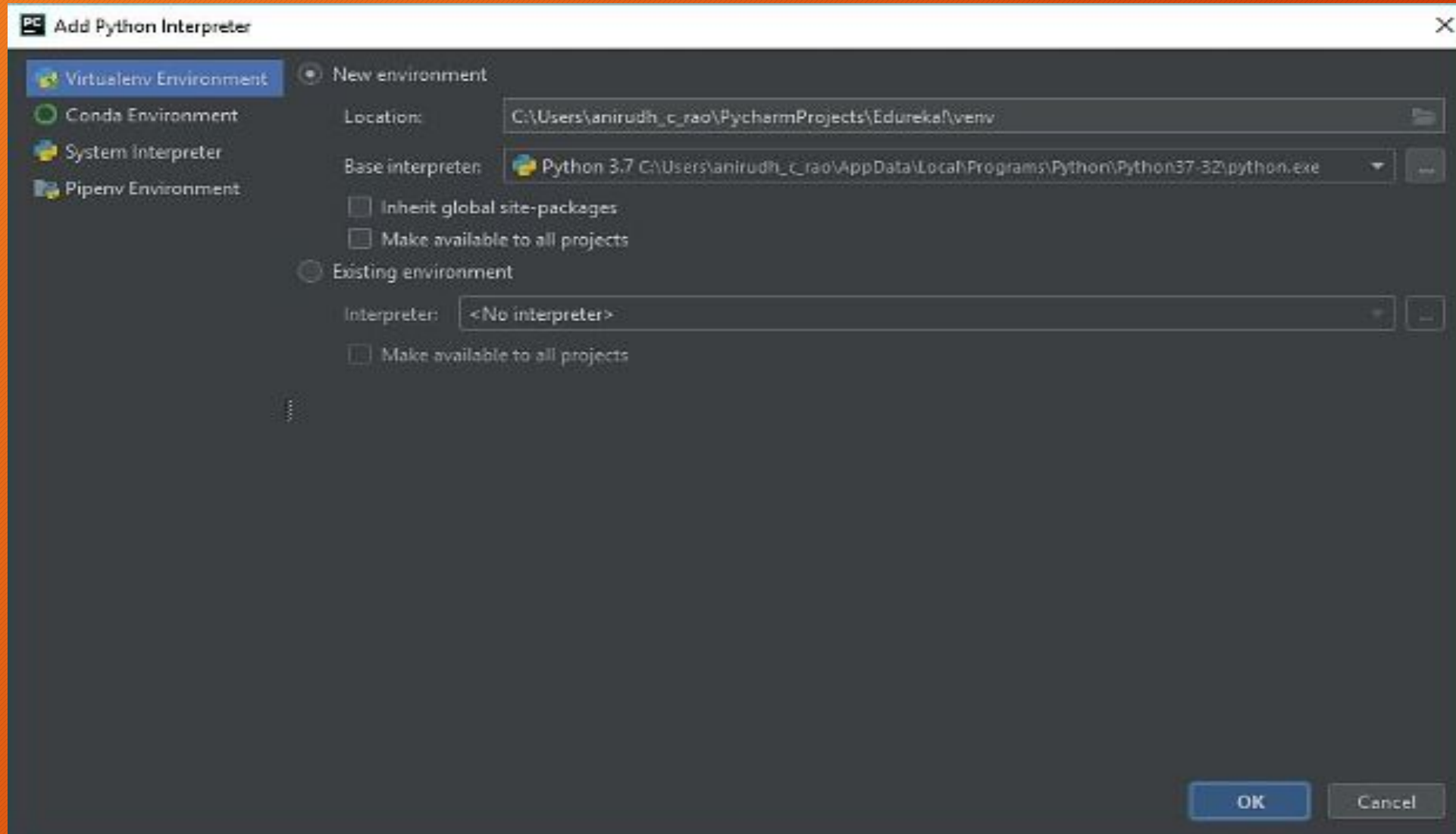
Creating a new project is as easy as clicking on the Create New Project tab and going from there.



This image basically helps us set up our Python Interpreter. However, this might be blank if you do not have Python installed on your system



Clicking on the little gear icon on the right will bring up the following page:



Here, you can make use of the System Interpreter if you have not installed Python separately. Do check the version of the Python installation that is present so it meets your requirements.

Why Learn Python?

Python's syntax is very easy to understand. The lines of code required for a task is less compared to other languages. Let me give you an example - If I have to print "Welcome To NIELIT KURUKSHETRA!" all I have to type:

```
print("Welcome To NIELIT KURUKSHETRA!")
```

Let's look at some cool features of Python:

- Simple and easy to learn
- Free and Open Source
- Portable
- Supports different programming paradigm
- Extensible

If you are wondering where you can use Python (Python Application), let me tell you that is where Python stands out.



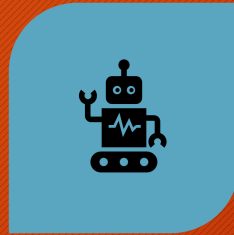
Python Applications



ARTIFICIAL
INTELLIGENCE



DESKTOP
APPLICATION



AUTOMATION



WEB
DEVELOPMENT



DATA
WRANGLING,
EXPLORATION AND
VISUALIZATION

Python Basics

The basic concepts in any programming language are the foundation of any programmer, We will start with the most basic concept in python.

Python Keywords

Keywords are nothing but special names that are already present in python. We can use these keywords for specific functionality while writing a python program.

Following is the list of all the keywords that we have in python:

Here is a list of the Python keywords

False	def	if	raise
None	del	import	return
True	elif	in	try
and	else	is	while
as	except	lambda	with
assert	finally	nonlocal	yield
break	for	not	
class	from	or	
continue	global	pass	

Python Comments

Syntax

```
#this is a single line comment
```

```
"""this is a docstring / multiline  
comment  
i hope it is clear  
"""
```

```
'''This is multiline comment'''
```