

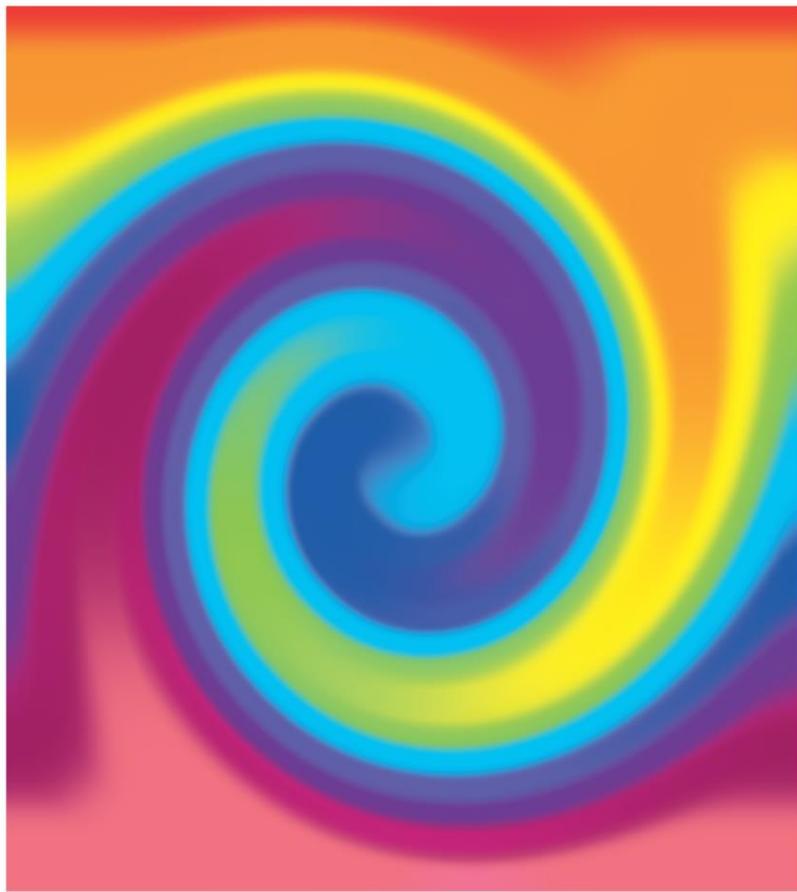


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CODING WITH PYTHON



A COURSE FOR ABSOLUTE BEGINNERS



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COURSE OUTLINE

5 WEEKS, SATURDAYS, 2-5 PM

Week 1:

- An introduction to Python
- Installing Python on Windows
- Python Shell

Week 2:

- Saving & Running scripts
- Operators & Variables
- Working with Strings

Week 3:

- Python Collections
- Condition Blocks

Week 4:

- Writing Loops
- Functions in Python

Week 5:

- Introducing Modules
- In-class Assessment

INSTRUCTOR CONTACT

ROOP OMAR

(oop.omar@gmail.com)

We will try to cater to all queries within class timings, but if you feel there is something you need help with later, or were not able to ask during the session, please feel free to drop me an email, and I will get back to you as soon as I can.



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WHY LEARN TO PROGRAM ?

CODING IS A 21ST CENTURY SKILL !

- Coding is the method of giving a computer instructions to perform a specific task.
- These instructions are communicated using a language that computers can understand.
- Learning to code at a young age is a great opportunity for teens and young adults to develop their problem-solving and critical thinking skills.
- It also instills the necessary focus and organization to see projects through to completion.
- It motivates youngsters to become makers of technology while preparing them for countless job opportunities.





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INTRODUCTION TO PYTHON

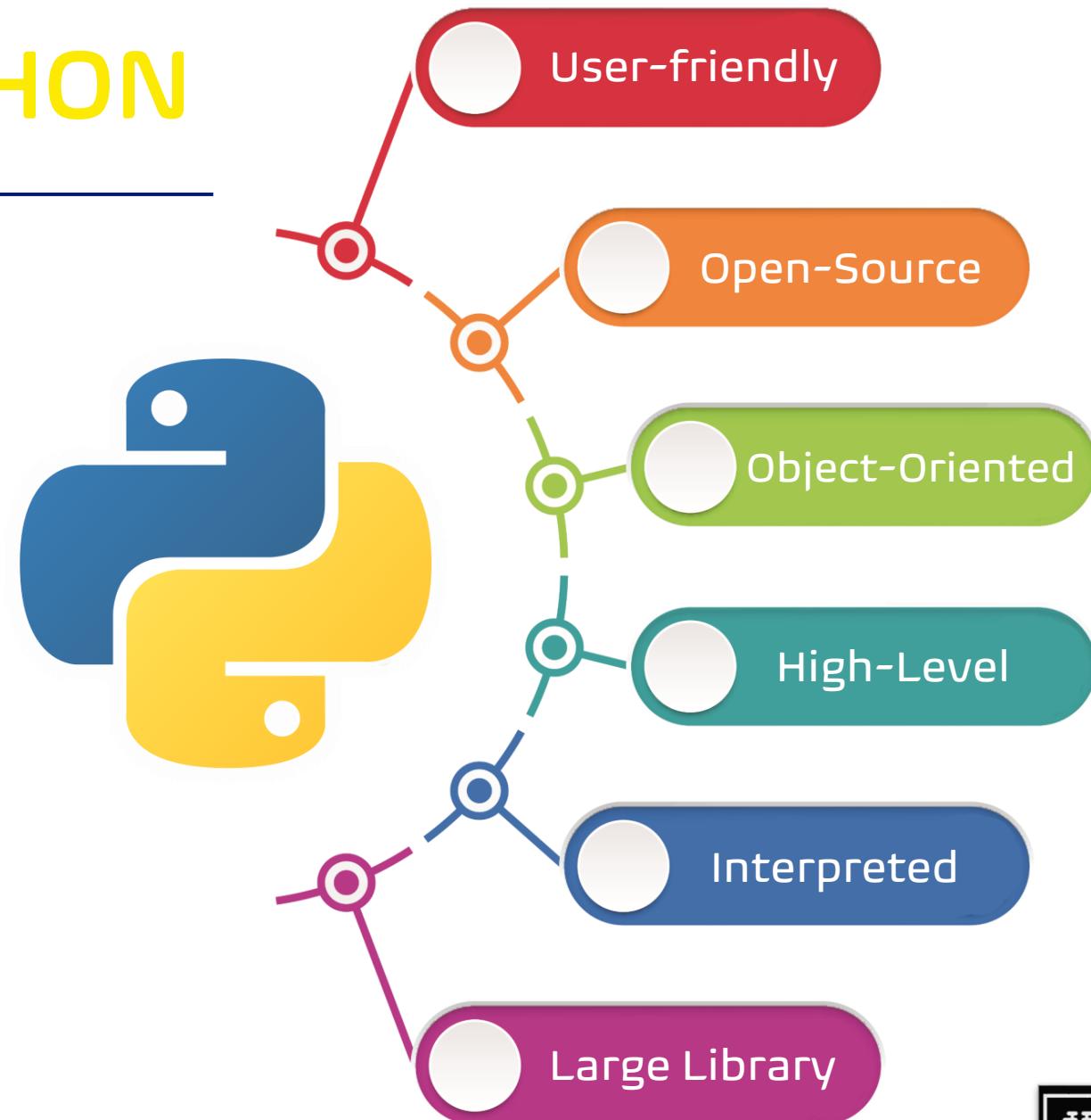
WHO CREATED PYTHON ?

- Created in the 1980s by a dutch programmer, **Guido Van Rossum**, who was working then at the National Research Institute for Mathematics & Computer Science in the Netherlands.
- As a hobby, he started developing a language that would use indentation instead of braces, making the code more readable.
- Python was officially released in 1989
- The name inspired by his favourite show "**Monty Python's Flying Circus**"

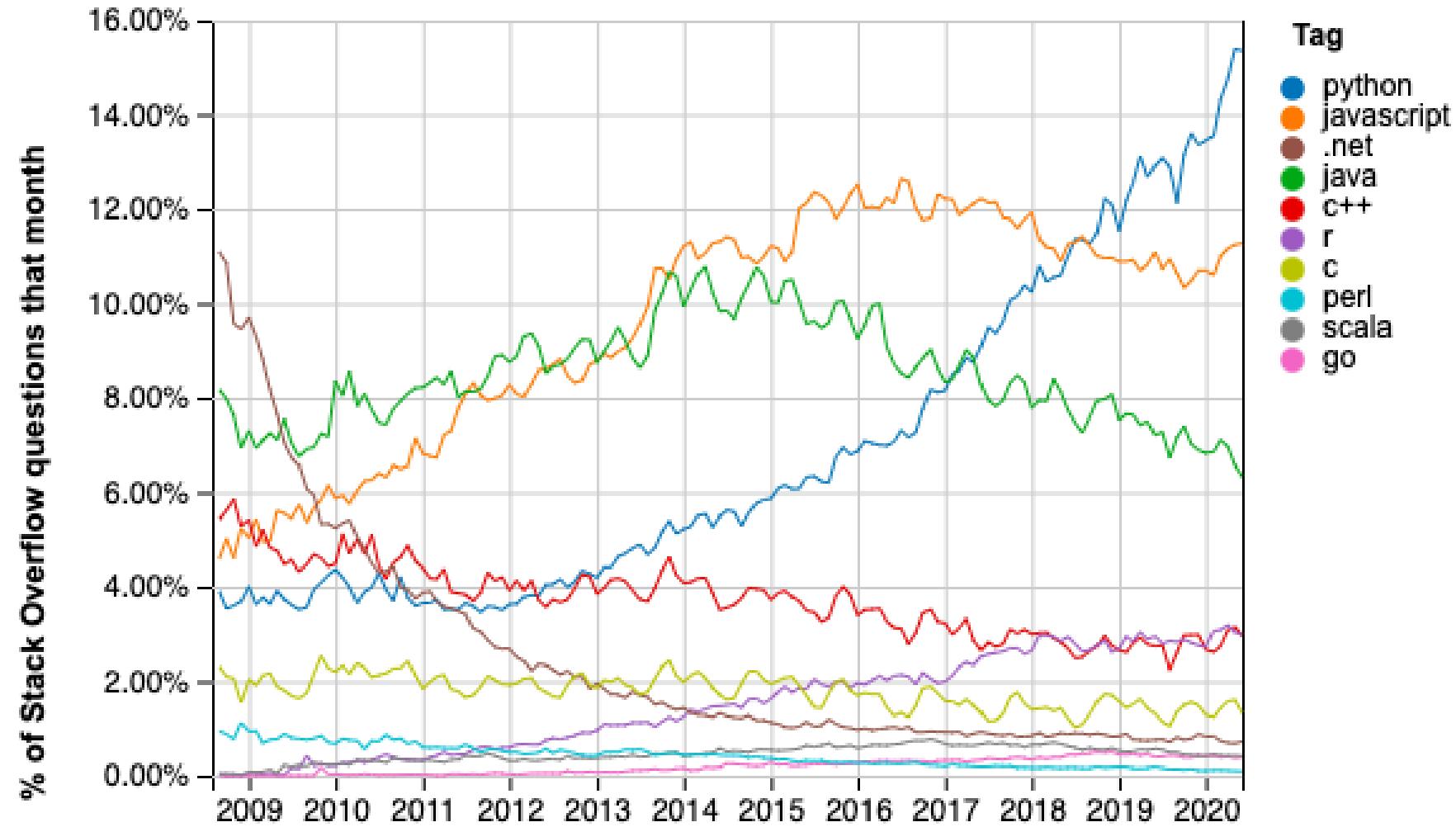


FEATURES OF PYTHON

- Python's syntax is very simple. It's much like writing in English.
- Hence, it is easy to read (and understand) and write code in Python.
- Python code is also concise.
- Requires fewer lines of code to perform the same functions as compared to other languages.
- This makes developers faster and more productive.

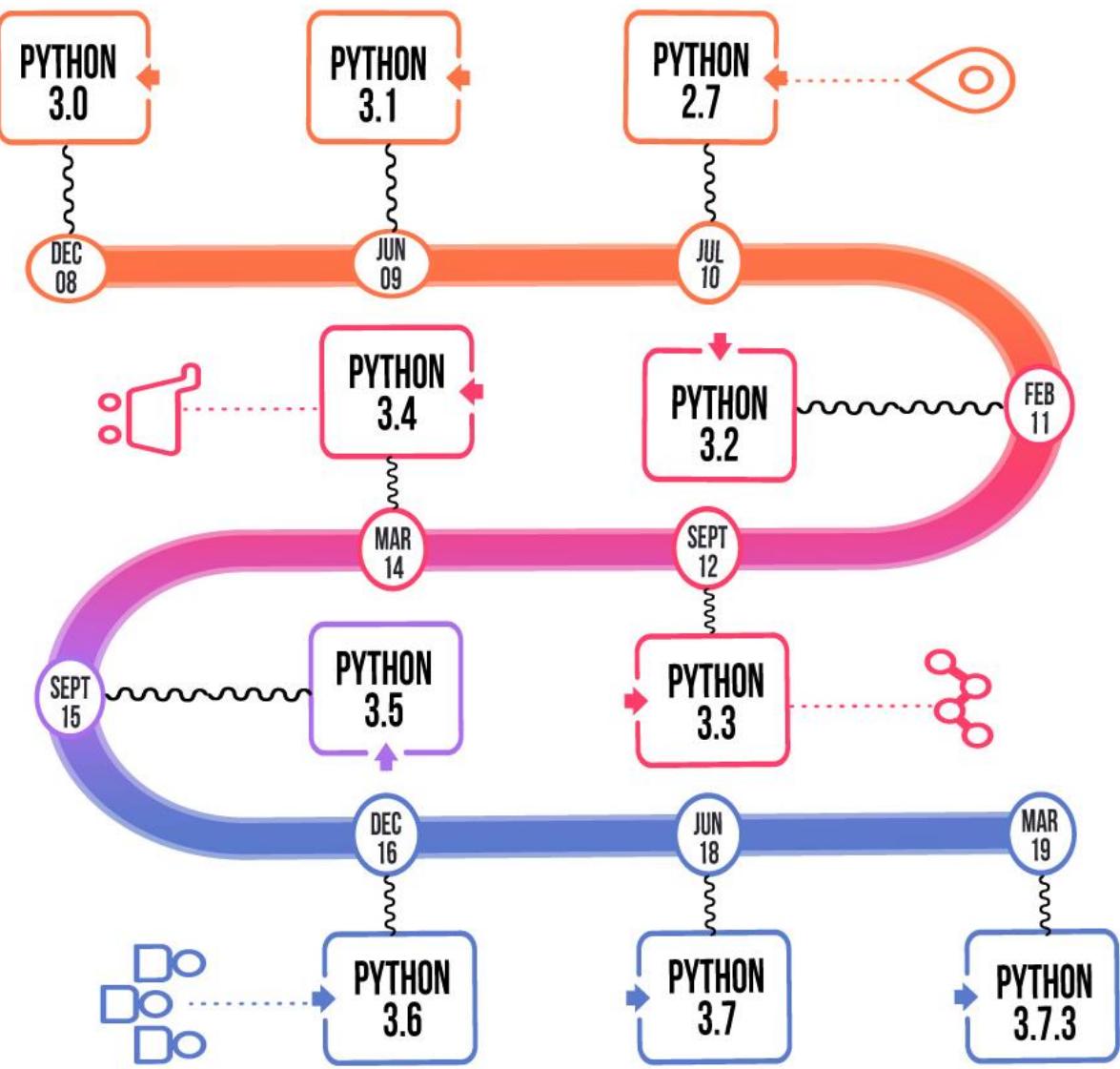
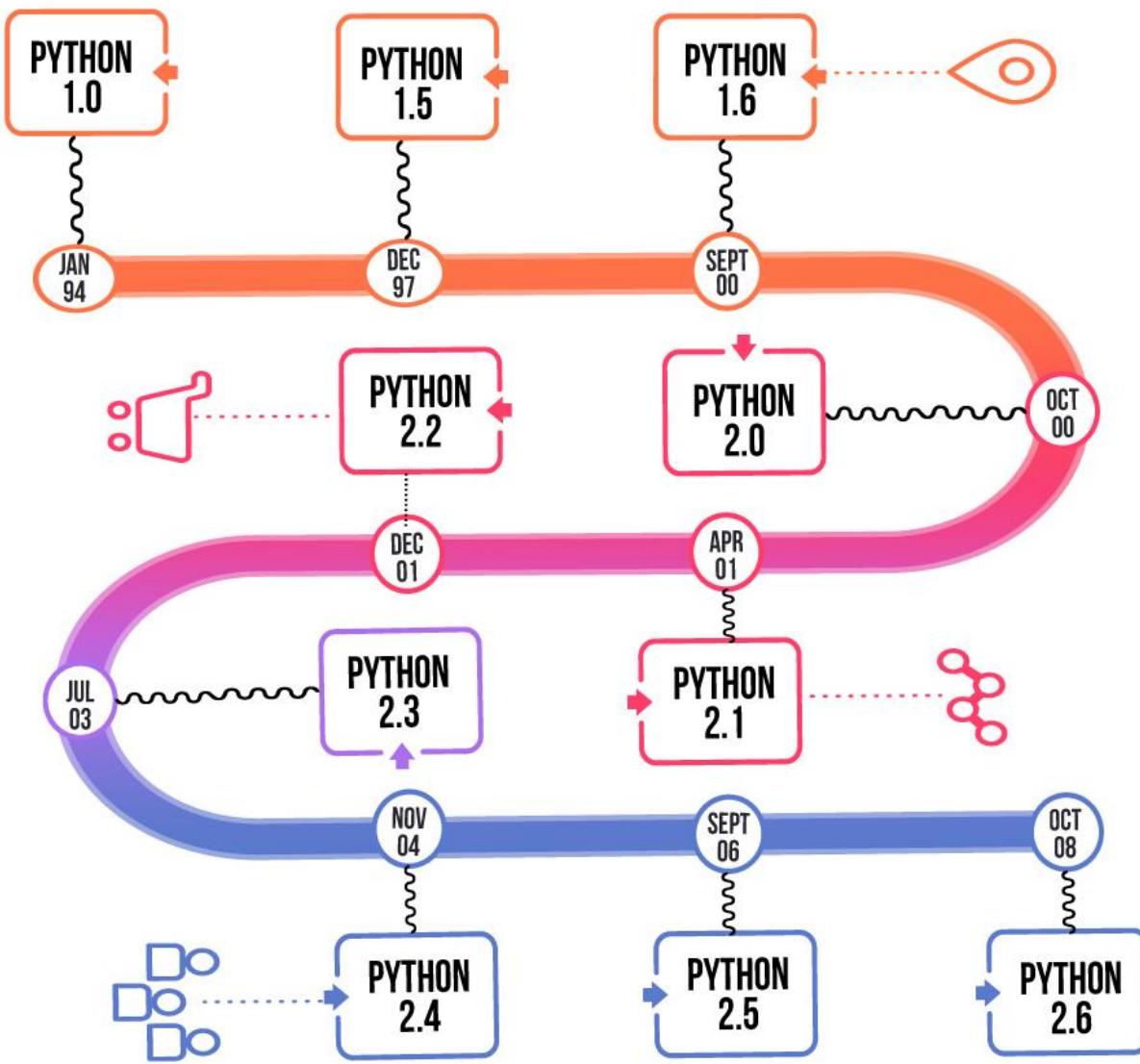


RISE TO POPULARITY



SOME TOP COMPANIES USING PYTHON





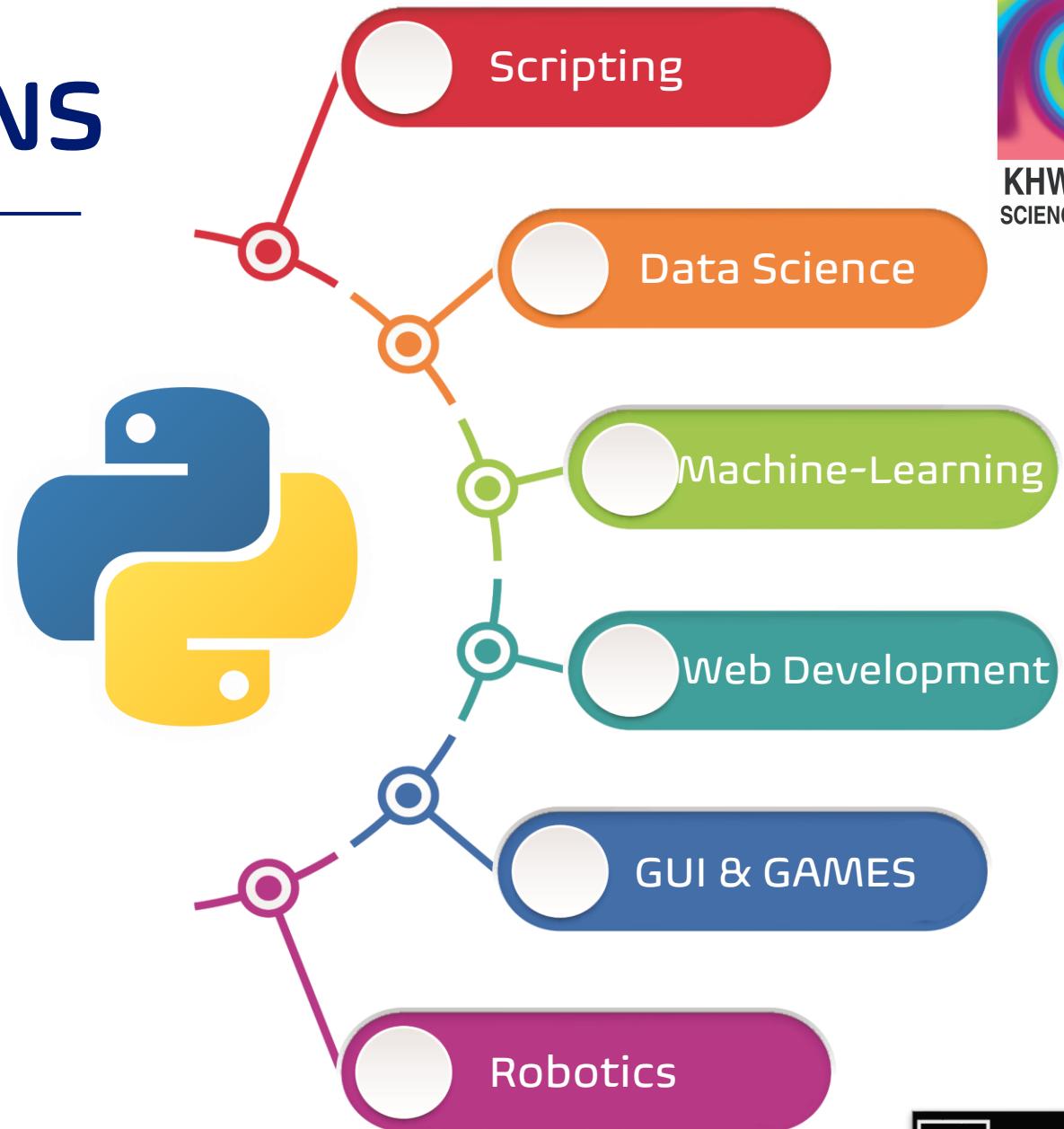


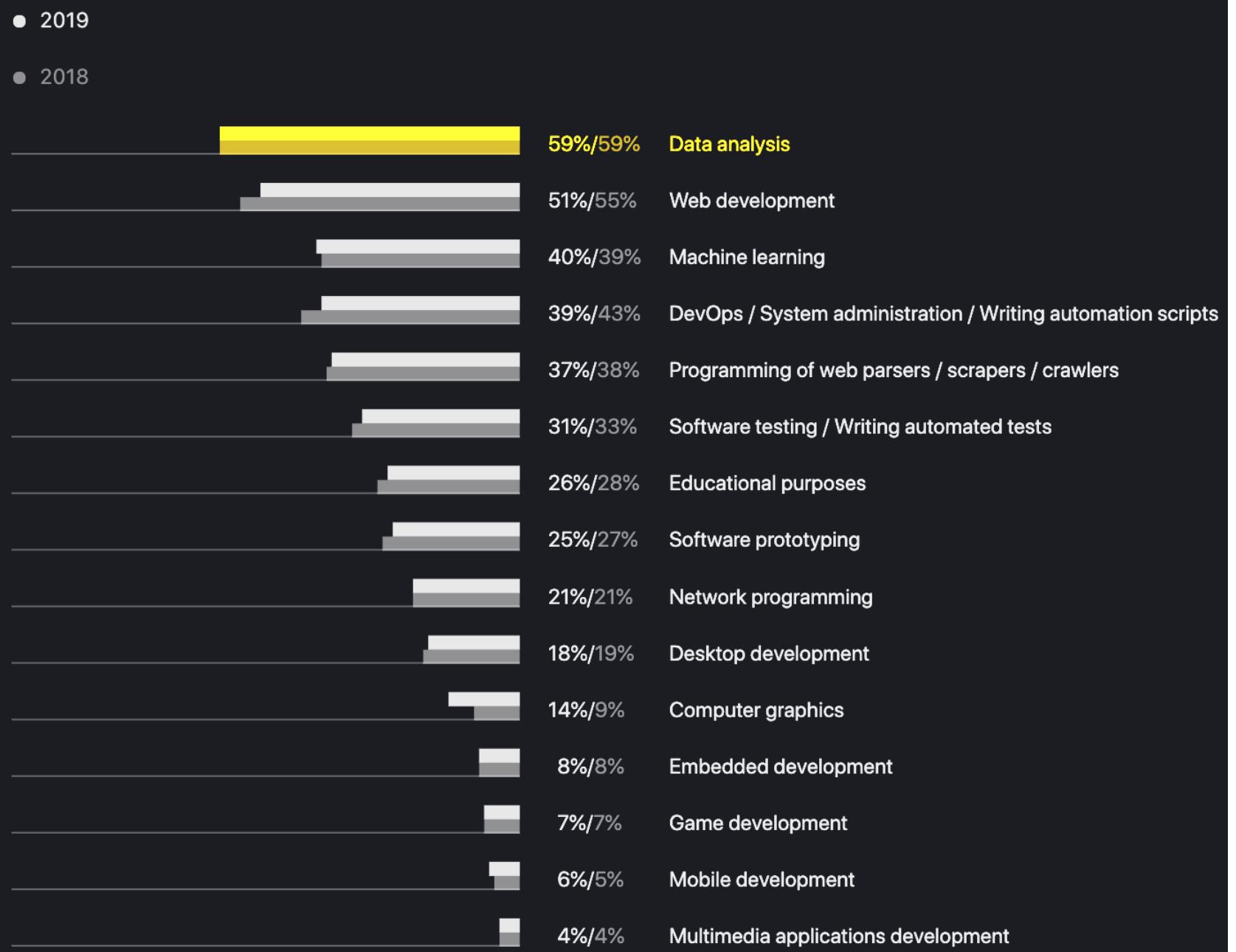
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APPLICATIONS OF PYTHON

PYTHON APPLICATIONS

- Python has significantly evolved since its creation.
- Facilitates building a plethora of apps.
- Python is a language that does it all, from web applications to video-games, Data Science, Machine Learning, real-time applications to embedded applications, and so much more.





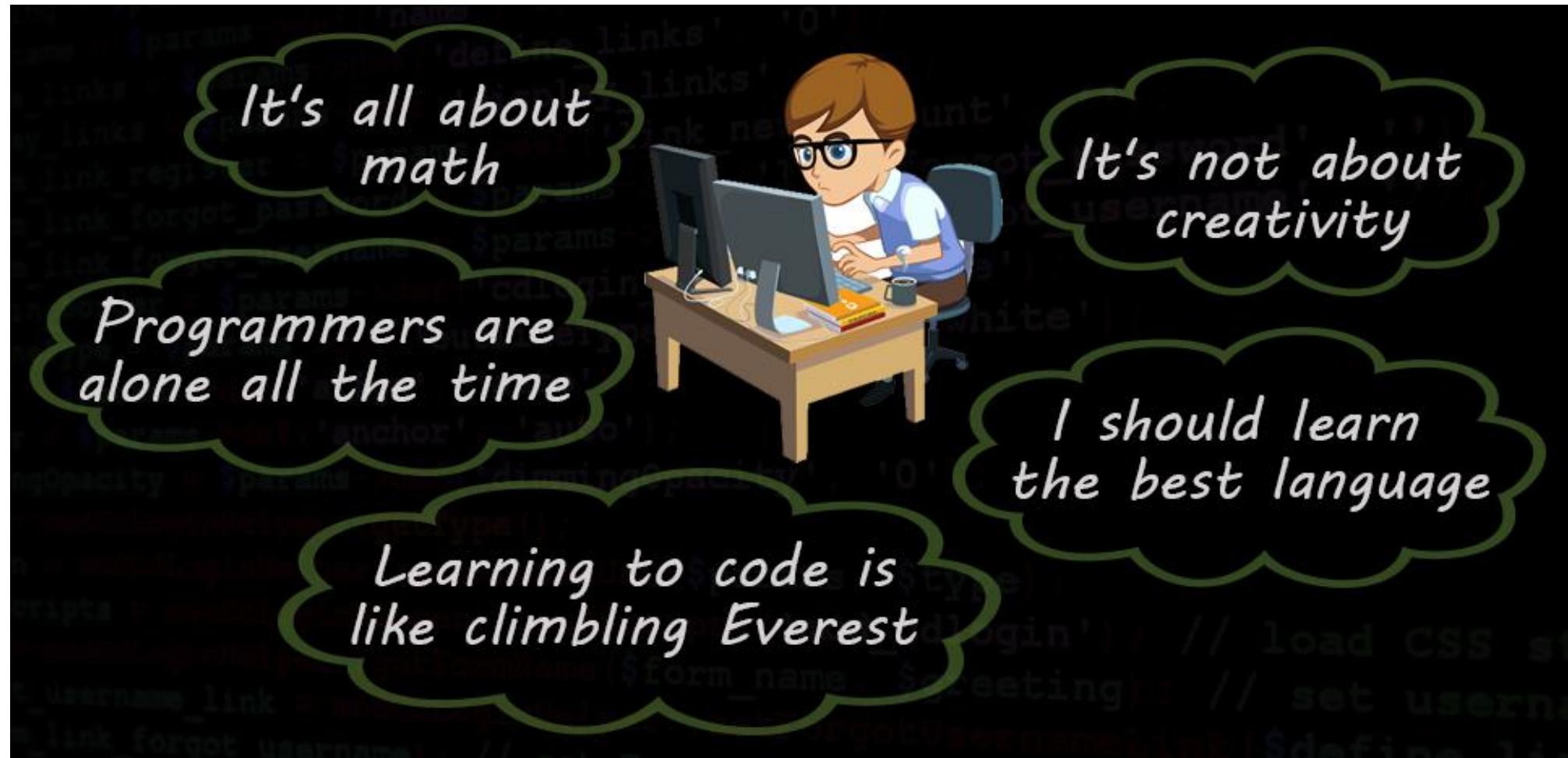


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MYTHS & MISCONCEPTIONS



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- Python is difficult and time-consuming
- It is a skill for smart people who are amazing at Maths
- Not compiled and used only for scripting
- Python is slow
- Python is not for big projects
- Python is not for secure, critical systems
- Python lacks support





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INSTALLING PYTHON ON WINDOWS MACHINES

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Download the latest version for Windows

Download Python 3.9.1

Looking for Python with a different OS? Python for [Windows](#), [Linux/UNIX](#), [Mac OS X](#), [Other](#)

Want to help test development versions of Python? [Prereleases](#), [Docker images](#)

Looking for Python 2.7? See below for specific releases



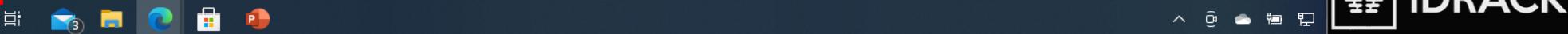
Active Python Releases

For more information visit the Python Developer's Guide.

Python version	Maintenance status	First released	End of support	Release schedule
3.9	bugfix	2020-10-05	2025-10	PEP 596
3.8	bugfix	2019-10-14	2024-10	PEP 569
3.7	security	2018-06-27	2023-06-27	PEP 537
3.6	security	2016-12-23	2021-12-23	PEP 494
2.7	end-of-life	2010-07-03	2020-01-01	PEP 373

What do you want to do with python-3.9.1-amd64.exe?
Open Save as ...

Type here to search



The screenshot shows the Python.org website's Windows downloads page. At the top, there are navigation links for Python, PSF, Docs, PyPI, Jobs, and Community. Below the header is the Python logo and a search bar with a magnifying glass icon. To the right of the search bar are buttons for 'Donate', 'Search', 'GO', and 'Socialize'. On the far right, there is a colorful circular logo for 'KHWARIZMI SCIENCE SOCIETY'. The main content area has a breadcrumb trail: Python > Downloads > Windows. Below this, a section titled 'Python Releases for Windows' is highlighted with a red border. This section contains links to the latest Python 3 and 2 releases. The page is divided into 'Stable Releases' and 'Pre-releases' sections, each listing download links for Windows embeddable packages, help files, and installers in both 32-bit and 64-bit formats.

Python Releases for Windows

- [Latest Python 3 Release - Python 3.9.2](#)
- [Latest Python 2 Release - Python 2.7.18](#)

Stable Releases

- [Python 3.9.2 - Feb. 19, 2021](#)

Note that Python 3.9.2 cannot be used on Windows 7 or earlier.

- [Download Windows embeddable package \(32-bit\)](#)
- [Download Windows embeddable package \(64-bit\)](#)
- [Download Windows help file](#)
- [Download Windows installer \(32-bit\)](#)
- [Download Windows installer \(64-bit\)](#)

- [Python 3.8.8 - Feb. 19, 2021](#)

Note that Python 3.8.8 cannot be used on Windows XP or earlier.

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- [Python 3.6.13 - Feb. 15, 2021](#)

Pre-releases

- [Python 3.9.2rc1 - Feb. 16, 2021](#)

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- [Python 3.8.8rc1 - Feb. 16, 2021](#)

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- [Download Windows help file](#)
- [Download Windows installer \(32-bit\)](#)
- [Download Windows installer \(64-bit\)](#)

- [Python 3.10.0a5 - Feb. 2, 2021](#)

- [Download Windows embeddable package \(32-bit\)](#)
- [Download Windows embeddable package \(64-bit\)](#)
- [Download Windows help file](#)



Type here to search





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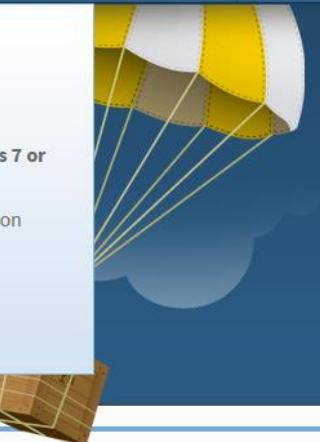
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Download for Windows

[Python 3.9.2](#)

Note that Python 3.9+ cannot be used on Windows 7 or earlier.

Not the OS you are looking for? Python can be used on many operating systems and environments.

[View the full list of downloads.](#)

Active Python Releases

For more information visit the [Python Developer's Guide](#).

Python version	Maintenance status	First released	End of support	Release schedule
3.9	bugfix	2020-10-05	2025-10	PEP 596
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3.6	security	2016-12-23	2021-12-23	PEP 494
2.7	end-of-life	2010-07-03	2020-01-01	PEP 373

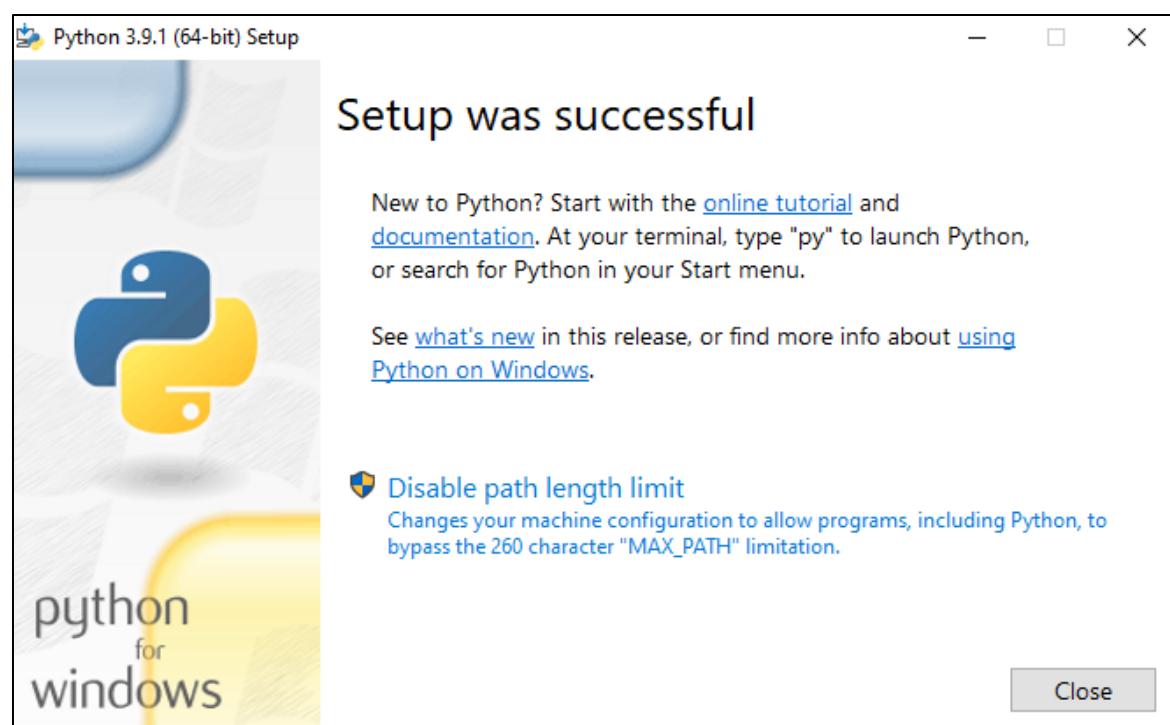
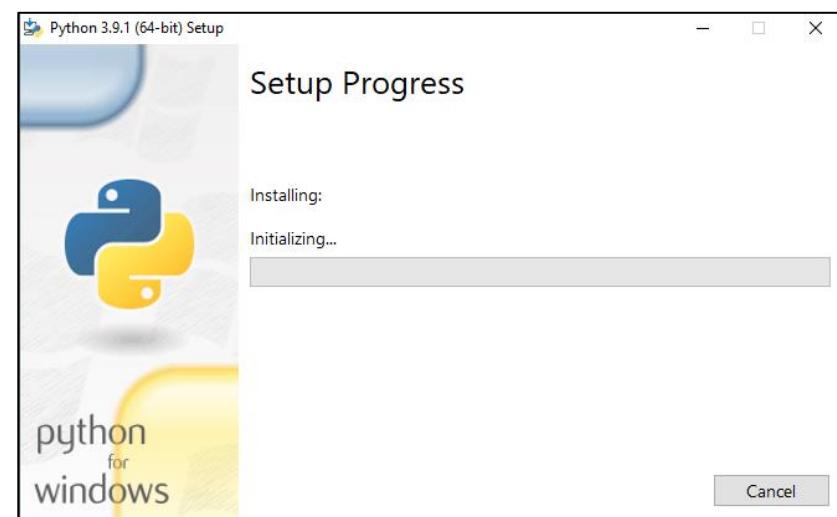
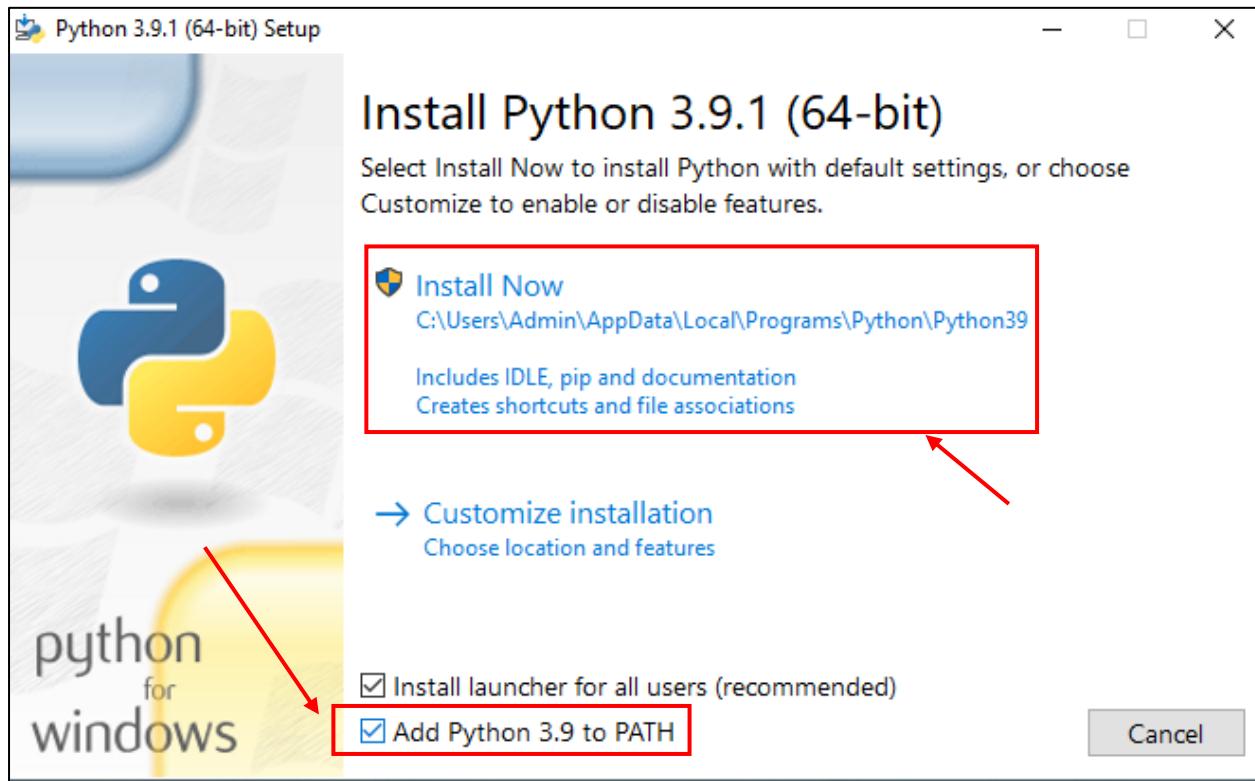
Looking for a specific release?

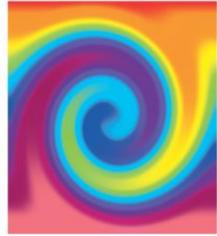
[Python releases by version number](#)





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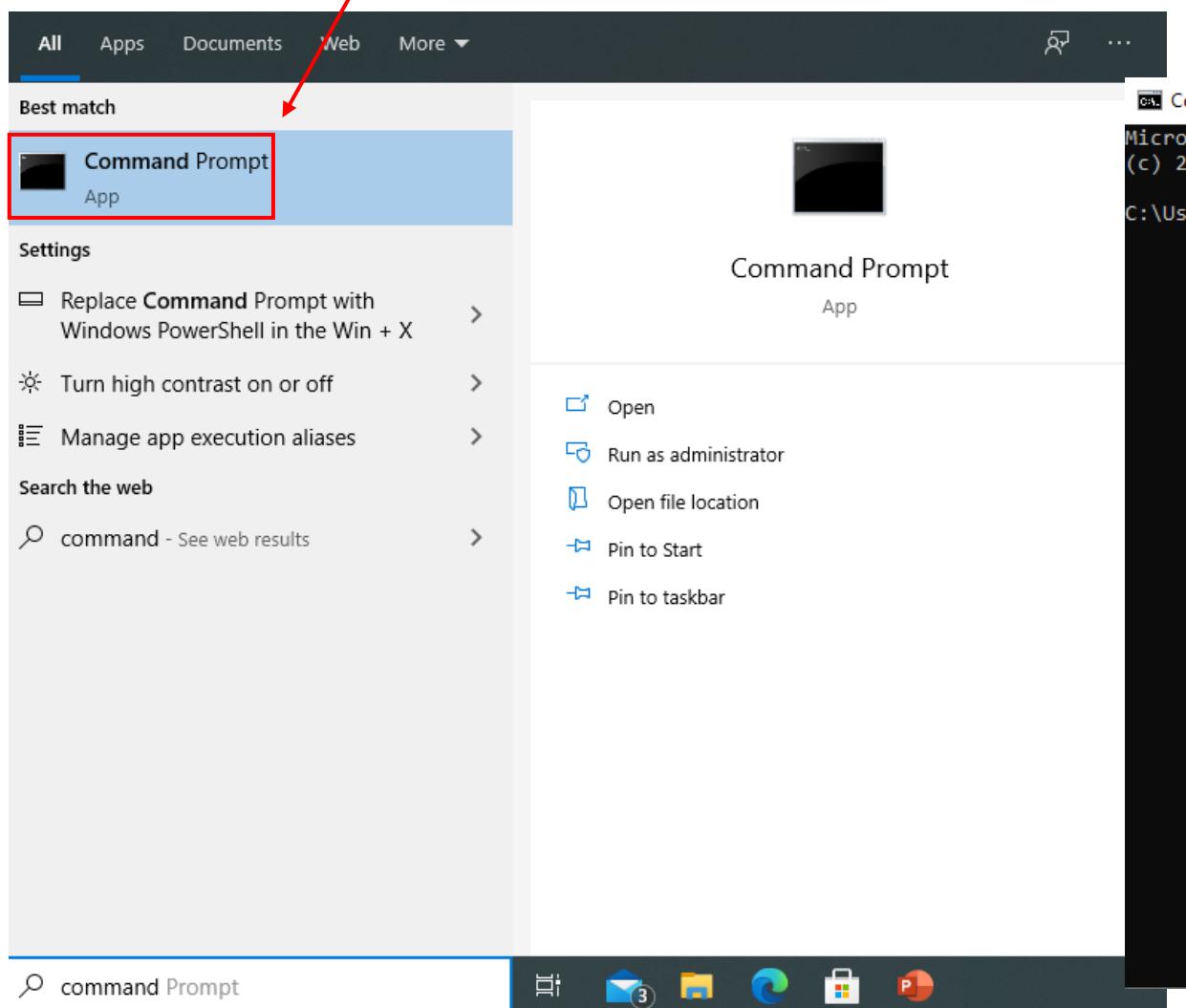


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THE PYTHON SHELL



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Command Prompt

Microsoft Windows [Version 10.0.18363.1379]
(c) 2019 Microsoft Corporation. All rights reserved.
C:\Users\Admin>

Command Prompt

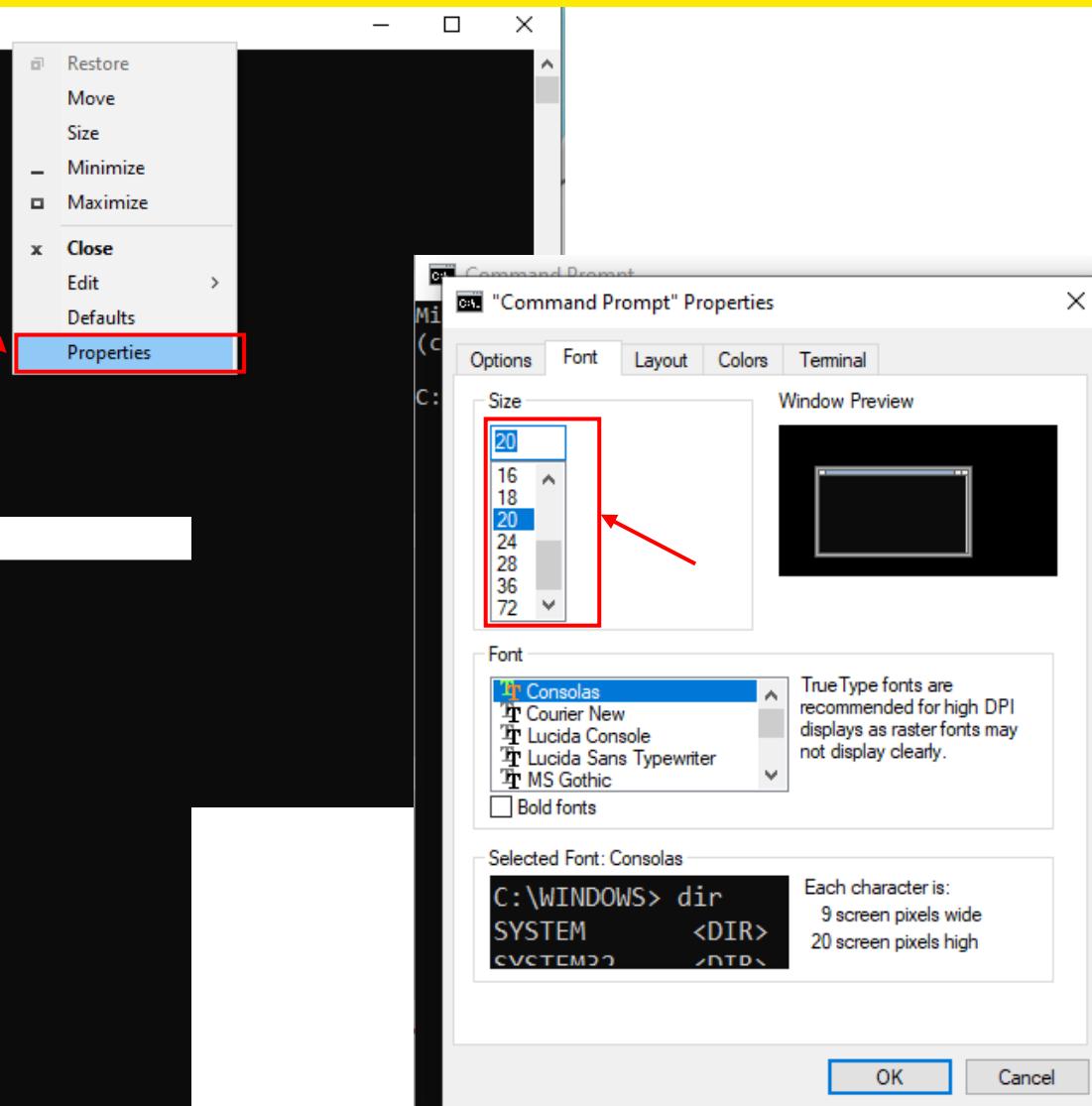
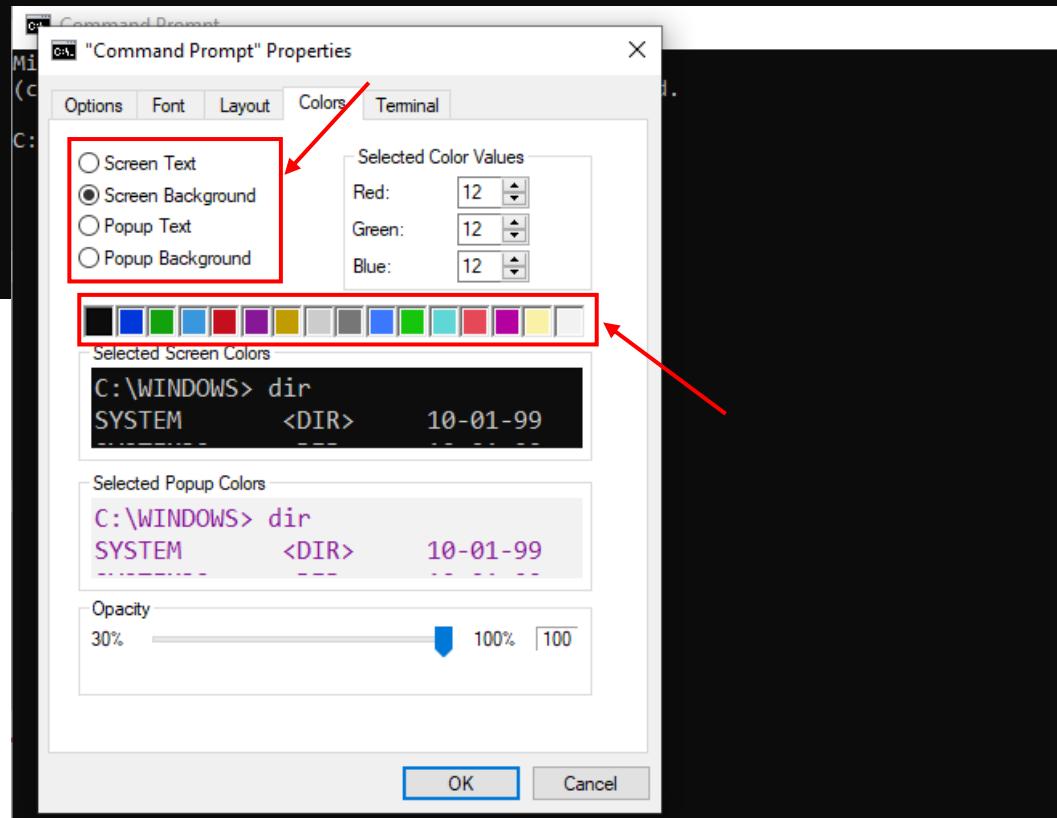
App

- Open
- Run as administrator
- Open file location
- Pin to Start
- Pin to taskbar

Command Prompt

Microsoft Windows [Version 10.0.18363.1379]
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C:\Users\Admin>





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```
Command Prompt
Microsoft Windows [Version 10.0.18363.1379]
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C:\Users\Admin>D:

D:\>dir
Volume in drive D is Work
Volume Serial Number is 0A84-FF6A

Directory of D:\

01/21/2021  02:55 PM    <DIR>          .Trash-1000
02/11/2021  05:45 AM      2,439,976 analysis-of-genomic-variants-of-pakistani-sub-population-sequenced-by-1000-genomes-project.pdf
01/21/2021  06:14 PM    <DIR>          DD
01/09/2021  06:45 PM    <DIR>          en-US
01/16/2021  12:29 PM    <DIR>          IDRACK
02/16/2021  12:19 PM    <DIR>          KSS
01/29/2021  12:14 AM    <DIR>          LibreOffice_7.1.0.3_Linux_x86-64_deb_helppack_en-US
12/01/2006  11:37 PM      904,704 msdia80.dll
01/09/2021  06:45 PM      5,883,668 openoffice-calc_4.1.9-1_amd64.deb
01/30/2021  06:14 AM    <DIR>          PERSONAL EXPRESSIONS
               3 File(s)   9,228,348 bytes
               7 Dir(s)  257,008,541,696 bytes free

D:\>
```



- Make a new Directory
- Change Directory
- Open NotePad
- View File Contents
- Python Shell

```
D:\>mkdir KSS_Python
```

```
D:\>cd KSS_Python
```

```
D:\KSS_Python>
```

```
D:\KSS_Python>notepad
```

```
D:\KSS_Python>type hello.txt
Hello to the World of Python!
Happy Learning!
D:\KSS_Python>
```

```
D:\KSS_Python>python
Python 3.9.1 (tags/v3.9.1:1e5d33e, Dec  7 2020, 17:08:21) [MSC v.1927 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>>
```



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```
D:\KSS_Python>python
Python 3.9.1 (tags/v3.9.1:1e5d33e, Dec  7 2020, 17:08:21) [MSC v.1927 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> 2+2
4
>>> 10/5
2.0
>>> 8*6
48
>>> 18-6
12
>>> 3**2
9
>>> print("Happy Learning")
Happy Learning
>>> print("12+24 = ", 12+24)
12+24 = 36
>>> print("The square of 6 = ", 6**2)
The square of 6 = 36
>>>
```

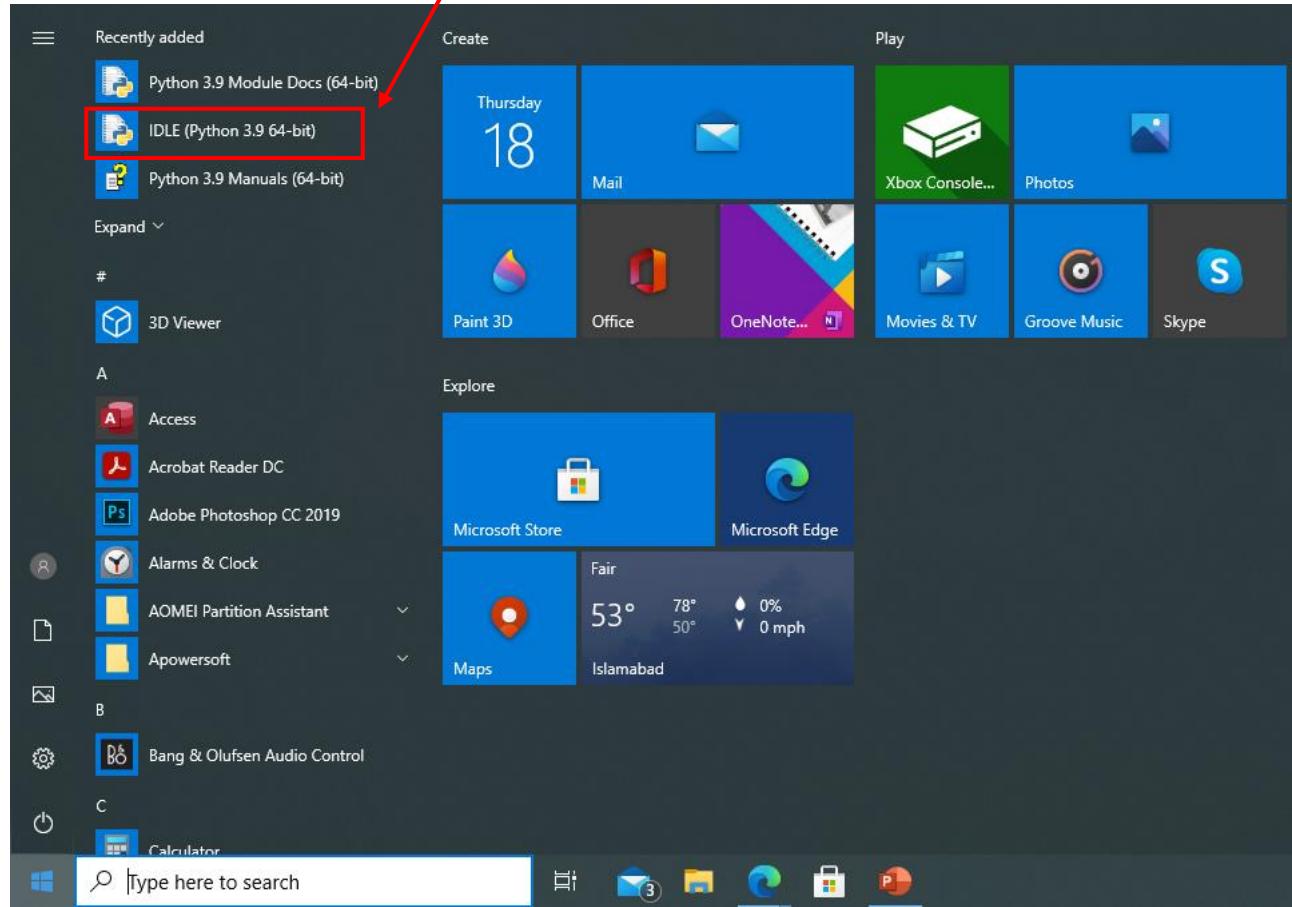


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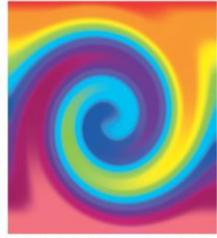
IDLE (Integrated Development & Learning Environment)



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A screenshot of the IDLE Shell 3.9.1 window. The title bar reads 'IDLE Shell 3.9.1'. The menu bar includes File, Edit, Shell, Debug, Options, Window, and Help. The main area displays Python version information and a help message. The bottom right corner shows 'Ln: 3 Col: 4'.

```
File Edit Shell Debug Options Window Help
Python 3.9.1 (tags/v3.9.1:le5d33e, Dec 7 2020, 17:08:21) [MSC v.1927 64 bit (AM
D64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
```



Other Editors



A T O M

1.54.0

[Release notes](#)

Windows

For 64-bit Windows 7 or later

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Code editing. Redefined.

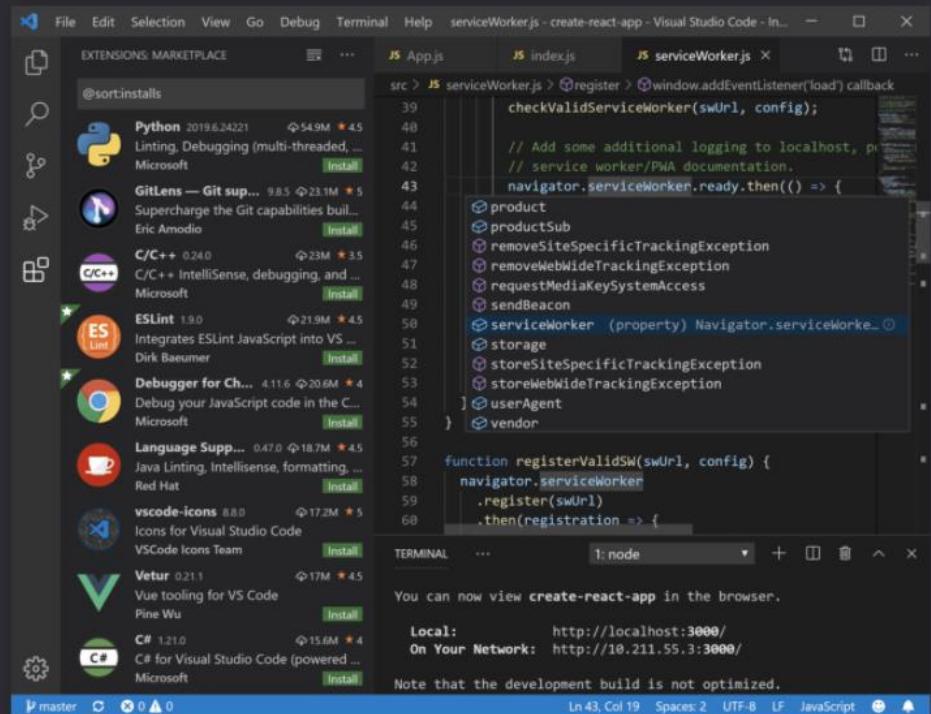
Free. Built on open source. Runs everywhere.

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Stable Build

Other platforms and Insiders Edition

By using VS Code, you agree to its
license and privacy statement.



The screenshot shows the Visual Studio Code interface. On the left, there's a sidebar for the Extensions Marketplace with various extensions listed such as Python, GitLens, C/C++, ESLint, Debugger for Chrome, Language Support for Java, vscode-icons, Vetur, and C# for Visual Studio Code. The main area shows a code editor with three files: App.js, index.js, and serviceWorker.js. The serviceWorker.js file contains code related to service workers and PWA documentation. Below the code editor is a terminal window showing a node environment. At the bottom, there are status bars for the file path (master), line and column numbers (Line 43, Col 19), and character encoding (UTF-8 LF JavaScript).



IntelliSense



Run and Debug



Built-in Git

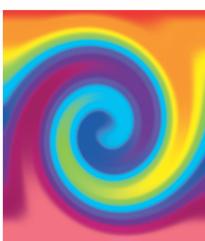


Extensions



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| [Y]es, I agree [N]o, thanks

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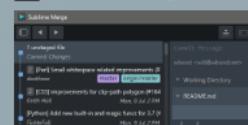
A sophisticated text editor for
code, markup and prose

DOWNLOAD FOR WINDOWS

Sublime Text 3 (Build 3211) Changelog

Introducing our Git client

Sublime Merge



Sublime Text

FOLDERS

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- third_party
- tools
- util
- .gitignore
- ACKNOWLEDGMENTS
- ADOPTERS.md
- AUTHORS
- BUILD
- CODEOWNERS
- configure
- CONTRIBUTING.md
- ISSUE_TEMPLATE.md
- LICENSE
- models.BUILD
- README.md
- RELEASE.md
- WORKSPACE
- sqlite3
- shell.c
- sqlite3.c
- sqlite3.h
- sqlite3ext.h

xla_compilation_cache.cc

```
193     arg.initialized = true;
194 } else {
195     // The values of uninitialized variables are not passed as inputs, since
196     // they are meaningless. However, it is legal to assign to a resource
197     // variable for the first time inside the XLA computation, so we do permit
198     // uninitialized variables.
199     arg.initialized = false;
200     arg.type = DT_INVALID;
201     arg.shape = xla::Shape();
202 }
203 ++input_num;
204 }
205
206 return Status::OK();
207 }
208
209 } // namespace
210
211 Status XlaCompilationCache::Compile(
212     const XlaCompiler::Options& options, const NameAttrList& function,
213     int num_constant_args, const std::vector<OptionalTensor>& variable_args,
214     OpKernelContext* ctx,
215     const XlaCompiler::CompilationResult** compilation_result,
216     xla::LocalExecutable** executable) {
217     VLOG(1) << "XlaCompilationCache::Compile" << DebugString();
218
219     if (VLOG_IS_ON(2)) {
220         VLOG(2) << "num_inputs=" << ctx->num_inputs()
221             << " num_constant_args=" << num_constant_args
222             << " num_variable_args=" << variable_args.size();
223         for (int i = 0; i < ctx->num_inputs(); i++) {
224             TensorShape shape = ctx->input(i).shape();
225             VLOG(2) << i << ": dtype=" << DataTypeString(ctx->input_dtype(i))
226             << " present=" << ctx->has_input(i)
227             << " shape=" << shape.DebugString();
228         }
229     }
230 }
```

Quickly jump to files and functions with Goto Anything

Here **Ctrl + P** is used to open the Goto Anything menu, **xcc** is used to select the file **xla_compilation_cache.cc**, **@** switches to symbol mode, and **:c** selects the **XlaCompilationCache::Compile** method.





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Some Exercises

1. Write a script that solves and shows the summation of $71 + 23$.
2. Do the same as above, saving the numbers in variables and displaying the answer as "Sum of X and Y is".
3. Ask the user to enter their Year of Birth. Then calculate and display their current age
4. Try to print the day, month, year in the form "Today is 20/02/2021".
5. Generate two random integers between 1-20, perform any two mathematical operations on them, and print answers to screen

Take a screenshot of your code and output for record. We will be reviewing this in the next session