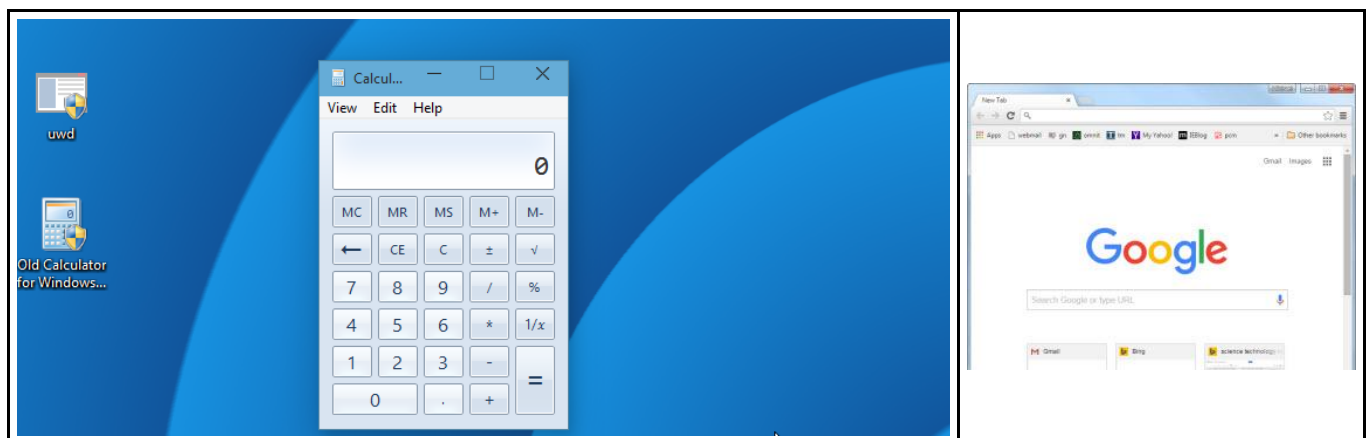
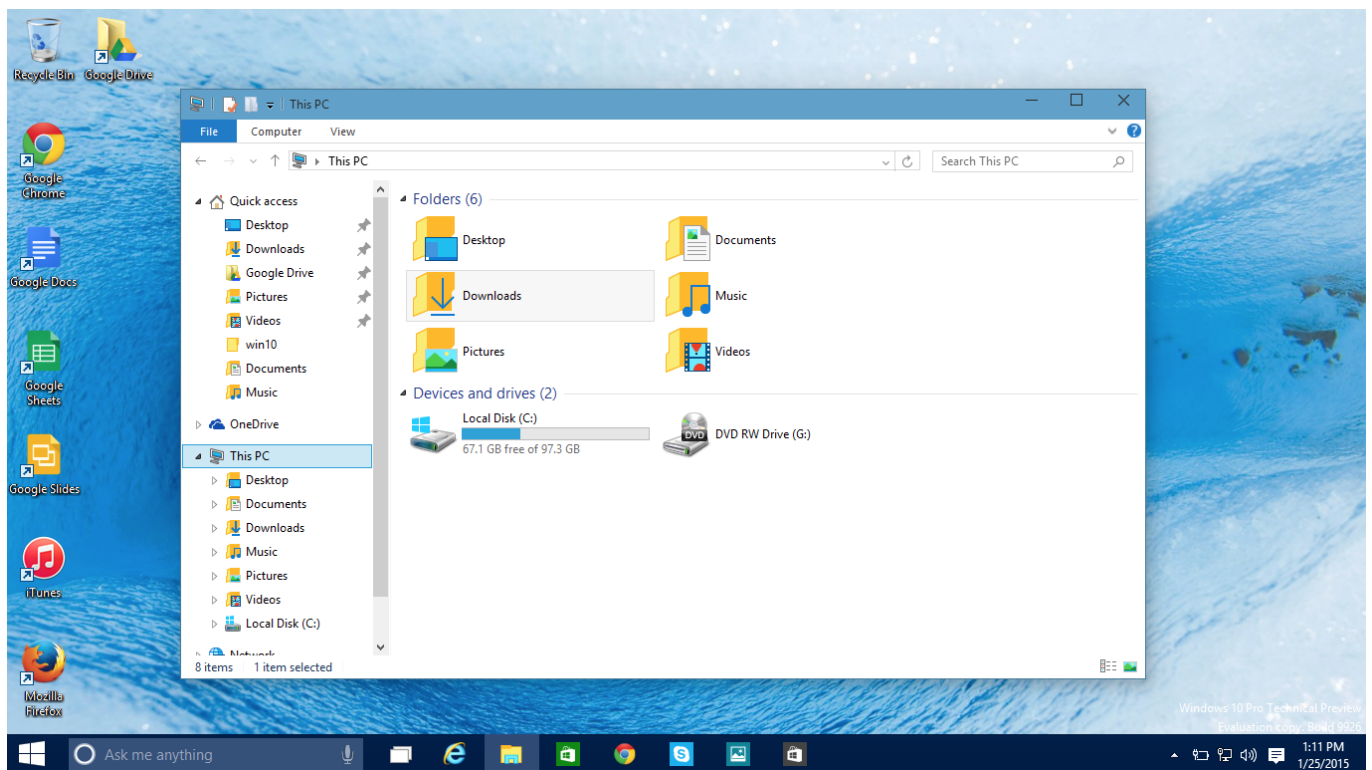


Lesson 1

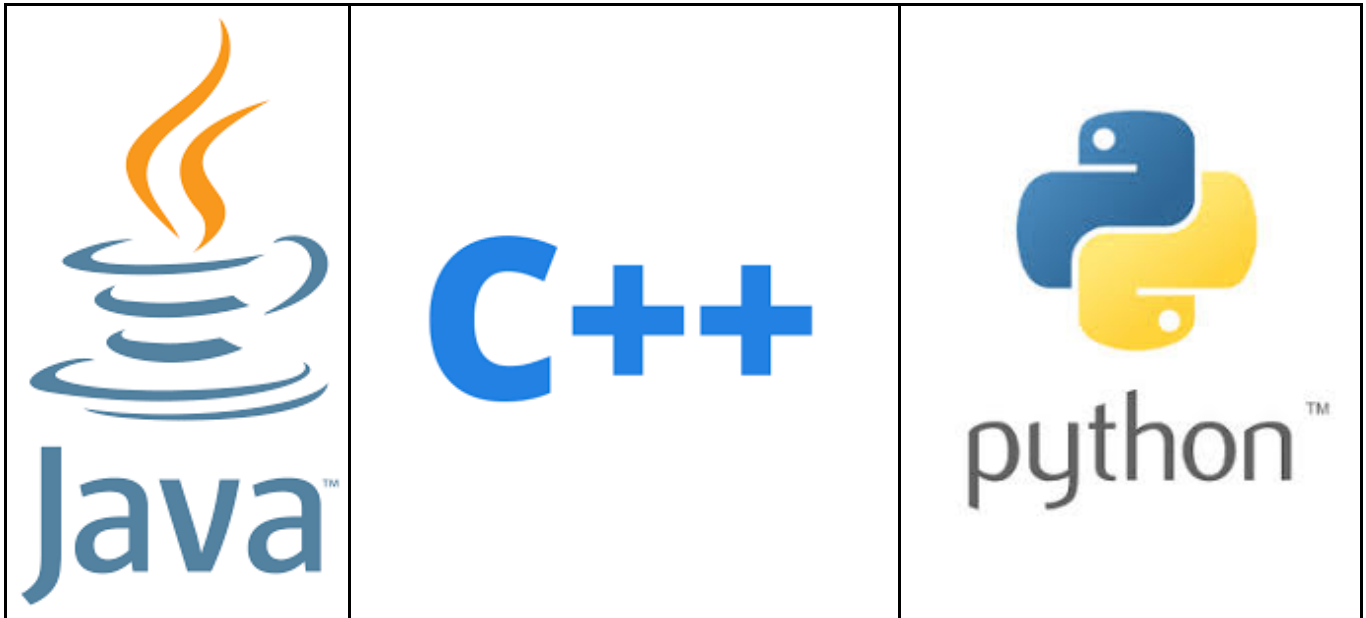
1. What is a program?
2. Course Objectives
3. Python:
 - Running your first program
 - Writing your first program
 - Python as a calculator
 - Variables

What is a program?



- Programs are not just about buttons and visible features
- a lot of things are happening in the background
- Try searching on Google, autocompletion? search results?
- Youtube => how does it know what to recommend you when you open a video?
<https://www.youtube.com/watch?v=9TC8yF9GV8A> (<https://www.youtube.com/watch?v=9TC8yF9GV8A>)

Programming languages



Programming

- Programming is just a tool
- Problem solving skills are essential
- Programming is used to implement Algorithms
- An Algorithm is a step by step method to solve a problem, we use it all the time but we are not aware of it, Examples?

By the end of this course

1. Programming (black box -> open box)
2. Implementing your own programs (Project/ mini projects)
3. What you can reach using programming? and put you on the track of how to get there

Why Python?

Easy language + Huge Capabilities + Online Support

Python	Java	C++	Ruby
<pre>print("Hello, World!")</pre>	<pre>public class HelloWorld { public static void main(String[] args) { System.out.println("Hello World!"); } }</pre>	<pre>#include <iostream> using namespace std; int main() { cout << "Hello world!" << endl; return 0; }</pre>	<pre>puts "hello world";</pre>

Back-end (Server-side) table in most popular websites																
Websites	ASP.NET	C	C++	D	Erlang	Go	Hack	Java	JavaScript	Perl	PHP	Python	Ruby	Scala	Xhp	
Google.com	No	Yes	Yes	No	No	Yes	No	Yes	No	No	No	Yes	No	No	No	
YouTube.com	No	Yes	Yes	No	No	Yes	No	Yes	No	No	No	Yes	No	No	No	
Facebook.com	No	No	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes	No	No	Yes	
Yahoo	No	No	No	No	No	No	No	No	Yes	No	Yes	No	No	No	No	
Amazon.com	No	No	Yes	No	No	No	No	Yes	No	Yes	No	No	No	No	No	
Wikipedia.org	No	No	No	No	No	No	No	No	No	No	Yes	No	No	No	No	
Twitter.com	No	No	Yes	No	No	No	No	Yes	No	No	No	No	Yes	Yes	No	
Bing	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	
eBay.com	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	Yes	No	
MSN.com	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	
Microsoft	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	
Linkedin.com	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	Yes	No	
Pinterest	No	No	No	No	Yes	No	No	No	No	No	No	Yes	No	No	No	
WordPress.com	No	No	No	No	No	No	No	No	Yes	No	Yes	No	No	No	No	

source: https://en.wikipedia.org/wiki/Programming_languages_used_in_most_popular_websites

Installing Python

1. If you are using Linux => Good news! python is already installed (version 2.7)
2. If you are using Windows => <https://www.python.org/downloads/>
(<https://www.python.org/downloads/>) (choose version 2.7)

Installing Code Editor

- For this course we will be using Pycharm
- There are other common editors used for python e.g. Sublime, Atom, etc.

Installation

1. Go here <https://www.jetbrains.com/pycharm/download/>
(<https://www.jetbrains.com/pycharm/download/>)
2. Choose Community Edition
3. For windows, installation is straightforward
4. For linux:
 - A. The download file has tar.gz (this is just a compressed file for linux)
 - B. Uncompress the file
 - C. Inside the extracted folder you will find bin folder which has a pycharmXXX.sh file
 - D. To open Pycharm you need to open terminal
 - E. type 'cd '
 - F. then type 'sh pycharmXXX.sh'

Running your first python program

1. Open PyCharm
2. Open python_examples folder
3. Run hello_world.py

Writing your first program

Example 1

- write a program that prints out your name
- Hint: you can modify the hello_world.py file to print your name instead of hello world and rerun it

Using Python Shell

- View -> Tool Windows -> Terminal -> write 'python'
- There are different ways to run python code (python shell, running a file)

Using Python as a calculator

- Operators:
 - +
 - -
 - *
 - /
 - //
 - %
- Types: int vs float
- Precedence

Errors

- Syntax Errors

```
>>> 3 +  
File "<stdin>", line 1  
    3 +  
      ^  
SyntaxError: invalid syntax
```

- Semantic Errors

```
>>> 3/0  
Traceback (most recent call last):  
  File "<stdin>", line 1, in <module>  
ZeroDivisionError: division by zero
```

Variables

- For now anything we calculated is just printed
- How to remember a value of an expression?
- Similar to variables in math

```
>>> x = 5  
>>> x = 3 + 5  
>>> y = x + 2
```

```
>>> width = 2  
>>> length = 4  
>>> area = width * length
```

Example 2:

You are in a country X and travelling to Germany next week. You have 100 dollars and you want to convert them to euros. You go to a currency exchange center and they tell you that they cannot convert it directly. They have to first convert the 100 dollars to currency X, and then convert it from currency X to euros. How many euros will you have in the end?

- Exchange rate from dollars to currency X is 15
- Exchange rate from currency X to euros is 0.05
- Exchange rate from dollars to euros is 0.8