Python Overview

Machine Learning @ RMIT

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Python: A General Purpose High Level Programming Language

- Developed by Guido van Rossum (A Dutch programmer)
- Name inspired by Monty Python – A BBC comedy show (1969 – 1974)
- First release: 1989
- Python 2: 2000
- Python 3: 2008 (no backward compatibility!)
- This course shall adopt Python 3.6 and above
- **Watch out:** there is a lot of code out there that will only work in Python 2!

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Key Advantages

- Easy to learn
- Easy to read
- Easy to code (minimal code when compared to JAVA)
- Dynamically typed programming language (vs. static)

PYTHON

```
print("Hello World!")
a,b = 10,20
print(a+b)
```

JAVA


```
public class HelloWorld {
public static void main(String[] args) {
System.out.println("Hello World!");
Int a,b;
a=10;
b=20;
System.out.println(a+b);
}}
```

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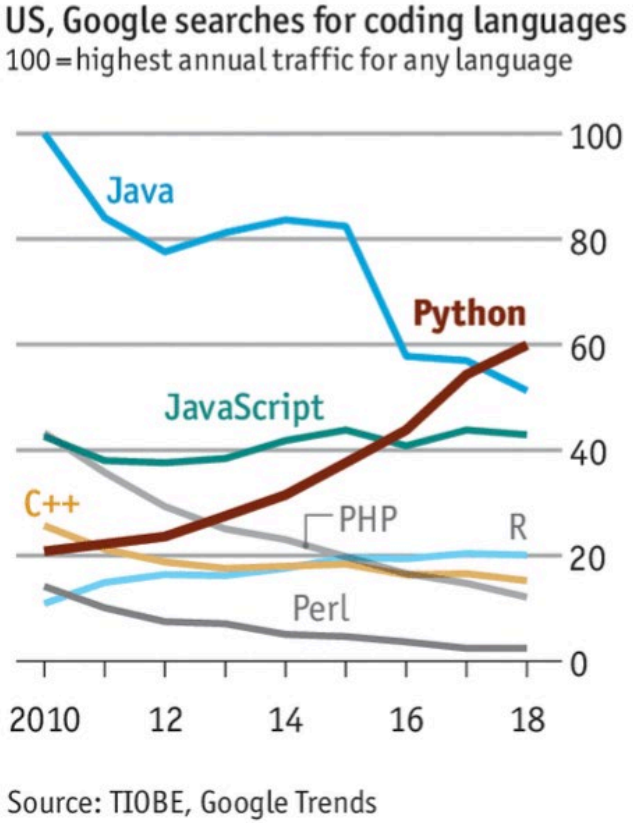
Python is used in

- Desktop Applications
- Web Applications
- Database Applications
- Networking Applications
- IOT Applications
- Mobile Applications
- Game Development
- **Data Science / ML**
- **AI in general**



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..and preferred in the large tech firms

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Python Data Science/ Scientific Computing Stack

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IDEs for Python

- **Jupyter Notebook** 

  - –Preferred IDE for documenting & sharing research outputs
  - –Browser-based
  - –Can embed latex, HTML, java script, etc.
  - –Can export to PDF, HTML
- **Spyder** 

  - –Preferred IDE for data analytics
  - –Layout similar to R Studio, but not as polished as R Studio
- **PyCharm** 

  - –Preferred IDE for professional code development
  - –Solid features for debugging, re-factoring, and code formatting, etc.
  - –Integration with Github and other code versioning repositories for teams of software developers
  - –Can appear complex for beginners
- **Others: VS Code** 

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Python vs. R

- Both are more than enough for at least 95% of the people using them
- Usually comes down to what your boss wants you to use!
- **In favour of R:**
  - –(Really) advanced statistical modelling
  - –Easy to install; R Studio
  - –Packages with no equivalent in Python: tidyverse, ggplot2, forecast

- **In favour of Python:**
  - –Better Object Oriented Programming support
  - –Fast, optimised for big data
  - – Solves the two-language problem: you only need one language for everything
  - – Packages with no equivalent in R: scikit-learn, Hyperopt (Bayesian deep learning fine-tuning)

- **More recently, for ML competitions on Kaggle: 90% Python, 10% R**

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print(‘Have Fun’)

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