



# Python Vs R

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# Python

- Dynamically typed
- Garbage collection
- High level
- A hybrid between compiled and interpreted (different versions can lean more towards each end)
- High readability
- Very popular
- Many libraries
- Popular with machine learning
- Flexible with many uses



# R

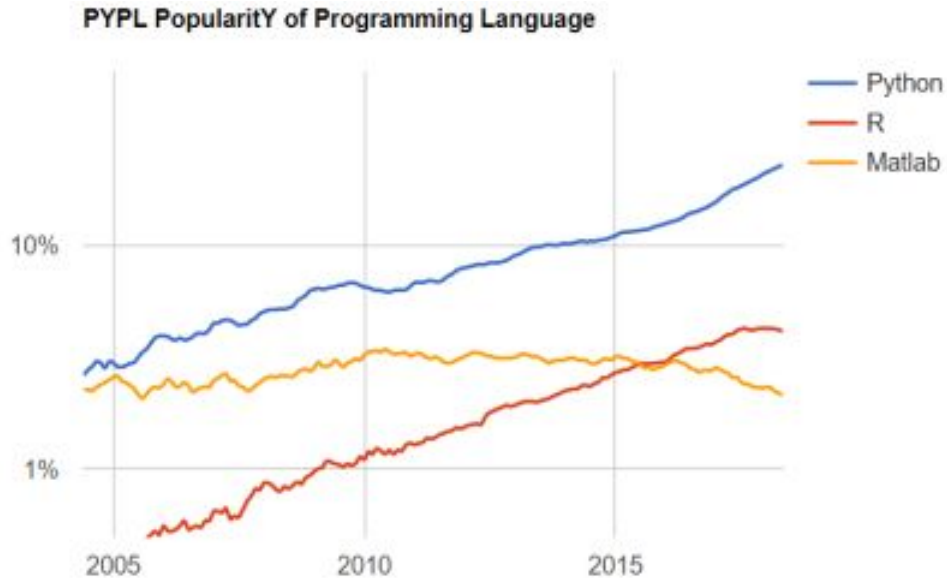
- Interpreted
- Dynamically typed
- Lower level than python
- Many great libraries for statistics
- Popular
- Garbage Collection

# Popularity of R and Python

Python maintained a large lead in popularity over R in the last 20 years.

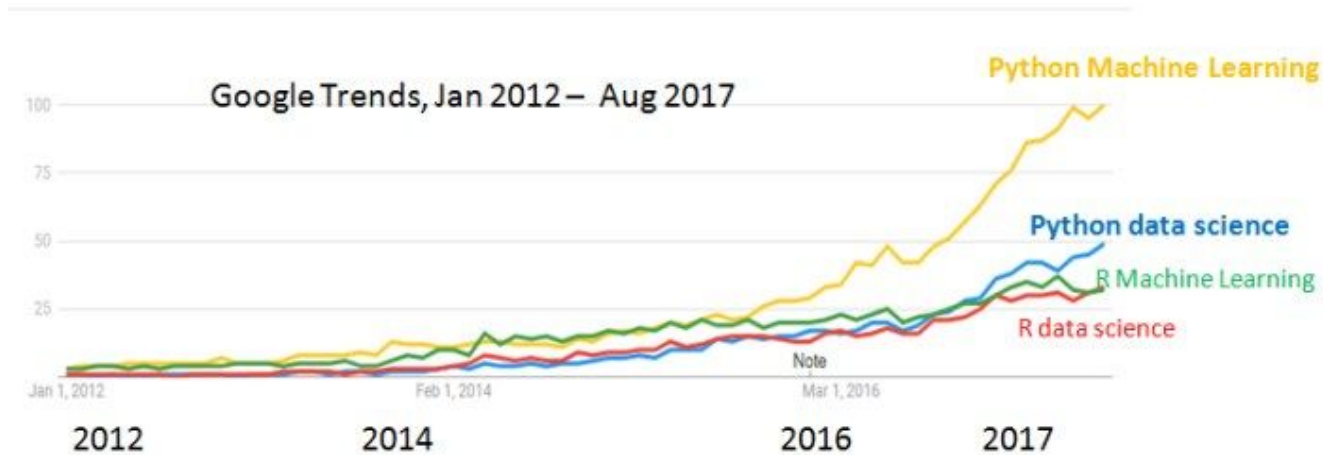
Both have grown substantially over the years.

Both are highly used in data analytics.



Graph of total popularity of Python, R, and Matlab

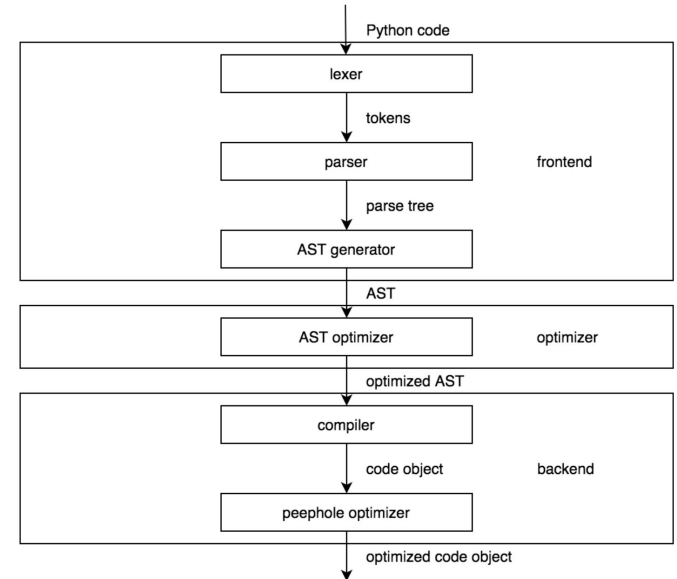
# Popularity in Data Science



Graph of popularity of Python and R in data science and machine learning

# Compiler Structure Of Python & R

- Python
  - Bytecode interpreted language
  - CPython
    - Source Code -> Build AST -> ByteCode
  - What happens when a function is defined?
    - Function object is created.
    - Frame object is created
  - Thread, Runtime and interpreter state
- R
  - Interpreted language
  - Expressions -> Function calls
  - R substitutes objects for symbols
  - Each expression is evaluated





# Python: Pros & Cons

## Pros:

- ❖ Easy to read, learn and write
- ❖ Interpreted Language
- ❖ Vast Libraries Support
- ❖ Free and open source

## Cons:

- ❖ Slow speed
- ❖ Not memory efficient
- ❖ Databases access
- ❖ Runtime errors



# R: Pros and Cons

## Pros:

- ❖ Open Source
- ❖ Use in Statistics
- ❖ Support for data wrangling
- ❖ Plotting and graphing
- ❖ Array of packages

## Cons:

- ❖ Data handling
- ❖ Hard to read/learn and write
- ❖ Weak origin
- ❖ Slow speed





# Industry Usage of Python

- General purpose language
- Artificial Intelligence and Machine Learning applications
- Deep Learning research
- Integrating data analytics



# Industry Usage of R

- Popular in fields that use lots of statistical analysis and visualization
- Used for data analysis, statistical learning and statistical modeling
- More focused on Data Science



# Conclusion

Python and R are both open source programming languages.

Python is more widely used in the industry compared to R. There are immense opportunities in R in the industry but Python wins in regards to the popularity.

Python and R have several libraries at its disposal

Python is more of a general purpose programming language and is very easy to learn. R has a steep learning curve



# Discussion Questions

1. What are some reasons why Python is more popular compared to R?
2. Do you think any other language could be the dominant language in data science and machine learning?



# Works Cited

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