Python Programming Lab

Vijaya Saradhi

IIT Guwahati

Thu, 25th Jul 2019

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- This course will not assume any specific background

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- `www.python.org`

TAs for this Course

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- In case you need more time on reasonable grounds, make explicit request to me with a copy to Vaibhav 24 hours before deadline.

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- Which programming languages you are familiar?
- How many lines of code you have written so far?
- Data Science - a compute intensive discipline. Requires understanding of several tools (including multiple languages)

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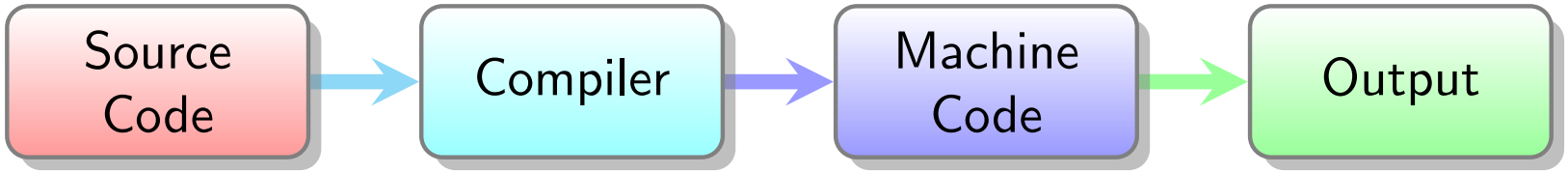
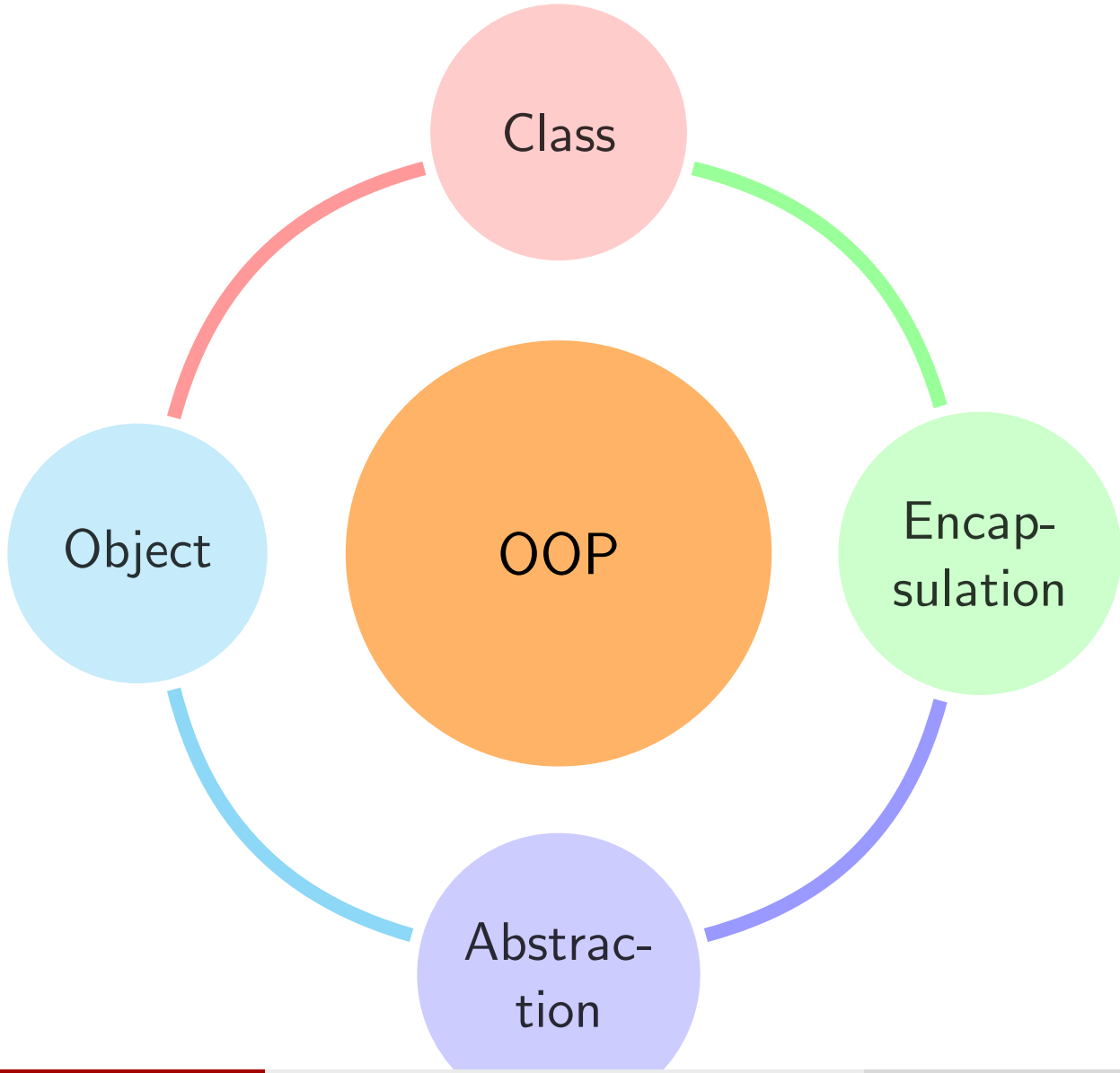
- It is used as a scripting or glue language to connect existing components together
- Python's syntax emphasizes readability in turn reduces the cost of program maintenance

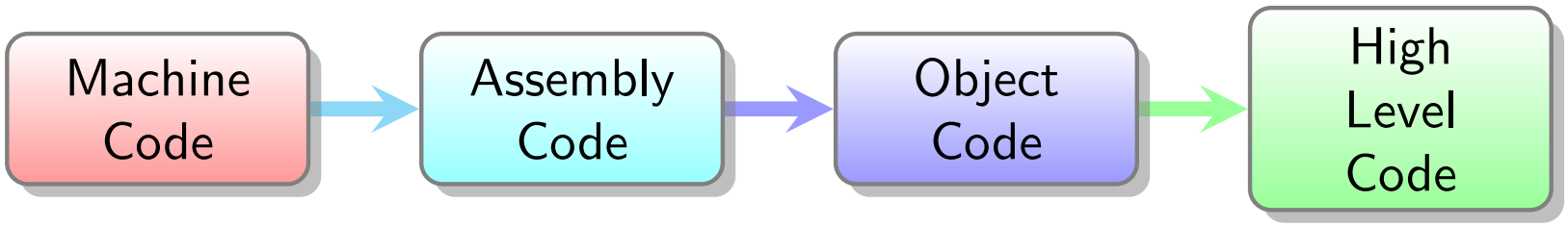
About Python - Interpreted



About Python - Object Oriented Programming Language



About Python - High level Language



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- When the interpreter discovers an error, it raises an exception

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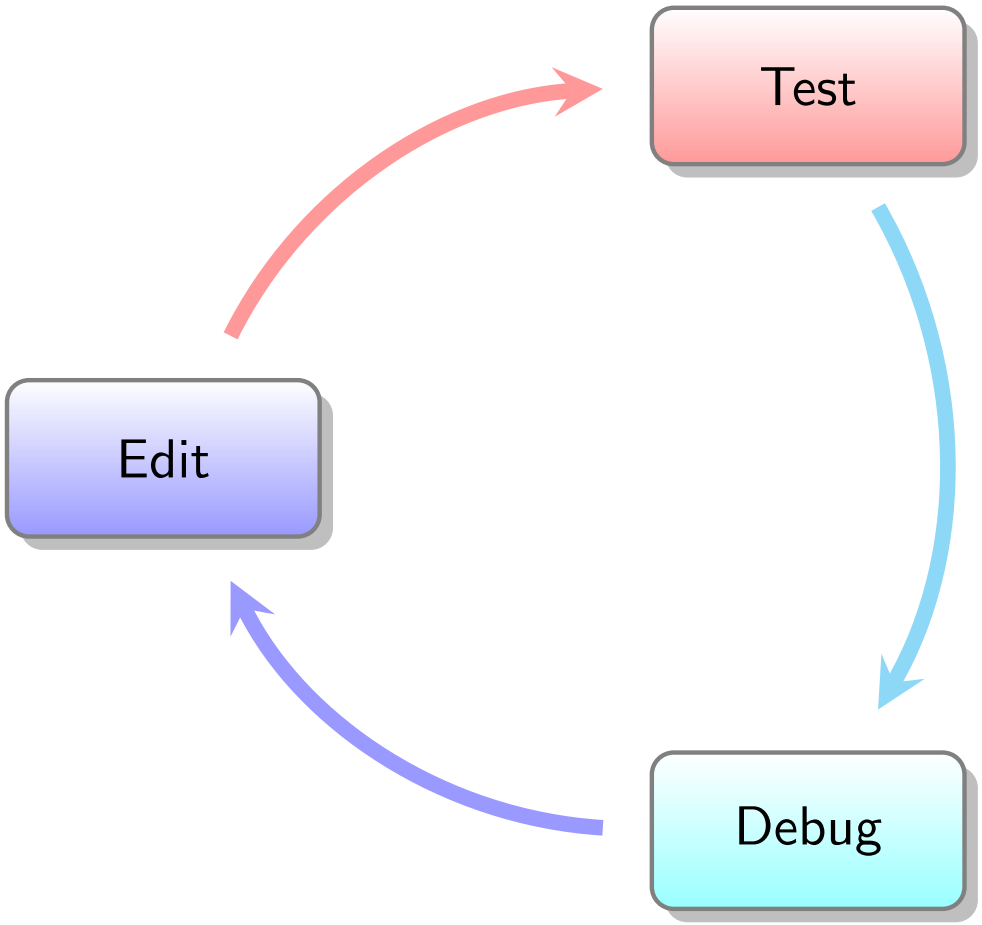

About Python - Comparison

With Java

+ve Take much less time to develop; Python programs typically 3-5 times shorter than equivalent Java programs

-ve Python programs are generally expected to run slower than Java programs

About Python - Comparison

With Javascript

-ve Python's "object-based" subset is roughly equivalent to JavaScript.

+ve Python, supports writing much larger programs and better code reuse through a true object-oriented programming style, where classes and inheritance play an important role.

About Python - Comparison

With Perl

- -ve Perl emphasizes support for common application-oriented tasks e.g. by having built-in regular expressions, file scanning and report generating features
- -ve Python emphasizes support for common programming methodologies such as data structure design and object-oriented programming, and encourages programmers to write readable (and thus maintainable) code by providing an elegant but not overly cryptic notation.
- -ve As a consequence, Python comes close to Perl but rarely beats it in its original application domain;
- +ve However Python has an applicability well beyond Perl's niche.

About Python - Comparison

With Tcl

+ve Tcl, which traditionally stores all data as strings, is weak on data structures, and executes typical code much slower than Python

+ve Tcl also lacks features needed for writing large programs, such as modular namespaces

About Python - Comparison

With Smalltalk

+ve Perhaps the biggest difference between Python and Smalltalk is Python's more "mainstream" syntax, which gives it a leg up on programmer training.

+ve Like Smalltalk, Python has dynamic typing and binding, and everything in Python is an object.

+ve Python distinguishes built-in object types from user-defined classes, and currently doesn't allow inheritance from built-in types

About Python - Comparison

With C++

- -ve Almost everything said for Java also applies for C++, just more so
- +ve Python is often 5-10 times shorter than equivalent C++ code!
- +ve Anecdotal evidence suggests that one Python programmer can finish in two months what two C++ programmers can't complete in a year