Pyccel

What is Pyccel?

- static compiler for Python 3, using Fortran or C as backend language.
- started as small open-source project in 2018 at IPP Garching.
- public repository is now hosted on GitHub, freely available for download.

Python's objects, variables, and garbage collection

Python is an **interpreted** language, **dynamically typed** and **garbage-collected.**

Python object:

- is created by the Python interpreter when `object.__new__()` is invoked (e.g. as a result of an expression).
- can be either mutable or immutable, but its **type** never changes.
- resides in memory and has a **reference count**.
- is accessed through one or more Python variables.
- is destroyed by the garbage collector when its reference count drops to zero.

For more details about Python object, see this.

Python variable:

- is a reference to a Python object in memory.
- is created with an assignment operation `x = expr`:
    1. if the variable x already exists, the interpreted reduces the reference count of its object

2. a new variable x is created, which references the **value** of `expr`.

- can be destroyed with the command del x.

For more details about Python variable, see this.

Static typed languages

A language is **statically-typed** if the type of a variable is known at **compile-time** instead of at run-time. Common examples of statically-typed languages include Java, C, C++, FORTRAN, Pascal and Scala. See this and this for more details.