

Report

- **Python Execution times**

METHOD	TIME
iterrows	0.0060 seconds
Apply Function	0.0049 seconds
Vectorized Execution	0.0035 seconds
Cython Execution	0.0019 seconds
Pandas Vectorized Execution:	0.0020 seconds

- **R Execution times**

METHOD	TIME
For loop	0.5352 seconds
Foreach	0.2685 seconds
Vectorized data tables	0.2362 seconds

- **Computational efficiency:**

In terms of computational efficiency, Python generally performs better than R. The Cython implementation in Python runs significantly faster than even the most optimized version of R. This indicates that Python is a better option for tasks that require high-performance computing.

4. Identify and describe one or two other considerations, in addition to these two, in determining which of the two environments – Python or R – is preferable to you.

While execution speed is important, coding simplicity also matters. R offers a simple syntax for efficient tasks, like using `data.table`. On the other hand, Python's libraries, such as NumPy and Pandas, are easy to use and optimized for performance. Python's Cython extension adds coding complexity but enhances performance. Python is preferred because it provides better runtime performance and is relatively easy to implement. R remains useful for statistical modeling but Python strikes a better balance between efficiency and ease of use. Other factors to consider include scalability and integration. Python integrates well with various data science tools, machine learning frameworks, and big data technologies, making it suitable for larger projects. Python

also has a larger, more active community with extensive documentation and is widely adopted in the industry, particularly in machine learning and deep learning. While both Python and R are valuable for data analysis, Python's superior computational efficiency, ease of integration, and scalability make it the preferred choice for performance-sensitive tasks. However, R is still relevant for traditional data manipulation and visualization tasks.