Sheet 0 - Results

Terrible Island

November 11th 2019

a) The algorithm in PYTHON can process the files with up to 924 bases, whereas the algorithm in JULIA can process the files with up to 1716 bases.

b) Both codes follow the same procedure, in that they check, for every base, all other bases, and then in each of these pairs, we check the exchange axiom. If we consider a set of n bases, and m to be the longest check for the exchange axiom (which will be at most the size of the largest base in the set), the complexity of the algorithm is $O(n^2m)$.

All pairs are checked twice in these algorithms, which could be optimised so the running time would be halved, though this would still keep the complexity at $O(n^2m)$.

c) Despite both codes carrying out the same actions, the JULIA code seems to be able to process more data than its PYTHON counterpart.