UNIVERSITÉ DU LUXEMBOURG

Patterns Counting

Parallel Computing

Goals

- ✯ Design a parallel algorithm in the SROM model.
- ✯ Think in groups of 2 or 3 students.

Exercise 1 – Patterns Counting

Design a parallel algorithm to search for multiple patterns in a string. We simply return the number of times each pattern in `patterns` occurs in `data`. Assume you run on a multicore processors with N threads with 1MB of shared cache among threads. Suppose `data.size()` is 1 billion elements, `patterns.size() < 1000`, and each pattern is less than 100 characters. Suppose you have access to a function `contains`, efficiently implementing a sequential search, with the signature given below.

```
bool contains(size_t begin, size_t end, const std::string& data,
  const std::string& pattern);

std::vector<size_t> search(const std::string& data,
  const std::vector<string>& patterns)
{
  // TO COMPLETE
}
```