

## 1 Methodology

We make every process read its own part of the file into a local array. Every process also reads the query file into a local query-array. One element at a time is taken out from the query array and every process searches for it in their local array. If some process finds it, it sends a message, the global index at where the element was found, to every process (including itself). Note: the global index is calculated by adding the number of elements with processors before it to the local index. The process with rank 0 then writes the index to the output file (or -1 if search was unsuccessful). The next element is taken out from the query array and the procedure is repeated until all 50 elements have been searched.

## 2 Execution Times

### 2.1 $p = 1$

The average time taken for the execution of the program is 10.3 seconds

### 2.2 $p = 2$

The average time taken for the execution of the program is 5.6 seconds

Speedup = 1.84x

#### 2.2.1 $p = 4$

The average time taken for the execution of the program is 3.0 seconds

Speedup = 3.43x

#### 2.2.2 $p = 8$

The average time taken for the execution of the program is 4.1 seconds

Speedup = 2.57x

## 3 Observations

For different number of threads