



deti

universidade de aveiro
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telecomunicações e informática

Message Passing Interface Applications

Computação em Larga Escala
Assignment 2

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Text Processing Problem - Implementation

- We used **2 structures** to help us solving the problem, like we did for the previous assignment.

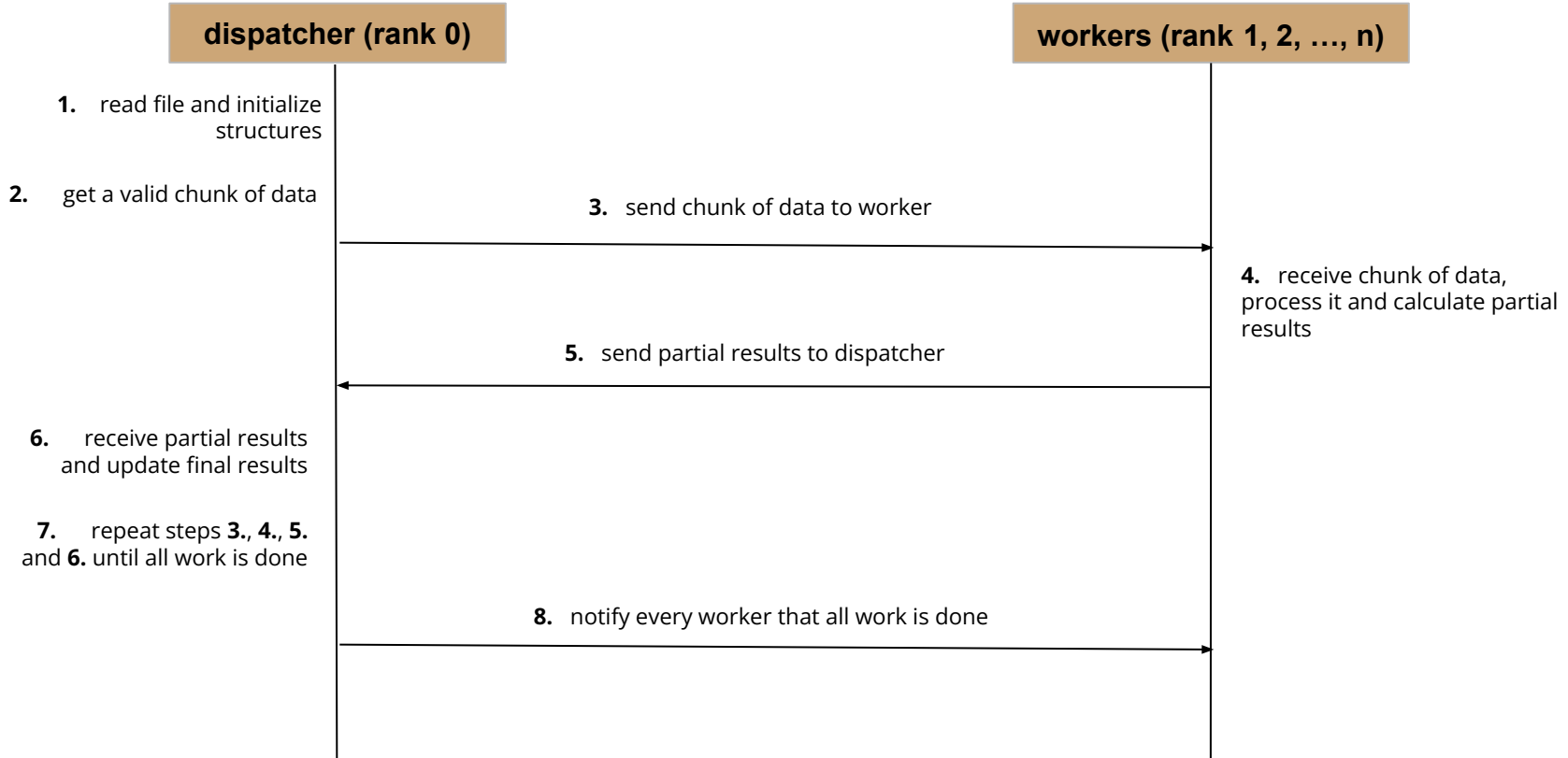
```
struct File {  
    int nWords;  
    int nWordsA;  
    int nWordsE;  
    int nWordsI;  
    int nWordsO;  
    int nWordsU;  
    int nWordsY;  
    bool is_finished;  
    char *filename;  
};
```

```
struct ChunkData {  
    int index;  
    bool is_finished;  
    int *chunk;  
    int chunk_size;  
    int nWords;  
    int nWordsA;  
    int nWordsE;  
    int nWordsI;  
    int nWordsO;  
    int nWordsU;  
    int nWordsY;  
};
```

Laptop Specifications:

Hardware Model	Micro-Star International Co., Ltd. GF63 Thin 9SC
Memory	16,0 GiB
Processor	Intel® Core™ i7-9750H CPU @ 2.60GHz × 12
Graphics	NV167 / Mesa Intel® UHD Graphics 630 (CFL GT2)
Disk Capacity	512,1 GB

Text Processing Problem - Implementation



Text Processing Problem - Results

- Timing Results for processing all files and with a chunk size of 4k bytes
- We execute the next command 5 times and we calculate the results that are in the table

```
$ mpiexec -n 5 ./prog1 -f dataset/text0.txt -f dataset/text1.txt -f dataset/text2.txt -f dataset/text3.txt -f dataset/text4.txt
```

Number of workers	Mean Execution Time (s)	Standard deviation (σ)	Variation (σ^2)
1	0.120854	0.010303	0.000106
2	0.096035	0.019195	0.000368
4 (default)	0.069495	0.005885	3.463764×10^{-5}
8	0.179997	0.043071	0.001855

Sort Integers Problem - Implementation

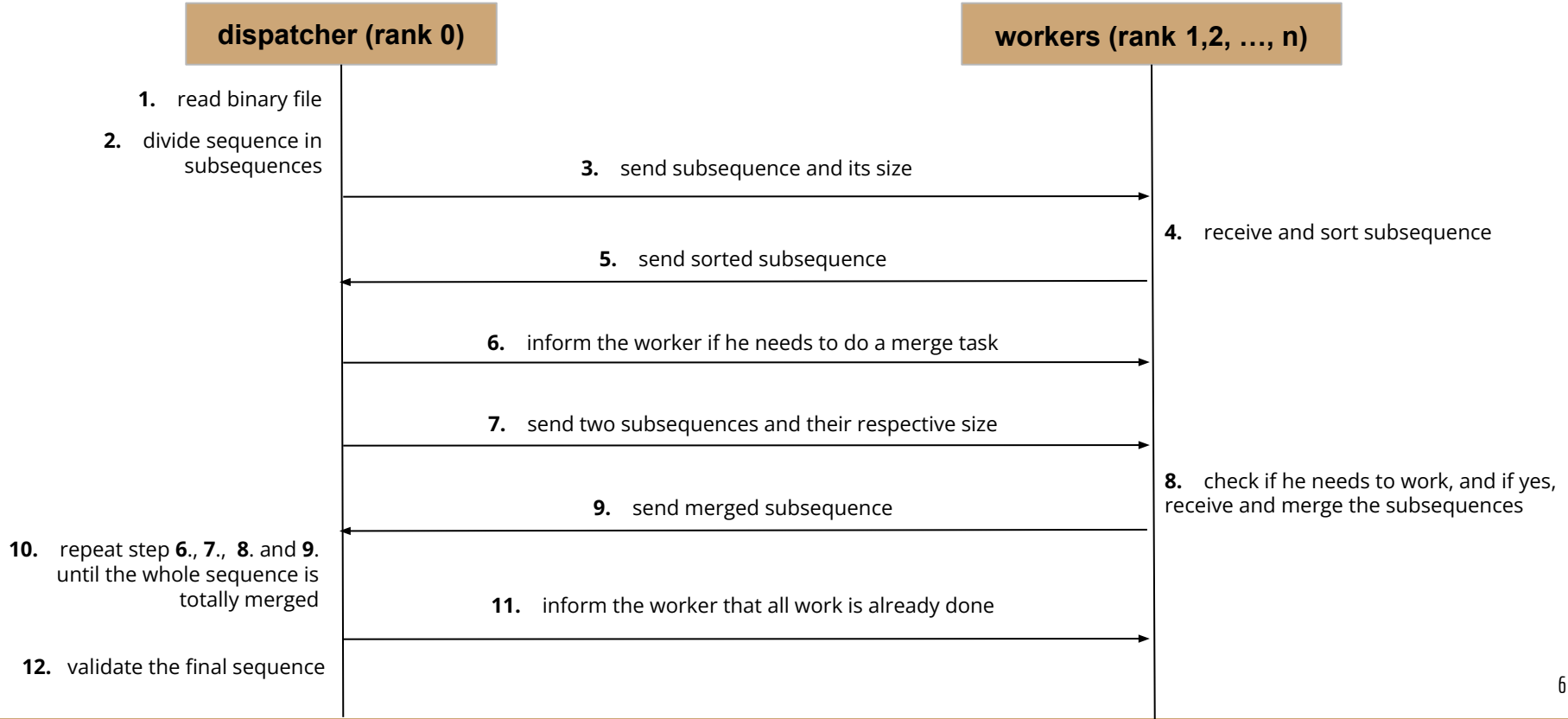
- We created **1 structure** to help us solving the problem.

```
struct File {  
    char *filename;  
    FILE *file;  
    int size;  
    int *sequence;  
    int **subsequences;  
    int *subsequences_length;  
    int all_subsequences_size;  
};
```

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Sort Integers Problem - Implementation



Sort Integers Problem - Results

- Timing Results for datSeq1M.bin.
- We execute the next command 5 times and we calculate the results that are in the table.

```
$ mpiexec -n 5 ./prog2 dataset/datSeq1M.bin
```

Number of workers	Mean Execution Time (s)	Standard deviation (σ)	Variation (σ^2)
1	1.331454	0.006087	3.705083×10^{-5}
2	0.654747	0.052690	0.002776
4 (default)	0.401097	0.014068	0.000197
8	0.728336	0.059044	0.003486