Yarin Getter

Parallel implementation of Sequence Alignment

MPI + OpenMP Integration:

MPI:

ROOT process is responsible for reading input file values and sharing those values with all other processes.

Also, he is responsible for dividing work between all processes, every process has an equal size of strings he needs to work on.

If there are remained strings (it could happen if the number of strings to calc is not divided equally by the number of processes), the ROOT process is responsible to calculate it also by itself.

ROOT process receives all calculations and prints the best alignment score for each string.

OpenMP:

every process using OpenMP for calculating the best alignment score for each string using OpenMP works with a bunch of threads working parallel and checking what is the best score each string gets by offset and mutant (n, k).

Main program flow:

1. ROOT process reads the input file and divides the strings equally between the processes.
2. Every process works on his part and checks what is the best possible score by offset and mutant (n, k) for his strings and sends the results back to the ROOT process.
3. ROOT process receiving all calculations and printing the best alignment score for each string.