a) What problems you encountered completing the assignment and how you overcame them:

I had trouble working around the assignment using MPI in general, specially with understanding the logic of message passing for this specific assignment. I was able to understand by looking at the examples posted by the professor on the class notes and looking up the extra functionalities I wanted my program to have.

b) Any problems you weren't able to overcome, or any bugs still left in the program:

I wasn't able to print the results optimally: I wanted to print the dictionary for each word and working in different threads, but I was only able to print a partially complete dictionary.

c) About how long it took you to complete the assignment:

The assignment took me about 4 and a half hours to complete, and most of the time was spent in understanding the new functionalities necessary for the assignment.

d) A short analysis of why the program behaves as it does with an increasing number of threads:

You run the program by writing:

mpirun -n <processes> python3 map-reduce-mpi.py

To achieve an ideal parallel speedup, you must set the number of processes as the number of cores of your computer.

e) Any observations or comments you had while doing the assignment:

It is challenging developing a program using message passing.

f) Output from the dumpCPUInfo.sh program:

```
student@linux-4oae:~/pythonTestProgs> dumpCPUInfo.sh cpuinfo.txt
model name      : Intel(R) Core(TM) i7-10750H CPU @ 2.60GHz
      4      36     220
```