CSE 344 -System Programming
Homework #2 Report

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Objective:

Process m (m for mother) will receive as a command-line argument the path to a regular ASCII file.The file will contain at least 8 rows, where each row will contain 16 comma separated real values.Every row is assumed to represent 8 coordinates in the form of :

$$x\_0,y\_0,x\_1,y\_1,...,x\_7,y\_7$$

where y_i = f(x_i) is an unknown function. There are 8 rows, so there are 8 unknown functions. Your task is to estimate these 8 functions through polynomial interpolation using the Lagrange form (check its wiki page) in two rounds. In the first round you will use the first 6 coordinates of each row, and in the second round you will the first 7 coordinates of each row, leaving the last coordinate for validation.

Design Explanation:

In my project, I ran my program with the file name I got from the command line.I created child processes from a main process with fork. Each child did the work of reading from the file by reading his own linen. And I called the parser function.I made use of the string library in this parser function. Because I had to convert what I read as characters to float numbers. I did this using the strtok function. Then I sent it to the calculation function.

Test Case:

```
ozan@ozan-C650-NOTEBOOK-DISCRETE:~/Desktop/1801042103$ make
gcc -Wall -ansi -std=gnu99 -pedantic-errors   -c -o main.o main.c
gcc -Wall -ansi -std=gnu99 -pedantic-errors -o main main.o
ozan@ozan-C650-NOTEBOOK-DISCRETE:~/Desktop/1801042103$ ./main example
x[0] = 6.0 y[0] = 8.0 x[1] = 1.0 y[1] = 12.0 x[2] = 5.0 y[2] = 5.0 x[3] = 9.0 y[3] = 7.0 x[4] = 8.0 y[4] = 2.0 x[5] = 7.0 y[5] = 4.0 x[6] = 4.0 y[6] = 6.0 x[7] = 5.5 y[7] = 2.0
Pid id: 29204 -->Polinominal : -23.5
x[0] = 4.0 y[0] = 9.0 x[1] = 6.0 y[1] = 3.0 x[2] = 2.0 y[2] = 9.0 x[3] = 7.0 y[3] = 3.0 x[4] = 9.0 y[4] = 2.0 x[5] = 1.0 y[5] = 6.0 x[6] = 8.0 y[6] = 7.0 x[7] = 5.8 y[7] = 4.0
Pid id: 29205 -->Polinominal : 30.2
x[0] = 1.0 y[0] = 8.0 x[1] = 7.0 y[1] = 7.0 x[2] = 5.0 y[2] = 9.0 x[3] = 2.0 y[3] = 3.0 x[4] = 9.0 y[4] = 1.0 x[5] = 17.0 y[5] = 0.0 x[6] = 3.0 y[6] = 3.0 x[7] = 8.0 y[7] = 5.0
Pid id: 29206 -->Polinominal : 44.4
x[0] = 9.0 y[0] = 10.0 x[1] = 7.0 y[1] = 7.0 x[2] = 8.0 y[2] = 9.0 x[3] = 5.0 y[3] = 3.0 x[4] = 2.0 y[4] = 1.0 x[5] = 3.0 y[5] = 1.0 x[6] = 4.0 y[6] = 8.0 x[7] = 6.0 y[7] = 7.0
Pid id: 29207 -->Polinominal : 445.7
x[0] = 1.0 y[0] = 1.0 x[1] = 3.0 y[1] = 4.0 x[2] = 5.0 y[2] = 8.0 x[3] = 7.0 y[3] = 3.0 x[4] = 15.0 y[4] = 1.0 x[5] = 4.0 y[5] = 4.0 x[6] = 8.0 y[6] = 10.0 x[7] = 9.0 y[7] = 7.0
Pid id: 29208 -->Polinominal : 467.6
x[0] = 8.0 y[0] = 7.0 x[1] = 1.0 y[1] = 0.0 x[2] = 18.0 y[2] = 8.0 x[3] = 2.0 y[3] = 9.0 x[4] = 4.0 y[4] = 4.0 x[5] = 3.0 y[5] = 6.0 x[6] = 6.0 y[6] = 8.0 x[7] = 10.0 y[7] = 9.0
Pid id: 29209 -->Polinominal : -46.6
x[0] = 5.0 y[0] = 8.0 x[1] = 8.0 y[1] = 3.0 x[2] = 7.0 y[2] = 7.0 x[3] = 3.0 y[3] = 2.0 x[4] = 15.0 y[4] = 1.0 x[5] = 10.0 y[5] = 6.0 x[6] = 6.0 y[6] = 6.0 x[7] = 4.1 y[7] = 6.0
Pid id: 29210 -->Polinominal : 597.7
x[0] = 1.0 y[0] = 9.0 x[1] = 3.0 y[1] = 3.0 x[2] = 4.0 y[2] = 4.0 x[3] = 9.0 y[3] = 4.0 x[4] = 6.0 y[4] = 2.0 x[5] = 7.0 y[5] = 1.0 x[6] = 5.0 y[6] = 3.0 x[7] = 3.5 y[7] = 3.0
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