CSE344 – System Programming - Homework #3
REPORT

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I read the first A and B files character by character. If there are no $2 \wedge n * 2 \wedge n$ elements in each file, the program is finished.Also, if n is less than 1, the program is finished.

I created 8 pipes as there will be bidirectional pipes between each child and parent.I used the for loop to create 4 childs.The parent sends each child the quarters in matrix A and B, which is necessary for the places to calculate in C.The child whose input comes over the pipe starts to calculate C and sends each calculated C value to the parent.

After all children send C values to the parent,the parent takes the values on the pipe and creates the C matrix.C matrix is sent to the function I get from the internet and the singular values are calculated.

Notes:

- At the end of the program, I free the pointer array I used in the program.

-I handler the SIGCHLD signal and every child goes to the handler when it's done.

-I handler the SIGINT signal and when ctrl c is made from the terminal, 5 processes are terminated.

There is an expression like All mathematical operations will be realized with an accuracy down to 3 decimal point in the homework. I did this and I did without separating my numbers as 3 digits after the comma. I wrote a myRound function that cut numbers to 3 digits after the comma. For example, the number 12.1234 makes 12.123. But I did my singular value operations as 3 digits after comma made my singular values more zero. And this result did not seem right to me. Therefore, the main program makes singular values in a non-separating way after the comma. I also added a rounded version of the Svd function to my file.

Outputs:

1)

```
zeynep@zeynep-VirtualBox:~/Desktop$ make clean
rm -rf *.o program
zeynep@zeynep-VirtualBox:~/Desktop$ make all
gcc -c program.c
gcc program.o -lm -o program
zeynep@zeynep-VirtualBox:~/Desktop$ ./program -i  inputPathA -o inputPathB -n 2
Singular Value 1 ==> 106931.266
Singular Value 2 ==> 6616.198
Singular Value 3 ==> 528.854
Singular Value 4 ==> 2266.492
zeynep@zeynep-VirtualBox:~/Desktop$ █
```

2)

```
zeynep@zeynep-VirtualBox:~/Desktop$ ./program -i  inputPathA -o inputPathB -n 8
Singular Value 1 ==> 439956896.000
Singular Value 2 ==> 1238976.875
Singular Value 3 ==> 1183203.875
Singular Value 4 ==> 1070650.375
Singular Value 5 ==> 1047280.438
Singular Value 6 ==> 1017681.812
Singular Value 7 ==> 984670.375
Singular Value 8 ==> 964985.438
Singular Value 9 ==> 959825.188
Singular Value 10 ==> 949473.312
Singular Value 11 ==> 915404.688
Singular Value 12 ==> 785637.438
Singular Value 13 ==> 751296.500
Singular Value 14 ==> 719451.812
Singular Value 15 ==> 697054.438
Singular Value 16 ==> 659076.375
Singular Value 17 ==> 634261.000
Singular Value 18 ==> 594794.875
Singular Value 19 ==> 567996.625
Singular Value 20 ==> 552769.312
Singular Value 21 ==> 540886.812
Singular Value 22 ==> 526062.500
Singular Value 23 ==> 499205.188
Singular Value 24 ==> 496144.531
Singular Value 25 ==> 485532.750
Singular Value 26 ==> 474137.812
Singular Value 27 ==> 469395.875
Singular Value 28 ==> 461048.562
Singular Value 29 ==> 452316.156
Singular Value 30 ==> 444345.844
Singular Value 31 ==> 436027.438
Singular Value 32 ==> 419598.719
Singular Value 33 ==> 412347.656
Singular Value 34 ==> 410615.938
Singular Value 35 ==> 396499.656
Singular Value 36 ==> 386940.812
Singular Value 37 ==> 381769.031
```

```
Singular Value 213 ==> 0.033
Singular Value 214 ==> 0.031
Singular Value 215 ==> 0.027
Singular Value 216 ==> 0.025
Singular Value 217 ==> 0.024
Singular Value 218 ==> 0.024
Singular Value 219 ==> 0.023
Singular Value 220 ==> 0.022
Singular Value 221 ==> 0.021
Singular Value 222 ==> 0.020
Singular Value 223 ==> 0.019
Singular Value 224 ==> 0.018
Singular Value 225 ==> 0.018
Singular Value 226 ==> 0.017
Singular Value 227 ==> 0.017
Singular Value 228 ==> 0.016
Singular Value 229 ==> 0.015
Singular Value 230 ==> 0.014
Singular Value 231 ==> 0.014
Singular Value 232 ==> 0.013
Singular Value 233 ==> 0.012
Singular Value 234 ==> 0.012
Singular Value 235 ==> 0.011
Singular Value 236 ==> 0.010
Singular Value 237 ==> 0.010
Singular Value 238 ==> 0.008
Singular Value 239 ==> 0.008
Singular Value 240 ==> 0.008
Singular Value 241 ==> 0.007
Singular Value 242 ==> 0.007
Singular Value 243 ==> 0.007
Singular Value 244 ==> 0.005
Singular Value 245 ==> 0.005
Singular Value 246 ==> 0.004
Singular Value 247 ==> 0.000
Singular Value 248 ==> 0.001
Singular Value 249 ==> 0.001
Singular Value 250 ==> 0.004
Singular Value 251 ==> 0.002
Singular Value 252 ==> 0.003
Singular Value 253 ==> 0.003
Singular Value 254 ==> 0.003
Singular Value 255 ==> 0.000
Singular Value 256 ==> 0.000
zeynep@zeynep-VirtualBox:~/Desktop$
```

3)

```
zeynep@zeynep-VirtualBox:~/Desktop$ ./program -i  inputPathA -o inputPathB -n 10
^CProgram receives SIGINT signal and terminates.
Program receives SIGINT signal and terminates.
Program receives SIGINT signal and terminates.
Program receives SIGINT signal and terminates.
Program receives SIGINT signal and terminates.
zeynep@zeynep-VirtualBox:~/Desktop$
```

4)

```
zeynep@zeynep-VirtualBox:~/Desktop$ ./program -i  inputPathA -o inputPathB -n 12
File Size is not enough.Program Terminates : Success
zeynep@zeynep-VirtualBox:~/Desktop$
```

5)

```
zeynep@zeynep-VirtualBox:~/Desktop$ make clean
rm -rf *.o program
zeynep@zeynep-VirtualBox:~/Desktop$ make all
gcc -c program.c
gcc program.o -lm -o program
zeynep@zeynep-VirtualBox:~/Desktop$ ./program -i  inputPathA -o inputPathB -n 3
Singular Value 1 ==> 439207.406
Singular Value 2 ==> 18317.855
Singular Value 3 ==> 10232.337
Singular Value 4 ==> 5861.797
Singular Value 5 ==> 4048.314
Singular Value 6 ==> 2623.944
Singular Value 7 ==> 381.075
Singular Value 8 ==> 1076.253
Singular Value with Round 1 ==> 439017.250
Singular Value with Round 2 ==> 0.000
Singular Value with Round 3 ==> 0.000
Singular Value with Round 4 ==> 0.000
Singular Value with Round 5 ==> 0.000
Singular Value with Round 6 ==> 0.000
Singular Value with Round 7 ==> 0.000
Singular Value with Round 8 ==> 0.000
zeynep@zeynep-VirtualBox:~/Desktop$
```

If I do the rounded svd , the result is like this.