

Operating Systems

Lab II

Threads

Name : Omar Shawky Anwer Ahmed

Seat Number : 43

Code Organization and main functions

`void initialize(int argc, char **argv) :`

To get the file names from the command line of set it by the default value.

`void readMatrix(char *fileName, int isFirst, int *r, int *c) :`

Used to read the matrix from the file called *fileName or say that the file is not found a terminate.

`void* rowRunnable(void* arg) :`

The function executed by the threads to compute the matrix multiplication using the first method.

`void* elementRunnable(void *arg) :`

The function executed by the threads to compute the matrix multiplication using the second method.

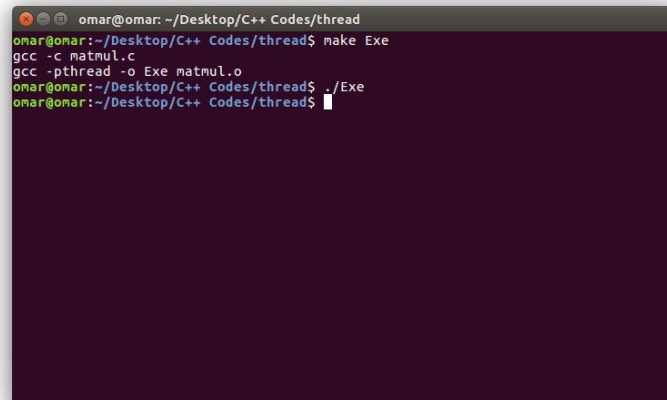
`void writeMatrix(char* fileName, int first):`

Used to write the matrix in the file called *fileName.

The flow of the program

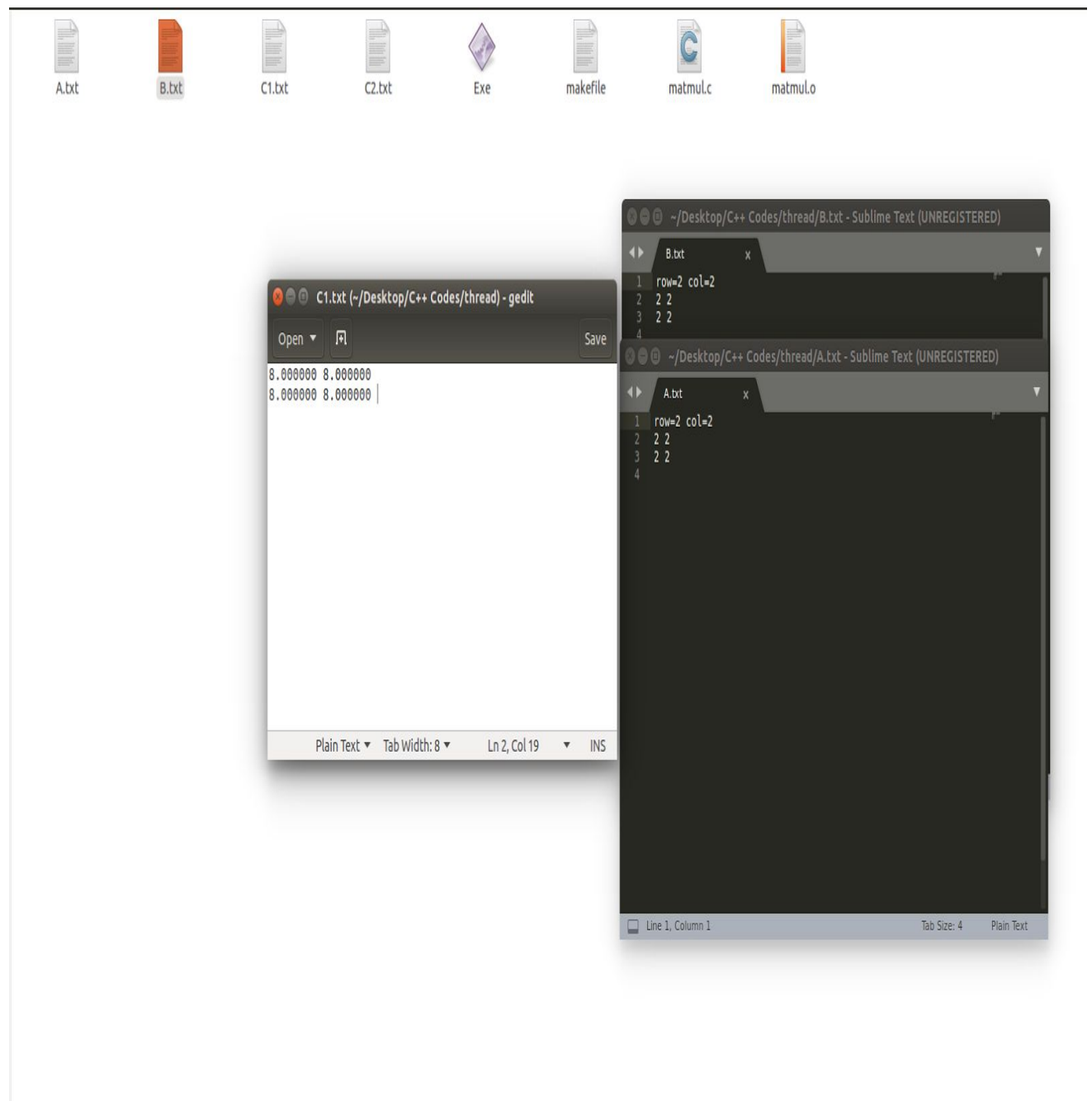
- The main call the initialize function.
- Allocate the space for the output matrices.
- Compute the matrix multiplication using row processing.
- Compute the matrix multiplication using element processing.
- Write the final matrices in the output files
- Free the memory allocated dynamically.

How to compile and run



```
omar@omar: ~/Desktop/C++ Codes/thread
omar@omar:~/Desktop/C++ Codes/thread$ make Exe
gcc -c matmul.c
gcc -pthread -o Exe matmul.o
omar@omar:~/Desktop/C++ Codes/thread$ ./Exe
omar@omar:~/Desktop/C++ Codes/thread$
```

Sample Runs





A.txt



B.txt



C1.txt



C2.txt



Exe



makefile



matmul.c



matmul.o

```

~/Desktop/C++ Codes/thread/A.txt - Sublime Text (UNREGISTERED)
A.txt x
1 row=50 col=50
2 713 932 568 832 794 951 535 731 958 38 292 53 117 688 867
423 654 696 779 224 626 135 455 594 986 831 385 67 489 97
784 371 601 636 506 558 566 946 478 24 270 219 191 996 550
788 54 863 806 492 689 789 818 582 937 710 787 729 254 212
254 734 666 709 25 826 15 39 406 275 780 40 651 488 707 40
935 112 928 655 533 775 297 18 960 892 572 61 273 872 314
627 665 862 804 589 699 747 410 782
3 251 350 484 787 278 726 952 664 819 62 885 434 754 420 941
467 907 860 206 799 312 159 183 921 187 129 357 886 842 959 49
898 71 813 677 761 825 684 390 415 129 564 635 189 622 932
272 483 561 774 533 794 564 15 536 901 435 71 14 768 566 72
735 53 966 946 161 952 12 614 855 407 77 727 704 769 700
908 237 417 25 798 430 673 314 809 402 68 302 393 234 17
551 911 164 350 838 570 905 909
4 24 680 571 253 57 899 63 256 181 985 176 200 398 174 946
815 780 518 651 910 95 113 949 617 91 521 362 855 918 540
171 91 58 107 176 588 696 18 305 498 908 37 939 920 70
859 114 840 440 445 858 861 563 215 95 496 25
402 348 997 118 844 104 462 442 829 217 444 16
925 79 913 868 694 258 596 97 968 816 849 12
349 447 675 717 866 264 245 766 685 957
5 794 396 225 96 954 562 618 750 529 456 826 73
678 354 720 717 503 564 489 432 844 52 362 89
947 985 586 663 245 529 999 524 30 699 81
393 45 820 459 61 178 689 227 399 80 703 71
504 295 986 489 591 247 113 77 995 682 615 69
222 537 76 652 727 221 58 43 202 212 23 94

```

```

~/Desktop/C++ Codes/thread/C2.txt - Sublime Text (UNREGISTERED)
C2.txt x
1 14158345.000000 14864980.000000 12473488.000000
14194143.000000 13117689.000000 14943299.000000
12708198.000000 15840617.000000 13702826.000000
13712782.000000 13513993.000000 13148666.000000
13057142.000000 14244241.000000 14278708.000000
12906718.000000 13094158.000000 13652038.000000
14117487.000000 13525483.000000 13648752.000000
12107181.000000 15282085.000000 13239486.000000
12291833.000000 16071429.000000 13343144.000000
14235804.000000 15307169.000000 13153540.000000
13249949.000000 15155708.000000 12538492.000000
13677907.000000 17223293.000000 14422635.000000
13784844.000000 12632863.000000 12435988.000000
13997398.000000 14740175.000000 11830665.000000
11960870.000000 15949127.000000 13464656.000000
14109955.000000 14178576.000000 14208113.000000
13933237.000000 14993722.000000
4217.000000 11763649.000000
3279.000000 13918536.000000
9155.000000 14081570.000000
2443.000000 14024472.000000
2657.000000 14912452.000000
0489.000000 14800875.000000
2292.000000 14136374.000000
7849.000000 13033673.000000
7805.000000 14135780.000000
11773.000000 14891743.000000
3644.000000 13065927.000000

```

```

~/Desktop/C++ Codes/thread/B.txt - Sublime Text (UNREGISTERED)
B.txt x
1 row=50 col=50
2 713 932 568 832 794 951 535 731 958 38 292 53 117 688 867
423 654 696 779 224 626 135 455 594 986 831 385 67 489 97
784 371 601 636 506 558 566 946 478 24 270 219 191 996 550
788 54 863 806 492 689 789 818 582 937 710 787 729 254 212
254 734 666 709 25 826 15 39 406 275 780 40 651 488 707 40
935 112 928 655 533 775 297 18 960 892 572 61 273 872 314
627 665 862 804 589 699 747 410 782
3 251 350 484 787 278 726 952 664 819 62 885 434 754 420 941
467 907 860 206 799 312 159 183 921 187 129 357 886 842 959 49
898 71 813 677 761 825 684 390 415 129 564 635 189 622 932
272 483 561 774 533 794 564 15 536 901 435 71 14 768 566 72
735 53 966 946 161 952 12 614 855 407 77 727 704 769 700
908 237 417 25 798 430 673 314 809 402 68 302 393 234 17
551 911 164 350 838 570 905 909
4 24 680 571 253 57 899 63 256 181 985 176 200 398 174 946
815 780 518 651 910 95 113 949 617 91 521 362 855 918 540
171 91 58 107 176 588 696 18 305 498 908 37 939 920 70
859 114 840 440 445 858 861 563 215 95 496 25
402 348 997 118 844 104 462 442 829 217 444 16
925 79 913 868 694 258 596 97 968 816 849 12
349 447 675 717 866 264 245 766 685 957
5 794 396 225 96 954 562 618 750 529 456 826 73
678 354 720 717 503 564 489 432 844 52 362 89
947 985 586 663 245 529 999 524 30 699 81
393 45 820 459 61 178 689 227 399 80 703 71
504 295 986 489 591 247 113 77 995 682 615 69
222 537 76 652 727 221 58 43 202 212 23 94

```