

Question – 3

Assignment - 3

In this problem, you will modify the `matmul.c` program provided, optimizing the execution of the matrix multiplication with first a dense matrix, and second with a sparse matrix. You are welcome to use `pthread`s, `OpenMP` or any of the optimizations that were presented in class to accelerate this code. Do not change the sparsity of the matrices in `matmul.c`. Do not use a GPU and do not use `OpenBLAS` in your solution. There will be prizes awarded for the fastest dense and the fastest sparse implementations.

Answer:

The code was executed using `openMP` and GPU/`OpenBLAS` wasn't used.

```
[sridhar.pray@explorer-02 ~]$ nano matmul_optimized.c
[sridhar.pray@explorer-02 ~]$ gcc -o matmul_optimized matmul_optimized.c -fopenmp
[sridhar.pray@explorer-02 ~]$ ./matmul_optimized
starting dense matrix multiply with blocking...
a result 4.44488e+07
Total time for dense matmul (with tiling + transpose) = 305.775400 ms
starting sparse matrix multiply...
A result 0
Total time for sparse matmul = 71.360443 ms
Sparsity of matrices = 0.750977_
```