CENG5030 Lab 03
General Matrix Multiply

1 Sample Code:

- Go to the `./Lab03-code/`
- Run `sh run_matmul.sh` in your terminal
- You can change many places in the code to get different runtime
    - matmul()
    - matmul_ikj()
    - matmul_AT()
    - matmul_BT()

2 Assignments:

Q1 Change the shape of matrix A, B mentioned in `matmul.cpp` to get the running time of the code. Plot the relationship between the values of `n` and the running times to figure out at which positions the running times change dramatically. Please analyze the relationship between cache size and matrix size.

Q2 Learn the `im2col` from the **Useful Materials** Section to implement it from scratch using C++ to optimize convolution operation. Please use the information of the caches you've learned to optimize the code, and analyze the results.

- Input_Feature_Map: $4 \times 4 \times 3$
- Kernel_Size: 3×3
- Num_Kernel: 3
- Stride: 1, no padding

Useful Materials:

- MATLAB im2col
- Making faster
- ConvNets in practice
- Gallery of Processor Cache Effects

Tips: You should learn the code style from the sample code to build your project.