Lab 9

选择项目：GPU 的 GEMM 实现

首先配置个人工作站环境，环境完成后，检查 nvcc 版本以确保配置环境成功

```
wyo@619-13:~$ nvcc -V
nvcc: NVIDIA (R) Cuda compiler driver
Copyright (c) 2005-2019 NVIDIA Corporation
Built on Sun_Jul_28_19:07:16_PDT_2019
Cuda compilation tools, release 10.1, V10.1.243
wyo@619-13:~$
```

接下来通过写好的.cu 文件比较 GPU 和 naive 矩阵乘法的时间关系

矩阵规模：16

```
wyo@619-13:~$ nvcc lab9.cu -lcublas
wyo@619-13:~$ ./a.out
GPU:Matrix multiplication took 0.046528 milliseconds.
Naive:Matrix multiplication took 0.016064 milliseconds.
wyo@619-13:~$
```

矩阵规模：32

```
wyo@619-13:~$ nvcc lab9.cu -lcublas
wyo@619-13:~$ ./a.out
GPU:Matrix multiplication took 6.557280 milliseconds.
Naive:Matrix multiplication took 0.132320 milliseconds.
wyo@619-13:~$
```

矩阵规模：64

```
wyo@619-13:~$  nvcc lab9.cu -lcublas
wyo@619-13:~$ ./a.out
GPU:Matrix multiplication took 6.594560 milliseconds.
Naive:Matrix multiplication took 1.435776 milliseconds.
wyo@619-13:~$
```

矩阵规模：128

```
wyo@619-13:~$ nvcc lab9.cu -lcublas
wyo@619-13:~$ ./a.out
GPU:Matrix multiplication took 0.059392 milliseconds.
Naive:Matrix multiplication took 7.935680 milliseconds.
wyo@619-13:~$
```

矩阵规模：256

```
wyo@619-13:~$ nvcc lab9.cu -lcublas
wyo@619-13:~$ ./a.out
GPU:Matrix multiplication took 0.061632 milliseconds.
Naive:Matrix multiplication took 64.030113 milliseconds.
wyo@619-13:~$
```

矩阵规模：512

```
wyo@619-13:~$ nvcc lab9.cu -lcublas
wyo@619-13:~$ ./a.out
GPU:Matrix multiplication took 0.087680 milliseconds.
Naive:Matrix multiplication took 790.612122 milliseconds.
wyo@619-13:~$
```

矩阵规模：1024

```
wyo@619-13:~$ nvcc lab9.cu -lcublas
wyo@619-13:~$ ./a.out
GPU:Matrix multiplication took 0.265056 milliseconds.
Naive:Matrix multiplication took 8844.577148 milliseconds.
wyo@619-13:~$
```

矩阵规模：2048

```
wyo@619-13:~$ nvcc lab9.cu -lcublas
wyo@619-13:~$ ./a.out
GPU:Matrix multiplication took 1.658656 milliseconds.
Naive:Matrix multiplication took 191326.015625 milliseconds.
wyo@619-13:~$
```