CUDA记时

CUDA并行编程系列课程

主讲：权双

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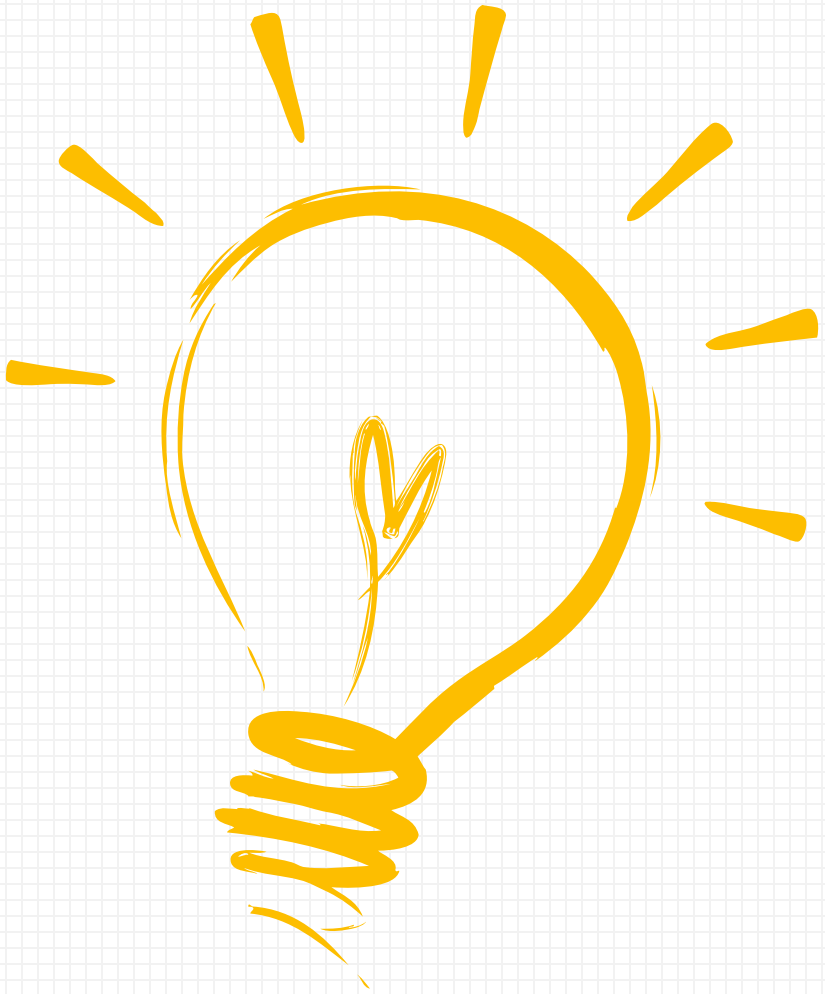

事件记时

★ 1、程序执行时间记时：是CUDA程序执行性能的重要表现

★ 2、使用CUDA 事件（event）记时方式

★ 3、 CUDA 事件记时可为主机代码、设备代码记时

```
cudaEvent_t start, stop;
ErrorCheck(cudaEventCreate(&start), __FILE__, __LINE__);
ErrorCheck(cudaEventCreate(&stop), __FILE__, __LINE__);
ErrorCheck(cudaEventRecord(start), __FILE__, __LINE__);
cudaEventQuery(start);  //此处不可用错误检测函数

/*****************************************************************
需要记时间的代码
*****************************************************************/

ErrorCheck(cudaEventRecord(stop), __FILE__, __LINE__);
ErrorCheck(cudaEventSynchronize(stop), __FILE__, __LINE__);
float elapsed_time;
ErrorCheck(cudaEventElapsedTime(&elapsed_time, start, stop), __FILE__, __LINE__);
printf("Time = %g ms.\n", elapsed_time);

ErrorCheck(cudaEventDestroy(start), __FILE__, __LINE__);
ErrorCheck(cudaEventDestroy(stop), __FILE__, __LINE__);
```

nvprof性能刨析

★ 1、nvprof是一个可执行文件

★ 2、执行命令：nvprof ./exe_name

```
            Type  Time(%)      Time     Calls       Avg       Min       Max  Name
 GPU activities:   66.41%  38.016us        11  3.4560us  2.7520us  4.2560us  addFromGPU(float*, float*, float*, int)
                   17.89%  10.240us         3  3.4130us  3.3920us  3.4240us  [CUDA memcpy HtoD]
                   10.73%  6.1440us         3  2.0480us  1.6320us  2.6880us  [CUDA memset]
                    4.97%  2.8480us         1  2.8480us  2.8480us  2.8480us  [CUDA memcpy DtoH]
      API calls:   95.18%  1.10411s         3  368.04ms  2.2000us  1.10410s  cudaMalloc
                    3.79%  43.908ms         1  43.908ms  43.908ms  43.908ms  cudaDeviceReset
                    0.48%  5.5992ms        22  254.51us     600ns  5.5740ms  cudaEventCreate
                    0.29%  3.3297ms         1  3.3297ms  3.3297ms  3.3297ms  cuDeviceGetPCIBusId
                    0.09%  1.1013ms        11  100.12us  39.300us  172.70us  cudaEventSynchronize
                    0.07%  768.00us        11  69.818us  9.7000us  628.20us  cudaLaunchKernel
                    0.04%  435.80us         4  108.95us  14.000us  220.70us  cudaMemcpy
                    0.03%  344.40us         3  114.80us  3.7000us  332.70us  cudaFree
                    0.02%  248.60us        22  11.300us  3.2000us  27.500us  cudaEventRecord
                    0.00%  32.700us        22  1.4860us     400ns  15.300us  cudaEventDestroy
                    0.00%  25.500us         3  8.5000us  3.5000us  17.300us  cudaMemset
                    0.00%  18.500us       101     183ns     100ns     900ns  cuDeviceGetAttribute
                    0.00%  14.500us        11  1.3180us     900ns  1.9000us  cudaEventElapsedTime
                    0.00%  11.500us        11  1.0450us     600ns  2.0000us  cudaEventQuery
                    0.00%  5.1000us         1  5.1000us  5.1000us  5.1000us  cudaDeviceSynchronize
                    0.00%  4.4000us         1  4.4000us  4.4000us  4.4000us  cudaSetDevice
                    0.00%  2.0000us         1  2.0000us  2.0000us  2.0000us  cudaGetDeviceCount
                    0.00%  1.8000us         1  1.8000us  1.8000us  1.8000us  cuDeviceGetName
                    0.00%  1.3000us         2     650ns     200ns  1.1000us  cuDeviceGet
                    0.00%  1.2000us         3     400ns     100ns     900ns  cuDeviceGetCount
                    0.00%  1.0000us         1  1.0000us  1.0000us  1.0000us  cudaGetLastError
                    0.00%     500ns         1     500ns     500ns     500ns  cuDeviceTotalMem
                    0.00%     200ns         1     200ns     200ns     200ns  cuDeviceGetUuid
```

THANKS

谢谢聆听