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Batch : B5

High Performance Computing Lab Practical No. 11

Title of practical: Understanding concepts of CUDA Programming Problem Statement 1:

Execute the following program and check the properties of your GPGPU.

#include <stdio.h> #include <stdlib.h> int main()

{

int deviceCount; cudaGetDeviceCount(&deviceCount); if (deviceCount == 0)

{

printf("There is no device supporting CUDA\n");

}

int dev;

for (dev = 0; dev < deviceCount; ++dev)

{

cudaDeviceProp deviceProp; cudaGetDeviceProperties(&deviceProp, dev); if (dev == 0)

{

if (deviceProp.major < 1)

{

printf("There is no device supporting CUDA.\n");

}

else if (deviceCount == 1)

{

printf("There is 1 device supporting CUDA\n");

}

else

{

deviceCount);

}

printf("There are %d devices supporting CUDA\n",

}

printf("\nDevice %d: \"%s\"\n", dev, deviceProp.name);

printf(" Major revision number: %d\n", deviceProp.major); printf(" Minor revision number: %d\n", deviceProp.minor); printf(" Total amount of global memory: %d bytes\n",

deviceProp.totalGlobalMem);

printf(" Total amount of constant memory: %d bytes\n", deviceProp.totalConstMem);

printf(" Total amount of shared memory per block: %d bytes\n", deviceProp.sharedMemPerBlock);

printf(" Total number of registers available per block: %d\n", deviceProp.regsPerBlock);

printf(" Warp size: %d\n", deviceProp.warpSize); printf(" Multiprocessor count:

%d\n",deviceProp.multiProcessorCount );

printf(" Maximum number of threads per block: %d\n", deviceProp.maxThreadsPerBlock);

printf(" Maximum sizes of each dimension of a block: %d x %d x %d\n", deviceProp.maxThreadsDim[0],deviceProp.maxThreadsDim[1], deviceProp.maxThreadsDim[2]);

printf(" Maximum sizes of each dimension of a grid: %d x %d x %d\n", deviceProp.maxGridSize[0], deviceProp.maxGridSize[1], deviceProp.maxGridSize[2]);

printf(" Maximum memory pitch: %d bytes\n", deviceProp.memPitch);

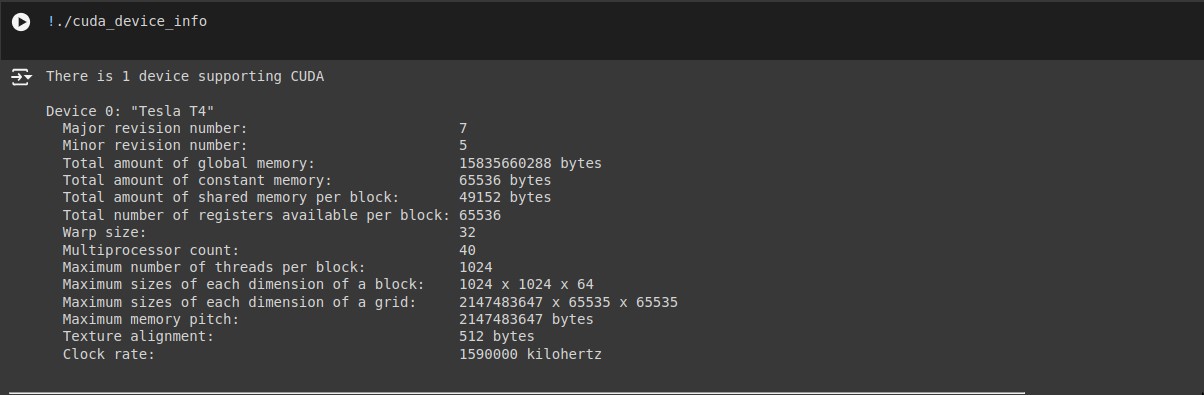
printf(" Texture alignment: %d bytes\n", deviceProp.textureAlignment);

printf(" Clock rate: %d kilohertz\n", deviceProp.clockRate);

}

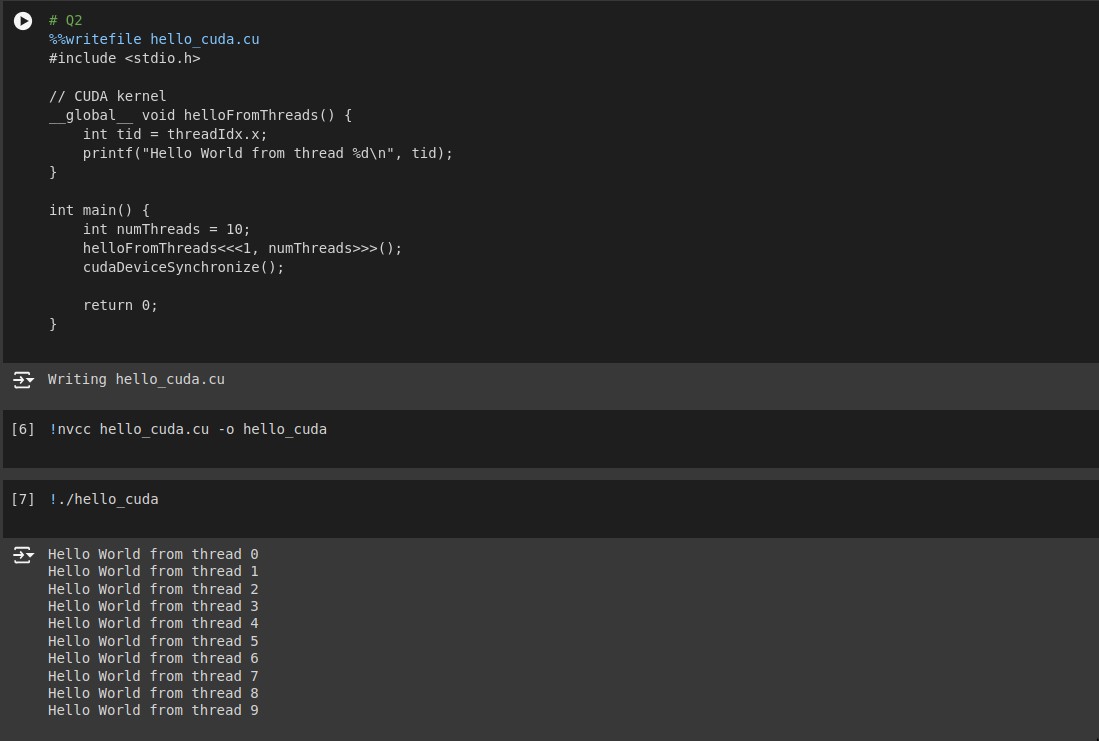
}

Output :



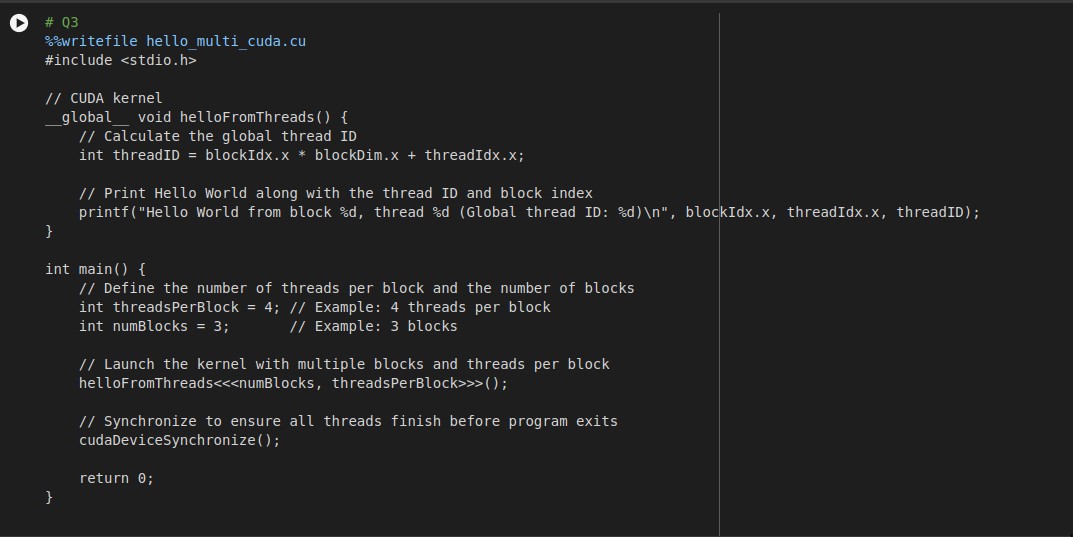
Problem Statement 2:

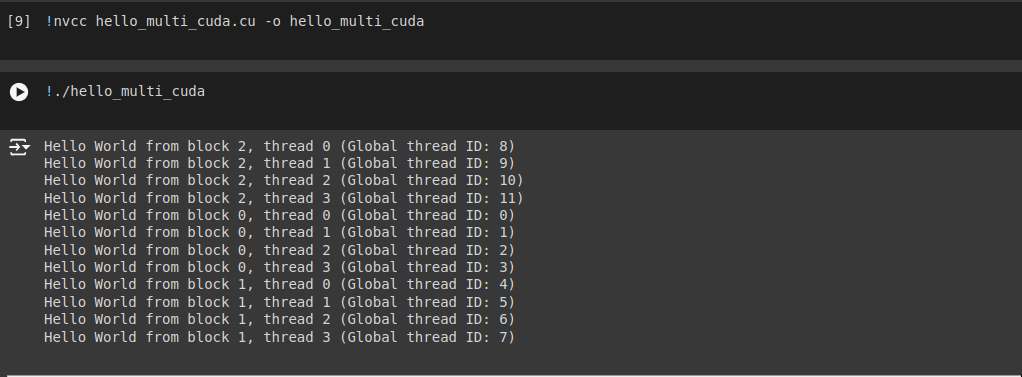
Write a program to where each thread prints its thread ID along with hello world. Lauch the kernel with one block and multiple threads.



Problem Statement 3:

Write a program to where each thread prints its thread ID along with hello world. Lauch the kernel with multiple blocks and multiple threads.





Problem Statement 4:

Write a program to where each thread prints its thread ID along with hello world. Lauch the kernel with 2D blocks and 2D threads.

