**מאיצים חישוביים ומערכות מואצות**

**046853**

**אביב תשע"ט**

**תרגיל בית 1**

204397368 **:שם:** יחזקאל עידו **תעודת זהות**

305285694 **:שם:** זוהר אוהד **תעודת זהות**

1. Knowing the System:
   1. CUDA Version: Cuda compilation tools, release 7.0, V7.0.27
   2. GPU Name: Persistence-M
   3. The number of SMs (Multiprocessors): 12
2. Implement device functions:
   1. Implanted in the hw1.cu file.
   2. Implanted in the hw1.cu file.
3. Implement a task serial version:
   1. Implanted in the hw1.cu file.
   2. *atomicAdd* has been used:  
      atomicAdd**(**hist\_shared **+** pixelValue**,** 1**);**
   3. atomicAdd is required for the correctness of the histogram - the histogram array allocated in shared memory, multiple threads running in the same thread block may trying to update the same pixel bucket in the same time. An atomic operation guarantees no two writers (in our case threads) can access in the same time to the same pixel bucket.
   4. Coping only one picture per iteration, by changing the source start pointer for copying:  
      int imageStartIndex **=** IMG\_HEIGHT **\*** IMG\_WIDTH **\*** i**;**CUDA\_CHECK**(**cudaMemcpy**(**image\_in\_device\_serial**,** **images\_in imageStartIndex,** IMG\_HEIGHT **\*** IMG\_WIDTH**,** cudaMemcpyHostToDevice**));**