Advanced Topics in Databases

Exercise 8

1. What is a GPU? Discuss the differences to CPUs. Why would you (not) use a GPU for data processing?

2. Explain the execution model that is most commonly used to program GPUs. Which GPU programming frameworks are available?

3. Implement a parallel filter kernel for the predicate ”=” using Cuda. The input is an array of integer values, the size of the vector, a constant integer comparison value, and the output array. The output array is a bitmap (char) where each bit corresponds to one item of the input array. To avoid conflicting writes, each thread should consume 8 values in one iteration.

4. Describe the principles of Index Nested Loop Joins on GPUs? Give an example for an Index Nested Loop Join on GPUs.

5. Describe the operator placement problem in heterogeneous systems? Why are analytic cost models not suited for this scenario?

6. Name and describe an alternative approach to analytic cost models for the operator problem.

Good Luck!