Harness the Power of GPUs:
An Introduction to GPGPU Programming
Lab 5: Advanced Matrix-Matrix Multiplication and Dot Product

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Task 1: Advanced matrix-matrix multiplication

- Enhance your previous matrix-matrix multiplication by using shared memory and matrix blocking.
Task 2: Dot product

• Allocate two vectors `a_host` and `b_host` of type `float` and 1,000,000 elements each. Transfer the vectors onto the device and compute the dot product. Implement a version using a custom reduction and one using atomic operations.

• Hints:
  – The dot product of two vectors `a` and `b` is defined as:
    \[ a \cdot b = a_1b_1 + a_2b_2 + \ldots + a_nb_n \]