LEBANESE AMERICAN UNIVERSITY
Department of Computer Science and Mathematics
CSC 447: Parallel Programing
Lab VI (PThreads)

Problem 1: Scalar Product

Write a scalable parallel program that takes, as a command line argument, the name of a file containing an integer N and 2 vectors of integers of size N. Your program should calculate the Scalar Product of the two vectors, using PThreads.

Sample input:	**Scalar Product:**
3	$s = u.v = 823$
11	
20	
7	
42	
10	
23	

Problem 2: Finite differences

Description:

In a one-dimensional finite difference problem, we have a vector $X^{(0)}$ of size N and must compute $X^{(T)}$ where:

$0 < i < N-1$ and $0 <= t < T$: $\mathbf{X_i^{(t+1)} = (X_{i-1}^{(t+1)} + 2X_i^{(t)} + X_{i+1}^{(t)}) / 4}$

That is, we must repeatedly update each element of X, with no element being updated in step $t+1$ until its neighbors have been updated in step t.

Your program:

Write a scalable parallel program that takes, as a command line argument, the name of a file containing a value T (number of steps), followed by integer N, and an array X of size N considered as the initial vector (at step t=0). Your program should update the vector $X^{(0)}$ until reaching $X^{(T)}$.