CS6868: Concurrent Programming
Spring 2014
Assignment 1: Due 22 February 2014, 11:59 pm

Problem 3:Longest Common Subsequence

Approach

In Longest Common Subsequence,we uses a dynamic programming approach, That is, We have a matrix whose each cell value depend upon previous cells (Left,Top,Diagonal).So LCS have a huge data dependency between each step of Program.
To parallelize LCS, We can divide Dynamic programming table into blocks,and we can process blocks in Diagonal(Inverse) strips.Block on each strip can be processed parallely as they don't have any dependency between them,while blocks in different strip should be processed in order.

Cilkview Scalability Analyzer Output

Cilkview Scalability Analyzer V2.0.0, Build 3566

Whole Program Statistics
1) Parallelism Profile

Work :	*37,269,597 instructions*
Span :	*9,152,829 instructions*
Burdened span :	*11,920,638 instructions*
Parallelism :	*4.07*
Burdened parallelism :	*3.13*
Number of spawns/syncs:	*347*
Average instructions / strand :	*35,767*
Strands along span :	*241*
Average instructions / strand on span :	*37,978*
Total number of atomic instructions :	*5,650*
Frame count :	*755*

2) Speedup Estimate

2 processors:	*1.30 - 2.00*
4 processors:	*1.52 - 4.00*
8 processors:	*1.66 - 4.07*
16 processors:	*1.75 - 4.07*
32 processors:	*1.79 - 4.07*
64 processors:	*1.82 - 4.07*
128 processors:	*1.83 - 4.07*
256 processors:	*1.83 - 4.07*

Cilk Parallel Region(s) Statistics - Elapsed time: 0.144 seconds

1) Parallelism Profile

Work :	*32,411,925 instructions*
Span :	*4,295,157 instructions*
Burdened span :	*7,062,966 instructions*
Parallelism :	*7.55*
Burdened parallelism :	*4.59*
Number of spawns/syncs:	*347*
Average instructions / strand :	*31,105*
Strands along span :	*120*
Average instructions / strand on span :	*35,792*
Total number of atomic instructions :	*5,650*
Frame count :	*755*
Entries to parallel region :	*1*

2) Speedup Estimate

2 processors:	*1.46 - 2.00*
4 processors:	*1.89 - 4.00*
8 processors:	*2.23 - 7.55*
16 processors:	*2.44 - 7.55*
32 processors:	*2.56 - 7.55*
64 processors:	*2.63 - 7.55*
128 processors:	*2.66 - 7.55*
256 processors:	*2.68 - 7.55*