1. A. The previous element a[i-1] is needed to calculate a[i]. The element b[i] depends on the calculation of a[i].

B. a[i] is the summation of 1 to i which can be calculated as . b[i] will also hold this summation since it’s equal to a[i].

2. Stencil Pattern

Analysis for random (without a file):

|  |  |
| --- | --- |
| **Number of Threads** | **Time Elapsed (ms)** |
| N = 400 M=1500 | |
| 1 | 25371 |
| 5 | 10519 |
| 10 | 9045 |
| 15 | 9972 |
| 25 | 8539 |
| 50 | 8163 |
| 75 | 8273 |
|  |  |
| N = 600 M = 1500 | |
| 1 | 55767 |
| 5 | 23168 |
| 10 | 18146 |
| 15 | 17499 |
| 25 | 17010 |
| 50 | 16814 |
| 75 | 16382 |
|  |  |
| N = 900 M = 1500 | |
| 1 | 126442 |
| 5 | 43293 |
| 10 | 38688 |
| 15 | 36541 |
| 25 | 35997 |
| 50 | 35562 |
| 75 | 35898 |

Life.cc gets significantly faster as more threads are added, especially between 1 thread and 5 threads.

3. Analysis for random(without a file):

|  |  |
| --- | --- |
| **Number of Threads** | **Time Elapsed (ms)** |
| N = 100 | |
| 1 | 638 |
| 5 | 451 |
| 10 | 4 |
| 15 | 507 |
| 25 | 689 |
| 50 | 118 |
| 75 | 476 |
|  |  |
| N = 784 | |
| 1 | 485 |
| 5 | 332 |
| 10 | 758 |
| 15 | 199 |
| 25 | 706 |
| 50 | 56 |
| 75 | 160 |
|  |  |
| N = 2304 | |
| 1 | 189 |
| 5 | 569 |
| 10 | 64 |
| 15 | 377 |
| 25 | 256 |
| 50 | 199 |
| 75 | 177 |
|  |  |
| N = 12100 |  |
| 1 | 792 |
| 5 | 699 |
| 10 | 619 |
| 15 | 751 |
| 25 | 853 |
| 50 | 860 |
| 75 | 441 |

When N is big enough, the performance should be better with an increase in number of threads.