Exercise 3

for (int i = 0; i < 4; ++i) {

for (int j = 1; j < 4; ++j) {

a[i + 2][j - 1] = b \* a[i][j] + 4;

}

}

(2, 0) -> I = 0 und j = 2 und I = 2 und j = 1

Some true dependencies here:

a[i + 2][j - 1] = b \* a[i][j] + 4;

from lecture

A math equations and symbols

AI-generated content may be incorrect.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Dep | Source | Type | Sink | Dist Vec | Dir Vec | Loop carried | Loop ind. | Dependence carried by loop |
| Dep1 | a[i+2][j-1] | True dependency | a[i][j] | (2,-1) | (<, >) | x |  | i, j -loop |

A[i+2][j-1] which are actually being read later on: i in interval [0,4] and j in interval [1,4]

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | j=1 | 2 | 3 | 4 |
| i = 0 | A[2][0] | A[2][1] | A[2][2] | A[2][3] |
| 1 | A[3][0] | A[3][1] | A[3][2] | A[3][3] |
| 2 | A[4][0] | A[4][1] | A[4][2] | A[4][3] |
| 3 | A[5][0] | A[5][1] | A[5][2] | A[5][3] |
| 4 | A[6][0] | A[6][1] | A[6][2] | A[6][3] |

The green statements

are not dependent and can be parallelized, the red ones can’t.