1. **Pair Approach**

|  |  |
| --- | --- |
| 15 91 80 12 19 80  17 15 80 18 91 18 | 19 15 80 18 91 18  18 15 18 18 80 18 |
| Mapper 1 | Mapper 2 |
| ((15, 91), 1)  ((15, 80), 1)  ((15, 12), 1)  ((15, 19), 1)  ((15, 80), 1)  ((91, 80), 1)  ((91, 12), 1)  ((91, 19), 1)  ((91, 80), 1)  ((80, 12), 1)  ((80, 19), 1)  ((12, 19), 1)  ((12, 80), 1)  ((19, 80), 1)  ((17, 15), 1)  ((17, 80), 1)  ((17, 18), 1)  ((17, 91), 1)  ((17, 18), 1)  ((15, 80), 1)  ((15, 18), 1)  ((15, 91), 1)  ((15, 18), 1)  ((80, 18), 1)  ((80, 91), 1)  ((80, 18), 1)  ((18, 91), 1)  ((91, 18), 1) | ((19, 15), 1)  ((19, 80), 1)  ((19, 18), 1)  ((19, 91), 1)  ((19, 18), 1)  ((15, 80), 1)  ((15, 18), 1)  ((15, 91), 1)  ((15, 18), 1)  ((80, 18), 1)  ((80, 91), 1)  ((80, 18), 1)  ((18, 91), 1)  ((91, 18), 1)  ((18, 15), 1)  ((15, 18), 1)  ((15, 18), 1)  ((15, 80), 1)  ((15, 18), 1)  ((18, 80), 1)  ((80, 18), 1) |
| S-S and partition | |
| ((12, \*), [1,1])  ((12, 19), [1])  ((12, 80), [1])  ((15, \*), [1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1]  ((15, 12), [1])  ((15, 18), [1,1, 1, 1,1,1,1])  ((15, 19), [1])  ((15, 80), [1, 1, 1, 1, 1])  ((15, 91), [1, 1, 1])  ((17, \*), [1,1,1,1,1])  ((17, 15), [1])  ((17, 80), [1])  ((17, 18), [1])  ((17, 91), [1])  ((17, 18), [1])  ((18, \*), [1,1,1])  ((18, 80), [1])  ((18, 91), [1,1])  ((19, \*), [1,1,1,1,1,1])  ((19, 15), [1])  ((19, 18), [1,1])  ((19, 80), [1,1])  ((19, 91), [1])  ((80, \*), [1,1,1,1,1,1,1,1,1])  ((80, 12), [1])  ((80, 18), [1,1,1,1,1])  ((80, 19), [1])  ((80, 91), [1,1])  ((91, \*), [1,1,1,1,1,1])  ((91, 12), [1])  ((91, 18), [1,1])  ((91, 19), [1])  ((91, 80), [1,1]) | |
| Reducer output | |
| ((12, \*), 2)  ((12, 19), 1/2)  ((12, 80), 1/2)  ((15, \*), 17)  ((15, 12), 1/17)  ((15, 18), 7/17)  ((15, 19), 1/17)  ((15, 80), 5/17)  ((15, 91), 3/17)  ((17, \*), 5)  ((17, 15), 1/5)  ((17, 80), 1/5)  ((17, 18), 1/5)  ((17, 91), 1/5)  ((17, 18), 1/5)  ((18, \*), 3)  ((18, 80), 1/3)  ((18, 91), 2/3)  ((19, \*), 6)  ((19, 15), 1/6)  ((19, 18), 2/6)  ((19, 80), 2/6)  ((19, 91), 1/6)  ((80, \*), 9)  ((80, 12), 1/9)  ((80, 18), 5/9)  ((80, 19), 1/9)  ((80, 91), 2/9)  ((91, \*), 6)  ((91, 12), 1/6)  ((91, 18), 2/6)  ((91, 19), 1/6)  ((91, 80), 2/6) | |

1. **Stripe Approach**

|  |  |
| --- | --- |
| 15 91 80 12 19 80  17 15 80 18 91 18 | 19 15 80 18 91 18  18 15 18 18 80 18 |
| Mapper 1 | Mapper 2 |
| 91 80 12 19 80  (15, [ 1 | 1 | 1 | 1 | 1 ])  80 12 19 80  (91, [ 1 | 1 | 1 | 1 ])  12 19  (80, [ 1 | 1 ])  19 80  (12, [ 1 | 1 ])  80  (19, [ 1 ])  15 80 18 91 18  (17, [ 1 | 1 | 1 | 1 | 1 ]  80 18 91 18  (15, [ 1 | 1 | 1 | 1 ])    18 91 18  (80, [ 1 | 1 | 1 ])  91  (18, [ 1 ])  18  (91, [ 1 ]) | 15 80 18 91 18  (19, [ 1 | 1 | 1 | 1 | 1 ])  80 18 91 18  (15, [ 1 | 1 | 1 | 1 ])    18 91 18  (80, [ 1 | 1 | 1 ])  91  (18, [ 1 ])  18  (91, [ 1 ])  15  (18, [ 1 ])  80  (18, [ 1 ])  18  (80, [ 1 ]) |
| S-S | |
| 19 80  (12, [ 1 | 1 ])  12 18 19 80 91  (15, [ 1 | 4 | 1 | 4 | 3])  15 80 18 91  (17, [ 1 | 1 | 2 | 1 ])  15 80 91  (18, [ 1 ], [ 1 ], [ 2 ])  15 18 80 91  (19, [ 1 | 2 | 2 | 1 ])  12 18 19 91  (80, [ 1 | 5 | 1 | 2])  12 18 19 80  (91, [ 1 | 2 | 1 | 2 ]) | |
| Reducer output | |
| 19 80  (12, [ 1/2 | 1/2 ])  12 18 19 80 91  (15, [ 1/13 | 4/13 | 1/13 | 4/13 | 3/13 ])  15 80 18 91  (17, [ 1/5 | 1/5 | 2/5 | 1/5 ])  15 80 91  (18, [ 1/4 ], [ 1/4 ], [ 2/4 ])  15 18 80 91  (19, [ 1/6 | 2/6 | 2/6 | 1/6 ])  12 18 19 91  (80, [ 1/9 | 5/9 | 1/9 | 2/9 ])  12 18 19 80  (91, [ 1/6 | 2/6 | 1/6 | 2/6 ]) | |