

A. 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]) ((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)

$((17, *), 5)$

$((17, 15), 1/5)$

$((17, 80), 1/5)$

$((17, 18), 1/5)$

$((17, 91), 1/5)$

$((17, 18), 1/5)$

$((18, *), 3)$

$((18, 80), 1/3)$

$((18, 91), 2/3)$

$((19, *), 6)$

$((19, 15), 1/6)$

$((19, 18), 2/6)$

$((19, 80), 2/6)$

$((19, 91), 1/6)$

$((80, *), 9)$

$((80, 12), 1/9)$

$((80, 18), 5/9)$

$((80, 19), 1/9)$

$((80, 91), 2/9)$

$((91, *), 6)$

$((91, 12), 1/6)$

$((91, 18), 2/6)$

$((91, 19), 1/6)$

$((91, 80), 2/6)$

B. 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])	15 80 18 91 18 (19, [1 1 1 1 1])
80 12 19 80 (91, [1 1 1 1])	80 18 91 18 (15, [1 1 1 1])
12 19 (80, [1 1])	18 91 18 (80, [1 1 1])
19 80 (12, [1 1])	91 (18, [1])
80 (19, [1])	18 (91, [1])
15 80 18 91 18 (17, [1 1 1 1 1])	15 (18, [1])
80 18 91 18 (15, [1 1 1 1])	80 (18, [1])
18 91 18 (80, [1 1 1])	18 (80, [1])
91 (18, [1])	
18 (91, [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])