**Name: Sovichea Cheth ID: 985421**

**W2D1 Assignment**

**Compute Relative Frequencies**

      Number of Input-Splits: 2

        Number of Reducers: 1

        Input Split 0

        15 91 80 12 19 80

        17 15 80 18 91 18

        Input Split 1

        19 15 80 18 91 18

        18 15 18 18 80 18

1. Pair Approach
2. Stripe Approach

**Answer:**

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 Output 1** | **Mapper Output 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) |
| **Shuffle-Sort** | |
| ((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, \*), [1,1,1,1])  ((18,15), [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, \*), 4)  ((18, 15), 1/4)  ((18, 80), 1/4)  ((18, 91), 2/4)  ((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 Output 1** | **Mapper Output 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 | ) | |
| **Shuffle Sort** | |
| |  |  |  |  | | --- | --- | --- | --- | |  | 19 | 80 |  | | (12, | 1 | 1 | ) |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  | 12 | 18 | 19 | 80 | 91 |  | | (15, | 1 | 4 | 1 | 4 | 3 | ) |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | |  | 15 | 18 | 80 | 91 |  | | (17, | 1 | 2 | 1 | 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 | 18 | 80 | 91 |  | | (17, | 1/5 | 2/5 | 1/5 | 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 | ) | | |
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