**1.A. With no combiner no in-Mapper combining**

|  |  |  |
| --- | --- | --- |
| **Mapper1-Input Split1**  **Output** | **Mapper3-Input Split3**  **Output** | **Mapper5-Input Split5**  **Output** |
| <cherry,1> <plum,1>  <mango,1> <cherry,1>  <olive,1> <banana,1>  <cherry,1> <cherry,1> | <banana,1> <mango,1>  <kiwi,1> <cherry,1>  <plum,1> <kiwi,1>  <banana,1> <banana,1> | <olive,1> <cherry,1>  <banana,1> <kiwi,1>  <radish,1> <olive,1>  <kiwi,1> <cherry,1> |
| **Mapper2-Input Split2**  **Output** | **Mapper4-Input Split4**  **Output** | **Mapper6-Input Split6**  **Output** |
| <cherry,1> <carrot,1>  <banana,1> <banana,1>  <radish,1> <mango,1>  <radish,1> <cherry,1> | <apple,1> <radish,1>  <mango,1> <kiwi,1>  <carrot,1> <banana,1>  <plum,1> <olive,1> | <banana,1> <olive,1>  <radish,1> <cherry,1>  <plum,1> <banana,1>  <banana,1> <radish,1> |
| **Reducer1-Input** | **Reducer2-Input** | **Reducer3-Input** |
| <apple,[1]>  <banana, [1,1,1,1,1,1,1,1,1,1,1]>  <carrot, [1,1]  <cherry, [1,1,1,1,1,1,1,1,1,1]>  <kiwi, [1,1,1,1,1]> | <mango, [1,1,1,1]>  <olive, [1,1,1,1,1]>  <plum, [1,1,1,1]> | <radish, [1,1,1,1,1,1] |
| **Reducer1-Output** | **Reducer2-Output** | **Reducer3-Output** |
| <apple,1>  <banana,11>  <carrot,2>  <cherry,10>  <kiwi,5> | <mango,4>  <olive,5>  <plum,4> | <radish,6> |

**B. With combiner no in-mapper combining**

|  |  |  |
| --- | --- | --- |
| **Mapper1-Input Split1**  **output** | **Mapper3-Input Split3**  **Output** | **Mapper5-Input Split5**  **Output** |
| <cherry,1> <plum,1>  <mango,1> <cherry,1>  <olive,1> <banana,1>  <cherry,1> <cherry,1 | <banana,1> <mango,1>  <kiwi,1> <cherry,1>  <plum,1> <kiwi,1>  <banana,1> <banana,1> | <olive,1> <cherry,1>  <banana,1> <kiwi,1>  <radish,1> <olive,1>  <kiwi,1> <cherry,1> |
| Mapper2-Input Split2  Output  <cherry,1> <carrot,1>  <banana,1> <banana,1>  <radish,1> <mango,1>  <radish,1> <cherry,1> | Mapper4-Input Split4  Output  <apple,1> <radish,1>  <mango,1> <kiwi,1>  <carrot,1> <banana,1>  <plum,1> <olive,1> | Mapper6-Input Split6  Output  <banana,1> <olive,1>  <radish,1> <cherry,1>  <plum,1> <banana,1>  <banana,1> <radish,1> |
| **Mapper1- combiner 1 output** | **Mapper3-combiner3 output** | **Mapper5-combiner5 output** |
| <banana,1>  <cherry,4>  <mango,1>  <olive,1>  <plum,1> | <banana,3>  <cherry,1>  <kiwi,2>  <mango,1>  <plum,1> | <banana,1>  <cherry,2>  <kiwi,2>  <olive,2>  <radish,1> |
| **Mapper2-combiner2 output** | **Mapper4-combiner4 output** | **Mapper6-combiner6 output** |
| <banana,2>  <carrot,1>  <cherry,2>  <mango,1>  <radish,2> | <apple,1>  <banana,1>  <carrot,1>  <kiwi,1>  <mango,1>  <olive,1>  <plum,1>  <radish,1> | <banana,3>  <cherry,1>  <olive,1>  <plum,1>  <radish,2> |
| **Reducer1-input** | **Reducer2-input** | **Reducer3-input** |
| <apple,[1]>  <banana, [1,2,3,,1,1,3]>  <carrot, [1,1]  <cherry, [4,2,1,2,1]>  <kiwi, [2,1,2]> | <mango,[1,1,1,1>  <olive,[1,1,2,1]>  <plum,[1,1,1,1> | <radish,[2,1,1,2> |
| **Reducer1-output** | **Reducer2-output** | **Reducer3-output** |
| <apple,1>  <banana,11>  <carrot,2>  <cherry,10>  <kiwi,5> | <mango,4>  <olive,5>  <plum,4> | <radish,6> |

**C. With in-mapper combiner**

|  |  |  |
| --- | --- | --- |
| **Mapper1-output** | **Mapper3-output** | **Mapper5-output** |
| <banana,1>  <cherry,4>  <mango,1>  <olive,1>  <plum,1> | <banana,3>  <cherry,1>  <kiwi,2>  <mango,1>  <plum,1> | <banana,1>  <cherry,2>  <kiwi,2>  <olive,2>  <radish,1> |
| **Mapper2-output** | **Mapper4-output** | **Mapper5-output** |
| <banana,2>  <carrot,1>  <cherry,2>  <mango,1>  <radish,2> | <apple,1>  <banana,1>  <carrot,1>  <kiwi,1>  <mango,1>  <olive,1>  <plum,1>  <radish,1> | <banana,3>  <cherry,1>  <olive,1>  <plum,1>  <radish,2> |
| **Reducer1-input** | **Reducer2-input** | **Reducer3-input** |
| <apple,[1]>  <banana, [1,2,3,,1,1,3]>  <carrot, [1,1]  <cherry, [4,2,1,2,1]>  <kiwi, [2,1,2]> | <mango,[1,1,1,1>  <olive,[1,1,2,1]>  <plum,[1,1,1,1> | <radish,[2,1,1,2> |
| **Reducer1-output** | **Reducer2-output** | **Reducer3-output** |
| <apple,1>  <banana,11>  <carrot,2>  <cherry,10>  <kiwi,5> | <mango,4>  <olive,5>  <plum,4> | <radish,6> |