

LeetCode #1128

Number of Equivalent Domino
Pairs

Hash Table counting

To count the number of pairs (i, j) for which $0 \leq i < j < \text{dominoes.length}$, and $\text{dominoes}[i]$ is equivalent to $\text{dominoes}[j]$, we can use a hash table to track the occurrences of each value. Then we accumulate the result by iterating through the values in the hash table and applying the formula $\text{pairs} = n * (n-1) / 2$, where n is the frequency of each element.


↓

dominoes	[1,2]	[1,2]	[1,1]	[2,1]	[2,2]
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freq	key	value

We need to avoid duplicating the same values, so a more concise way to achieve that is by sorting the values. Since there are only two elements, it can be done quickly. Alternatively, we could use an if/else branch.

dominoes



[1,2]	[1,2]	[1,1]	[2,1]	[2,2]
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freq

key	value
(1, 2)	1

`freq[sort(dominoes[i])] += 1`

`freq[(1,2)] = 1`

dominoes



[1,2]	[1,2]	[1,1]	[2,1]	[2,2]
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freq

key	value
(1, 2)	2

`freq[sort(dominoes[i])] += 1`

`freq[(1,2)] = 2`

dominoes



[1,2]	[1,2]	[1,1]	[2,1]	[2,2]
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freq

key	value
(1, 2)	2
(1, 1)	1

`freq[sort(dominoes[i])] += 1`

`freq[(1,1)] = 1`

dominoes



[1,2]	[1,2]	[1,1]	[2,1]	[2,2]
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freq

key	value
(1, 2)	3
(1, 1)	1

`freq[sort(dominoes[i])] += 1`

`freq[(1,2)] = 3`

dominoes



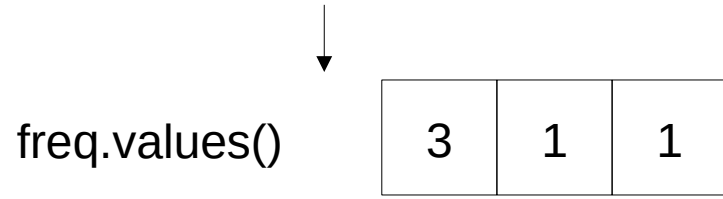
[1,2]	[1,2]	[1,1]	[2,1]	[2,2]
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freq

key	value
(1, 2)	3
(1, 1)	1
(2, 2)	1

`freq[sort(dominoes[i])] += 1`

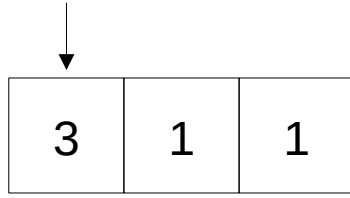
`freq[(2,2)] = 1`



res = 0

Then we iterate through freq.values() and accumulate the result by using the formula $\text{pairs} = n * (n-1) / 2$, where n is the i -th element of freq.values()

freq.values()



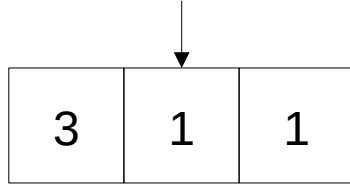
3	1	1
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res = 3

$\text{res} = \text{res} + \text{freq.values()}[i] * (\text{freq.values()}[i] - 1) / 2$

$\text{Res} = 0 + 3 * (3 - 1) / 2 = 0 + 3 * 2 / 2 = 0 + 6 / 2 = 0 + 3 = 3$

freq.values()

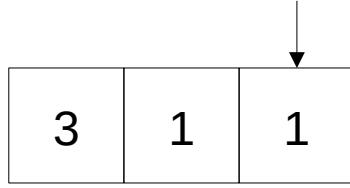


3	1	1
---	---	---

res = 3

$\text{res} = \text{res} + \text{freq.values()}[i] * (\text{freq.values()}[i]-1) / 2$
 $\text{res} = 3 + 1 * (1-1) / 2 = 3 + 1 * 0 / 2 = 3 + 0 / 2 = 3$

freq.values()



A horizontal array of three cells containing the values 3, 1, and 1. An arrow points down to the top of the third cell, which contains the value 1.

3	1	1
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res = 3

$$\text{res} = \text{res} + \text{freq.values()}[i] * (\text{freq.values()}[i]-1) / 2$$
$$\text{res} = 3 + 1 * (1-1) / 2 = 3 + 1 * 0 / 2 = 3 + 0 / 2 = 3$$