

5kyu Train of Dominoes

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Python



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The dominoes in a full set come in a couple of types. For each number of pips there is a double domino, ranging from double blank represented `[0, 0]` up to double six, sometimes nine, fifteen, or in general `[n, n]`. Then there are all combinations of different numbers. For instance, a standard set has a single domino with a blank on one end and six pips on the other, which could be represented either as `[0, 6]` or equivalently `[6, 0]`.

Imagine you are given two identical sets of dominoes, except that the doubles from one set are removed. For instance, if the sets have at most `n=2` pips, then you have `[0, 1]`, `[0, 2]`, and `[1, 2]` from both sets, but you're given only a single `[0, 0]`, `[1, 1]`, and `[2, 2]`. In general there will be $(n + 1) * (n + 1)$ dominoes to work with. Your task is to line up all these dominoes end to end such that the values on adjacent dominoes match where they meet. This sequence of dominoes is called a train.

The input is a single number, e.g. `n=2` as the max, and the output is a list such as `[0, 1, 1, 0, 2, 1, 2, 2, 0, 0]` which represents the values where dominoes meet, capped by the values at each end. In other words, this list is interpreted as the train `[0, 1]`, `[1, 1]`, `[1, 0]`, `[0, 2]`, `[2, 1]`, `[1, 2]`, `[2, 2]`, `[2, 0]`, `[0, 0]`. Other possibilities with all these dominoes in a different order could also be accepted as correct. Graph theory proves there is always a valid solution, but a graph isn't necessarily needed to generate one.

Best of luck! :-)