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--- Day 13: Distress Signal ---

You climb the hill and again try contacting the Elves. However, you instead
receive a signal you weren't expecting: a distress signal.

Your handheld device must still not be working properly; the packets from
the distress signal got decoded out of order. You'll need to re-order the
list of received packets (your puzzle input) to decode the message.

Your list consists of pairs of packets; pairs are separated by a blank
line. You need to identify how many pairs of packets are in the right
order.

For example:

```
[1,1,3,1,1]
[1,1,5,1,1]

[[1],[2,3,4]]
[[1],4]

[9]
[[8,7,6]]

[[4,4],4,4]
[[4,4],4,4,4]

[7,7,7,7]
[7,7,7]

[]
[3]

[[[]]]
[[]]

[1,[2,[3,[4,[5,6,7]]]],8,9]
[1,[2,[3,[4,[5,6,0]]]],8,9]
```

Packet data consists of lists and integers. Each list starts with [, ends
with], and contains zero or more comma-separated values (either integers
or other lists). Each packet is always a list and appears on its own line.

When comparing two values, the first value is called left and the second
value is called right. Then:

  - If both values are integers, the lower integer should come first. If
    the left integer is lower than the right integer, the inputs are in
    the right order. If the left integer is higher than the right integer,
    the inputs are not in the right order. Otherwise, the inputs are the
    same integer; continue checking the next part of the input.
  - If both values are lists, compare the first value of each list, then
    the second value, and so on. If the left list runs out of items first,
    the inputs are in the right order. If the right list runs out of items
    first, the inputs are not in the right order. If the lists are the
    same length and no comparison makes a decision about the order,
    continue checking the next part of the input.
  - If exactly one value is an integer, convert the integer to a list
    which contains that integer as its only value, then retry the
    comparison. For example, if comparing [0,0,0] and 2, convert the right
    value to [2] (a list containing 2); the result is then found by
    instead comparing [0,0,0] and [2].

Using these rules, you can determine which of the pairs in the example are
in the right order:

```
== Pair 1 ==
- Compare [1,1,3,1,1] vs [1,1,5,1,1]
  - Compare 1 vs 1
  - Compare 1 vs 1
  - Compare 3 vs 5
    - Left side is smaller, so inputs are in the right order

== Pair 2 ==
- Compare [[1],[2,3,4]] vs [[1],4]
  - Compare [1] vs [1]
    - Compare 1 vs 1
  - Compare [2,3,4] vs 4
    - Mixed types; convert right to [4] and retry comparison
    - Compare [2,3,4] vs [4]
      - Compare 2 vs 4
        - Left side is smaller, so inputs are in the right order

== Pair 3 ==
- Compare [9] vs [[8,7,6]]
  - Compare 9 vs [8,7,6]
    - Mixed types; convert left to [9] and retry comparison
    - Compare [9] vs [8,7,6]
      - Compare 9 vs 8
        - Right side is smaller, so inputs are not in the right order

== Pair 4 ==
- Compare [[4,4],4,4] vs [[4,4],4,4,4]
  - Compare [4,4] vs [4,4]
    - Compare 4 vs 4
    - Compare 4 vs 4
  - Compare 4 vs 4
  - Compare 4 vs 4
  - Left side ran out of items, so inputs are in the right order

== Pair 5 ==
- Compare [7,7,7,7] vs [7,7,7]
  - Compare 7 vs 7
  - Compare 7 vs 7
  - Compare 7 vs 7
  - Right side ran out of items, so inputs are not in the right order

== Pair 6 ==
- Compare [] vs [3]
  - Left side ran out of items, so inputs are in the right order

== Pair 7 ==
- Compare [[[]]] vs [[]]
  - Compare [[]] vs []
    - Right side ran out of items, so inputs are not in the right order

== Pair 8 ==
- Compare [1,[2,[3,[4,[5,6,7]]]],8,9] vs [1,[2,[3,[4,[5,6,0]]]],8,9]
  - Compare 1 vs 1
  - Compare [2,[3,[4,[5,6,7]]]] vs [2,[3,[4,[5,6,0]]]]
    - Compare 2 vs 2
    - Compare [3,[4,[5,6,7]]] vs [3,[4,[5,6,0]]]
      - Compare 3 vs 3
      - Compare [4,[5,6,7]] vs [4,[5,6,0]]
        - Compare 4 vs 4
        - Compare [5,6,7] vs [5,6,0]
          - Compare 5 vs 5
          - Compare 6 vs 6
          - Compare 7 vs 0
            - Right side is smaller, so inputs are not in the right order
```

What are the indices of the pairs that are already in the right order? (The
first pair has index 1, the second pair has index 2, and so on.) In the

above example, the pairs in the right order are 1, 2, 4, and 6; the sum of
these indices is 13.

Determine which pairs of packets are already in the right order. What is
the sum of the indices of those pairs?

Your puzzle answer was 5506.

--- Part Two ---

Now, you just need to put all of the packets in the right order. Disregard
the blank lines in your list of received packets.

The distress signal protocol also requires that you include two additional
divider packets:

```
[[2]]
[[6]]
```

Using the same rules as before, organize all packets - the ones in your
list of received packets as well as the two divider packets - into the
correct order.

For the example above, the result of putting the packets in the correct
order is:

```
[]
[[]]
[[[]]]
[1,1,3,1,1]
[1,1,5,1,1]
[[1],[2,3,4]]
[1,[2,[3,[4,[5,6,0]]]],8,9]
[1,[2,[3,[4,[5,6,7]]]],8,9]
[[1],4]
[[2]]
[3]
[[4,4],4,4]
[[4,4],4,4,4]
[[6]]
[7,7,7]
[7,7,7,7]
[[8,7,6]]
[9]
```

Afterward, locate the divider packets. To find the decoder key for this
distress signal, you need to determine the indices of the two divider
packets and multiply them together. (The first packet is at index 1, the
second packet is at index 2, and so on.) In this example, the divider
packets are 10th and 14th, and so the decoder key is 140.

Organize all of the packets into the correct order. What is the decoder key
for the distress signal?

Your puzzle answer was 21756.

Both parts of this puzzle are complete! They provide two gold stars: **

At this point, you should return to your Advent calendar and try another puzzle.

If you still want to see it, you can get your puzzle input.

You can also [Share] this puzzle.