Divide into two problems

Vladimir
Joanna
Joel
Eric
Lance
Adriana
Yoel
Aaron
Sort each list recursively

1. Lance
2. Adriana
3. Yoel
4. Aaron

1. Vladimir
2. Joanna
3. Joel
4. Eric
Sort each list recursively

Aaron
Adriana
Lance
Yoel

Vladimir
Joanna
Joel
Eric
Merge the two lists

Aaron
Adriana
Lance
Yoel

Eric
Joanna
Joel
Vladimir
Merge the two lists

Aaron
Adriana
Lance
Yoel

Eric
Joanna
Joel
Vladimir
Merge the two lists

Aaron
Adriana
Lance
Yoel
Eric
Joanna
Joel
Vladimir
Merge the two lists

Aaron
Adriana
Eric
Lance
Yoel

Joanna
Joel
Vladimir
Counting Inversions

Divide into front and back halves

Count inversions within each half, and sort each half

Then, count inversions between front and back half
Counting Inversions between front and back

*Merge.* Whenever a back item is pushed up, count how many it goes past

front: 2 4 6 7

back: 1 3 5 8
Counting Inversions between front and back

*Merge.* Whenever a back item is pushed up, count how many it goes past

```
front:  2  4  6  7
```

```
back:  1  3  5  8
```

skips over 2, 4, 6 and 7

Inversions: 4
Counting Inversions between front and back

Merge. Whenever a back item is pushed up, count how many it goes past.

Inversions: 4
Counting Inversions between front and back

*Merge.* Whenever a back item is pushed up, count how many it goes past from front, nothing to count

Inversions: 4
Counting Inversions between front and back

*Merge.* Whenever a back item is pushed up, count how many it goes past

1 2

front:  4 6 7  

back:  3 5 8

3 skips over 4, 6, and 7

Inversions: 7
Counting Inversions between front and back

Merge. Whenever a back item is pushed up, count how many it goes past

Inversions: 7

3 skips over 4, 6, and 7
Counting Inversions between front and back

Merge. Whenever a back item is pushed up, count how many it goes past

Inversions: 7

4 is in front: no change
Counting Inversions between front and back

Merge. Whenever a back item is pushed up, count how many it goes past

Inversions: 9

1 2 3 4 5

front: 6 7

back: 8

5 moves past 6 and 7
Counting Inversions between front and back

Merge. Whenever a back item is pushed up, count how many it goes past

Inversions: 9