
Bubblesort
Sorting Algorithms

[0]	[1]	[2]	[3]	[4]	[5]
8	2	3	1	7	5

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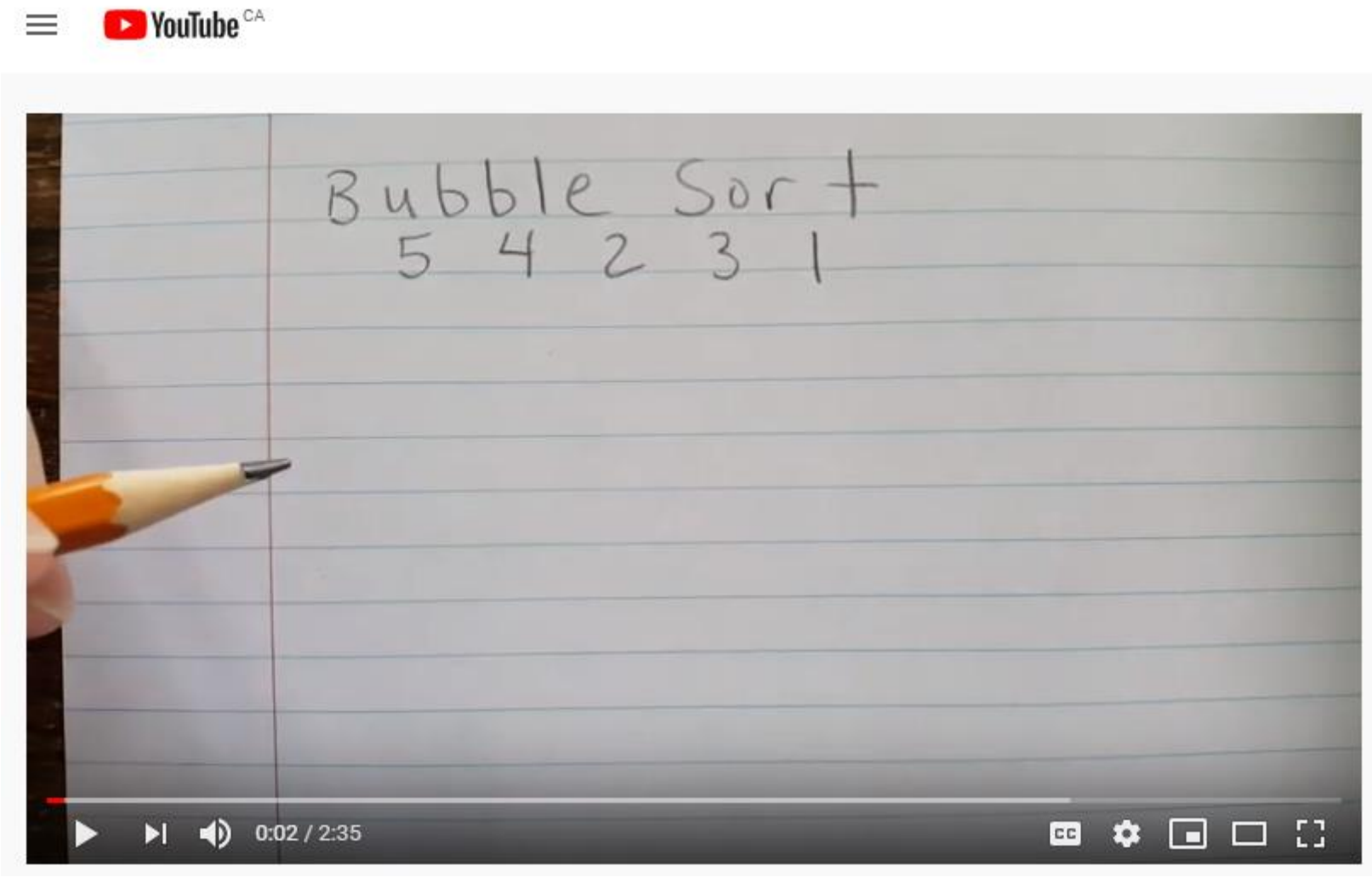
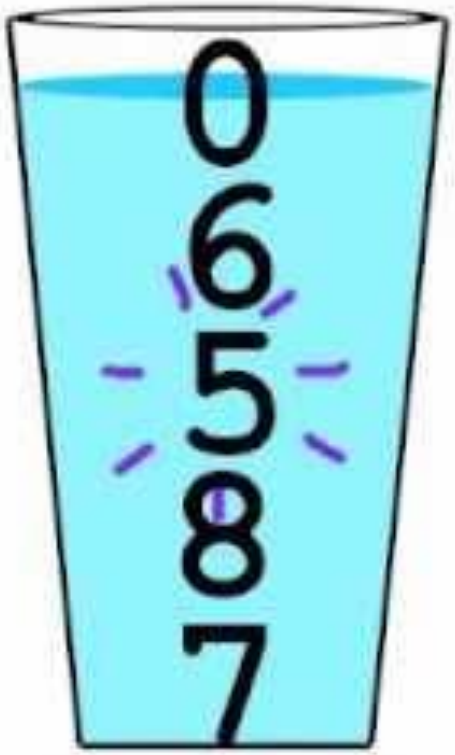
2	1	3	7	5	8
2	1	3	5	7	8
1	2	3	5	7	8

I posted a video to YouTube tracing Bubble Sort:



https://www.youtube.com/watch?v=W2rIMC7HlW8



In a **bubble sort**, the "heaviest" item sinks to the bottom of the list while the "lightest" floats up to the top

A card for you to write:

Bubblesort Characteristics

- Long series of swaps up the array on each pass
- In the general case – slow – O(n^2)
- In its best case – almost sorted – fast – close to O(n)
- First sorting algorithm to be coded in 1955.

A card for you to write:

Bubblesort Swapping Tradeoff

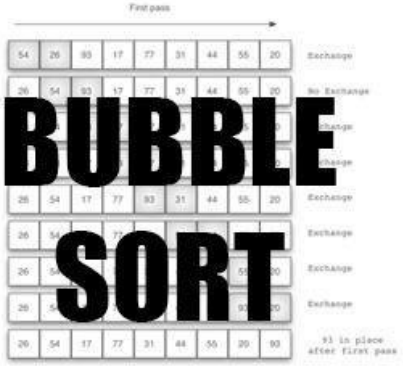
(-) In the general case, bubble sort is one of the slowest sorts. It's method of swapping one-by-one up the array takes forever.

(+) If the array is almost sorted, it is one of the only sorts that can stop as soon as it is sorted. The slow swapping method ALSO checks if the array is sorted and allows the code to stop early.

beef stock

chicken stock

laughing stock



The Bubble Sort Code

```
int n = a.length;
for (int i = 0 ; i < n - 1 ; i++)
{  for (int j = 0 ; j < n - 1 - i ; j++)
   {  if (a [j + 1] < a [j])
      {  int temp = a [j];
         a [j] = a [j + 1];
         a [j + 1] = temp;
      }
   }
}
```

The three line swap.

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```

If the two neighbours are out of order

Swap them!

The Bubble Sort Code

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int n = a.length;
for (int i = 0 ; i < n - 1 ; i++)
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```

Go down the array once!

Swapping out of order pairs!

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