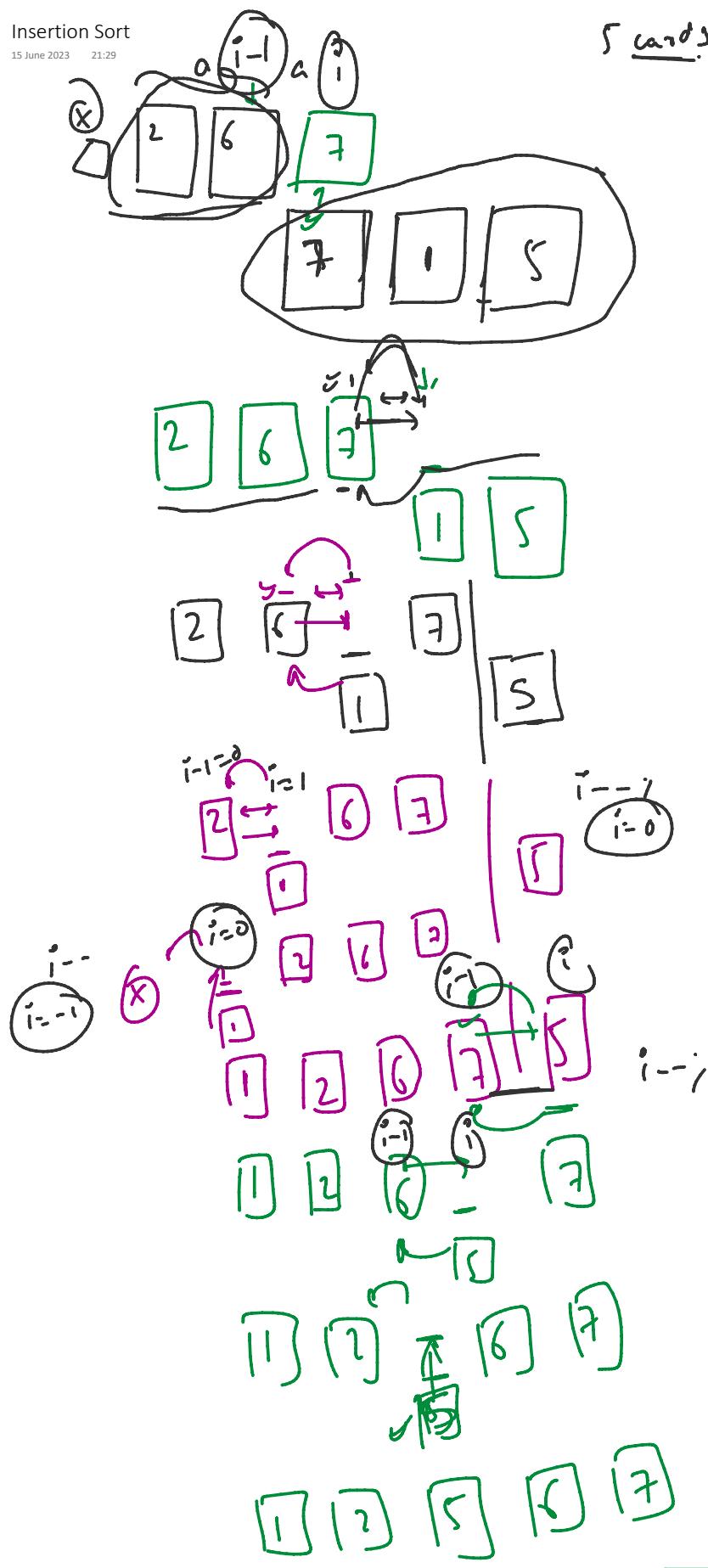


Insertion Sort

15 June 2023 21:29

5 cards



$\begin{cases} \text{if } a[i-1] > a[i] \\ \text{swap}(i-1, i) \end{cases}$

2

1 3 5 6

5 < 6 1 = 3

1, 3, 5, 6

5

1

4, 2, 9

$$6 > 4$$

1, 3, 5, 4, 6. |

$$0[2] > a[3]$$

1, 3, 4, 5, 6

$$\begin{array}{c} 3 < 4 \\ \hline 1, 3, 4, 5, 6 \end{array} \quad \left| \begin{array}{c} i=4 \\ 3 \\ 2 \end{array} \right. \quad \begin{array}{c} i=9 \\ 6 \\ 9 \end{array} \quad \alpha(i) = 2$$

$$6 > 2$$

1, 3, 4, 5, 26

5 > 2

1, 3, 4, 2, 5, 6

472

1, 3, 2, 4, 5, 6

$$3 > 2$$

1, 2, 3, 4, 5, 6, 7, 8, 9

$a[0] \quad a[1]$

```
for (int i=1; p<v; i++)
```

```

for (int i=1; i<=n; i++) {
    j = i-1
    while (j >= 0 && c[i] > c[j+1])
        {
            swap (c[i], c[j+1])
            j--
        }
}

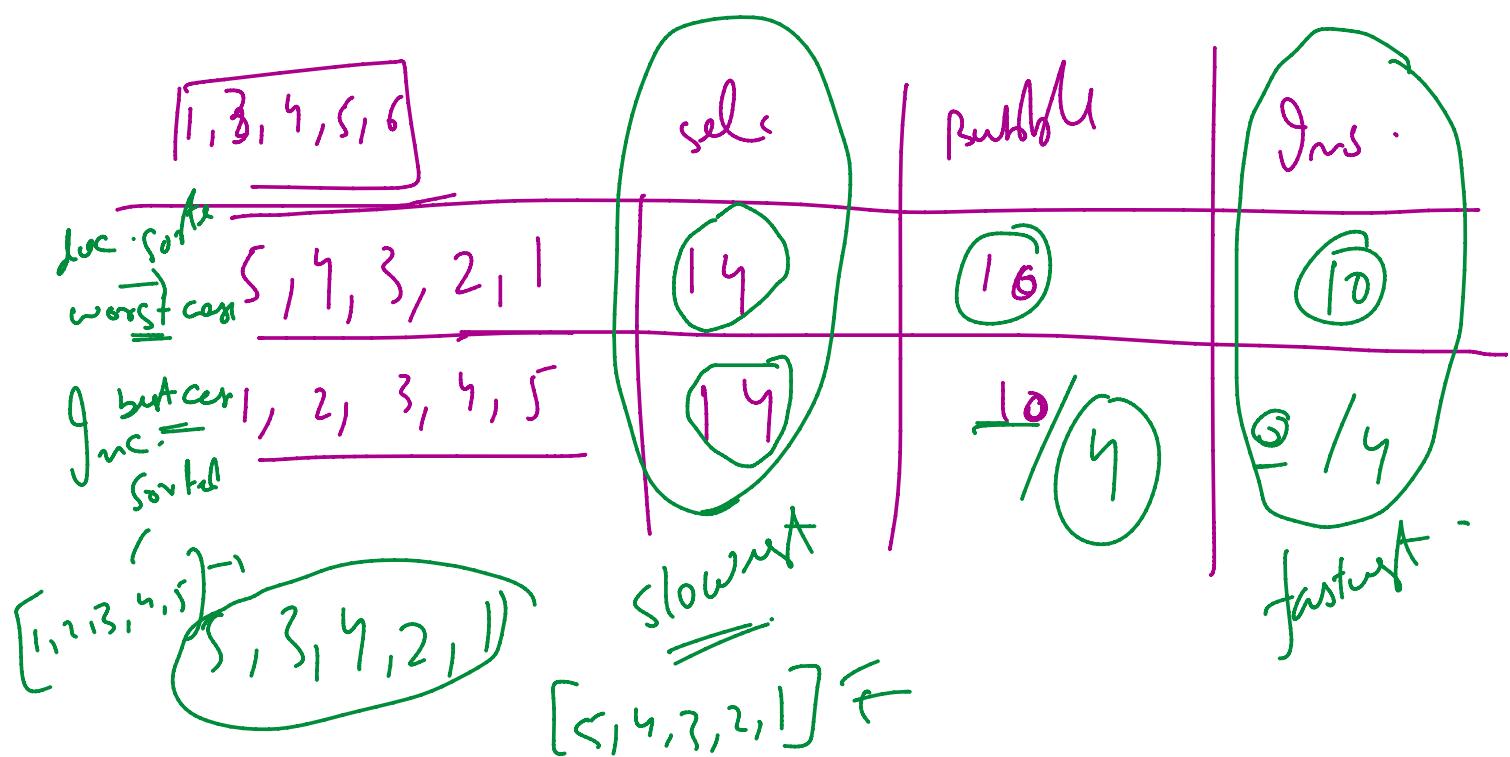
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$i = 3$ $i = 4$
 $1, 3, 4, 6, 2, 9.$
 6 $\boxed{\begin{array}{l} \text{key} = c[3] \\ \text{key} = 4 \end{array}}$
 if $\text{key} < c[i]$
 $c[i+1] = c[i]$
 $c[n] = c[3]$

$c[2] > 4$
 $c[3] = c[2]$
 $\textcircled{3} \leq \textcircled{4}$

$c[j+1] = \text{key}.$

$c[2] = \textcircled{4}$



$arr_1 = \{ 9, 1, 8, 2, 7, 3, 4, 5, 6, 10 \}$
 $arr_2 = \{ 1, 3, 5, 6, 7, 2, 4, 8, 9, 10 \}$

probably bubble sort will beat insertion sort in such type of array but with only margin of few computations
 Insertion will beat bubble sort with comparable diff.

If an array is almost sorted or position of each element is ' k '.

position of each element is 'k'
positions away from its sorted position
thus Insertion sort is the fastest
(even among quick, merge & heap sort)
range of k is $0 \leq k \leq 25 \text{ to } 30$
 $0 \leq k \leq (25, 30)$

