LAPORAN TUGAS
MATA KULIAH ALGORITMA DAN STRUKTUR DATA

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PERTEMUAN - 6 - Sorting
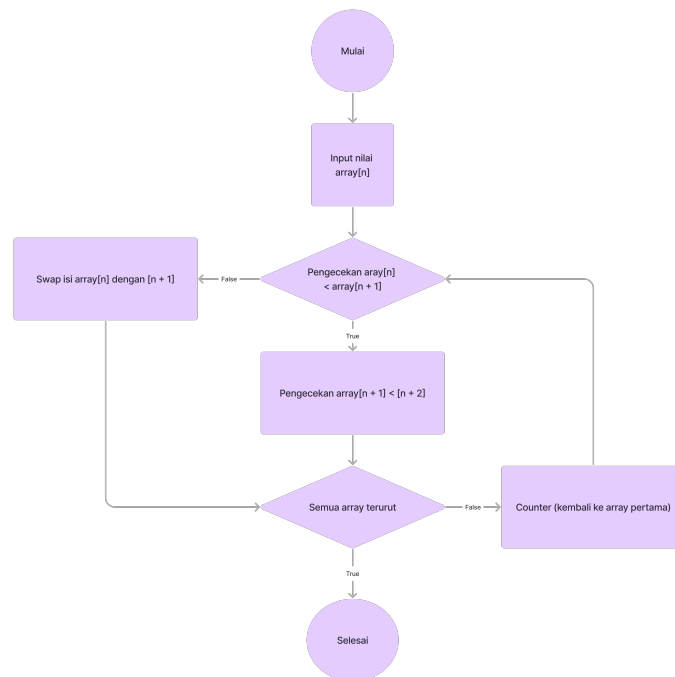
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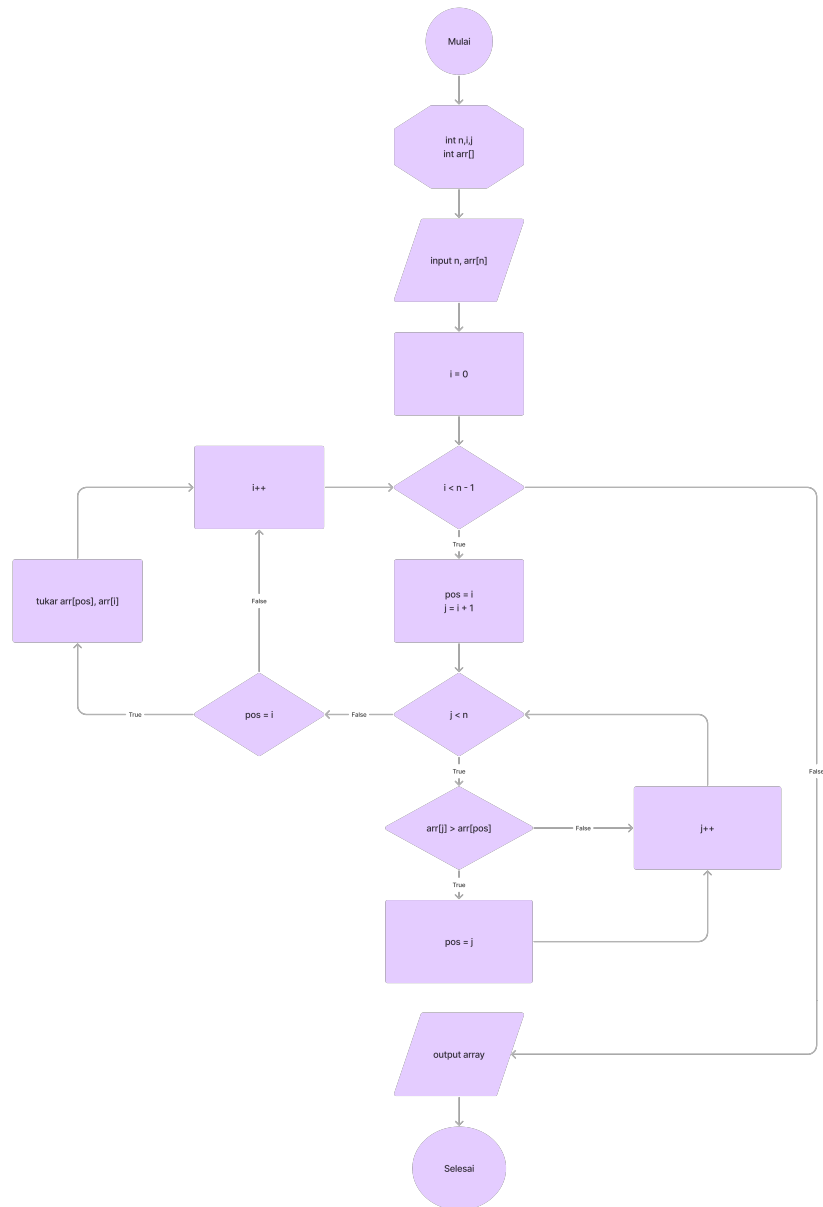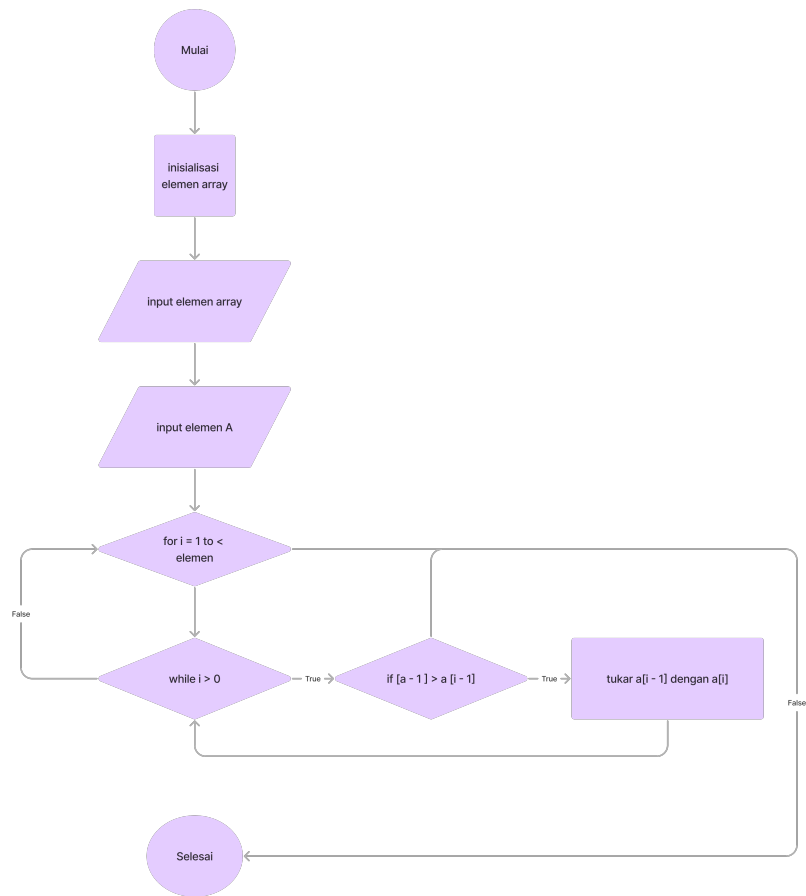# 2024

Latihan 1

1. Flowchart Visualisasi Bubble Sort

2. Flowchart Visualisasi Selection Sort

```
                              ┌─────────┐
                              │  Mulai  │
                              └─────────┘
                                   │
                              ┌─────────┐
                              │ int n,i,j│
                              │ int arr[]│
                              └─────────┘
                                   │
                              ┌─────────┐
                              │input n, arr[n]│
                              └─────────┘
                                   │
                              ┌─────────┐
                              │  i = 0  │
                              └─────────┘
                                   │
   ┌──────┐     ┌──────┐      ◇─────────◇
   │      │◄────│ i++  │◄─────│ i < n - 1│──────────────┐
   │      │     └──────┘      ◇─────────◇          False│
   │      │        │False          │True                │
┌────────────┐     │          ┌─────────┐               │
│tukar arr[pos],   │          │ pos = i │               │
│   arr[i]   │     │          │ j = i + 1│              │
└────────────┘     │          └─────────┘               │
      │True    ◇─────────◇  False  │                    │
      └────────│ pos = i │◄────────◇─────────◇          │
               ◇─────────◇         │  j < n  │◄─────┐   │
                              ◇─────────◇     │     │
                                   │True       │     │
                              ◇─────────◇  False┌──────┐│
                              │arr[j] > arr[pos]│──►│ j++ ││
                              ◇─────────◇      └──────┘│
                                   │True          │   │
                              ┌─────────┐          │   │
                              │ pos = j │──────────┘   │
                              └─────────┘              │
                                   ┌───────────────────┘
                              ┌─────────┐
                              │output array│
                              └─────────┘
                                   │
                              ┌─────────┐
                              │ Selesai │
                              └─────────┘
```

3. Flowchart Visualisasi Insertion Sort

```
                    ( Mulai )
                        |
              +-------------------+
              |   inisialisasi    |
              |   elemen array    |
              +-------------------+
                        |
              /   input elemen array   /
                        |
              /   input elemen A   /
                        |
              < for i = 1 to <     >
              <     elemen         >
   False                |
                  < while i > 0 >  -- True --> < if [a - 1 ] > a [i - 1] >  -- True -->  | tukar a[i - 1] dengan a[i] |
                                                                                                              False
                    ( Selesai )
```

Latihan 2

1. Bubble Sort [23,35,7,14,67]

Tahap 0   : 23 < 35   = swap [35,**23**,7,14,67]
               : 23 < 7   = no swap [35,**23**,7,14,67]
               : 7 < 14   = swap [35,23,14,**7**,67]
               : 7 < 67   = swap [35,23,14,67,**7**]

Tahap 1   : 35 < 23   = no swap [35,23,14,67,**7**]
               : 23 < 14   = no swap [35,23,14,67,**7**]
               : 14 < 67   = swap [35,23,67,**14**,7]

Tahap 2   : 35 < 23   = no swap [35,23,67,14,7]
               : 23 < 67   = swap [35,67,**23**,14,7]

Tahap 3   : 35 < 67   = swap [67,**35**,23,14,7]

2. Selection Sort [23,35,7,14,67]

Tahap 0   :

Index = 0; id = 0;
Max awal = 23

- 35 > 23 (Max = 35, id = 1)
- 7 > 35
- 14 > 35
- 67 > 35 (Max = 67, id = 4)

Swap index 0 dan id 4 [**67**,35,7,14,23]

Tahap 1   :

Index = 1; id = 1;
Max awal = 35

- 7 > 35
- 14 > 35
- 23 > 35
Swap index 1 dan id 1 [**67,35**,7,14,23]

Tahap 2   :
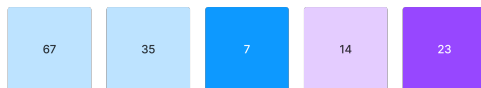
Index = 2; id = 2;
Max awal = 7;

- 14 > 7 (Max = 14, id = 3)
- 23 > 14 (Max = 23, id = 4)

Swap index 2 dan id 4 [**67,35,23,**14,7]

Tahap 3   :
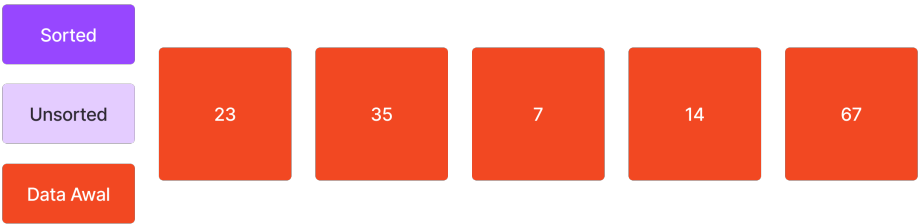

Index = 3; id = 3;
Max awal = 14

- 7 > 14 (Max = 14, id = 4)

Swap index 3 dan id 3 [**67,35,23,14**,7]
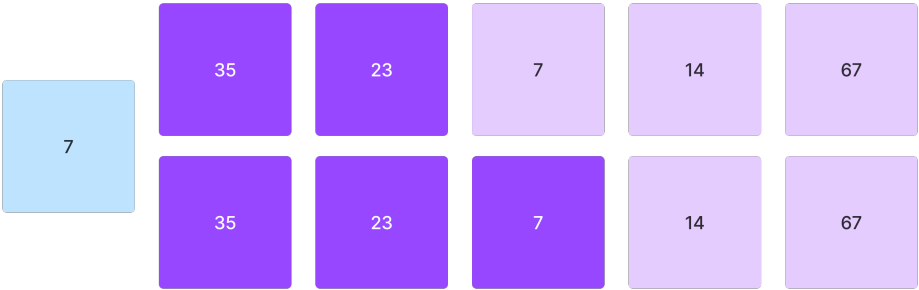
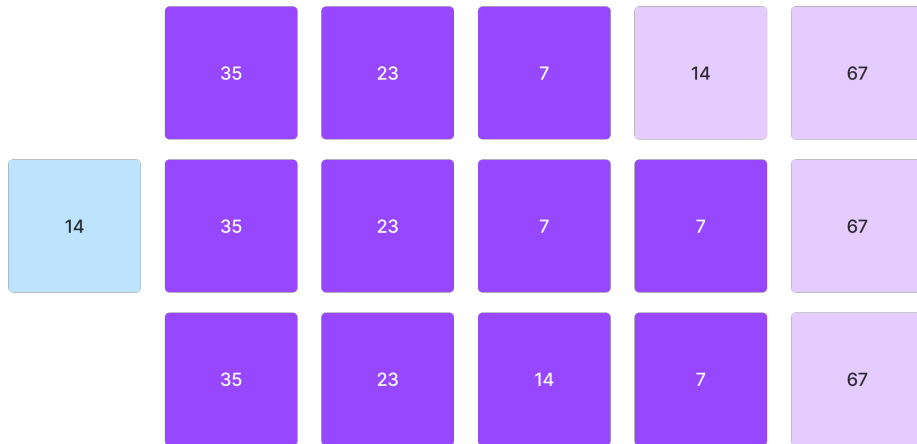**Hasil Akhir   :**

3. Insertion Sort

Sorted		23	35	7	14	67
Unsorted						
Data Awal						

Tahap 0   :

	23	35	7	14	67
35	35	35	7	14	67
	35	23	7	14	67

[23,35,7,14,67]
[35,35,7,14,67]
[**35,23,**7,14,67]

Tahap 1   :

	35	23	7	14	67
7	35	23	7	14	67

[35,23,7,14,67]
[**35,23,**7,14,67]

Tahap 2   :

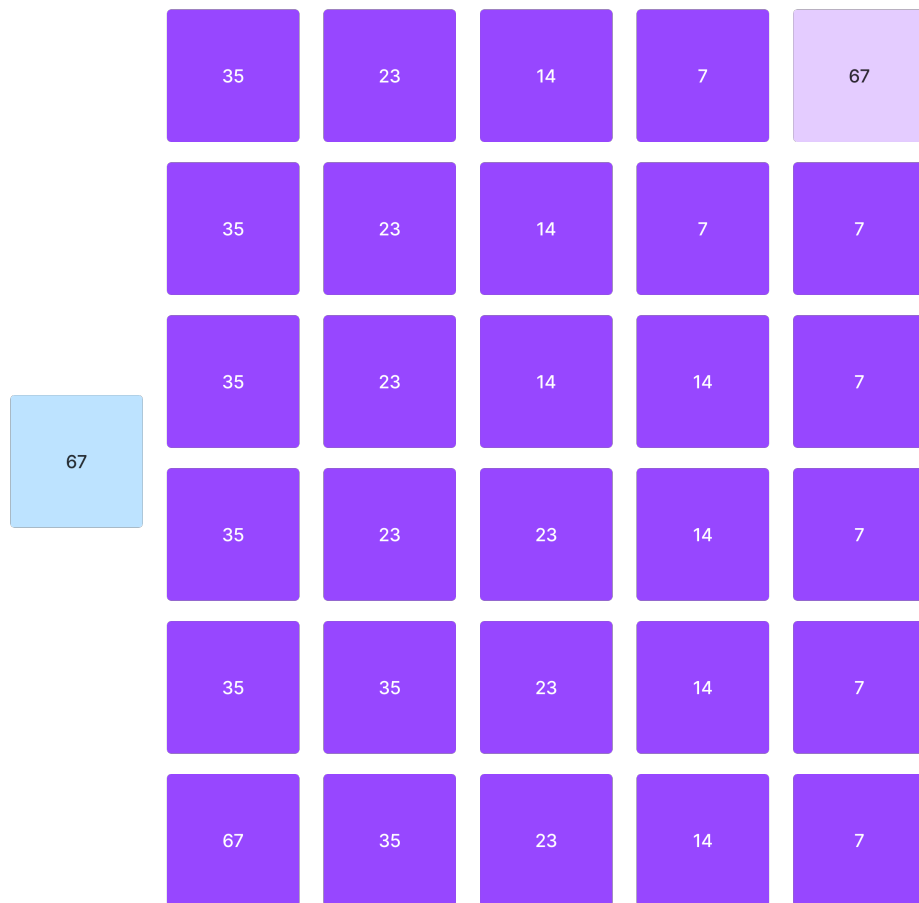|	35	23	7	14	67
14	35	23	7	7	67
	35	23	14	7	67

[35,23,7,14,67]
[35,23,7,7,67]
[**35,23,14**,7,67]

Tahap 3   :

[35,23,14,7,67]
[35,23,14,7,7]
[35,23.14.14.7]
[35,23,23,14,7]
[35,35,23,14,7]
[**67,35,23,14**,7]