Nama : Martin Caesar Partogi

NPM : 242310034

TI-24-PA 2

Link Git HUB : https://github.com/Martin-CaesarP/Desain_Analisis_Algoritma

Tugas descending memakai metode bubble sort, insertion sort, dan selection sort.

1.

Bubble sort

```cpp
#include <iostream>
using namespace std;

void bubsort(int arr[], int n) {
    int i, j, temp;
    for (i = 0; i < n - 1; i++) {
        for (j = 0; j < n - i - 1; j++) {

            if (arr[j] < arr[j + 1]) {
                temp = arr[j];
                arr[j] = arr[j + 1];
                arr[j + 1] = temp;
            }
        }
    }
}

int main() {
    int array[100], n, i;
    cout << "Masukkan banyak elemen = ";
    cin >> n;
    cout << "Masukkan nilai = \n";
    for (i = 0; i < n; i++) {
        cin >> array[i];
    }
    bubsort(array, n);
    cout << "Hasil pengurutan dengan algoritma bubble sort (descending) = \n";
    for (i = 0; i < n; i++) {
        cout << array[i] << " ";
    }
    cout << "\n";
    return 0;
}
```

```
C:\Lab. Analisis Algoritma dar
Masukkan banyak elemen = 4
Masukkan nilai =
2
4
3
1
Hasil pengurutan dengan algoritma bubble sort (descending) =
4 3 2 1

--------------------------------
Process exited after 14.86 seconds with return value 0
Press any key to continue . . .
```

Insertion sort

```cpp
#include <iostream>
using namespace std;

int main() {
    int y;
    cout << "Memasukkan banyak array: ";
    cin >> y;
    int x[y];

    for (int i = 0; i < y; i++) {
        cout << "Masukkan angka ke-" << i << " : ";
        cin >> x[i];
        cout << endl;
    }

    for (int i = 1; i < y; i++) {
        int key = x[i];
        int j = i - 1;

        while (j >= 0 && x[j] < key) {
            x[j + 1] = x[j];
            j--;
        }

        x[j + 1] = key;

        cout << "Proses sorting: ";
        for (int m = 0; m < y; m++) {
            cout << x[m] << " ";
        }
        cout << endl;
    }

    cout << "Hasil akhir: ";
    for (int m = 0; m < y; m++) {
        cout << x[m] << " ";
    }

    return 0;
}
```

```
C:\Lab. Analisis Algoritma dar
Memasukkan banyak array: 4
Masukkan angka ke-0 : 8

Masukkan angka ke-1 : 5

Masukkan angka ke-2 : 7

Masukkan angka ke-3 : 4

Proses sorting: 8 5 7 4
Proses sorting: 8 7 5 4
Proses sorting: 8 7 5 4
Hasil akhir: 8 7 5 4
--------------------------------
Process exited after 37.48 seconds with return value 0
Press any key to continue . . .
```

Selection sort

```cpp
#include <iostream>
using namespace std;

void selectionSort(int arr[], int n) {
    int i, j, maxIndex, temp;

    for (i = 0; i < n - 1; i++) {
        maxIndex = i;
        for (j = i + 1; j < n; j++) {
            if (arr[j] > arr[maxIndex]) {
                maxIndex = j;
            }
        }
        temp = arr[maxIndex];
        arr[maxIndex] = arr[i];
        arr[i] = temp;
        cout << "Iterasi ke - " << i + 1 << " : ";
        for (int k = 0; k < n; k++) {
            cout << arr[k] << " ";
        }
        cout << endl;
    }
}

int main() {
    int n, i;
    cout << "Masukkan jumlah elemen: ";
    cin >> n;

    int arr[n];

    cout << "Masukkan nilai elemen: ";
    for (i = 0; i < n; i++) {
        cin >> arr[i];
    }

    cout << "Data sebelum sorting: ";
    for (i = 0; i < n; i++) {
        cout << arr[i] << " ";
    }

    cout << endl;
    selectionSort(arr, n);

    cout << "Data setelah sorting (descending): ";
    for (i = 0; i < n; i++) {
        cout << arr[i] << " ";
    }

    return 0;
}
```

```
C:\Lab. Analisis Algoritma dar
Masukkan jumlah elemen: 4
Masukkan nilai elemen: 5
2
4
1
Data sebelum sorting: 5 2 4 1
Iterasi ke - 1 : 5 2 4 1
Iterasi ke - 2 : 5 4 2 1
Iterasi ke - 3 : 5 4 2 1
Data setelah sorting (descending): 5 4 2 1
--------------------------------
Process exited after 9.62 seconds with return value 0
Press any key to continue . . .
```

2.

Memakai metode Bubble sort

```cpp
#include <iostream>
#include <string>

using namespace std;

void bubbleSort(string arr[], int n) {
    for (int i = 0; i < n - 1; i++) {
        for (int j = 0; j < n - i - 1; j++) {
            if (arr[j] > arr[j + 1]) {
                string temp = arr[j];
                arr[j] = arr[j + 1];
                arr[j + 1] = temp;
            }
        }
    }
}

int main() {
    int jumlahBuku;
    cout << "Masukkan jumlah buku: ";
    cin >> jumlahBuku;
    cin.ignore();

    string judulBuku[jumlahBuku];

    cout << "Masukkan judul buku:" << endl;
    for (int i = 0; i < jumlahBuku; i++) {
        getline(cin, judulBuku[i]);
    }

    bubbleSort(judulBuku, jumlahBuku);

    cout << "\nJudul buku setelah diurutkan (ascending):" << endl;
    for (int i = 0; i < jumlahBuku; i++) {
        cout << judulBuku[i] << endl;
    }

    return 0;
}
```

```
C:\Lab. Analisis Algoritma dar
Masukkan jumlah buku: 4
Masukkan judul buku:
Sejarah
Menguasai C++ dalam 30 menit
#1 menjadi Leader
Cara Memahami Wanita

Judul buku setelah diurutkan (ascending):
#1 menjadi Leader
Cara Memahami Wanita
Menguasai C++ dalam 30 menit
Sejarah

--------------------------------
Process exited after 133.9 seconds with return value 0
Press any key to continue . . .
```