Praktikum 10

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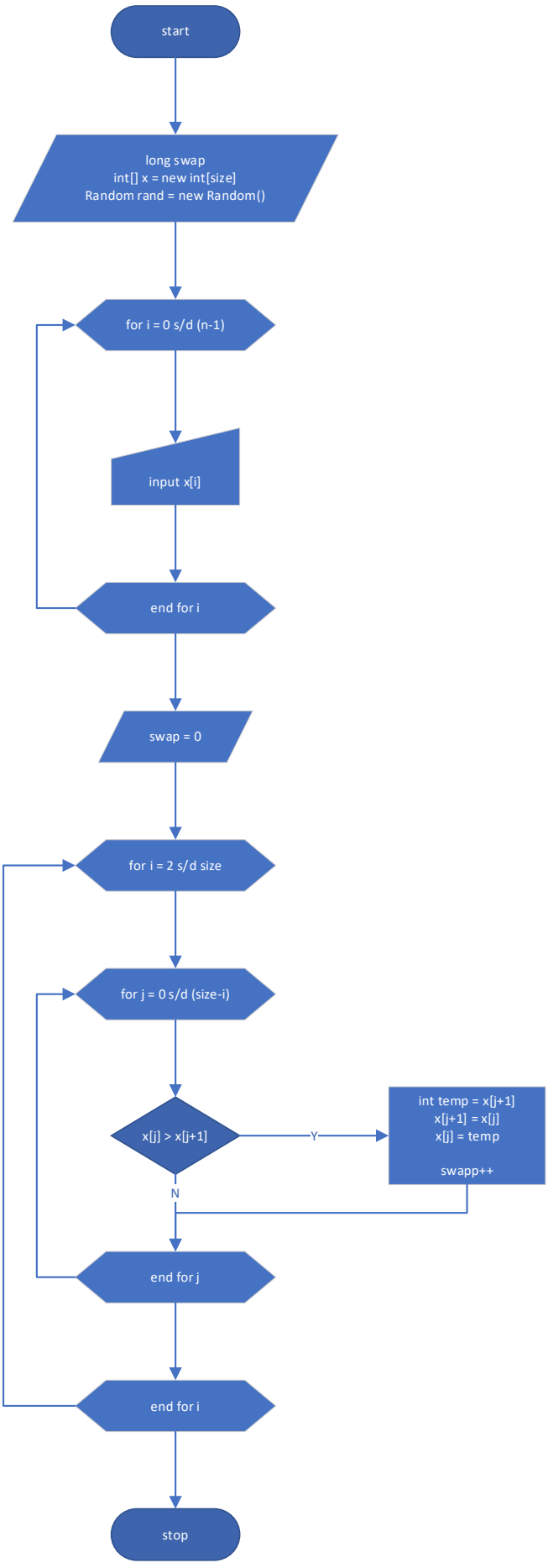
152011513020/D3-Sistem Informasi

LATIHAN BUBBLE SORT

Soal 1

Tuliskanlah algoritma bubble sort dengan menggunakan flow chart


start
long swap
int[] x = new int[size]
Random rand = new Random()
for i = 0 s/d (n-1)
input x[i]
end for i
swap = 0
for i = 2 s/d size
for j = 0 s/d (size-i)
x[j] > x[j+1]
Y
int temp = x[j+1]
x[j+1] = x[j]
x[j] = temp
swapp++
N
end for j
end for i
stop

Soal 2

Tuliskanlah algoritma bubble sort dengan menggunakan pseudo code

0. start
1. long swap
1. int[] x = new int[size]
2. Random rand = new Random()
3. for i = 0 s/d (n-1)
4. input x[i]
5. end for i
6. swap = 0
7. for i = 2 s/d size
8. for j = 0 s/d (size-1)
9. if (x[j] > x[j+1]), jika no => ke 10
10. int temp = x[j+1]
11. x[j+1] = x[j]
12. x[j] = temp
13. swap++
14. end for j
15. end for i
16. stop

Soal 3

Implementasikan algoritma bubble sort dalam bentuk function di dalam class array

```
package tugas10_152011513020;


import java.util.Random;


public class Tugas10_152011513020 {


//    public static long bubbleSort(int size){
//        long swap;
//        int[] x     = new int[size];
//        Random rand = new Random();
//
//        //Memasukan Angka Random
//        for (int i=0; i<size; i++){
//            x[i]    = rand.nextInt(10000000);
//        }
```

```
//
//      //Sorting
//      swap = 0;
//      for (int i=2; i<size; i++){
//          for (int j=0; j<size-i; j++){
//              if(x[j] > x[j+1]){
//                  int temp    = x[j+1];
//                  x[j+1]      = x[j];
//                  x[j]        = temp;
//
//                  swap++;
//              }
//          }
//      }
//      return swap;
//  }

   public static void main(String[] args) {
//      Tugas10_152011513020 a;
//
//      a   = new Tugas10_152011513020();
//
//      a.bubbleSort(1000);
//
//      System.out.println(a.bubbleSort(1000));

      //Class
      Bubble arr;

      arr = new Bubble(10);
```

```
        arr.random(20);
        arr.bubbleSort();
        arr.print();
    }
}

package tugas10_152011513020;

import java.util.Random;

public class Bubble {
    private int max;
    private int size;
    private int []data;

    public Bubble(int maxSize){
        this.data   = new int [maxSize];
        this.max    = maxSize;
        this.size   = 0;
    }

    public void random(int n){
        Random r    = new Random();
        for(int i=0; i<this.max; i++){
            this.data[i]    = r.nextInt(n);
        }
    }

    public void tukar(int i, int j){
        int z   = data[i];
        data[i] = data[j];
```

```
        data[j] = z;
        System.out.println("Yang ditukar = " + data[i] + " dan " + data[j]);
    }

    public void bubbleSort(){
        int x[]     = this.data;
        int n       = this.max;
        long total  = 0;
        for(int i=1; i<n; i++){
            for(int j=0; j<(n-i); j++){
                if(x[j] > x[j+1]){
                    tukar(j,j+1);
                    total++;
                }
            }
        }
        System.out.println("Total swap  = " + total);
    }

    public void print(){
        for (int i=0; i<this.max; i++){
            System.out.print(this.data[i] + " ");
        }
    }
}
```

SOAL 4

Buatlah 3 set data random bulat positip kurang dari 10.000.000 masing2 sebanyak 1.000, 100.000 dan 1.000.000. Selanjutnya simpan data tersebut ke dalam array

SOAL 5

Lakukanlah sorting pada ketiga set data tersebut dengan menggunakan buuble sort, selanjutnya hitunglah berapa kali dilakukan data swaping (menukar data) dan waktu yang diperlukan untuk sorting setiap set data.

SOAL 6

Ulangilah [soal 5] dan [soal 6] sebanyak empat kali dan tuliskan hasilnya dalam bentuk tabel

	PERCOBAAN 1		PERCOBAAN 2		PERCOBAAN 3		PERCOBAAN 4	
Data Set	swap	waktu	swap	waktu	swap	waktu	swap	waktu
1.000	243522	0 s	11015	0 s	7466	0 s	12828	0 s
100.000	3171728	9 s	1528071	9 s	2532008	9 s	2452136	12 s
1.000.000	56733226	20 m 4 s	26574921	18 m 21 s	26904312	18 m 34 s	21043132	15 m 31 s

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-----Main-----

```
package tugas10_152011513020;

import java.util.Random;

public class Tugas10_152011513020 {

//    public static long bubbleSort(int size){
//        long swap;
//        int[] x     = new int[size];
//        Random rand = new Random();
//
//        //Memasukan Angka Random
//        for (int i=0; i<size; i++){
//            x[i]    = rand.nextInt(10000000);
//        }
//
//        //Sorting
//        swap = 0;
//        for (int i=2; i<size; i++){
//            for (int j=0; j<size-i; j++){
//                if(x[j] > x[j+1]){
//                    int temp    = x[j+1];
//                    x[j+1]      = x[j];
//                    x[j]        = temp;
//
//                    swap++;
//                }
//            }
//        }
//        return swap;
//    }

    public static void main(String[] args) {
//        Tugas10_152011513020 a;
//
//        a   = new Tugas10_152011513020();
//
//        a.bubbleSort(1000);
//
//        System.out.println(a.bubbleSort(1000));

        //Class
        Bubble arr;

        arr = new Bubble(10);

        arr.random(20);
        arr.bubbleSort();
        arr.print();
    }
```

```
}

-----Class-----
package tugas10_152011513020;

import java.util.Random;

public class Bubble {
    private int max;
    private int size;
    private int []data;

    public Bubble(int maxSize){
        this.data   = new int [maxSize];
        this.max    = maxSize;
        this.size   = 0;
    }

    public void random(int n){
        Random r    = new Random();
        for(int i=0; i<this.max; i++){
            this.data[i]    = r.nextInt(n);
        }
    }

    public void tukar(int i, int j){
        int z   = data[i];
        data[i] = data[j];
        data[j] = z;
        System.out.println("Yang ditukar = " + data[i] + " dan " + data[j]);
    }

     public void bubbleSort(){
        int x[]     = this.data;
        int n       = this.max;
        long total  = 0;
        for(int i=1; i<n; i++){
            for(int j=0; j<(n-i); j++){
                if(x[j] > x[j+1]){
                    tukar(j,j+1);
                    total++;
                }
            }
        }
        System.out.println("Total swap  = " + total);
    }

    public void print(){
        for (int i=0; i<this.max; i++){
            System.out.print(this.data[i] + " ");
        }
    }
}
```