TUGAS 4

ALGORITMA STRUKTUR DATA

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PROGRAM STUDI D4 TEKNIK INFORMATIKA

JURUSAN TEKNOLOGI INFORMASI

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2020

Quiz Nomor 1

```java
 * @author Daffa Cahyo
 */

public class QuizNomor1 {

    /**
     * @param args the command line arguments
     */
    String nama;

    static void menghitungChar(String nama) {
        char[] huruf = new char[nama.length()];                 // O(1)
        int[] jumlahHuruf = new int[nama.length()];             // O(1)
        int jumlahHurufBerbeda = 1;                             // O(1)
        huruf[0] = nama.charAt(0);                              // O(1)
        jumlahHuruf[0] = 1;                                     // O(1)

        for (int i = 1; i < nama.length(); i++) {               // O(n)
            boolean sudahMuncul = false;
            for (int j = 0; j < jumlahHurufBerbeda; j++) {      // O(n)
                if (nama.charAt(i) == huruf[j]) {
                    sudahMuncul = true;                         // O(1)
                    jumlahHuruf[j] += 1;                        // O(1)
                }
            }
            if (!sudahMuncul) {
                huruf[jumlahHurufBerbeda] = nama.charAt(i);     // O(1)
                jumlahHuruf[jumlahHurufBerbeda] = 1;            // O(1)
                jumlahHurufBerbeda++;                           // O(1)
            }
        }
        System.out.println("\nHasil :");
        for (int i = 0; i < jumlahHurufBerbeda; i++) {          // O(n)
            System.out.println("Huruf " + huruf[i] + " : " + jumlahHuruf[i] + " abjad");
        }
    }
}
```

Main class.

```java
package quiz1;

/**
 *
 * @author Daffa Cahyo
 */
import java.util.Scanner;
public class QuizNomor2Main {

    public static void main(String[] args) {
        Scanner daffa = new Scanner(System.in);                          // O(1)
        QuizNomor1 main1 = new QuizNomor1();                             // O(1)
        QuizNomor2 main2 = new QuizNomor2();                             // O(1)

        System.out.print("Masukan nama : ");                             // O(1)
        main1.nama = daffa.nextLine();                                   // O(1)

        main1.menghitungChar(main1.nama);                                // O(1)
        main2.perbandinganBF(main1.nama);                                // O(1)
        main2.perbandinganDC(main1.nama, 0, main1.nama.length() - 1);    // O(1)

        System.out.println("**********");                                // O(1)
        System.out.println("Brute Force");                               // O(1)
        System.out.println("Abjad terkecil : " + main2.small);           // O(1)
        System.out.println("Abjad terbesar : " + main2.big);             // O(1)

        System.out.println("**********");                                // O(1)
        System.out.println("Divide and Conquer");                        // O(1)
        System.out.println("Abjad terkecil : " + main2.getSmall());      // O(1)
        System.out.println("Abjad terbesar : " + main2.getBig());        // O(1)
    }
}
```

Total Operasi:

1 + 1 + 1 + 1 + 1(15 * 12) + 1 + 1 + 1 + 1 + 1 + (15 * 1) = 5 + 180 +5 +15 =205

Notasi Big O(n)

Quiz Nomor 2

```java
 * @author Daffa Cahyo
 */

public class QuizNomor2 {

    char big, small, big1, small1;

    public void perbandinganBF(String nama) {
        big = nama.charAt(0);                                   // O(1)
        small = nama.charAt(0);                                 // O(1)

        for (int i = 0; i < nama.length(); i++) {               // O(n)
            if (nama.charAt(i) != ' ') {
                if (nama.charAt(i) < small) {
                    small = nama.charAt(i);                     // O(1)
                } else if (nama.charAt(i) > big) {
                    big = nama.charAt(i);                       // O(1)
                }
            }
        }

    }

    public void perbandinganDC(String nama, int indeks_awal, int indeks_akhir) {
        int tengah;
        char big2, small2;

        if (indeks_awal == indeks_akhir) {
            big1 = nama.charAt(indeks_awal);                    // O(1)
            small1 = nama.charAt(indeks_akhir);                 // O(1)
        } else {
            tengah = (indeks_awal + indeks_akhir) / 2;          // O(1)
            perbandinganDC(nama, indeks_awal, tengah);
            big2 = big1;                                        // O(1)
            small2 = small1;                                    // O(1)
            perbandinganDC(nama, tengah + 1, indeks_akhir);
            if (big2 != ' ' && small2 != ' ') {
                if (big1 < big2) {
                    big1 = big2;                                // O(1)
                } else if (small1 > small2) {                   //
                    small1 = small2;                            // O(1)
                }
            }
        }
    }

    public char getBig() {
        return big1;                                            // O(1)
    }

    public char getSmall() {
        return small1;                                          // O(1)
    }
}
```

Total Operasi:

$1 + 1 + (15 * 1) + 1 + 1 + 1\ (2^{4} * 1\ ^{*}\ 1) + 1 + 1 + 1 + 1 = 40$

Notasi Big O(n)