Penyusunan Rencana Kuliah dengan Topological Sort (Penerapan Decrease and Conquer)

Laporan Tugas Kecil II
Mata kuliah IF2211 Strategi Algoritma

Disusun Oleh :

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ALGORTIMA TOPO-SORT

Merekursif List yang berisi Object Graph dengan dan men pop indeks 0 dari list;

Memasukkan ke himpunan solusi mereka yang tidak memiliki prerequisite

Memasukkan ke himpunan solusi mereka yang memliki prerequisite yang sudah di dalam himpunan solusi

Jika tidak dimasukkan kedalam himpunan solusi maka isi list pada saat itu akan dimasukkan ke dalam List Graph ke posisi paling akhir

Menoutput (log) himpunan list solusi (satu mata kuliah per semester) jika List sudah kosong (semua Mata kuliah sudah masuk kedalam himpunan solusi)

https://github.com/mizuday/Tucil2_13519075

KODE PROGRAM

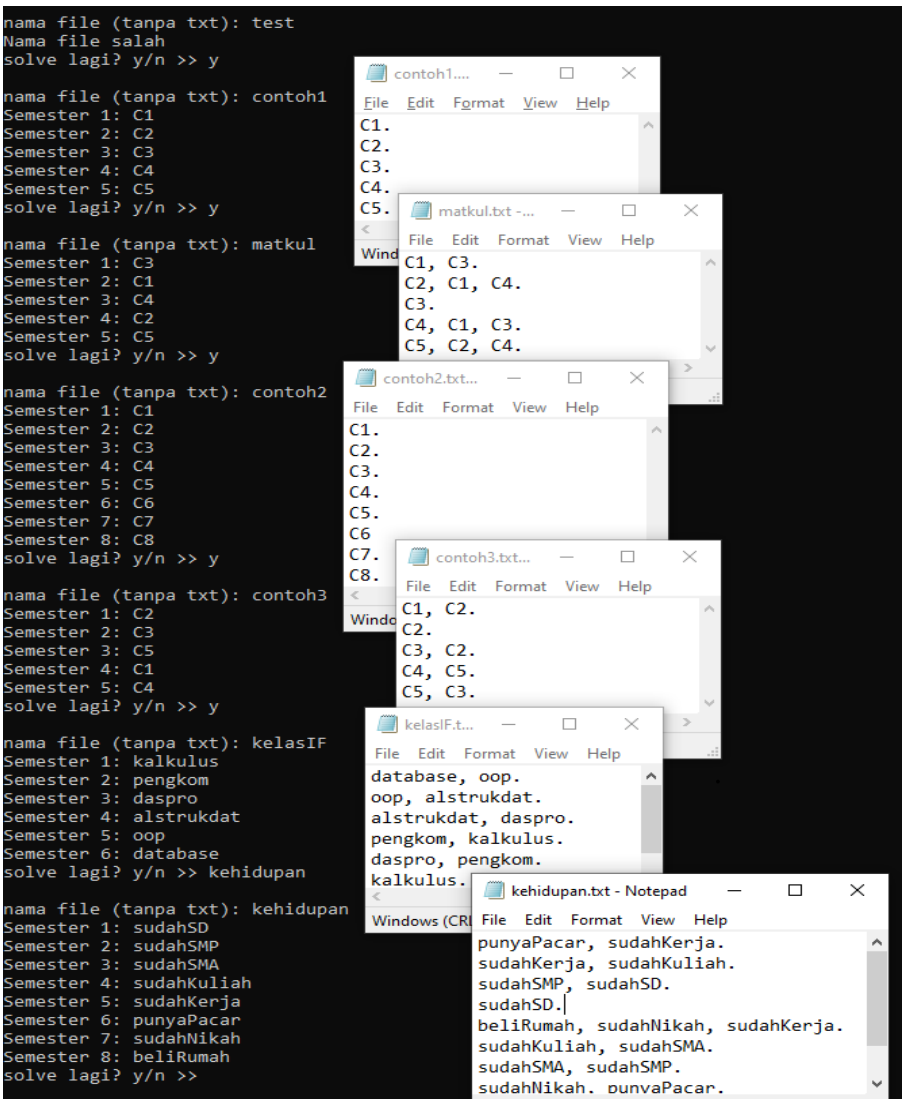
```
class Main {
    public static void main(String[] args) {
        while (true) {
            System.out.println();
            Scanner sc= new Scanner(System.in);
            System.out.print("nama file (tanpa txt): ");
            String namafile = sc.nextLine();

            List<Graph<String>> graph = Graph.fileToGraph("../test/" + namafile + ".txt");

            List<String> solusi = new ArrayList<>();
            Graph.solver(graph, solusi);
            System.out.print("solve lagi? y/n >> ");
            String in = sc.nextLine().toLowerCase();
            if (in.equals("n")|| in.equals("no")){
                break;
            }
        }
    }
}

class Graph<T> {
    private T prec;
    private T succ;

    public Graph(T preccc, T succc){
        prec = preccc;
        succ = succc;
```

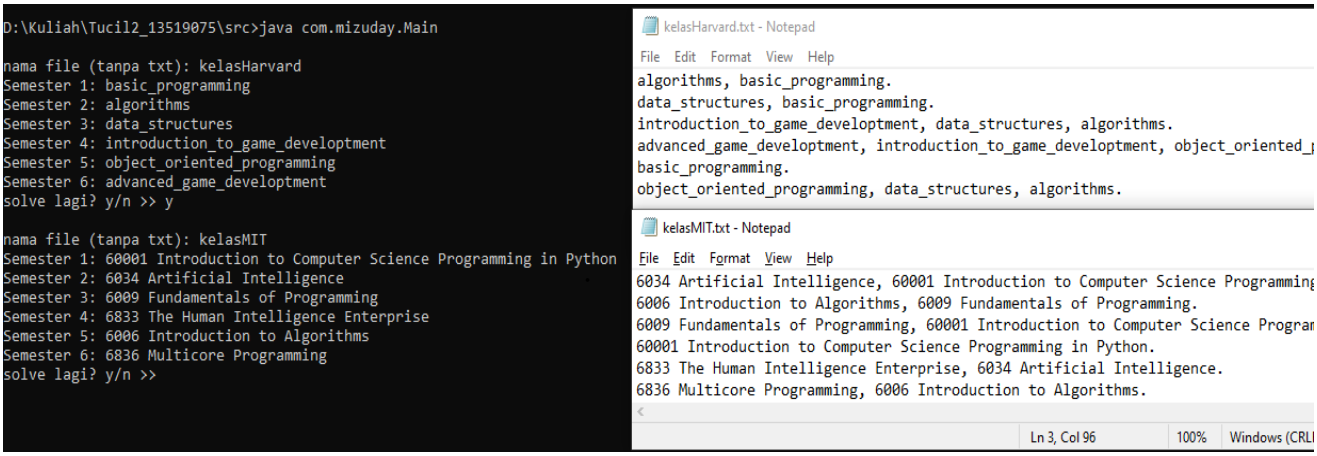
```
    }

    public T getPrec(){
        return prec;
    }

    public T getSucc(){
        return succ;
    }

    public void cetakIsi(){
        System.out.println("{" + prec + ", "+ succ + "}");
    }

    public static boolean punyaPrec(List<Graph<String>> lg, Graph<String> g){
        int i = 0;
        while (i < lg.size()) {
            if (lg.get(i).getSucc().equals(g.getPrec()))
                return true;
            else
                i += 1;
        }
        return false;
    }

    public static boolean dalamList(List<Graph<String>> lg, String str){
        for (Graph<String> stringGraph : lg) {
            if (stringGraph.getSucc().equals(str) || stringGraph.getPrec().equals(str))
                return true;
        }
        return false;
    }

    public static void solver(List<Graph<String>> graph, List<String> solusi){
        if (!graph.isEmpty()) {
           try {
                if (punyaPrec(graph, graph.get(0))) {
                    graph.add(graph.get(0));
                }
                else {
                    if (!solusi.contains(graph.get(0).getPrec()))
                        solusi.add(graph.get(0).getPrec());

                    if (!dalamList(graph, graph.get(0).getSucc())) {
                        solusi.add(graph.get(0).getSucc());
```

```
                }
            }
            graph.remove(0);
            solver(graph, solusi);
        } catch (NullPointerException e) {
            System.out.println("NullPointerException Caught");
        }

    }
    else {
        int counter = 0;
        for (String string : solusi){
            System.out.println("Semester "+ (counter+1) + ": " +string);
            counter++;
        }
    }
}

public static List<Graph<String>> fileToGraph(String namafile){
    List<Graph<String>> graph = new ArrayList<>();
    List<String[]> data = new ArrayList<>();
    try {
        BufferedReader reader = new BufferedReader(new FileReader(namafile));
        String line = reader.readLine();
        while (line != null) {
            line = line.replace(".", "");
            String[] temp = line.split(", ");
            data.add(temp);
            line = reader.readLine();
        }
        reader.close();

        boolean akhir;
        for (int i = 0; i < data.size(); i++) {
            akhir = true;
            for (int j = 0; j < data.size(); j++) {
                if (j == i) {
                }
                else {
                    for (int k = 0; k < data.get(j).length; k++) {
                        if (data.get(i)[0].equals(data.get(j)[k])) {
                            graph.add(new Graph<>(data.get(i)[0], data.get(j)[0]));
                            akhir = false;
                        }
                    }
```

```
                    }
                }
                if (akhir)
                    graph.add(new Graph<>(data.get(i)[0], ""));
            }

        } catch (IOException e) {
            System.out.println("Nama file salah");
        }

        return graph;
    }
}
```

SKRINSHUT OUTPUT PROGRAM





Poin	Ya	Tidak
1. Program berhasil dikompilasi	✓	
2. Program berhasil *running*	✓	
3. Program dapat menerima berkas input dan menuliskan output.	✓	
4. Luaran sudah benar untuk semua kasus input.	✓	