Form Isian Tugas-2 *Membuat DSL*

Nama Kelompok   :   **A-Lay Generation**
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                                          2. Fathan Adi Pranaya - 13511027
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Domain "problem" yang dipilih   :   Android Layout
Domain "solusi" yang dipilih   :   Desktop Programming, IT
Deksripsi platform, tools   :   Android, JAVA
Sumber inspirasi   :   Pembuatan layout XML aplikasi Android secara manual
                                          dianggap kurang efisien karena harus menuliskan beberapa
                                          kode yang sama berkali-kali
Source code   :   Lihat Lampiran
Input/output   :   Lihat Lampiran

Lampiran Source Code :

File : Attribute.java

```java
package alay;
public class Attribute {
        private String key;
        private String value;
        public Attribute(String key, String value) {
                super();
                this.key = key;
                this.value = value;
        }
        public String getKey() {
                return key;
        }
        public void setKey(String key) {
                this.key = key;
        }
        public String getValue() {
                return value;
        }
        public void setValue(String value) {
                this.value = value;
        }
}
```

File : LayoutTree.java

```java
package alay;
import java.util.ArrayList;
public class LayoutTree {
        private ArrayList <LayoutTree> children = new ArrayList<LayoutTree>();
        private String type;
        private ArrayList <Attribute> attributes =  new ArrayList<Attribute>();
        public LayoutTree(String line) {
                if (line.contains(" -> ")) {
                        String[] splitter = line.split(" -> ");
                        this.type = splitter[0];
                        String[] splitter2 = splitter[1].split(", ");
                        for (String temp : splitter2) {
                                String[] splitter3 = temp.split(":");
                                Attribute att1 = new Attribute(splitter3[0], splitter3[1]);
                                this.attributes.add(att1);
                        }
                } else {
                        this.type = line;
                }
        }
```

```java
        public ArrayList<LayoutTree> getChildren() {
                return children;
        }
        public String toString() {
                String temp = "";
                temp += "<" +this.type+" xmlns:android=\"http://schemas.android.com/apk/res/android\"";
                for (Attribute att : this.attributes) {
                        temp += "\n" + ((char) 9) + "android:" + att.getKey() + "=\"" + att.getValue() +
"\"";
                }
                temp += ">\n";

                for (LayoutTree tree: this.children) {
                        temp += iterateXML(tree);
                }

                temp += "</" + this.type + ">\n";
                return temp;
        }
        public String iterateXML(LayoutTree parent) {
                String temp = "";
                temp += "<" +parent.type+" ";
                for (Attribute att : parent.attributes) {
                        temp += "\n" + ((char) 9) + "android:" + att.getKey() + "=\"" + att.getValue() +
"\"";
                }
                temp += ">\n";
                for (LayoutTree tree: parent.children) {
                        temp += iterateXML(tree);
                }

                temp += "</" + parent.type + ">\n";
                return temp;
        }
        public void setChildren(ArrayList<LayoutTree> children) {
                this.children = children;
        }
        public void addChildren(LayoutTree child) {
                this.children.add(child);
        }
        public String getType() {
                return type;
        }
        public void setType(String type) {
                this.type = type;
        }
        public ArrayList<Attribute> getAttributes() {
                return attributes;
        }
        public void setAttributes(ArrayList<Attribute> attributes) {
                this.attributes = attributes;
        }
}
```

File : Main.java

```java
package alay;
import java.io.BufferedWriter;
import java.io.File;
import java.io.FileReader;
import java.io.FileWriter;
import java.io.IOException;
import java.util.Scanner;
public class Main {
        private LayoutTree layoutTree;
        private String line;
        public Main() throws IOException {
                readFile("input.txt");
        }

        public void generateXML() throws IOException {
                String content = "";
                content += "<?xml version=\"1.0\" encoding=\"utf-8\"?>\n";
                content += layoutTree.toString();
                File file = new File("actvity_main.xml");
```

```java
                    // if file doesnt exists, then create it
                    if (!file.exists()) {
                            file.createNewFile();
                    }
                    FileWriter fw = new FileWriter(file.getAbsoluteFile());
                    BufferedWriter bw = new BufferedWriter(fw);
                    bw.write(content);
                    bw.close();
                    System.out.println("Output file layout android : activity_main.xml");
            }
        private int getLevel(String line) {
                    int ctr = 0;
                    for (char ch: line.toCharArray()) {
        // ASCII TAB CHAR = 9
                            if ((int) ch == 9) {
                                    ctr++;
                            }
            }
                    return ctr;
            }
        public void parse(int ctr, LayoutTree parent, Scanner sc) {
        while (getLevel(line) == ctr) {
                    LayoutTree newChild = new LayoutTree(line.trim());
                    parent.addChildren(newChild);
                    if (sc.hasNextLine()) {
                            line = sc.nextLine();
                            parse(ctr+1, newChild, sc);
                    } else {
                            break;
                    }
            }
            }
        public void readFile(String filename) throws IOException {
                    Scanner sc = new Scanner(new FileReader(filename));
                    int ctr = 1;
        line = sc.nextLine();
        layoutTree = new LayoutTree(line);
        line = sc.nextLine();
        parse(ctr, layoutTree, sc);
        generateXML();
        sc.close();
            }
        public static void main(String[] args) throws IOException {
                    Main m = new Main();
            }
}
```

Lampiran input/output :

Grammar DSL :

S - L | L Atts | L A | L Atts A | V | V Atts
SS - S | S SS
A - ENTER C
C - Tabs SS
Tabs - TAB | TAB Tabs
Atts - Att | Att KOMA Atts
Att - PANAH KEY TD VAL
PANAH - ->
TD - :
KOMA - ,
TAB - \w
ENTER - \n
L - FrameLayout | AbsoluteLayout | TableLayout | RelativeLayout | LinearLayout | GridLayout
V – ListView | GridView | TextView | …

Input

```
RelativeLayout -> layout_width:fill_parent, layout_height:fill_parent, background:#2ecc71, gravity:center
         ScrollView -> layout_width:match_parent, layout_height:match_parent
                   LinearLayout -> layout_width:match_parent, layout_height:match_parent, orientation:vertical
                           TextView -> layout_width:wrap_content, layout_height:wrap_content, layout_gravity:center_horizontal,
layout_marginTop:10dp, text:A-LAY GENERATION, textColor:#fff, textSize:20dp, textStyle:bold
                           LinearLayout -> layout_width:wrap_content, layout_height:wrap_content, layout_marginLeft:30dp,
layout_marginTop:20dp, orientation:horizontal
                                   ImageButton -> id:@+id/Button01, layout_width:wrap_content, layout_height:wrap_content,
minHeight:50dp, onClick:onMyButtonClick, src:@drawable/ridho, text:Hello World, textSize:22dp
                                   TextView -> layout_width:wrap_content, layout_height:wrap_content,
layout_gravity:center_vertical, text:Ridho Akbarisanto, textSize:15dp, textStyle:bold
                           LinearLayout -> layout_width:wrap_content, layout_height:wrap_content, layout_marginLeft:30dp,
layout_marginTop:20dp, orientation:horizontal
                                   ImageButton -> id:@+id/Button01, layout_width:wrap_content, layout_height:wrap_content,
minHeight:50dp, onClick:onMyButtonClick, src:@drawable/fathan, text:Hello World, textSize:22dp
                                   TextView -> layout_width:wrap_content, layout_height:wrap_content,
layout_gravity:center_vertical, text:Fathan Adi Pranaya, textSize:15dp, textStyle:bold
                           LinearLayout -> layout_width:wrap_content, layout_height:wrap_content, layout_marginLeft:30dp,
layout_marginTop:20dp, orientation:horizontal
                                   ImageButton -> id:@+id/Button01, layout_width:wrap_content, layout_height:wrap_content,
minHeight:50dp, onClick:onMyButtonClick, src:@drawable/sonny, text:Hello World, textSize:22dp
                                   TextView -> layout_width:wrap_content, layout_height:wrap_content,
layout_gravity:center_vertical, text:Sonny Lazuardi Hermawan, textSize:15dp, textStyle:bold
                           LinearLayout -> layout_width:wrap_content, layout_height:wrap_content, layout_marginLeft:30dp,
layout_marginTop:20dp, orientation:horizontal
                                   ImageButton -> id:@+id/Button01, layout_width:wrap_content, layout_height:wrap_content,
minHeight:50dp, onClick:onMyButtonClick, src:@drawable/yogi, text:Hello World, textSize:22dp
                                   TextView -> layout_width:wrap_content, layout_height:wrap_content,
layout_gravity:center_vertical, text:Yogi Salomo, textSize:15dp, textStyle:bold
```

Output

```xml
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
        android:layout_width="fill_parent"
        android:layout_height="fill_parent"
        android:background="#2ecc71"
        android:gravity="center">
<ScrollView
        android:layout_width="match_parent"
        android:layout_height="match_parent">
<LinearLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:orientation="vertical">
<TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center_horizontal"
        android:layout_marginTop="10dp"
        android:text="A-LAY GENERATION"
        android:textColor="#fff"
        android:textSize="20dp"
        android:textStyle="bold">
</TextView>
<LinearLayout
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginLeft="30dp"
        android:layout_marginTop="20dp"
        android:orientation="horizontal">
<ImageButton
        android:id="@+id/Button01"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:minHeight="50dp"
        android:onClick="onMyButtonClick"
        android:src="@drawable/ridho"
        android:text="Hello World"
        android:textSize="22dp">
</ImageButton>
```

```xml
<TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center_vertical"
        android:text="Ridho Akbarisanto"
        android:textSize="15dp"
        android:textStyle="bold">
</TextView>
</LinearLayout>
<LinearLayout
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginLeft="30dp"
        android:layout_marginTop="20dp"
        android:orientation="horizontal">
<ImageButton
        android:id="@+id/Button01"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:minHeight="50dp"
        android:onClick="onMyButtonClick"
        android:src="@drawable/fathan"
        android:text="Hello World"
        android:textSize="22dp">
</ImageButton>
<TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center_vertical"
        android:text="Fathan Adi Pranaya"
        android:textSize="15dp"
        android:textStyle="bold">
</TextView>
</LinearLayout>
<LinearLayout
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginLeft="30dp"
        android:layout_marginTop="20dp"
        android:orientation="horizontal">
<ImageButton
        android:id="@+id/Button01"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:minHeight="50dp"
        android:onClick="onMyButtonClick"
        android:src="@drawable/sonny"
        android:text="Hello World"
        android:textSize="22dp">
</ImageButton>
<TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center_vertical"
        android:text="Sonny Lazuardi Hermawan"
        android:textSize="15dp"
        android:textStyle="bold">
</TextView>
</LinearLayout>
<LinearLayout
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginLeft="30dp"
        android:layout_marginTop="20dp"
        android:orientation="horizontal">
<ImageButton
        android:id="@+id/Button01"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:minHeight="50dp"
        android:onClick="onMyButtonClick"
        android:src="@drawable/yogi"
        android:text="Hello World"
        android:textSize="22dp">
```

```
</ImageButton>
<TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center_vertical"
        android:text="Yogi Salomo"
        android:textSize="15dp"
        android:textStyle="bold">
</TextView>
</LinearLayout>
</LinearLayout>
</ScrollView>
</RelativeLayout>
```

Screenshot