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# VOCATIONAL SCHOOL GRADUATE ACADEMY

## Mobile Programmer

Pertemuan 9 : Proyek Aplikasi Data Persistence Pada Mobile

Perguruan Tinggi: Politeknik Negeri Padang



KOMINFO



#JADIJAGOANDIGITAL

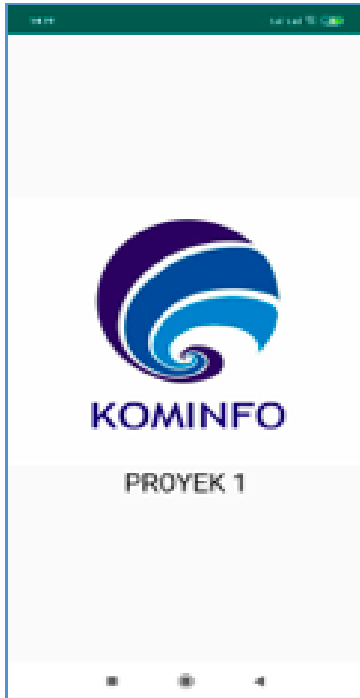
Badan Penelitian dan Pengembangan Sumber Daya Manusia

# Proyek

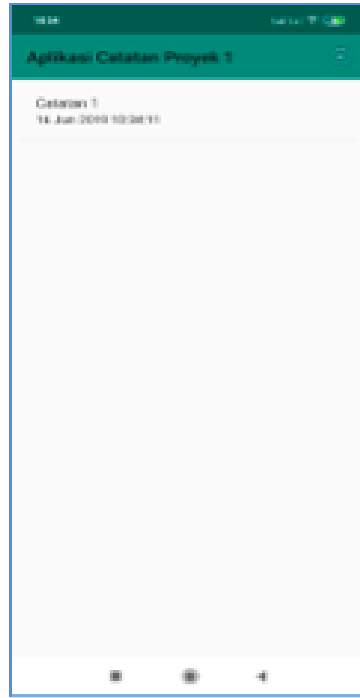
Membangun Aplikasi Android:

- Aplikasi catatan harian.
- Aplikasi validasi login.

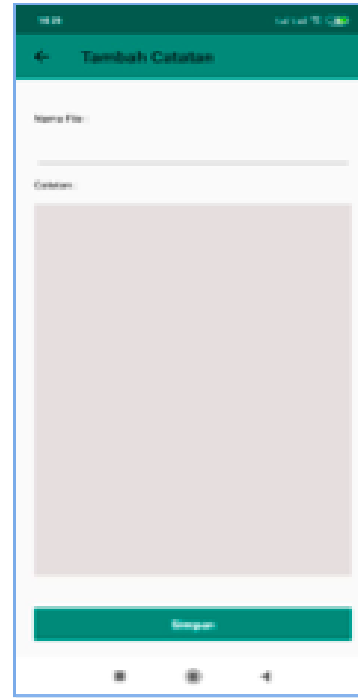
# Aplikasi Catatan Harian



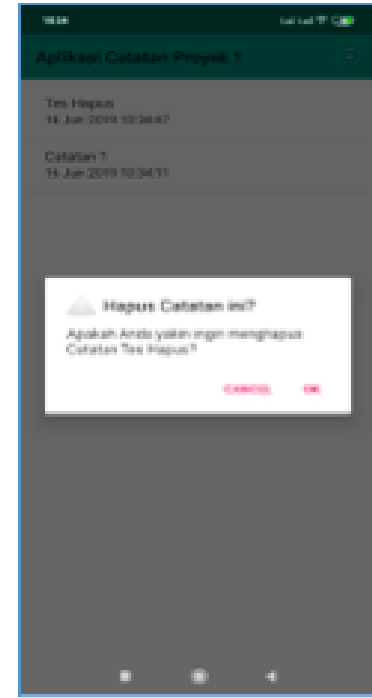
Gambar 1. Tampilan  
Splashscreen



Gambar 2. Tampilan Halaman  
Utama



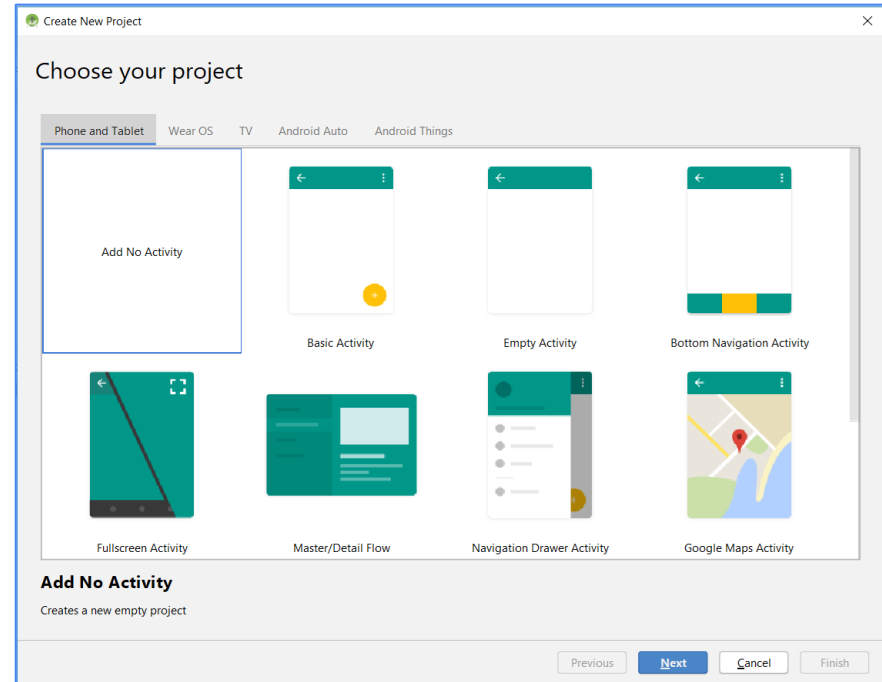
Gambar 3. Tampilan Halaman  
Tambah Catatan



Gambar 4. Tampilan Konfirmasi  
Hapus Catatan

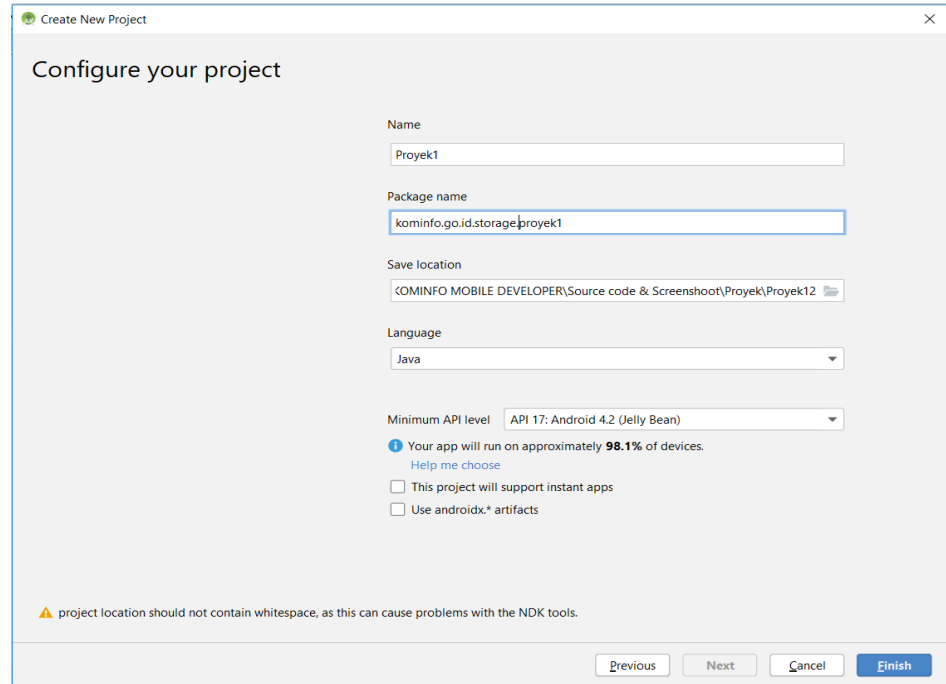
# Membuat Proyek Baru

- Buatlah sebuah proyek baru pada android studio, dan berikan nama pada proyek yang akan anda buat (sebagai contoh Proyek1).



# Membuat Proyek Baru

- Tuliskan nama proyek dan package



Create New Project

Configure your project

Name  
Proyek1

Package name  
kominfo.go.id.storage.proyek1

Save location  
C:\OMINFO MOBILE DEVELOPER\Source code & Screenshoot\Proyek\Proyek12

Language  
Java

Minimum API level  
API 17: Android 4.2 (Jelly Bean)

! Your app will run on approximately **98.1%** of devices.  
[Help me choose](#)

☐ This project will support instant apps

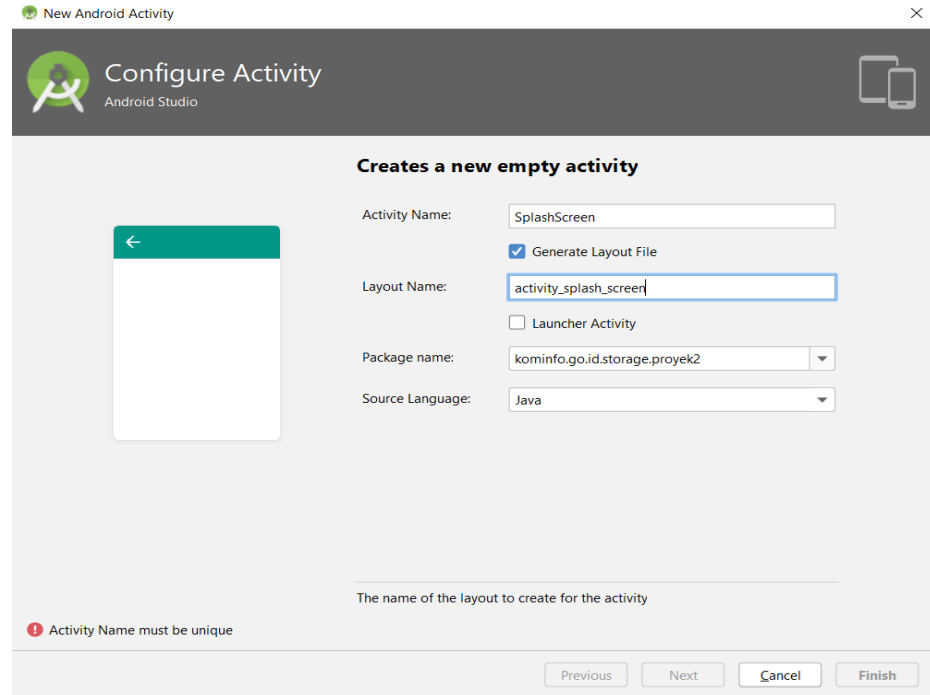
☐ Use android.\* artifacts

⚠ project location should not contain whitespace, as this can cause problems with the NDK tools.

Previous Next Cancel Finish

# Membuat Halaman Splashscreen

- Buatlah sebuah *Activity*, beri nama kelas `SplashScreen.java` beserta file layout dengan nama `activity_splash_screen.xml`



# Membuat Halaman Splashscreen

- Desainlah sebuah tampilan pada `activity_splash_screen`
- Struktur Komponen Layout

```
RelativeLayout
└─ LinearLayout(vertical)
    └─ ImageView
    └─ TextView- "PROYEK 1"
```



# Membuat Halaman Splashscreen

- Sesuaikan kode xml pada activity\_splash\_screen.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".SplashScreen">

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_centerInParent="true"
        android:orientation="vertical">

        <ImageView
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:adjustViewBounds="true"
            android:fitsSystemWindows="true"
            android:src="@drawable/logo" />

        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_gravity="center_horizontal"
            android:text="PROYEK 1"
            android:textColor="#000"
            android:textSize="30sp" />
    </LinearLayout>

</RelativeLayout>
```



# Membuat Halaman Splashscreen

- Pada kelas Java **SplashScreen.java**, tambahkan kode berikut

```
package kominfo.go.id.storage.proyek1;

import android.content.Intent;
import android.os.Handler;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;

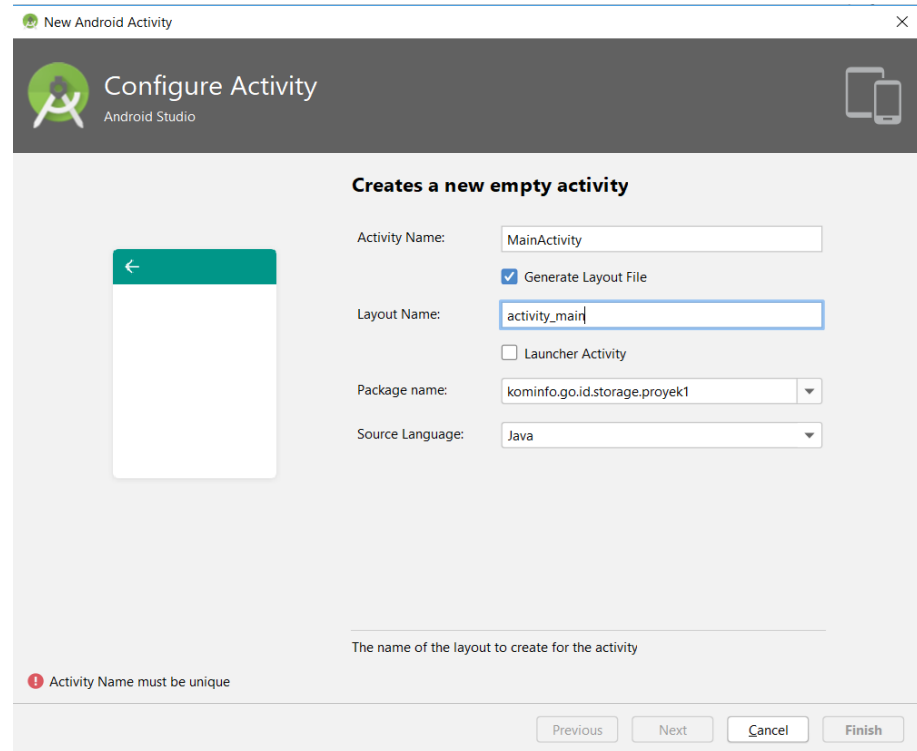
public class SplashScreen extends AppCompatActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_splash_screen);

        new Handler().postDelayed(new Runnable() {
            @Override
            public void run() {
                Intent intent = new Intent(SplashScreen.this,
MainActivity.class);
                startActivity(intent);
                finish();
            }
        }, 3000);
    }
}
```

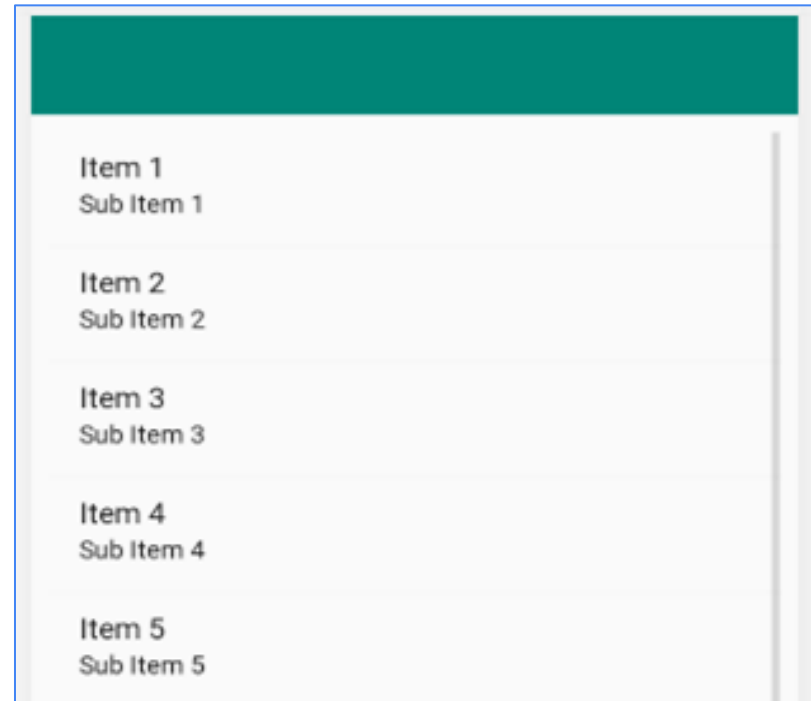
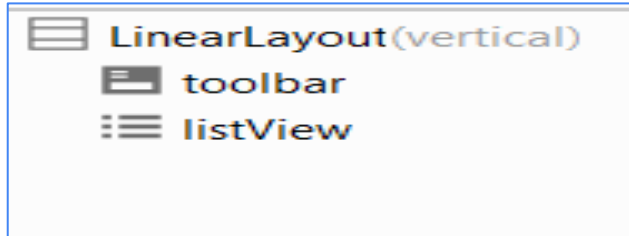
# Membuat Halaman Main (Utama)

- Buatlah sebuah *Activity*,  
beri nama kelas  
**MainActivity.java**  
beserta file layout dengan  
nama  
**activity\_main.xml**



# Membuat Halaman Main (Utama)

- Desainlah sebuah tampilan View pada activity\_main sebagaimana berikut :
- Struktur Layout pada activity\_main



# Membuat Halaman Main (Utama)

- Sesuaikan kode *xml* pada `activity_main.xml`

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    tools:context=".MainActivity">

    <android.support.v7.widget.Toolbar
        android:id="@+id/toolbar"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:background="?attr/colorPrimary"
        android:minHeight="?attr/actionBarSize"
        android:theme="?attr/actionBarTheme" />

    <ListView
        android:id="@+id/listView"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:padding="10dp" />

</LinearLayout>
```

# Membuat Halaman Main (Utama)

- Pada class Java `MainActivity.java`, tambahkan kode

```
package koninfo.go.id.storage.proyek1;

import android.Manifest;
import android.content.DialogInterface;
import android.content.Intent;
import android.content.pm.PackageManager;
import android.os.Build;
import android.os.Environment;
import android.support.annotation.NonNull;
import android.support.v4.app.ActivityCompat;
import android.support.v7.app.AlertDialog;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.support.v7.widget.Toolbar;
import android.util.Log;
import android.view.Menu;
import android.view.MenuItem;
import android.view.View;
import android.widget.AdapterView;
import android.widget.AdapterView.OnItemClickListener;
import android.widget.ListView;
import android.widget.SimpleAdapter;
import android.widget.Toast;

import java.io.File;
import java.text.SimpleDateFormat;
import java.util.ArrayList;
import java.util.Date;
import java.util.HashMap;
import java.util.Map;

public class MainActivity extends AppCompatActivity {
```

```
public class MainActivity extends AppCompatActivity {

    public static final int REQUEST_CODE_STORAGE = 100;
    ListView listView;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        Toolbar toolbar = findViewById(R.id.toolbar);
        setSupportActionBar(toolbar);
        getSupportActionBar().setTitle("Aplikasi Catatan Proyek 1");
        listView = findViewById(R.id.listView);
        listView.setOnItemClickListener(new
        AdapterView.OnItemClickListener() {
            @Override
            public void onItemClick(AdapterView<?> parent, View view,
            int position, long id) {
                Intent intent = new Intent(MainActivity.this,
                InsertAndViewActivity.class);
                Map<String, Object> data = (Map<String, Object>)
                parent.getAdapter().getItem(position);
                intent.putExtra("Filename",
                data.get("name").toString());
            }
        });
    }
}
```

# Membuat Halaman Main (Utama)

- Lanjutan class Java MainActivity.java

```
        Toast.makeText(MainActivity.this, "You clicked " +
data.get("name"), Toast.LENGTH_SHORT).show();

        startActivity(intent);
    }
}

    listView.setOnItemClickListener(new
AdapterView.OnItemClickListener() {
    @Override
    public boolean onItemClick(AdapterView<?> parent, View
view, int position, long id) {
        Map<String, Object> data = (Map<String, Object>)
parent.getAdapter().getItem(position);

        tampilkanDialogKonfirmasiHapusCatatan(data.get("name").toString());
        return true;
    }
});

}

@Override
protected void onResume() {
    super.onResume();
    if (Build.VERSION.SDK_INT >= 23) {
        if (periksaIzinPenyimpanan()) {
            mengambilListFilePadaFolder();
        }
    } else {
        mengambilListFilePadaFolder();
    }
}
```

```
    public boolean periksaIzinPenyimpanan() {
        if (Build.VERSION.SDK_INT >= 23) {
            if
(checkSelfPermission(android.Manifest.permission.WRITE_EXTERNAL_STORAGE
)
            == PackageManager.PERMISSION_GRANTED) {
                return true;
            } else {
                ActivityCompat.requestPermissions(this, new
String[]{Manifest.permission.WRITE_EXTERNAL_STORAGE},
REQUEST_CODE_STORAGE);
                return false;
            }
        } else {
            return true;
        }
    }

    @Override
    public void onRequestPermissionsResult(int requestCode, @NonNull
String[] permissions, @NonNull int[] grantResults) {
        super.onRequestPermissionsResult(requestCode, permissions,
```

## Membuat Halaman Main (Utama)

- Lanjutan class Java **MainActivity.java**

```
grantResults);
    switch (requestCode) {
        case REQUEST_CODE_STORAGE:
            if (grantResults[0] ==
PackageManager.PERMISSION_GRANTED) {
                menqamhillistFilePadaFolder();
            }
            break;
    }
}

void menqamhillistFilePadaFolder() {
    String path =
Environment.getExternalStorageDirectory().toString() +
"/kominfo.proyek1";
    File directory = new File(path);

    if (directory.exists()) {
        File[] files = directory.listFiles();
        String[] filenames = new String[files.length];
        String[] dateCreated = new String[files.length];
        SimpleDateFormat simpleDateFormat = new
SimpleDateFormat("dd MMM YYYY HH:mm:ss");
        ArrayList<Map<String, Object>> itemDataList = new
ArrayList<Map<String, Object>>[];
```

```

2
    for (int i = 0; i < files.length; i++) {
        filenames[i] = files[i].getName();
        Date lastModDate = new Date(files[i].lastModified());
        dateCreated[i] = SimpleDateFormat.format(lastModDate);
        Map<String, Object> listItemMap = new HashMap<>();
        listItemMap.put("name", filenames[i]);
        listItemMap.put("date", dateCreated[i]);
        itemDataList.add(listItemMap);
    }

    SimpleAdapter simpleAdapter = new SimpleAdapter(this,
itemDataList, android.R.layout.simple_list_item_2,
        new String[]{"name", "date"}, new
int[]{android.R.id.text1, android.R.id.text2});
    listView.setAdapter(simpleAdapter);
    simpleAdapter.notifyDataSetChanged();
}

@Override
public boolean onCreateOptionsMenu(Menu menu) {
    getMenuInflater().inflate(R.menu.menu, menu);
    return true;
}

@Override
public boolean onOptionsItemSelected(MenuItem item) {
    switch (item.getItemId()) {
        case R.id.action_tambah:
            Intent intent = new Intent(this,

```

# Membuat Halaman Main (Utama)

- Lanjutan class Java **MainActivity.java**

```
InsertAndViewActivity.class);
        startActivity(intent);
        break;
    }
    return super.onOptionsItemSelected(item);
}

void tampilkanDialogKonfirmasiHapusCatatan(final String filename) {
    new AlertDialog.Builder(this)
        .setTitle("Hapus Catatan ini?")
        .setMessage("Apakah Anda yakin ingin menghapus Catatan\n"+filename+"?")
        .setIcon(android.R.drawable.ic_dialog_alert)
        .setPositiveButton(android.R.string.yes, new
DialogInterface.OnClickListener() {

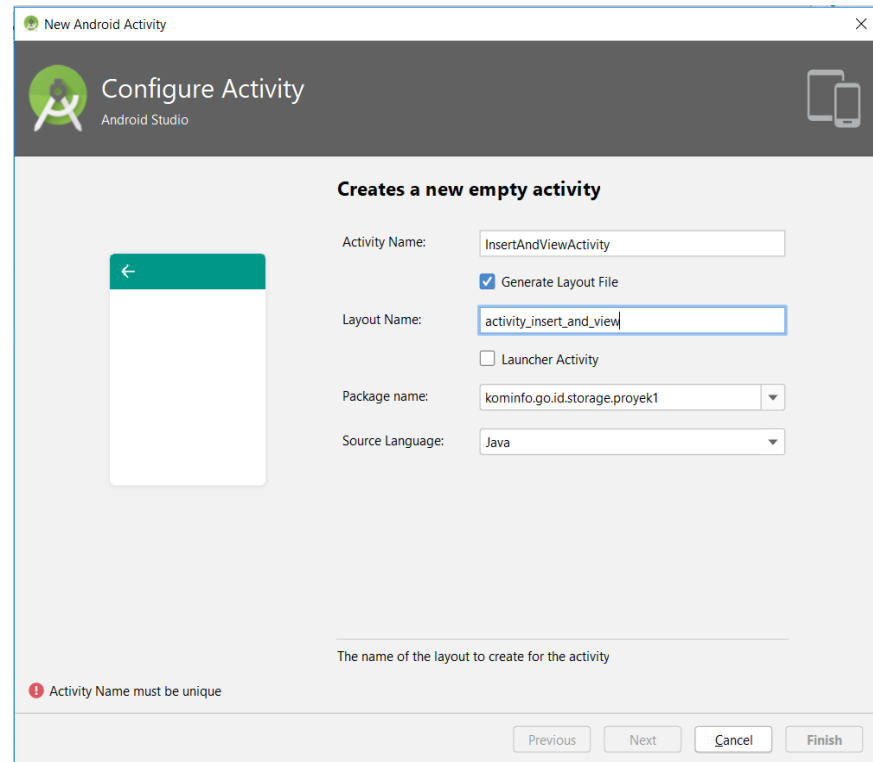
            public void onClick(DialogInterface dialog, int
whichButton) {
                hapusFile(filename);
            }
        })
        .setNegativeButton(android.R.string.no, null).show();
}

void hapusFile(String filename) {
    String path =
Environment.getExternalStorageDirectory().toString() +
"/kominfo/proyek1";
    File file = new File(path, filename);
    if (file.exists()) {
        file.delete();
    }
    mengambilListFilePadaFolder();
}
}
```



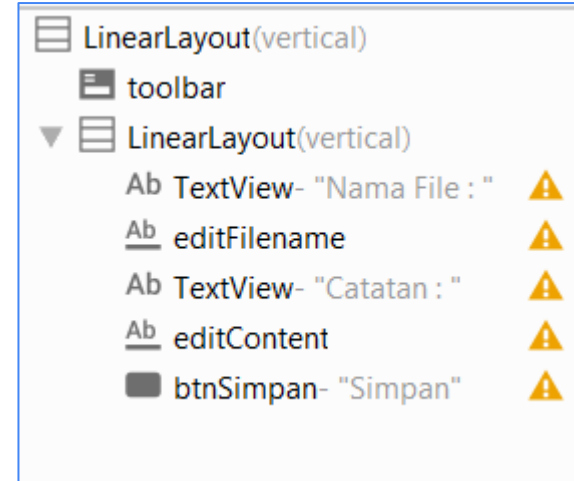
# Membuat Halaman Tambahan Catatan

- Tambahkan Activity baru, berikan nama Activity dengan `InsertAndViewActivity`, serta nama layout `activity_insert_and_view`



# Membuat Halaman Tambahan Catatan

- Buatlah sebuah desain layout, dengan tampilan sebagaimana berikut:



# Membuat Halaman Tambahan Catatan

- Sesuaikan kode *xml* pada layout **activity\_insert\_and\_view** sebagaimana kode berikut

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"

    tools:context=".InsertAndViewActivity">

    <android.support.v7.widget.Toolbar
        android:id="@+id/toolbar"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:background="?attr/colorPrimary"
        android:minHeight="?attr/actionBarSize"
        android:theme="?attr/actionBarTheme" />

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:orientation="vertical"
        android:padding="20dp">
        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_marginBottom="5dp"
            android:text="Nama File : "
            android:layout_marginTop="20dp"
            android:textColor="#000"
            android:textSize="12sp" />

        <EditText
            android:id="@+id/editFilename"
            android:layout_width="match_parent"
            android:layout_height="40dp"
            android:layout_marginTop="10dp"
            android:padding="5dp"
            android:singleLine="true"
            android:textSize="14sp" />
    </LinearLayout>
</LinearLayout>
```

# Membuat Halaman Tambahan Catatan

- Lanjutan kode *xml* pada layout **activity\_insert\_and\_view:**

```
<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginTop="10dp"
    android:layout_marginBottom="5dp"
    android:text="Catatan : "
    android:textColor="#000"
    android:textSize="12sp" />

<EditText
    android:id="@+id/editContent"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:layout_marginTop="10dp"
    android:layout_weight="1"
    android:gravity="top|left"
    android:background="#E6E6FA"
    android:singleLine="false"
    android:padding="5dp"
    android:textColor="#000"
    android:textSize="14sp" />

<Button
    android:id="@+id/btnSimpan"
    android:layout_width="match_parent"
    android:layout_height="40dp"
    android:layout_marginTop="40dp"
    android:background="@color/colorPrimary"
    android:text="Simpan"
    android:textAllCaps="false"
    android:textColor="#FFF"
    android:textSize="14sp"
    android:textStyle="bold" />
</LinearLayout>
```

# Membuat Halaman Tambahan Catatan

- Pada class java `InsertAndViewActivity`, tambahkan kode berikut ini :

```
package kominfo.go.id.storage.proyek1;

import android.Manifest;
import android.content.DialogInterface;
import android.content.Intent;
import android.content.pm.PackageManager;
import android.os.Build;
import android.os.Environment;
import android.support.annotation.NonNull;
import android.support.v4.app.ActivityCompat;
import android.support.v7.app.AlertDialog;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.support.v7.widget.Toolbar;
import android.view.MenuItem;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;

import java.io.BufferedReader;
import java.io.File;
import java.io.FileOutputStream;
import java.io.FileReader;
import java.io.IOException;
import java.io.OutputStreamWriter;
```

```
public class InsertAndViewActivity extends AppCompatActivity implements
View.OnClickListener {
    public static final int REQUEST_CODE_STORAGE = 100;
    int eventID = 0;
    EditText edtFileName, edtContent;
    Button btnSimpan;
    boolean isEditable = false;
    String fileName = "";
    String tempCatatan = "";

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_insert_and_view);
        Toolbar toolbar = findViewById(R.id.toolbar);
        setSupportActionBar(toolbar);

        getSupportActionBar().setDisplayHomeAsUpEnabled(true);
        getSupportActionBar().setDisplayShowHomeEnabled(true);

        edtFileName = findViewById(R.id.editFilename);
        edtContent = findViewById(R.id.editContent);
        btnSimpan = findViewById(R.id.btnSimpan);

        btnSimpan.setOnClickListener(this);

        Bundle extras = getIntent().getExtras();

        if (extras != null) {
```

# Membuat Halaman Tambahan Catatan

- Lanjutan sintaks pada class java **InsertAndViewActivity**:

```

        fileName = extras.getString("filename");
        edtFileName.setText(fileName);
        getSupportActionBar().setTitle("Ubah Catatan");
    } else {
        getSupportActionBar().setTitle("Tambah Catatan");
    }
    eventID = 1;
    if (Build.VERSION.SDK_INT >= 23) {
        if (periksaIzinPenyimpanan()) {
            bacaFile();
        }
    } else {
        bacaFile();
    }
}

@Override
public void onClick(View v) {
    switch (v.getId()) {
        case R.id.btnSimpan:
            eventID = 2;
            if
(!tempCatatan.equals(edtContent.getText().toString())) {
                if (Build.VERSION.SDK_INT >= 23) {
                    if (periksaIzinPenyimpanan()) {
                        tampilkanDialogKonfirmasiPenyimpanan();
                    }
                } else {
                    tampilkanDialogKonfirmasiPenyimpanan();
                }
            }
            break;
    }
}

```

```

    public boolean periksaIzinPenyimpanan() {
        if (Build.VERSION.SDK_INT >= 23) {
            if
(checkSelfPermission(android.Manifest.permission.WRITE_EXTERNAL_STORAGE
)
                == PackageManager.PERMISSION_GRANTED) {
                return true;
            } else {
                ActivityCompat.requestPermissions(this, new
String[]{Manifest.permission.WRITE_EXTERNAL_STORAGE},
REQUEST_CODE_STORAGE);
                return false;
            }
        } else {
            return true;
        }
    }

    @Override

```

# Membuat Halaman Tambahan Catatan

- Lanjutan sintaks pada class java InsertAndViewActivity:

```
public void onRequestPermissionsResult(int requestCode, @NonNull
String[] permissions, @NonNull int[] grantResults) {
    super.onRequestPermissionsResult(requestCode, permissions,
grantResults);
    switch (requestCode) {
        case REQUEST_CODE_STORAGE:
            if (grantResults[0] ==
PackageManager.PERMISSION_GRANTED) {
                if (eventID == 1) {
                    bacaFile();
                } else {
                    tampilkanDialogKonfirmasiPenyimpanan();
                }
            }
            break;
    }
}

void bacaFile() {
    String path =
Environment.getExternalStorageDirectory().toString() +
"/kominfo.proyek1";
    File file = new File(path, editFileName.getText().toString());
    if (file.exists()) {

        StringBuilder text = new StringBuilder();

        try {
            BufferedReader br = new BufferedReader(new
FileReader(file));

            String line = br.readLine();
```

```
        while (line != null) {
            text.append(line);
            line = br.readLine();
        }
        br.close();
    } catch (IOException e) {
        System.out.println("Error " + e.getMessage());
    }
    tempCatatan = text.toString();
    editText.setText(text.toString());
}

void buatDanUbah() {
    String state = Environment.getExternalStorageState();
    if (!Environment.MEDIA_MOUNTED.equals(state)) {
        return;
    }
    String path =
Environment.getExternalStorageDirectory().toString() +
"/kominfo.proyek1";
    File parent = new File(path);
    if (parent.exists()) {
        File file = new File(path,
```

# Membuat Halaman Tambahan Catatan

- Lanjutan sintaks pada class java InsertAndViewActivity:

```
edtFileName.getText().toString());
FileOutputStream outputStream = null;
try {
    file.createNewFile();
    outputStream = new FileOutputStream(file);
    OutputStreamWriter streamWriter = new
OutputStreamWriter(outputStream);
    streamWriter.append(edtContent.getText());
    streamWriter.flush();
    streamWriter.close();
    outputStream.flush();
    outputStream.close();
} catch (Exception e) {
    e.printStackTrace();
}
} else {
    parent.mkdir();
    File file = new File(path,
edtFileName.getText().toString());
    FileOutputStream outputStream = null;
    try {
        file.createNewFile();
        outputStream = new FileOutputStream(file, false);

outputStream.write(edtContent.getText().toString().getBytes());
        outputStream.flush();
        outputStream.close();
    } catch (Exception e) {
        e.printStackTrace();
    }
}
```

```
onBackPressed();
}

void tampilkanDialogKonfirmasiPenyimpanan() {
    new AlertDialog.Builder(this)
        .setTitle("Simpan Catatan")
        .setMessage("Apakah Anda yakin ingin menyimpan Catatan
ini?")
        .setIcon(android.R.drawable.ic_dialog_alert)
        .setPositiveButton(android.R.string.yes, new
DialogInterface.OnClickListener() {

            public void onClick(DialogInterface dialog, int
whichButton) {

                buatDanUbah();
            }
        })
        .setNegativeButton(android.R.string.no, null).show();
}

@Override
public void onBackPressed() {
    if (!tempCatatan.equals(edtContent.getText().toString())) {
        tampilkanDialogKonfirmasiPenyimpanan();
    }
}
```



# Membuat Halaman Tambahan Catatan

- Lanjutan sintaks pada class java `InsertAndViewActivity`:

```
    }  
    super.onBackPressed();  
}  
  
@Override  
public boolean onOptionsItemSelected(MenuItem item) {  
    if (item.getItemId() == android.R.id.home) {  
        onBackPressed();  
    }  
    return super.onOptionsItemSelected(item);  
}  
}
```

# Membuat Halaman Tambahan Catatan

- Jalankan aplikasi tersebut, lalu ujilah fungsionalitasnya baik untuk fungsi tambah, ubah, hapus, dan baca data

Tampilan Awal Aplikasi Catatan Harian



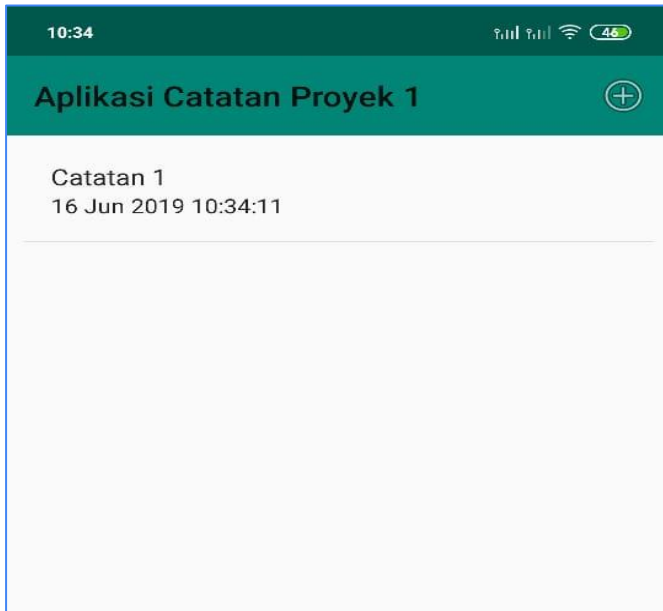
Tampilan Form Tambah Catatan

A screenshot of a mobile application interface for adding a note. At the top, a dark green header bar contains the time '10:35' on the left and signal, Wi-Fi, and battery (46%) icons on the right. Below the header, a teal bar displays a white back arrow icon on the left and the text 'Tambah Catatan' on the right. The main area is white and contains two labels: 'Nama File :' followed by a horizontal line, and 'Catatan :' followed by a large, empty light gray rectangular box.

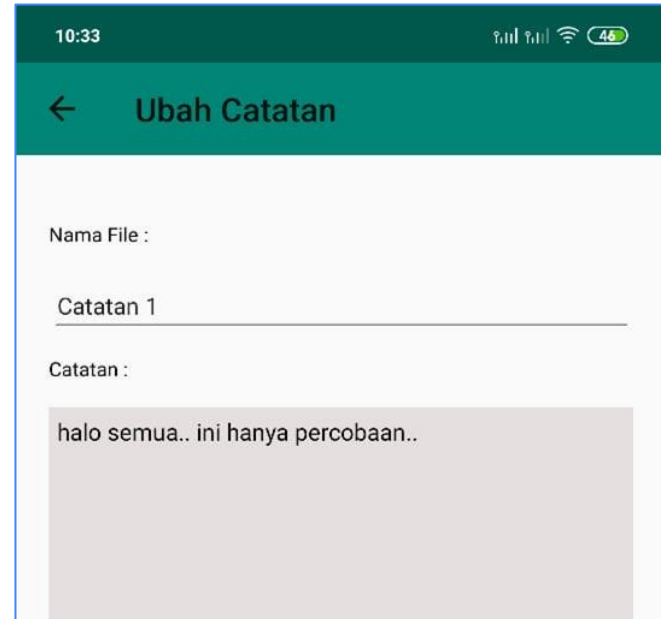
# Membuat Halaman Tambahan Catatan

- Jalankan aplikasi tersebut, lalu ujilah fungsionalitasnya baik untuk fungsi tambah, ubah, hapus, dan baca data.

*Tampilan Saat Catatan telah disimpan*



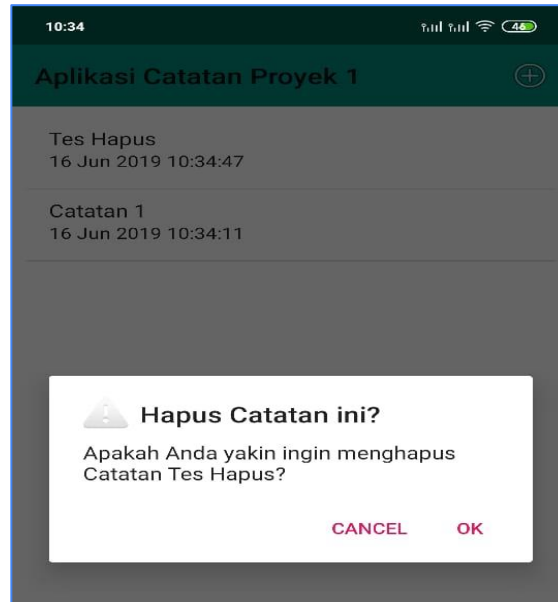
*Tampilan Form Ubah Catatan*



# Membuat Halaman Tambahan Catatan

- Jalankan aplikasi tersebut, lalu ujilah fungsionalitasnya baik untuk fungsi tambah, ubah, hapus, dan baca data.

Tampilan saat Hapus Catatan (ada konfirmasi hapus)

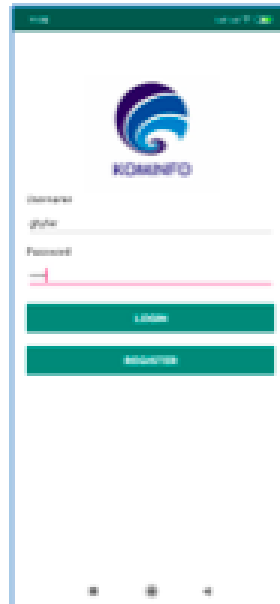


# Aplikasi Validasi Login

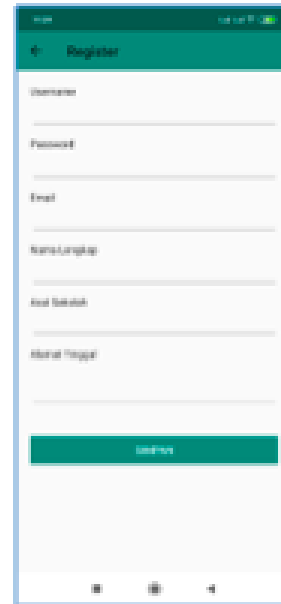
- Penyimpanan file (data persistence) menggunakan internal storage.
- Perhatikan beberapa tampilan berikut ini :



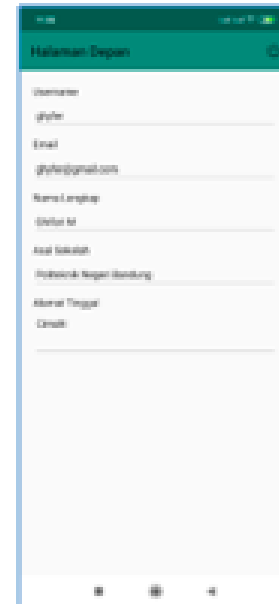
Gambar Tampilan Splashscreen



Gambar Tampilan Halaman Login



Gambar Tampilan Halaman Register



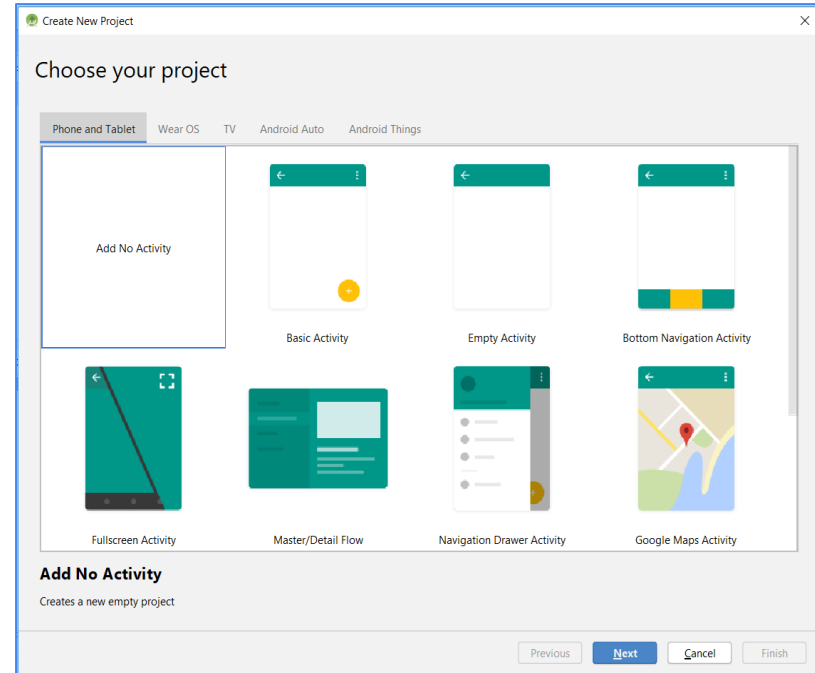
Gambar Tampilan Halaman Home

# Aplikasi Validasi Login

- Melakukan pengecekan terhadap data user yang tersimpan pada file teks.
- Pertama kali aplikasi dijalankan akan muncul *splahscreen*,
- Apabila user belum teregistrasi, maka dapat melakukan registrasi pada halaman registrasi,
- Apabila sudah memiliki akun dapat login menggunakan akun tersebut pada halaman login.
- Setelah berhasil login, aplikasi akan masuk ke halaman utama yang memunculkan data user.
- Tersedia juga tombol logout untuk keluar dari aplikasi.

# Aplikasi Validasi Login

- Buatlah sebuah proyek baru pada android studio, dan berikan nama pada proyek yang akan anda buat (sebagai contoh Proyek2).



# Aplikasi Validasi Login

- Tuliskan nama proyek dan package

Create New Project

Configure your project

Name  
Proyek2

Package name  
kominfo.go.id.storage.proyek2

Save location  
COMINFO MOBILE DEVELOPER\Source code & Screenshoot\Proyek\Proyek22

Language  
Java

Minimum API level  
API 17: Android 4.2 (Jelly Bean)

**i** Your app will run on approximately **98.1%** of devices.  
[Help me choose](#)

☐ This project will support instant apps

☐ Use androidx.\* artifacts

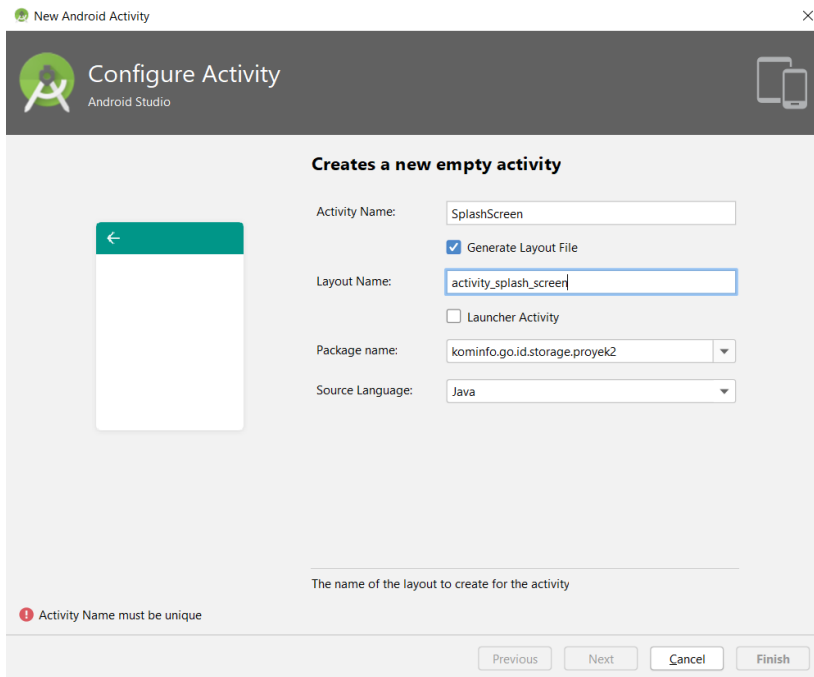
**⚠** project location should not contain whitespace, as this can cause problems with the NDK tools.

Previous Next Cancel Finish



# Membuat Halaman Splashscreen

2. Buatlah sebuah *Activity*, beri nama kelas `SplashScreen.java` beserta file layout dengan nama `activity_splash_screen.xml`



Tambahkan Activity SplashScreen

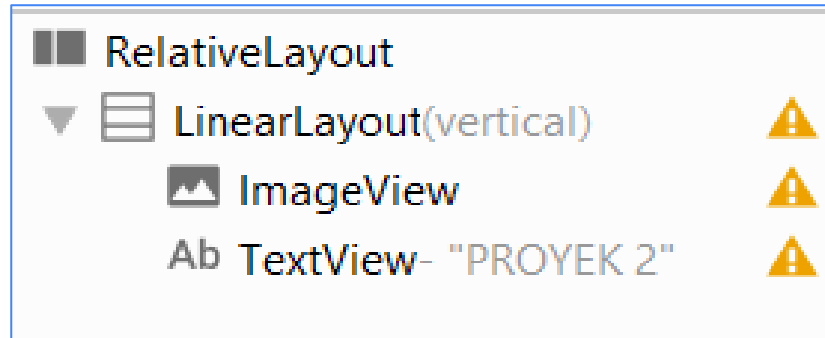
# Membuat Halaman Splashscreen

3. Desainlah sebuah tampilan pada **activity\_splash\_screen** sebagaimana berikut ini :



Desain Tampilan SplashScreen

# Membuat Halaman Splashscreen



*Struktur Layout Komponennya*

# Membuat Halaman Splashscreen

Sesuaikan kode xml pada **activity\_splash\_screen.xml** sebagaimana berikut :

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".SplashScreen">

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_centerInParent="true"
        android:orientation="vertical">

        <ImageView
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:adjustViewBounds="true"
            android:fitsSystemWindows="true"
            android:src="@drawable/logo" />

        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_gravity="center_horizontal"
            android:text="PROYEK 2"
            android:textColor="#000"
            android:textSize="30sp" />

    </LinearLayout>

</RelativeLayout>
```

# Membuat Halaman Splashscreen

5. Pada kelas Java **SplashScreen.java**, tambahkan kode berikut ini :

```
package kominfo.go.id.storage.proyek2;

import android.content.Intent;
import android.os.Handler;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;

import java.io.BufferedReader;
import java.io.File;
import java.io.FileReader;
import java.io.IOException;

public class SplashScreen extends AppCompatActivity {

    public static final String FILENAME = "login";

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_splash_screen);

        new Handler().postDelayed(new Runnable() {
            @Override
            public void run() {
```

# Membuat Halaman Splashscreen

5. Pada kelas Java **SplashScreen.java**, tambahkan kode berikut ini :

```
        if (isLogin()) {
            Intent intent = new Intent(SplashScreen.this,
MainActivity.class);
            startActivity(intent);

        } else {
            Intent intent = new Intent(SplashScreen.this,
LoginActivity.class);
            startActivity(intent);
        }

        finish();

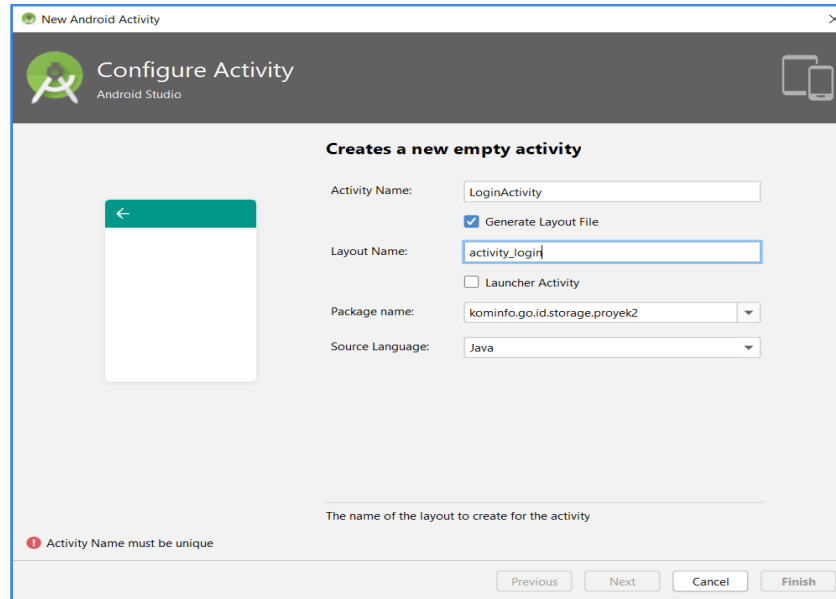
    }

    }, 3000);
}

boolean isLogin() {
    File sdcard = getFilesDir();
    File file = new File(sdcard, FILENAME);
    if (file.exists()) {
        return true;
    } else {
        return false;
    }
}
```

# Membuat Halaman Login

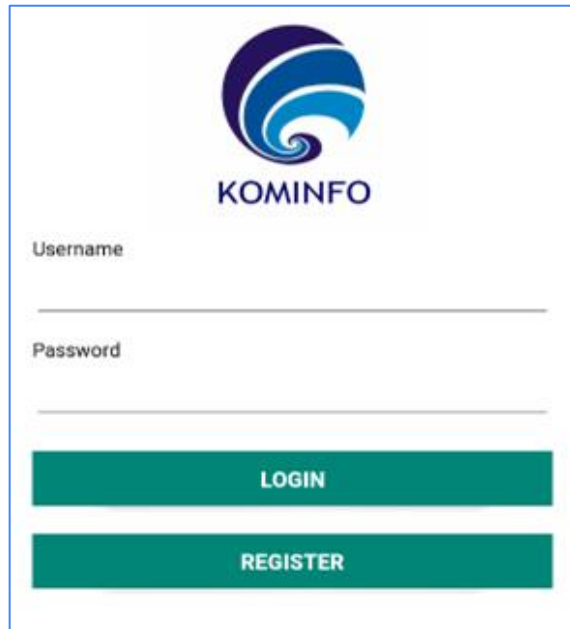
1. Buatlah sebuah *Activity*, beri nama kelas **LoginActivity.java** beserta file layout dengan nama **activity\_login.xml**.



Tambahkan LoginActivity dan Layout activity\_login

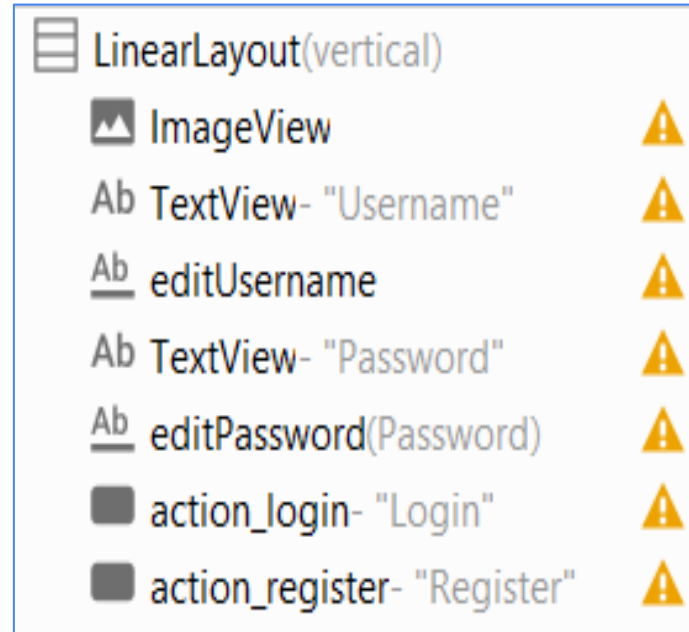
# Membuat Halaman Login

2. Desainlah sebuah tampilan pada **activity\_login** sebagaimana berikut :



The design of the login page (activity\_login) features a white background. At the top center is the KOMINFO logo, which consists of a stylized blue and purple wave icon above the text "KOMINFO". Below the logo, there are two input fields: "Username" and "Password", each with a light gray border and a small gray label to its left. Below the "Password" field is a green button with the text "LOGIN" in white. At the bottom is another green button with the text "REGISTER" in white.

Desain Tampilan pada activity\_login



Struktur Layout pada activity\_main



# Membuat Halaman Login

3. Sesuaikan kode `xml` pada `activity_login.xml` sebagaimana berikut :

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:background="#FFF"
    android:orientation="vertical"
    android:padding="20dp"
    tools:context=".LoginActivity">

    <ImageView
        android:layout_width="200dp"
        android:layout_height="wrap_content"
        android:layout_gravity="center_horizontal"
        android:layout_marginTop="40dp"
        android:adjustViewBounds="true"
        android:fitsSystemWindows="true"
        android:src="@drawable/logo" />

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Username"
        android:textColor="#000"
        android:textSize="14sp" />

    <EditText
        android:id="@+id/editUsername"
        android:layout_width="match_parent"
        android:layout_height="40dp"
        android:layout_marginTop="5dp"
```

# Membuat Halaman Login

```
android:digits="ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz1234567890"
    android:inputType="textFilter"
    android:textColor="#000"
    android:textSize="14sp" />

<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginTop="10dp"
    android:text="Password"
    android:textColor="#000"
    android:textSize="14sp" />

<EditText
    android:id="@+id/editPassword"
    android:layout_width="match_parent"
    android:layout_height="40dp"
    android:layout_marginTop="5dp"
    android:inputType="textPassword"
    android:textColor="#000"
    android:textSize="14sp" />
```

# Membuat Halaman Login

```
<Button
    android:id="@+id/action_login"
    android:layout_width="match_parent"
    android:layout_height="40dp"
    android:layout_marginTop="20dp"
    android:background="@color/colorPrimary"
    android:text="Login"
    android:textColor="#FFF"
    android:textSize="16sp"
    android:textStyle="bold"
/>

<Button
    android:id="@+id/action_register"
    android:layout_width="match_parent"
    android:layout_height="40dp"
    android:layout_marginTop="20dp"
    android:background="@color/colorPrimary"
    android:text="Register"
    android:textColor="#FFF"
    android:textSize="16sp"
    android:textStyle="bold"
/>
</LinearLayout>
```

# Membuat Halaman Login

4. Pada kelas Java **LoginActivity.java**, tambahkan kode berikut ini :

```
package kominfo.go.id.storage.proyek2;

import android.content.Intent;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;

import java.io.BufferedReader;
import java.io.File;
import java.io.FileOutputStream;
import java.io.FileReader;
import java.io.IOException;

public class LoginActivity extends AppCompatActivity {
    public static final String FILENAME = "login";

    EditText editUsername, editPassword;
    Button btnLogin, btnRegister;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_login);
        editUsername = findViewById(R.id.editUsername);
        editPassword = findViewById(R.id.editPassword);
        btnLogin = findViewById(R.id.action_login);
        btnRegister = findViewById(R.id.action_register);
    }
}
```

# Membuat Halaman Login

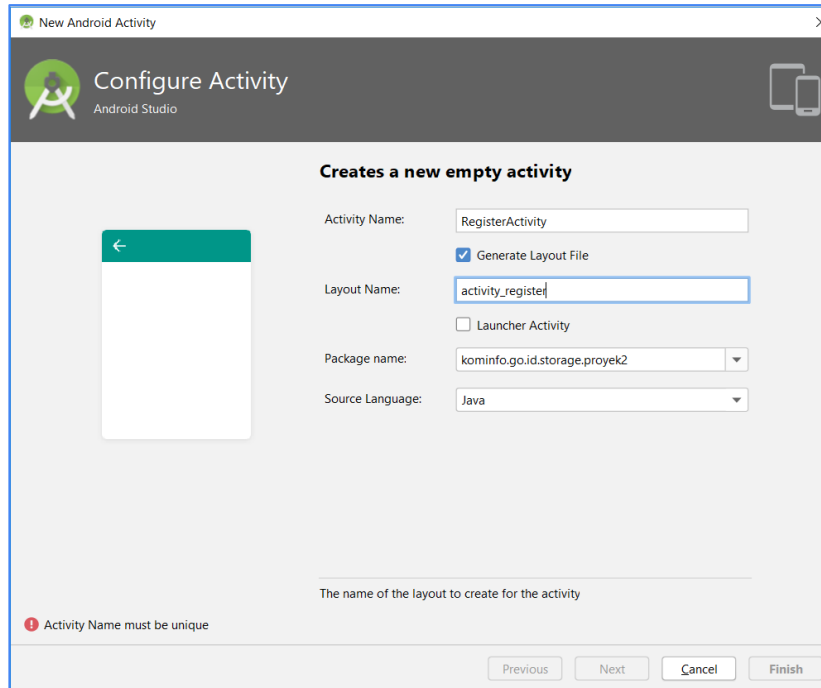
```
        btnLogin.setOnClickListener(new View.OnClickListener() {  
            @Override  
            public void onClick(View v) {  
                login();  
            }  
        });  
  
        btnRegister.setOnClickListener(new View.OnClickListener() {  
            @Override  
            public void onClick(View v) {  
                Intent intent = new Intent(LoginActivity.this,  
RegisterActivity.class);  
                startActivity(intent);  
            }  
        });  
    }  
  
    void simpanFileLogin() {  
        String isiFile = editUsername.getText().toString() + ";" +  
editPassword.getText().toString();  
        File file = new File(getFilesDir(), FILENAME);  
  
        FileOutputStream outputStream = null;  
        try {  
            file.createNewFile();  
            outputStream = new FileOutputStream(file, false);  
            outputStream.write(isiFile.getBytes());  
            outputStream.flush();  
            outputStream.close();  
        } catch (Exception e) {  
            e.printStackTrace();  
        }  
        Toast.makeText(this, "Login Berhasil",  
Toast.LENGTH_SHORT).show();  
        onBackPressed();  
    }  
}
```

# Membuat Halaman Login

```
void login() {  
    File sdcard = getFilesDir();  
    File file = new File(sdcard,  
editUsername.getText().toString());  
    if (file.exists()) {  
        StringBuilder text = new StringBuilder();  
        try {  
            BufferedReader br =  
                new BufferedReader(new FileReader(file));  
            String line = br.readLine();  
            while (line != null) {  
                text.append(line);  
                line = br.readLine();  
            }  
            br.close();  
        } catch (IOException e) {  
            System.out.println("Error " + e.getMessage());  
        }  
        String data = text.toString();  
        String[] dataUser = data.split(";");  
  
        if (dataUser[1].equals(editPassword.getText().toString()))  
        {  
            simpanFileLogin();  
            Intent intent = new Intent(this, MainActivity.class);  
            startActivity(intent);  
            finish();  
        } else {  
            Toast.makeText(this, "Password Tidak Sesuai",  
Toast.LENGTH_SHORT).show();  
        }  
        } else {  
            Toast.makeText(this, "User Tidak Ditemukan",  
Toast.LENGTH_SHORT).show();  
        }  
    }  
}
```

# Membuat Halaman Register

1. Selanjutnya, tambahkan *Activity* baru, berikan nama *Activity* dengan **RegisterActivity**, serta nama layout **activity\_register**.



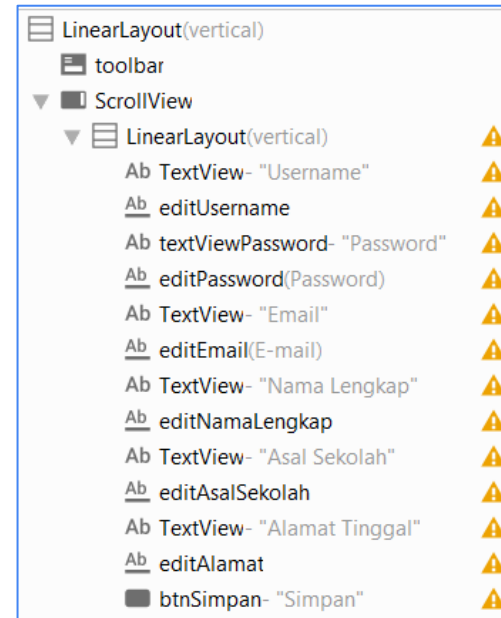
Tambahkan RegisterActivity

# Membuat Halaman Register

2. Buatlah sebuah desain layout, dengan tampilan sebagaimana berikut :

The visual design shows a vertical form with a teal header bar at the top. Below the header, there are seven input fields, each with a label and a horizontal line for text entry. The labels are: Username, Password, Email, Nama Lengkap, Asal Sekolah, and Alamat Tinggal. At the bottom of the form is a teal button with the text "SIMPAN" in white capital letters.

Desain Tampilan RegisterActivity



Struktur Layout RegisterActivity



# Membuat Halaman Register

3. Sesuaikan kode `xml/activity_register.xml` sebagaimana berikut ini :

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    tools:context=".RegisterActivity">

    <android.support.v7.widget.Toolbar
        android:id="@+id/toolbar"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:background="?attr/colorPrimary"
        android:minHeight="?attr/actionBarSize"
        android:theme="?attr/actionBarTheme" />

    <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"
            android:padding="20dp">

            <TextView
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:text="Username"
                android:textColor="#000"
                android:textSize="14sp" />
```

# Membuat Halaman Register

3. Sesuaikan kode `xml/activity_register.xml` sebagaimana berikut ini :

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    tools:context=".RegisterActivity">

    <android.support.v7.widget.Toolbar
        android:id="@+id/toolbar"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:background="?attr/colorPrimary"
        android:minHeight="?attr/actionBarSize"
        android:theme="?attr/actionBarTheme" />

    <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"
            android:padding="20dp">

            <TextView
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:text="Username"
                android:textColor="#000"
                android:textSize="14sp" />
```

# Membuat Halaman Register

3. Sesuaikan kode `xml/activity_register.xml` sebagaimana berikut ini :

```
        android:layout_height="40dp"
        android:layout_marginTop="5dp"
        android:inputType="textPassword"
        android:textColor="#000"
        android:textSize="14sp" />

<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginTop="10dp"
    android:text="Email"
    android:textColor="#000"
    android:textSize="14sp" />

<EditText
    android:id="@+id/editEmail"
    android:layout_width="match_parent"
    android:layout_height="40dp"
    android:layout_marginTop="5dp"
    android:inputType="textEmailAddress"
    android:textColor="#000"
    android:textSize="14sp" />

<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginTop="10dp"
    android:text="Nama Lengkap"
    android:textColor="#000"
    android:textSize="14sp" />
```

# Membuat Halaman Register

3. Sesuaikan kode *xml* `activity_register.xml` sebagaimana berikut ini :

```
<EditText
    android:id="@+id/editNamaLengkap"
    android:layout_width="match_parent"
    android:layout_height="40dp"
    android:layout_marginTop="5dp"
    android:textColor="#000"
    android:textSize="14sp" />

<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginTop="10dp"
    android:text="Asal Sekolah"
    android:textColor="#000"
    android:textSize="14sp" />

<EditText
    android:id="@+id/editAsalSekolah"
    android:layout_width="match_parent"
    android:layout_height="40dp"
    android:layout_marginTop="5dp"
    android:textColor="#000"
    android:textSize="14sp" />

<TextView
    android:layout_width="wrap_content"
```

# Membuat Halaman Register

3. Sesuaikan kode `xml/activity_register.xml` sebagaimana berikut ini :

```
        android:layout_height="wrap_content"
        android:layout_marginTop="10dp"
        android:text="Alamat Tinggal"
        android:textColor="#000"
        android:textSize="14sp" />

        <EditText
            android:id="@+id/editAlamat"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_marginTop="5dp"
            android:gravity="top|left"
            android:lines="3"
            android:padding="5dp"
            android:singleLine="false"
            android:textColor="#000"
            android:textSize="14sp" />

        <Button
            android:id="@+id/btnSimpan"
            android:layout_width="match_parent"
            android:layout_height="40dp"
            android:layout_marginTop="40dp"
            android:background="@color/colorPrimary"
            android:text="Simpan"
            android:textColor="#FFF"
            android:textSize="14sp" />
    </LinearLayout>
</ScrollView>

</LinearLayout>
```

# Membuat Halaman Register

4. Pada kelas Java **RegisterActivity.java**, tambahkan kode berikut ini :

```
package kominfo.go.id.storage.proyek2;

import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.support.v7.widget.Toolbar;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;

import java.io.File;
import java.io.FileOutputStream;

public class RegisterActivity extends AppCompatActivity {

    EditText editUsername, editPassword, editEmail, editNamaLengkap,
    editAsalSekolah, editAlamat;
    Button btnSimpan;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_register);

        Toolbar toolbar = findViewById(R.id.toolbar);
        setSupportActionBar(toolbar);

        getSupportActionBar().setDisplayHomeAsUpEnabled(true);
        getSupportActionBar().setDisplayShowHomeEnabled(true);

        getSupportActionBar().setTitle("Register");
    }
}
```

# Membuat Halaman Register

4. Pada kelas Java `RegisterActivity.java`, tambahkan kode berikut ini :

```
editUsername = findViewById(R.id.editUsername);
editPassword = findViewById(R.id.editPassword);
editEmail = findViewById(R.id.editEmail);
editNamaLengkap = findViewById(R.id.editNamaLengkap);
editAsalSekolah = findViewById(R.id.editAsalSekolah);
editAlamat = findViewById(R.id.editAlamat);
btnSimpan = findViewById(R.id.btnSimpan);
btnSimpan.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        if (isValidation()) {
            simpanFileData();
        } else {
            Toast.makeText(RegisterActivity.this, "Mohon
Lengkapi Seluruh Data", Toast.LENGTH_SHORT).show();
        }
    }
});

boolean isValidation() {
    if (editUsername.getText().toString().equals("")) ||
```

# Membuat Halaman Register

4. Pada kelas Java  
**RegisterActivity.java**,  
tambahkan kode berikut ini :

```
editPassword.getText().toString().equals("")) ||
editEmail.getText().toString().equals("")) ||
editNamaLengkap.getText().toString().equals("")) ||
editAsalSekolah.getText().toString().equals("")) ||
editAlamat.getText().toString().equals("")) {
    return false;
} else {
    return true;
}

void simpanFileData() {
    String isiFile = editUsername.getText().toString() + ";" +
editPassword.getText().toString() + ";" +
editEmail.getText().toString() + ";" +
editNamaLengkap.getText().toString() + ";" +
editAsalSekolah.getText().toString() + ";" +
editAlamat.getText().toString();
    File file = new File(getFilesDir(),
editUsername.getText().toString());

    FileOutputStream outputStream = null;
    try {
        file.createNewFile();
        outputStream = new FileOutputStream(file, false);
        outputStream.write(isiFile.getBytes());
        outputStream.flush();
        outputStream.close();
    } catch (Exception e) {
        e.printStackTrace();
    }
    Toast.makeText(this, "Register Berhasil",
Toast.LENGTH_SHORT).show();
    onBackPressed();
}
}
```



# Membuat Halaman Register

5. Selanjutnya tambahkan kode java **MainActivity** sebagaimana berikut ini :

```
package kominfo.go.id.storage.proyek2;

import android.content.DialogInterface;
import android.content.Intent;
import android.support.v7.app.AlertDialog;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.support.v7.widget.Toolbar;
import android.view.Menu;
import android.view.MenuItem;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
import android.widget.Toast;

import java.io.BufferedReader;
import java.io.File;
import java.io.FileReader;
import java.io.IOException;

public class MainActivity extends AppCompatActivity {
    EditText editUsername, editPassword, editEmail, editNamaLengkap,
    editAsalSekolah, editAlamat;
    Button btnSimpan;
    TextView textViewPassword;

    public static final String FILENAME = "login";
```

# Membuat Halaman Register

5. Selanjutnya tambahkan kode java **MainActivity** sebagaimana berikut ini :

```
@Override
protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_register);

    Toolbar toolbar = findViewById(R.id.toolbar);
    setSupportActionBar(toolbar);

    getSupportActionBar().setTitle("Halaman Depan");

    editUsername = findViewById(R.id.editUsername);
    textViewPassword = findViewById(R.id.textViewPassword);
    editPassword = findViewById(R.id.editPassword);
    editEmail = findViewById(R.id.editEmail);
    editNamaLengkap = findViewById(R.id.editNamaLengkap);
    editAsalSekolah = findViewById(R.id.editAsalSekolah);
    editAlamat = findViewById(R.id.editAlamat);
    btnSimpan = findViewById(R.id.btnSimpan);

    btnSimpan.setVisibility(View.GONE);
    editUsername.setEnabled(false);
    editPassword.setVisibility(View.GONE);
    textViewPassword.setVisibility(View.GONE);
    editEmail.setEnabled(false);
    editNamaLengkap.setEnabled(false);
    editAsalSekolah.setEnabled(false);
}
```

# Membuat Halaman Register

5. Selanjutnya tambahkan kode java **MainActivity** sebagaimana berikut ini :

```
        editAlamat.setEnabled(false);

        bacaFileLogin();
    }

    void bacaFileLogin() {
        File sdcard = getFilesDir();
        File file = new File(sdcard, FILENAME);
        if (file.exists()) {
            StringBuilder text = new StringBuilder();
            try {
                BufferedReader br =
                    new BufferedReader(new FileReader(file));
                String line = br.readLine();
                while (line != null) {
                    text.append(line);
                    line = br.readLine();
                }
                br.close();
            } catch (IOException e) {
                System.out.println("Error " + e.getMessage());
            }
            String data = text.toString();
            String[] dataUser = data.split(";");
            bacaDataUser(dataUser[0]);
        }
    }
```

# Membuat Halaman Register

5. Selanjutnya tambahkan kode java **MainActivity** sebagaimana berikut ini :

```
void bacaDataUser(String fileName) {  
    File sdcard = getFilesDir();  
    File file = new File(sdcard, fileName);  
    if (file.exists()) {  
        StringBuilder text = new StringBuilder();  
        try {  
            BufferedReader br =  
                new BufferedReader(new FileReader(file));  
            String line = br.readLine();  
            while (line != null) {  
                text.append(line);  
                line = br.readLine();  
            }  
            br.close();  
        } catch (IOException e) {  
            System.out.println("Error " + e.getMessage());  
        }  
        String data = text.toString();  
        String[] dataUser = data.split(";");  
  
        editUsername.setText(dataUser[0]);  
        editEmail.setText(dataUser[2]);  
        editNamaLengkap.setText(dataUser[3]);  
        editAsalSekolah.setText(dataUser[4]);  
        editAlamat.setText(dataUser[5]);  
  
    } else {  
        Toast.makeText(this, "User Tidak Ditemukan",
```

# Membuat Halaman Register

5. Selanjutnya tambahkan kode java **MainActivity** sebagaimana berikut ini :

```
Toast.LENGTH_SHORT).show();
    }

    @Override
    public boolean onCreateOptionsMenu(Menu menu) {
        getMenuInflater().inflate(R.menu.menu, menu);
        return true;
    }

    @Override
    public boolean onOptionsItemSelected(MenuItem item) {
        switch (item.getItemId()) {
            case R.id.action_logout:
                tampilkanDialogKonfirmasiLogout();
                break;
        }
        return super.onOptionsItemSelected(item);
    }

    void hapusFile() {
        File file = new File(getFilesDir(), FILENAME);
        if (file.exists()) {
            file.delete();
        }
    }
}
```

# Membuat Halaman Register

5. Selanjutnya tambahkan kode java **MainActivity** sebagaimana berikut ini :

```
void tampilkanDialogKonfirmasiLogout() {  
    new AlertDialog.Builder(this)  
        .setTitle("Logout")  
        .setMessage("Apakah Anda yakin ingin Logout?")  
        .setIcon(android.R.drawable.ic_dialog_alert)  
        .setPositiveButton(android.R.string.yes, new  
DialogInterface.OnClickListener() {  
  
            public void onClick(DialogInterface dialog, int  
whichButton) {  
  
                hapusFile();  
                Intent intent = new Intent(MainActivity.this,  
LoginActivity.class);  
                startActivity(intent);  
                finish();  
            }  
        })  
        .setNegativeButton(android.R.string.no, null).show();  
}
```

# Menguji Aplikasi Proyek 2

1. Jalankan aplikasi, lalu
2. Uji fungsionalitas registrasi, login dan logout.

# Kesimpulan

- Proyek1, anda membuat aplikasi catatan harian dimana proses penyimpanannya menggunakan *external storage*.
- Proyek2, anda membuat aplikasi validasi login, dimana data user disimpan pada *internal storage*.
- Data persistence dapat digunakan untuk menyimpan data apapun sesuai kebutuhan dalam bentuk file. Data ini bersifat tetap dan tidak akan hilang selama tidak dihapus.



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