

ANDROID DEVELOPMENT

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ANDROID HISTORY

- Android is an open source and Linux-based **Operating System** for mobile devices such as smartphones and tablet computers. Android was developed by the *Open Handset Alliance*, led by Google, and other companies.
- The first beta version of the Android Software Development Kit (SDK) was released by Google in 2007 where as the first commercial version, Android 1.0, was released in September 2008.

ANDROID



Cupcake



Donut



Eclair



Froyo



Gingerbread



Honeycomb



Ice Cream Sandwich



Jelly Bean



KitKat



Lollipop



Marshmallow

REQUIRED TOOLS

- Java JDK5 or later version
 - Java Runtime Environment (JRE) 6
 - Android SDK
 - Android Studio
 - Eclipse IDE for Java Developers
 - ADB Driver
-



I INSTALLED ANDROID STUDIO



**BECAUSE I THOUGHT IT WILL
BE FASTER THAN ECLIPSE**



PROJECT FOLDERS

- **src** - This contains the `.java` source files for your project. By default, it includes a `MainActivity.java` source file having an activity class that runs when your app is launched using the app icon.
 - **res/drawable** - This is a directory for drawable objects that are designed for high-density screens.
 - **res/layout** - This is a directory for files that define your app's user interface.
 - **res/values** - This is a directory for other various XML files that contain a collection of resources, such as strings and colors definitions.
 - **AndroidManifest.xml** - This is the manifest file which describes the fundamental characteristics of the app and defines each of its components.
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ACTIVITIES

- An activity represents a single screen with a user interface, in-short Activity performs actions on the screen. For example, an email application might have one activity that shows a list of new emails, another activity to compose an email, and another activity for reading emails. If an application has more than one activity, then one of them should be marked as the activity that is presented when the application is launched.

```
public class MainActivity extends Activity {  
    @Override  
    public void onCreate(Bundle savedInstanceState) {  
        super.onCreate(savedInstanceState);  
        setContentView(R.layout.activity_main);  
    }  
}
```


LAYOUT

```
<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=".MainActivity" >

  <TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_centerHorizontal="true"
    android:layout_centerVertical="true"
    android:text="@string/hello_world"/>

</RelativeLayout>
```

MANIFEST

```
<manifest xmlns:android=http://schemas.android.com/apk/res/android
    package="com.example.helloworld"
    android:versionCode="1"
    android:versionName="1.0" >
    <uses-sdk
        android:minSdkVersion="8"
        android:targetSdkVersion="22" />
    <uses-permission android:name="android.permission.CAMERA" />
    <uses-permission android:name="android.permission.INTERNET" />
    <application
        android:icon="@drawable/ic_launcher"
        android:label="@string/app_name"
        android:theme="@style/AppTheme" >
        <activity
            android:name=".MainActivity"
            android:label="@string/title_activity_main" >
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />
                <category android:name="android.intent.category.LAUNCHER"/>
            </intent-filter>
        </activity>
    </application>
</manifest>
```

BUILDING WITH GRADLE

```
apply plugin: 'com.android.application'
```

```
android {  
    compileSdkVersion 23  
    buildToolsVersion "23.0.3"  
    defaultConfig {  
        applicationId "com.resentient.hwat"  
        versionCode 2  
        versionName "1.0.2"  
    }  
}
```

```
dependencies {  
    testCompile 'junit:junit:4.12'  
    compile 'com.android.support:appcompat-v7:23.4.0'  
    compile 'com.clarifai:clarifai-api-java:1.2.0'  
}
```

**MY COMP SAID GRADLE BUILD
FAILED**

SO...

PASSING DATA BETWEEN ACTIVITIES

Ways to pass data between activities:

- Save the data in a database
- Save the data in a file
- Use Shared preferences
- Use Intent

SHARED PREFERENCES

Shared Preferences allow you to save and retrieve data in the form of key-value pair. Shared Preferences values will persist across user sessions. Data in shared preferences will be persistent even though user closes the application. You can get values from Shared preferences using `getSharedPreferences()` method.

```
SharedPreferences sharedPreferences = getSharedPreferences("MyPreferences",
Context.MODE_PRIVATE);

if (sharedPreferences.getBoolean("LaunchedFirstly", true)) {

    SharedPreferences.Editor e = sharedPreferences.edit();
    e.putBoolean("LaunchedFirstly", false);
    e.commit();

}
```

INTENT

An **Intent** in the Android operating system is a software mechanism that allows users to start some actions or just passing some info between two activities.

Example:

```
Intent i = new Intent(getApplicationContext(), MyActivity.class);
```

```
i.putExtra("name", "Ihor");
```

```
i.putExtra("surname", "Sokolyk");
```

```
startActivity(i);
```

```
Intent intent = getIntent();
```

```
String message = intent.getStringExtra("name");
```

Starting camera example:

```
Intent intent = new Intent(MediaStore.ACTION_IMAGE_CAPTURE);
Uri file = Uri.fromFile(new File(pathToImage));
intent.putExtra(MediaStore.EXTRA_OUTPUT, file);
startActivityForResult(intent, 100);
```

@Override

```
protected void onActivityResult(int requestCode, int resultCode, Intent data) {
    if (requestCode == 100) {
        if (resultCode == RESULT_OK) {
            takenPhoto.setImageURI(file);
        }
    }
}
```


Sharing in facebook example:

```
public void shareOnFacebook(View view) {
    Uri uri = Uri.fromFile(takeScreenshot());

    Intent sharingIntent = new Intent(android.content.Intent.ACTION_SEND);
    sharingIntent.setType("image/*");
    sharingIntent.putExtra(Intent.EXTRA_STREAM, uri);
    setDefaultPackageForIntent(sharingIntent, "com.facebook");

    if (sharingIntent.getPackage() != null) {
        startActivity(sharingIntent);
    } else {
        Toast.makeText(getApplicationContext(), "Facebook not installed",
        Toast.LENGTH_SHORT).show();
    }
}
```

GET VIEW ELEMENTS FROM ACTIVITY

```
ImageView takenPhoto = (ImageView) findViewById(R.id.imageView);  
takenPhoto.setImageBitmap(BitmapFactory.decodeResource(getResources(),  
R.drawable.correct));  
takenPhoto.setVisibility(View.INVISIBLE);
```

ADDING LISTENERS TO ELEMENTS

```
final Button button = (Button) findViewById(R.id.button_id);
button.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        // Perform action on click
    }
});
```

ON TOUCH AND SWIPE EVENTS

@Override

```
public boolean onTouchEvent(MotionEvent event) {  
    int action = event.getActionMasked();  
    switch (action) {  
        case MotionEvent.ACTION_DOWN:  
            initialX = event.getX();  
            initialY = event.getY();  
            Log.d(TAG, "Action was DOWN");  
            break;  
        case MotionEvent.ACTION_MOVE:  
            Log.d(TAG, "Action was MOVE");  
            break;
```

```
case MotionEvent.ACTION_UP:
    float finalX = event.getX();
    float finalY = event.getY();
    Log.d(TAG, "Action was UP");
    if (initialX < finalX) {
        Log.d(TAG, "Left to Right swipe performed");
    }
    if (initialX > finalX) {
        Log.d(TAG, "Right to Left swipe performed");
    }
    if (initialY < finalY) {
        Log.d(TAG, "Up to Down swipe performed");
    }
    if (initialY > finalY) {
        Log.d(TAG, "Down to Up swipe performed");
    }
    break;
}
return super.onTouchEvent(event);
}
```

DIALOG WINDOWS

```
final Dialog dialog = new Dialog(this);  
dialog.requestWindowFeature(Window.FEATURE_NO_TITLE);  
dialog setContentView(R.layout.share_dialog);  
dialog.setCanceledOnTouchOutside(true);  
dialog.show();
```

CHECK INTERNET CONNECTION

```
ConnectivityManager connectivity = (ConnectivityManager)
getApplicationContext().getSystemService(Context.CONNECTIVITY_SERVICE);
if (connectivity != null) {
    NetworkInfo info = connectivity.getActiveNetworkInfo();
    if (info != null)
        if (info.getState() == NetworkInfo.State.CONNECTED) {
            Toast.makeText(getApplicationContext(), "Connected",
Toast.LENGTH_SHORT).show();
        }
    }
}
```

ASYNC TASK

```
class DataLoader extends AsyncTask<Void, Void, Void> {

    @Override
    protected Void doInBackground(Void... params) {
        insertLevelsDataIntoDatabase();
        return null;
    }

    @Override
    protected void onPostExecute(Void aVoid) {
        new android.os.Handler().postDelayed(
            new Runnable() {
                public void run() {
                    Intent intent = new Intent(getApplicationContext(), WelcomeActivity.class);
                    startActivity(intent);
                    finish();
                }
            }, 2000);
        super.onPostExecute(aVoid);
    }
}

DataLoader dataLoader = new DataLoader();
dataLoader.execute();
```


SQLITE

Creating database:

```
public class DatabaseCreator extends SQLiteOpenHelper {

    public DatabaseCreator(Context context) {
        super(context, "MyDatabase", null, 1);
    }

    @Override
    public void onCreate(SQLiteDatabase db) {
        db.execSQL("CREATE TABLE IF NOT EXISTS levels ("
            + "id integer primary key autoincrement,"
            + "levelId integer NOT NULL,"
            + "question text NOT NULL,"
            + "answer text NOT NULL,"
            + "type text NOT NULL,"
            + "image BLOB default NULL,"
            + "isLevelCompleted integer);");
    }

    @Override
    public void onUpgrade(SQLiteDatabase db, int oldVersion, int newVersion) {

    }

}
```

Inserting data into database:

```
DatabaseCreator dbHelper = new DatabaseCreator(context);
```

```
SQLiteDatabase db = dbHelper.getWritableDatabase();
```

```
ContentValues cv = new ContentValues();
```

```
cv.put("levelId", 1);
```

```
cv.put("question", "Catch smile");
```

```
cv.put("answer", "smile");
```

```
cv.put("type", "emotion");
```

```
if (db.update("levels", cv, "levelId = " + 1, null) == 0) {
```

```
    db.insert("levels", null, cv);
```

```
}
```

```
cv.clear();
```

Fetching data from database:

```
DatabaseCreator dbHelper = new DatabaseCreator(context);
SQLiteDatabase db = dbHelper.getWritableDatabase();
Cursor cursor = db.rawQuery("SELECT * FROM levels WHERE levelId = 1", null);
if (cursor.moveToFirst()) {
    do {
        levelQuestion = cursor.getString(cursor.getColumnIndex("question"));
        levelAnswer = cursor.getString(cursor.getColumnIndex("answer"));
        levelType = cursor.getString(cursor.getColumnIndex("type"));
        correctImage = cursor.getBlob(cursor.getColumnIndex("image"));
    } while (cursor.moveToNext());
}
cursor.close();
```

**Thank you for your Time and
Attention!**

