
Mobile Application Development Fragments

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Activities

What is an Activity?

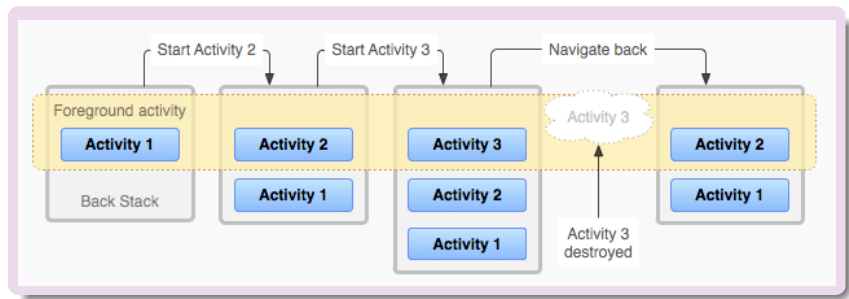
- Most visible element of an app
- Typically single screen individually displayed on device
- Application usually has many activities
- Prior to Honeycomb, the UI tightly bound to activity
- Subsequently modularization possible using Fragment class

```
public class ResidenceCameraActivity extends Activity
{
    ...
    @Override
    protected void onCreate(Bundle savedInstanceState)
    {
        super.onCreate(savedInstanceState);
        ...
    }
}
```

Activities

Tasks & back stack

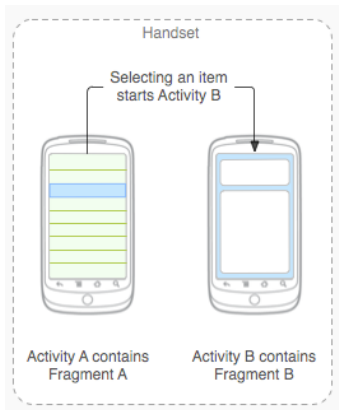
- **Task** : collection of activities
- Stored or arranged in **back stack**
- Can navigate these using back button
- Task list managed by Android O.S.



Fragments

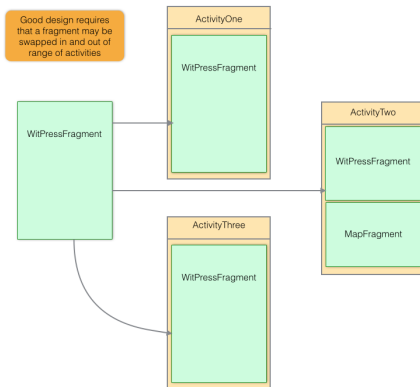
What is a Fragment?

- Controller object to perform tasks for activity
- Typically represents behaviour of portion of UI in activity
- Can be used without UI



Fragments

Swap in and out of activities



Fragments

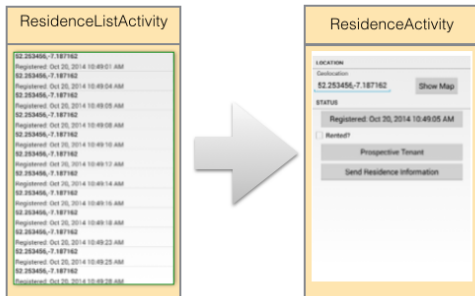
Tablet

ResidenceListDetailsActivity

| | |
|---|--|
| S2.253456,-7.187162 Registered: Oct 20, 2014 10:49:01 AM | LOCATION |
| S2.253456,-7.187162 Registered: Oct 20, 2014 10:49:04 AM | Geolocation |
| S2.253456,-7.187162 Registered: Oct 20, 2014 10:49:05 AM | <u>52.253456,-7.187162</u> Show Map |
| S2.253456,-7.187162 Registered: Oct 20, 2014 10:49:08 AM | STATUS |
| S2.253456,-7.187162 Registered: Oct 20, 2014 10:49:10 AM | Registered: Oct 20, 2014 10:49:05 AM |
| S2.253456,-7.187162 Registered: Oct 20, 2014 10:49:12 AM | <input type="checkbox"/> Rented? |
| S2.253456,-7.187162 Registered: Oct 20, 2014 10:49:14 AM | Prospective Tenant |
| S2.253456,-7.187162 Registered: Oct 20, 2014 10:49:16 AM | Send Residence Information |
| S2.253456,-7.187162 Registered: Oct 20, 2014 10:49:18 AM | <small>File for persons use</small> |
| S2.253456,-7.187162 Registered: Oct 20, 2014 10:49:19 AM | |
| S2.253456,-7.187162 Registered: Oct 20, 2014 10:49:22 AM | |
| S2.253456,-7.187162 Registered: Oct 20, 2014 10:49:23 AM | |
| S2.253456,-7.187162 Registered: Oct 20, 2014 10:49:25 AM | |
| S2.253456,-7.187162 Registered: Oct 20, 2014 10:49:28 AM | |

Fragments

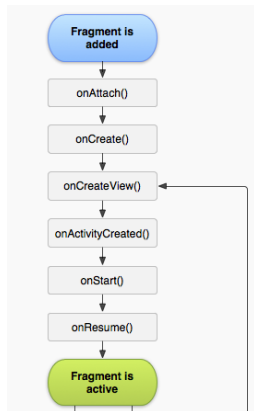
Phone



Fragments

Lifecycle

- Fragments have own lifecycle
- This directly affected by host activity
- Example when activity paused, fragment paused
- Fragment has some extra lifecycle functionality
 - Example: *onCreateView*



Fragments

Manipulating fragments

- FragmentManager responsible managing fragments
- Fragment transactions are used to add, remove, attach, detach, or replace fragments
- Can add remove fragment while activity running
- Can manipulate each fragment independently

```
private void initializeMapFragment()
{
    FragmentManager fm = getChildFragmentManager();
    mapFragment = (SupportMapFragment) fm.findFragmentById(R.id.map);
    if (mapFragment == null)
    {
        mapFragment = SupportMapFragment.newInstance();
        fm.beginTransaction().replace(R.id.map, mapFragment).commit();
    }
}
```

Fragments

Creating Fragments

- Can create declaratively
 - Within xml layout file
- Or programatically
 - Example in previous *initializeMapFragment*
- Can nest fragments within fragment

```
<!-- fragment_residence.xml -->
<LinearLayout ...>
  <LinearLayout...>
    ...
    <FrameLayout
      android:id="@+id/map"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"/>
  </LinearLayout>
</LinearLayout>
```

Fragments

Modify Activity.onCreate to accept Fragment

- Introduce a fragment container
- Main layout now inflated in fragment
- Instantiate fragment

```
public class MainActivity extends FragmentActivity
{
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.fragment_container);
        FragmentManager manager = getSupportFragmentManager();
        Fragment fragment = manager.findFragmentById(R.id.fragmentContainer);
        if (fragment == null) {
            fragment = new MainFragment();
            manager.beginTransaction().add(R.id.fragmentContainer, fragment).
                commit();
        }
    }
}
```

Fragments

Introduce a fragment

- Fragment class extends `Fragment`
- Fragment class has
 - `public void onCreate(Bundle)`
 - `public View onCreateView(...)`
- `Fragment onCreateView` : inflates layout

```
public class ResidenceFragment extends Fragment {
    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
    }
    @Override
    public View onCreateView(LayoutInflater inflater, ...) {
        View v = inflater.inflate(R.layout.myrent, parent, false);
        return v;
    }
}
```

MyRent app

Activity only

```
public class ResidenceActivity extends Activity {  
    ...  
    @Override  
    protected void onCreate(Bundle savedInstanceState) {  
        super.onCreate(savedInstanceState);  
        setContentView(R.layout.activity_residence);  
        UUID resId = ...;  
        ..  
        addListeners();  
        updateControls(residence);  
    }  
    ...  
}
```

MyRent app

Activity + Fragment

```
public class ResidenceActivity extends FragmentActivity
{
    public void onCreate(Bundle savedInstanceState)
    {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.fragment_container);

        FragmentManager manager = getSupportFragmentManager();
        Fragment fragment = manager.findFragmentById(R.id.fragmentContainer);
        if (fragment == null)
        {
            fragment = new ResidenceFragment();
            manager.beginTransaction().add(R.id.fragmentContainer, fragment).
                commit();
        }
    }
}
```

MyRent app

Activity + Fragment

```
public class ResidenceFragment extends Fragment implements ... {
    ...
    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        UUID resId = ...;
        ...
    }
    @Override
    public View onCreateView(...) {
        View v = inflater.inflate(R.layout.fragment_residence, parent, false);
        addListeners(v);
        updateControls(residence);
        return v;
    }
    ...
}
```

Referenced Material

1. Android Documentation: Fragments

`http://developer.android.com/guide/components/fragments.html`

[Accessed 2014-10-22]