

Mastering Android Tasks

Why I am on stage?

- Ran is Android GDE.
- Ran knows how to use Impress
- Ran spent lot of time on Android tasks.
- Ran can break-dance.



```
public void DoAgenda() {  
  
    ArrayList<Item> agenda = new ArrayList<Item>() ;  
  
    agenda.add(new Item("What is activity"));  
    agenda.add(new Item("What is Task"));  
    agenda.add(new Item("Manipulating tasks and back stack"));  
    agenda.add(new Item("Debugging"));  
}
```

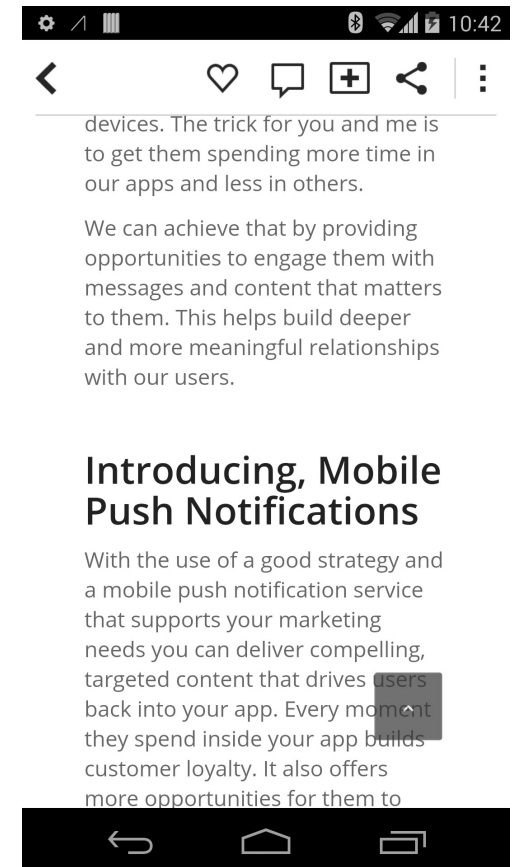
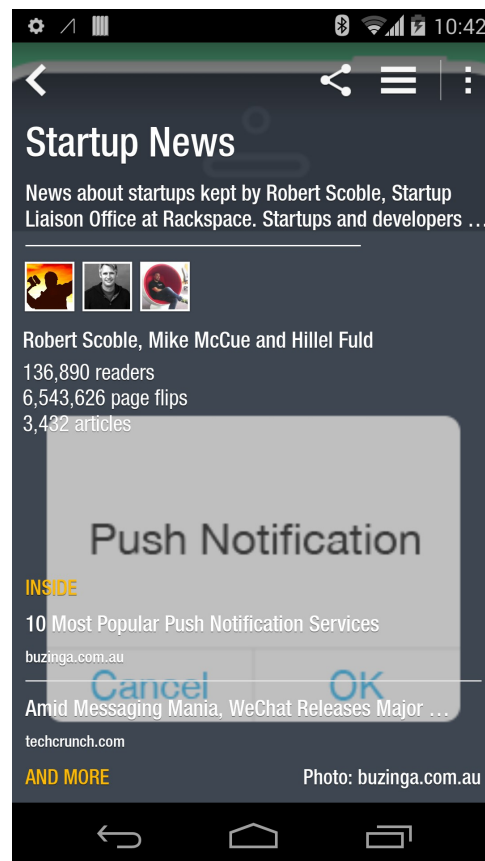
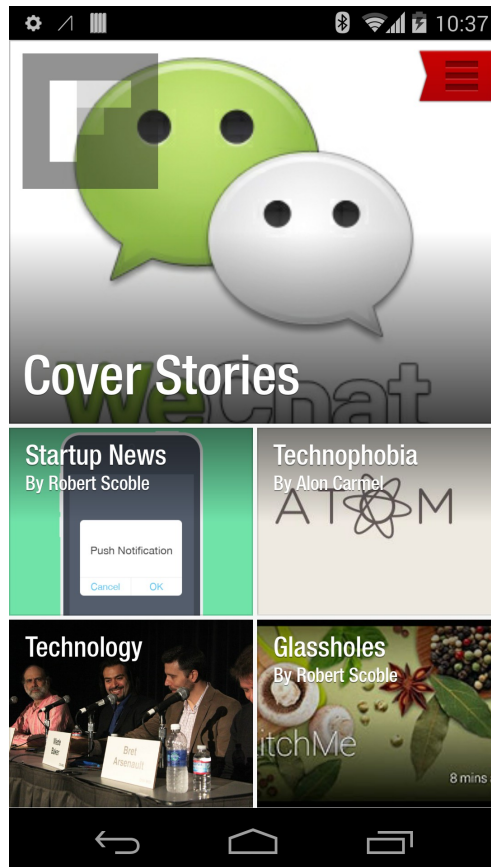
Activities

- Single UI screen.
- Stacked like a deck of cards.
- Only one is visible.
- Only one is active.
- New *Activities* are places on top.



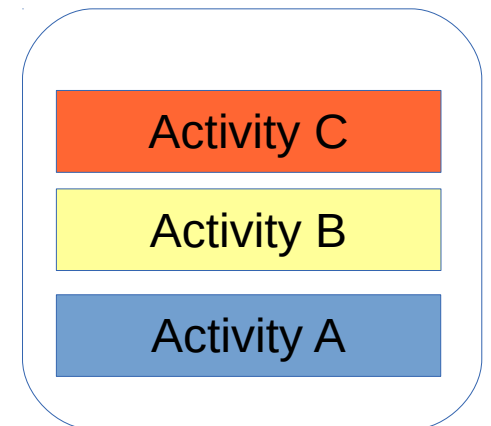
Activities

- Application may have more than one *Activity*



Task

- Collection of activities.
- Organized in stack (i.e. “back stack”)
- Task have at least one activity.
- New activities placed on top
- LIFO Queue
- Each task has a “name” called Affinity.



Tasks

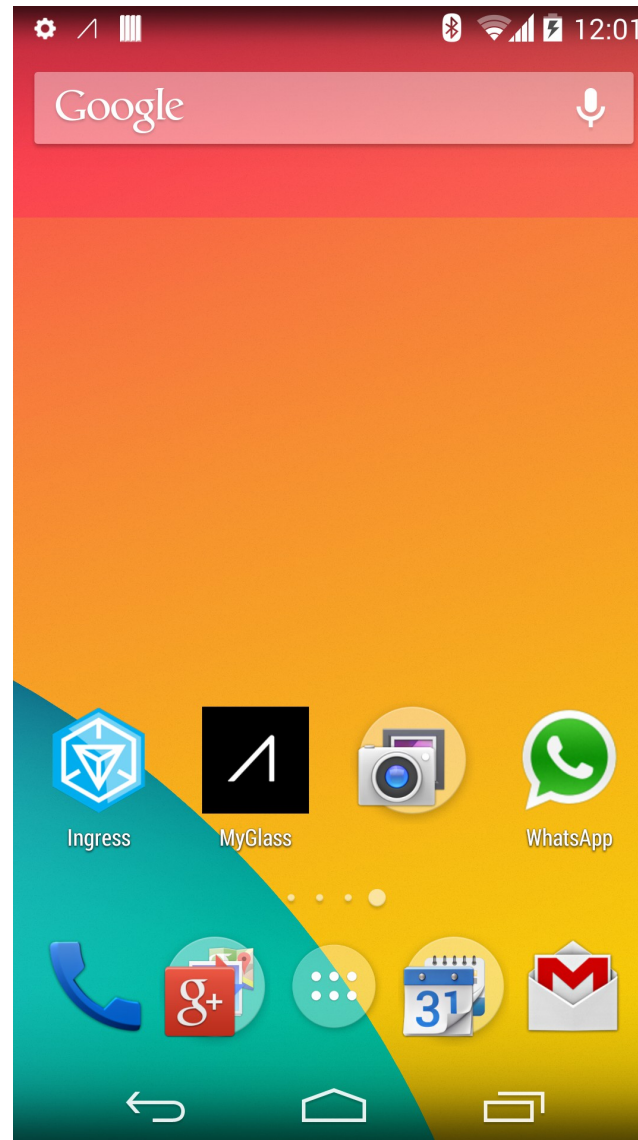
- Each app has at least one task
 - May have more
- Tasks can be moved to “background”
 - Keeping their back stack.
- User navigate between tasks
 - Easy switching between apps.
 - Multitasking experience.

User's Action

- Home

(Foreground Task)

(Background Tasks)



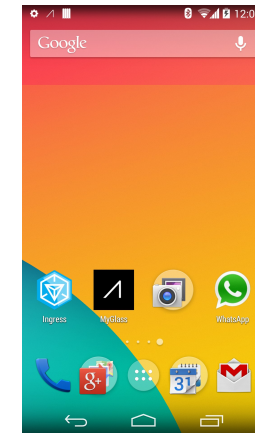
User's Action

- Home
- Ingress

(Foreground Task)



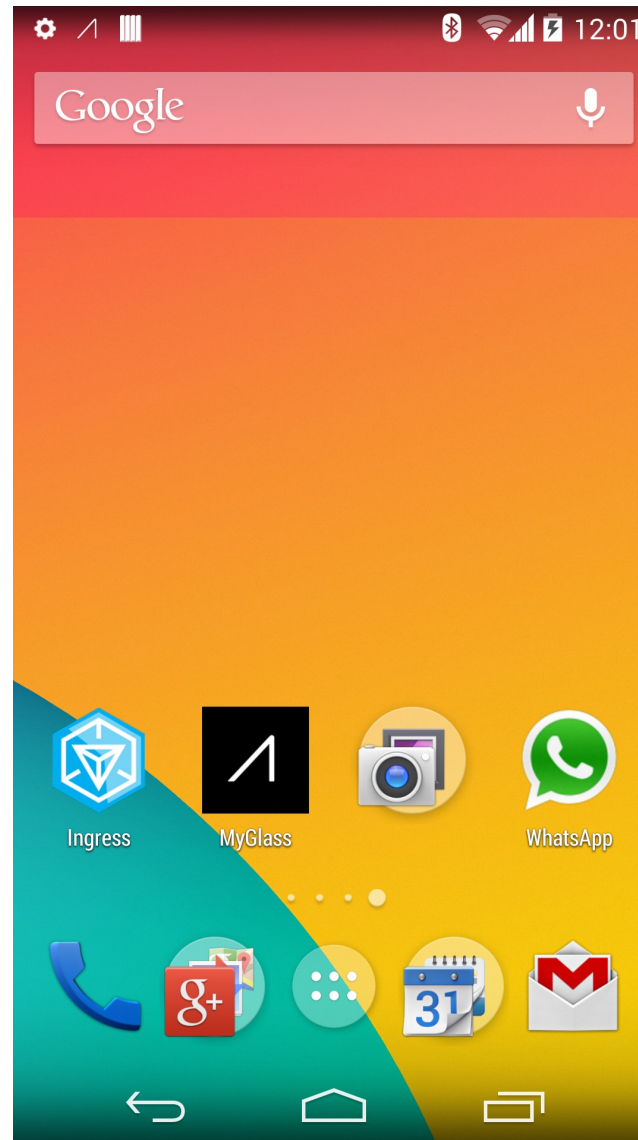
(Background Tasks)



User's Action

- Home
- Ingress
- Home

(Foreground Task)



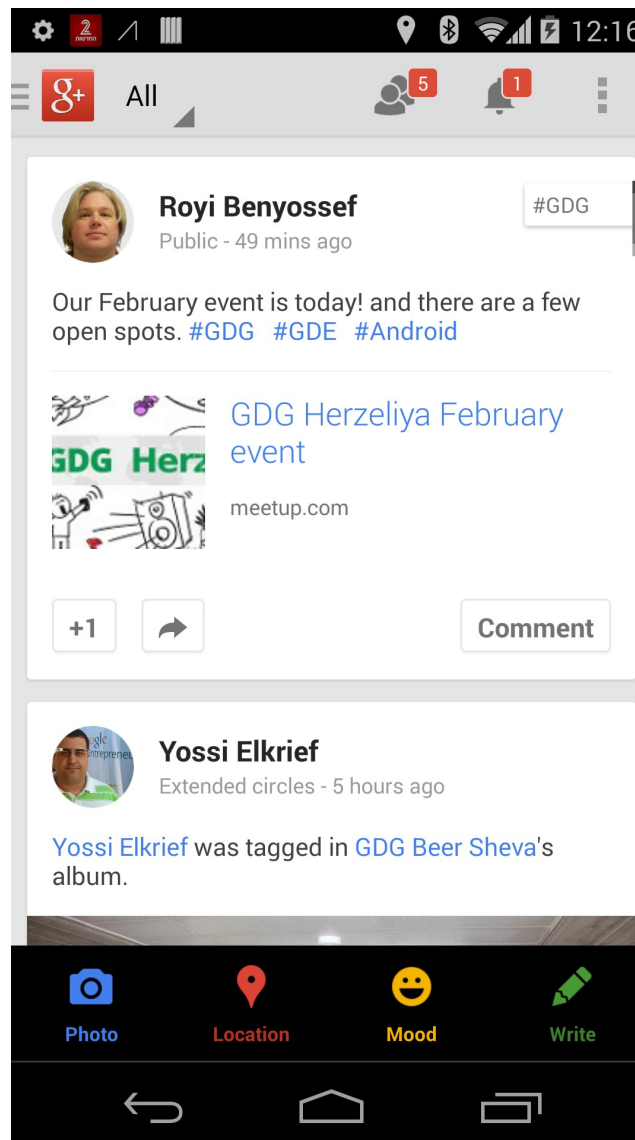
(Background Tasks)



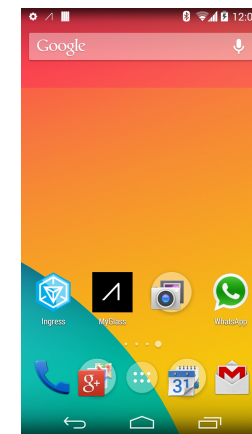
User's Action

- Home
- Ingress
- Home
- G+

(Foreground Task)



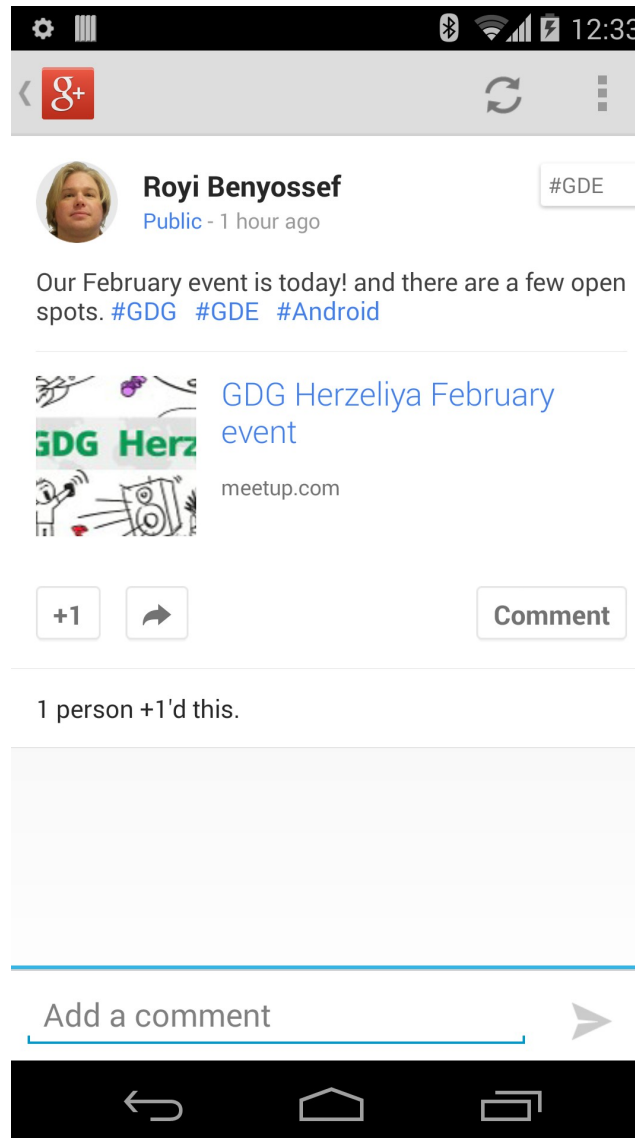
(Background Tasks)



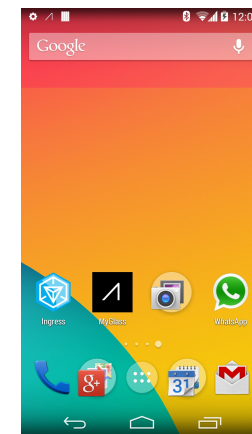
User's Action

- Home
- Ingress
- Home
- G+
- Enters Post

(Foreground Task)



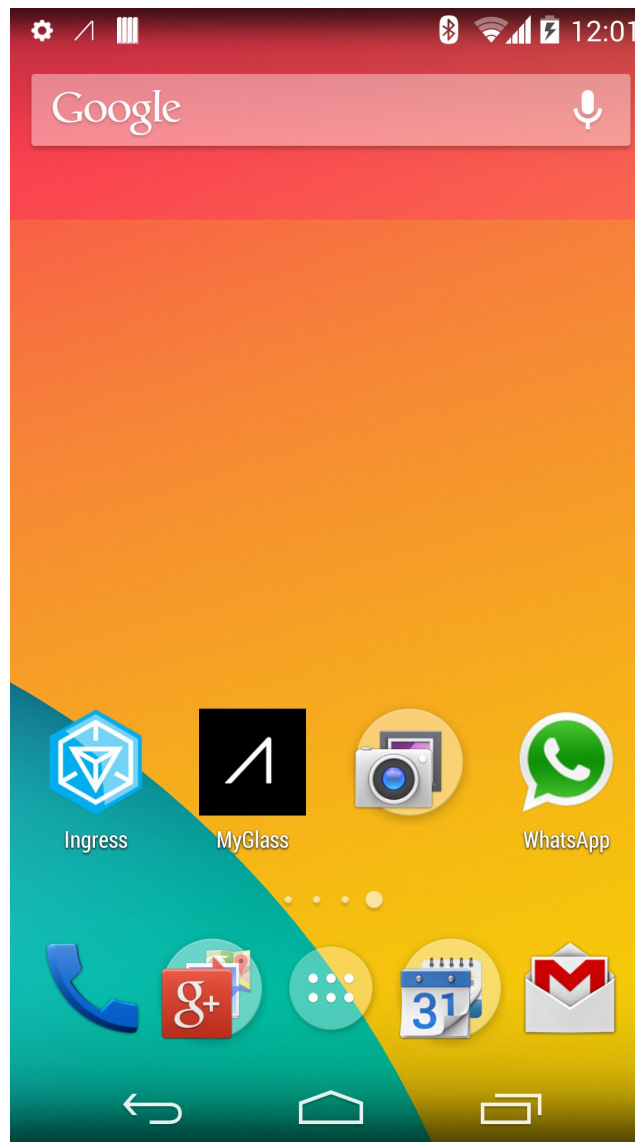
(Background Tasks)



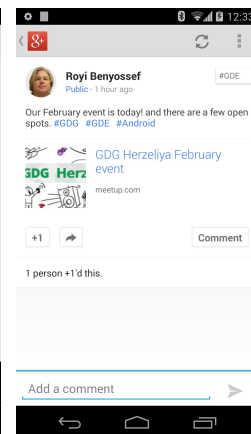
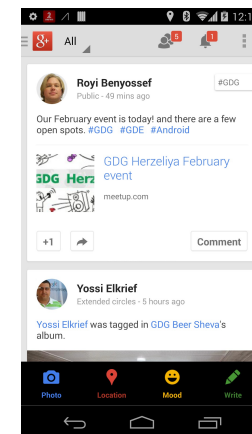
User's Action

- Home
- Ingress
- Home
- G+
- Enters Post
- Home

(Foreground Task)



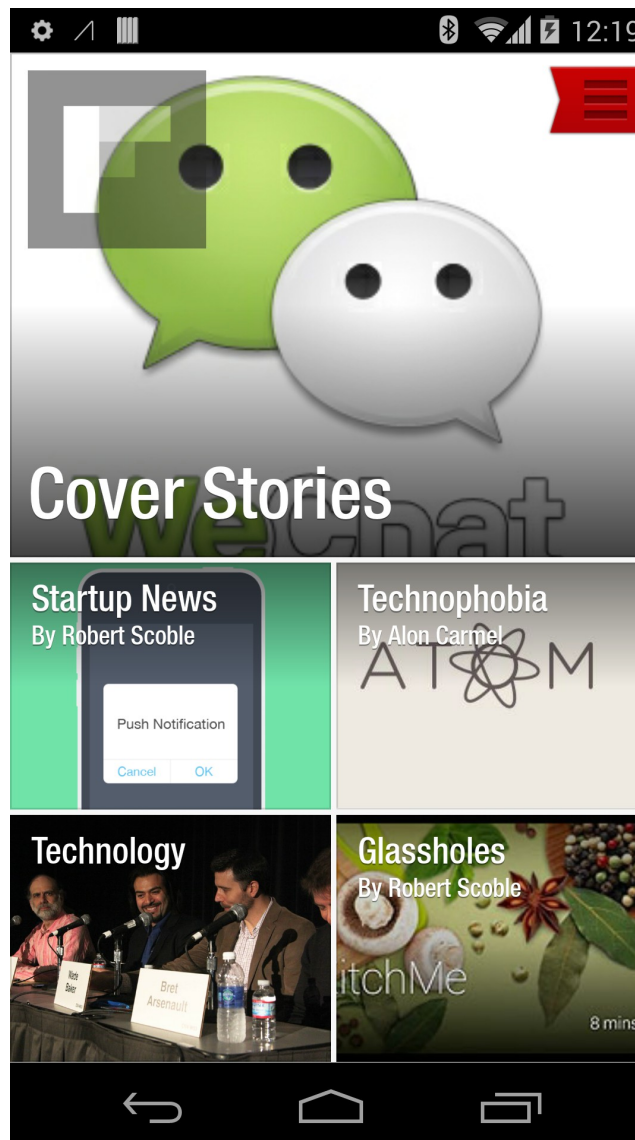
(Background Tasks)



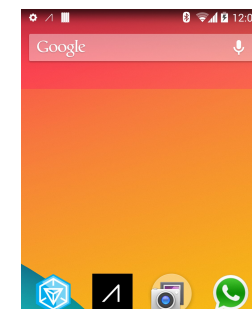
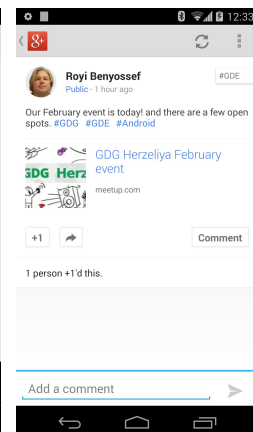
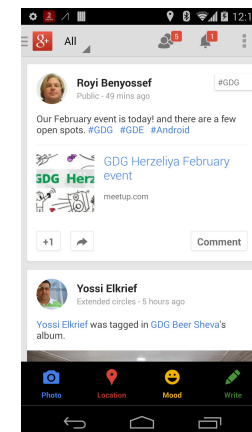
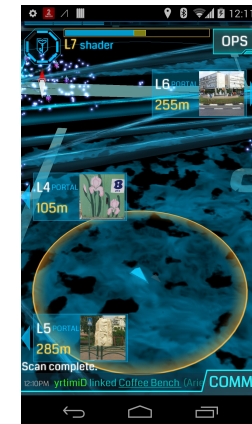
User's Action

- Home
- Ingress
- Home
- G+
- Enters Post
- Home
- Flipboard

(Foreground Task)



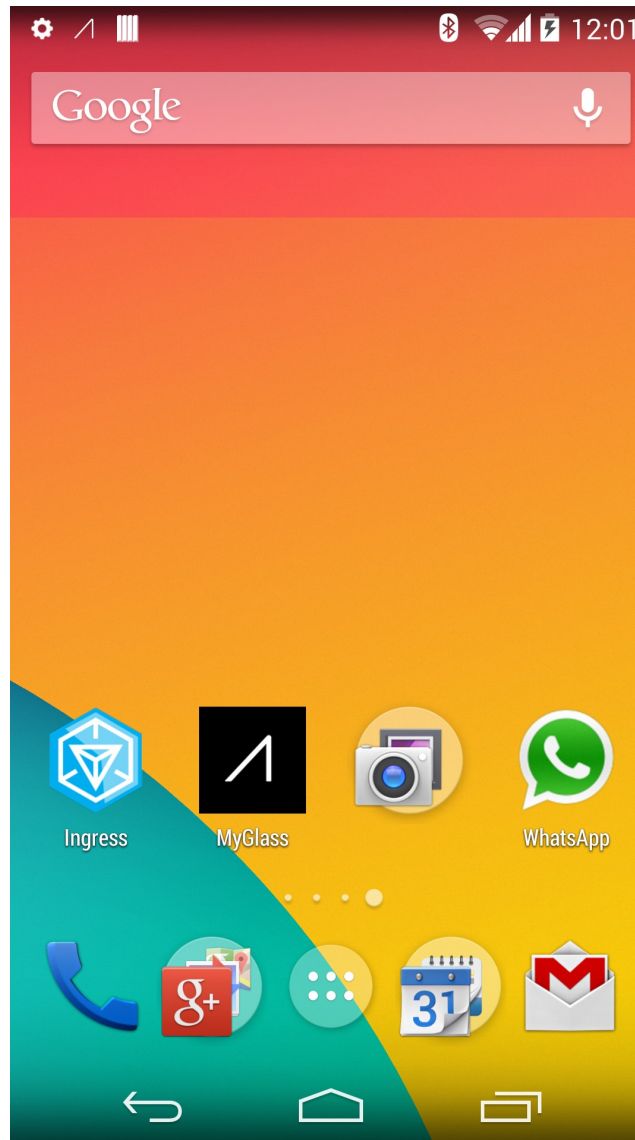
(Background Tasks)



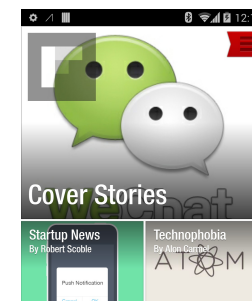
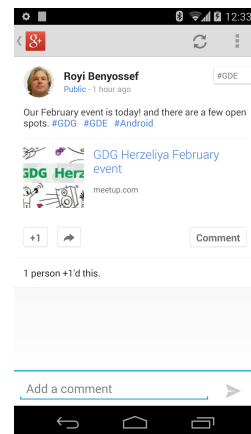
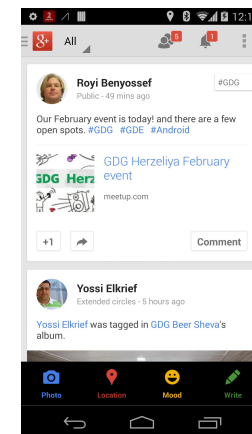
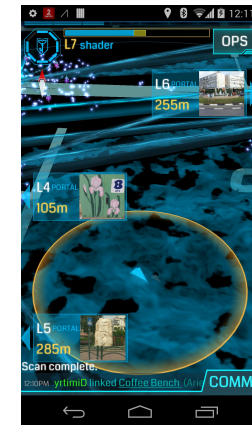
User's Action

- Home
- Ingress
- Home
- G+
- Enters Post
- Home
- Flipboard
- Home

(Foreground Task)



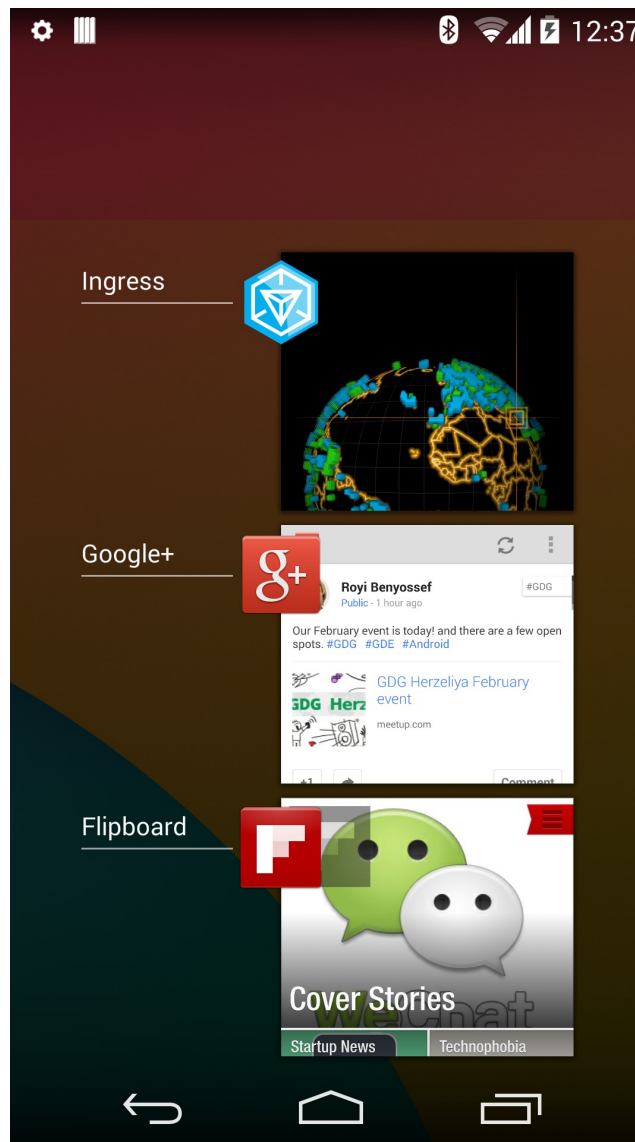
(Background Tasks)



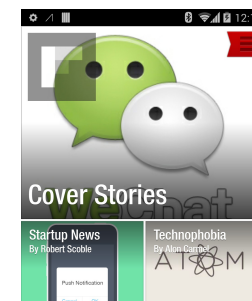
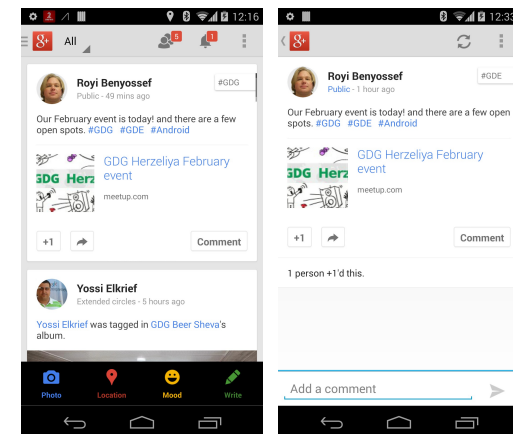
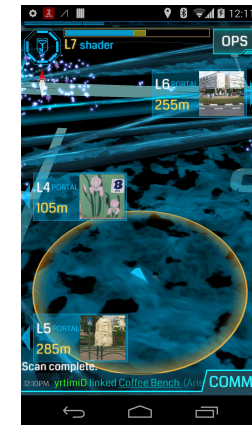
User's Action

- Home
- Ingress
- Home
- G+
- Enters Post
- Home
- Flipboard
- Home
- Recent Apps

(Foreground Task)



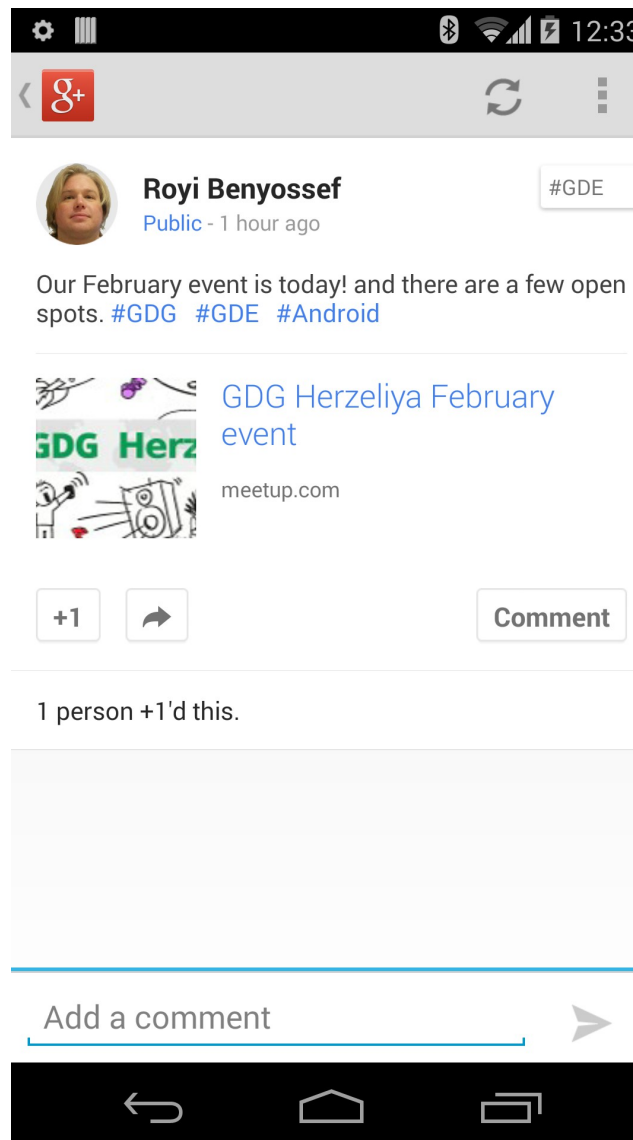
(Background Tasks)



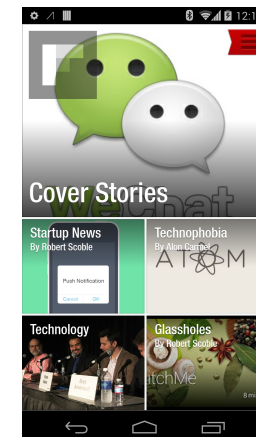
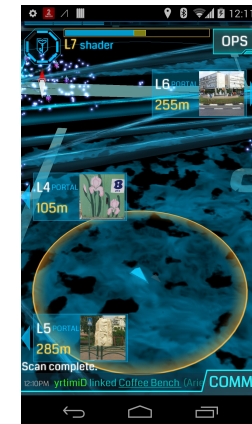
User's Action

- Home
- Ingress
- Home
- G+
- Enters Post
- Home
- Flipboard
- Home
- Recent Apps
- G+

(Foreground Task)



(Background Tasks)



Why Manipulate?

Why Manipulate default behavior?

- Multiple entry points to the app
 - Launcher
 - Notification
 - Share Intent
- “Singleton” Activity
 - Activity that wants to share data between instances.
(example: browser)

Changing default behavior

- `<activity>` tag attributes in `AndroidManifest.xml`
 - Launchmode
 - TaskAffinity
 - ...
- Adding flags to Intent used to launch the activity
 - `FLAG_ACTIVITY_NEW_TASK`
 - `FLAG_ACTIVITY_CLEAR_TOP`
 - `FLAG_ACTIVITY_SINGLE_TOP`
- Warning – only sounds easy.

Android:taskAffinity

- Used to determine the task that should hold the activity
 - Task that has the same affinity value
- By Default: all activities share the same affinity (package name)
- Task's affinity is the affinity of the activity that created it (also called root activity)

Example

Manifest:

```
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.myApp"
    android:versionCode="1"
    android:versionName="1.0" >

    <application android:allowBackup="true" >
        <activity android:name="ActivityA" />

        <activity android:name="ActivityB" android:taskAffinity="com.something" />

    </application>

</manifest>
```

- Activity A is launched

Example

Manifest:

```
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.myApp"
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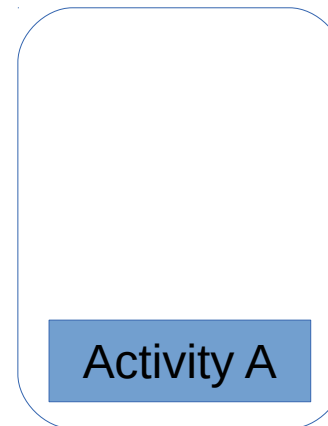
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</manifest>
```

- Activity A is launched



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Example

Manifest:

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<manifest xmlns:android="http://schemas.android.com/apk/res/android"
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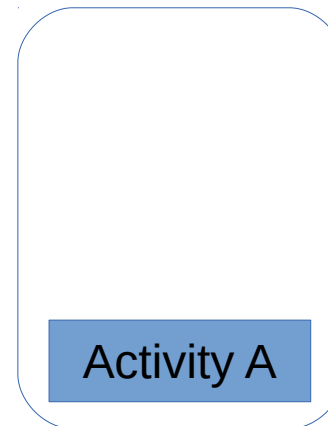
        <activity android:name="ActivityB" android:taskAffinity="com.something" />

    </application>

</manifest>
```

- Activity A is launched
- Activity A's code:

```
Intent I = new Intent (this,ActivityB.class)
startActivity(i)
```



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Example

Manifest:

```
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.myApp"
    android:versionCode="1"
    android:versionName="1.0" >

    <application android:allowBackup="true" >
        <activity android:name="ActivityA" />

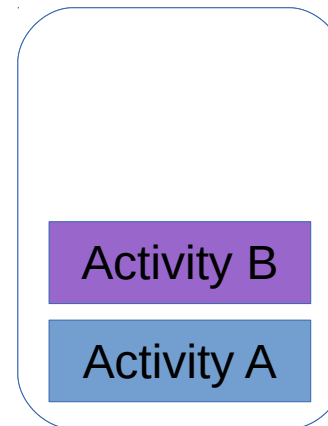
        <activity android:name="ActivityB" android:taskAffinity="com.something" />

    </application>

</manifest>
```

- Activity A is launched
- Activity A's code:

```
Intent I = new Intent (this,ActivityB.class)
startActivity(i)
```



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What?

Why like this?

- Activity B added to the same task although it had different affinity
- In order to create a new task – you need to add `FLAG_ACTIVITY_NEW_TASK` to the launching intent

Example

Manifest:

```
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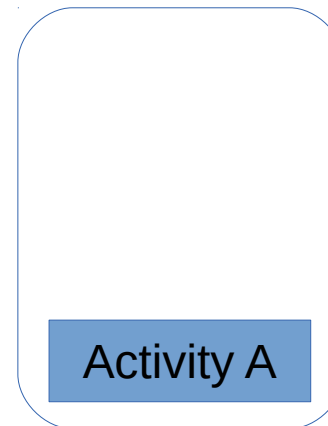
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    </application>

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```

- Activity A is launched



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Example

Manifest:

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    </application>

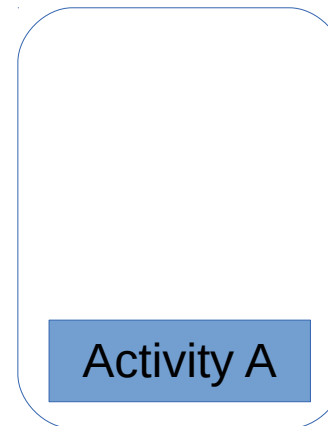
</manifest>
```

- Activity A is launched
- Activity A's code:

Intent I = new Intent(this,ActivityB.class)

I.addFlags(Intent.FLAG_ACTIVITY_NEW_TASK)

startActivity(i)



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Example

Manifest:

```
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.myApp"
    android:versionCode="1"
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    <application android:allowBackup="true" >
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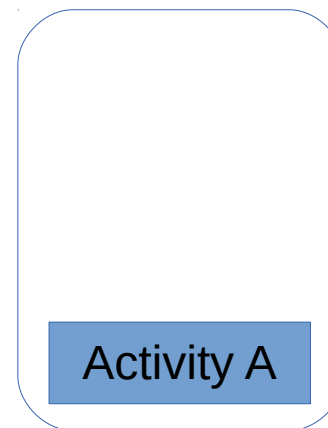
</manifest>
```

- Activity A is launched
- Activity A's code:

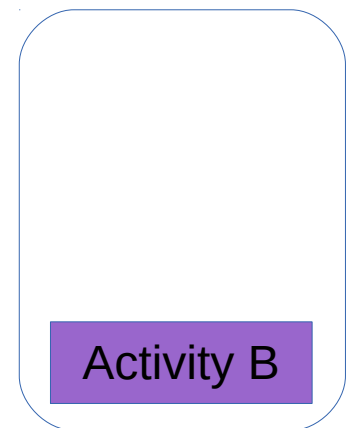
Intent I = new Intent (this,ActivityB.class)

I.addFlags(Intent.FLAG_ACTIVITY_NEW_TASK)

startActivity(i)



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Android:launchMode

- Specifies how the Activity should be launched
- Four different modes:
 - Standard (default)
 - Single Top
 - Single Task
 - Single Instance

Launch Mode: Standard

- New instance is created in the calling activity's task
- Activity can have multiple instances
- Instances can reside in different tasks
- One task can have multiple instances

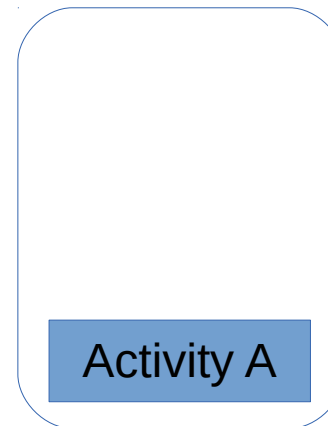
Example

Manifest:

```
<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" android:taskAffinity="com.something" />
```

- Activity A is launched



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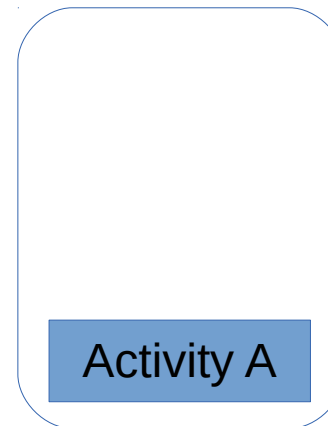
Example

Manifest:

```
<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" android:taskAffinity="com.something" />
```

- Activity A is launched
- Activity A launches Activity B (no flags)



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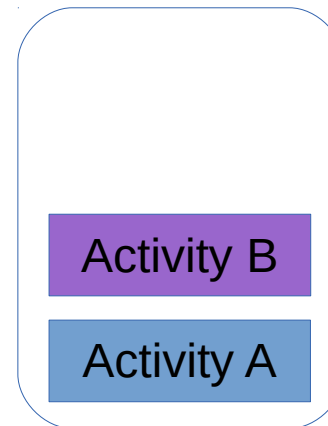
Example

Manifest:

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```
<activity android:name="ActivityB" android:taskAffinity="com.something" />
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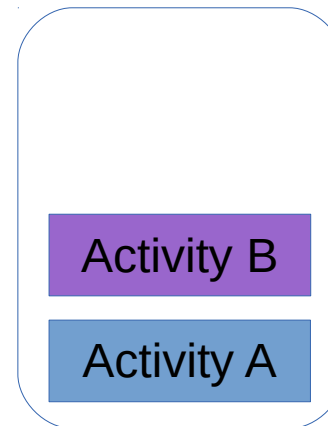
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- Activity A is launched
- Activity A launches Activity B (no flags)
- Activity B launches Activity A



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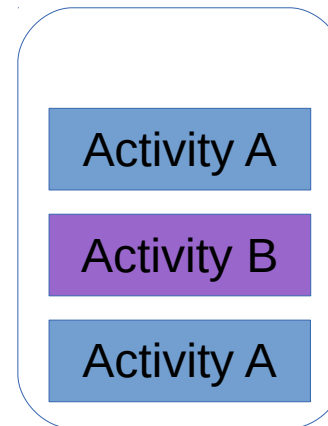
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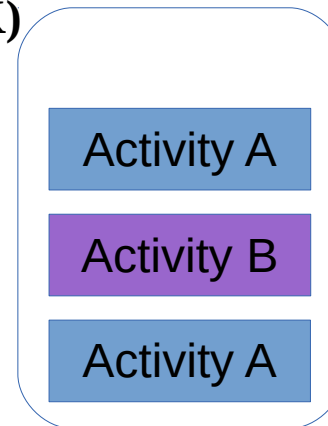
Example

Manifest:

```
<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" android:taskAffinity="com.something" />
```

- Activity A is launched
- Activity A launches Activity B (no flags)
- Activity B launches Activity A
- Activity A launches Activity B (**with flag NEW_TASK**)



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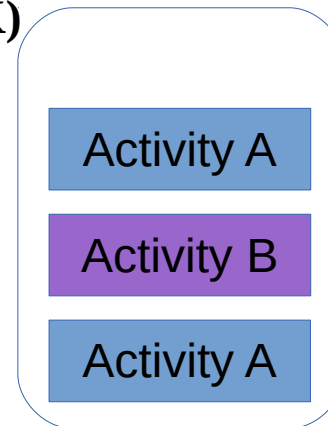
Example

Manifest:

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<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" android:taskAffinity="com.something" />
```

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- Activity A launches Activity B (no flags)
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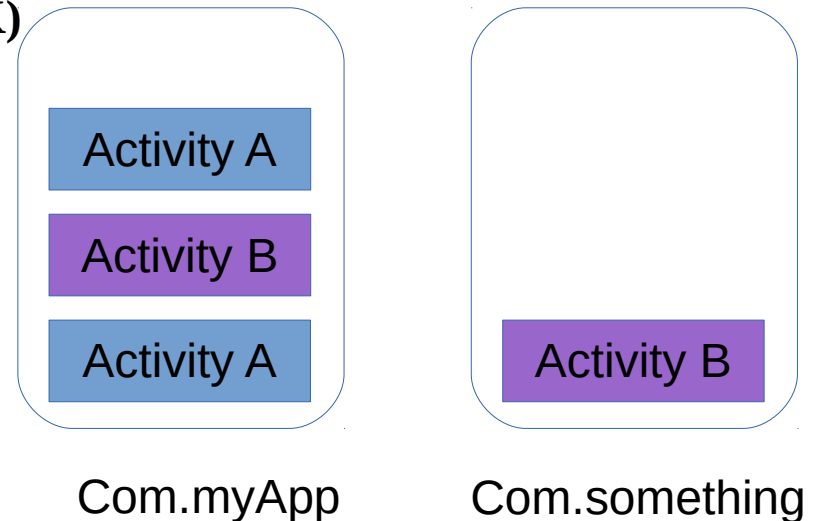
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- Activity B launches Activity A
- Activity A launches Activity B (**with flag NEW_TASK**)
- Activity B launches Activity A



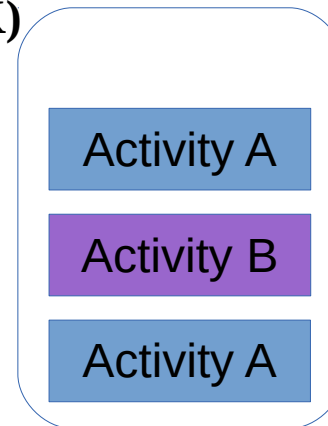
Example

Manifest:

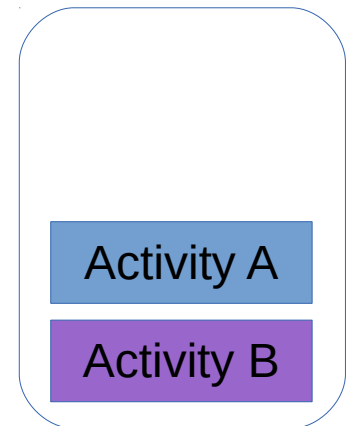
```
<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" android:taskAffinity="com.something" />
```

- Activity A is launched
- Activity A launches Activity B (no flags)
- Activity B launches Activity A
- Activity A launches Activity B (**with flag NEW_TASK**)
- Activity B launches Activity A



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Launch Mode: Single Top

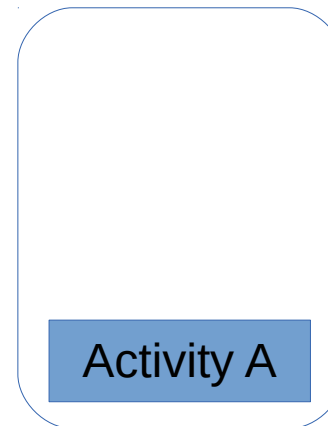
- If an instance of the activity is at the top of the stack – new activity will not be create, instead – `onNewIntent()` will be called.
- Activity can have multiple instances
- Instances can reside in different tasks
- One task can have multiple instances

Example

Manifest:

```
<activity android:name="ActivityA"  
    android:launchMode="singleTop">  
</activity>  
<activity android:name="ActivityB"  
    android:taskAffinity="com.something" >  
</activity>
```

- Activity A is launched



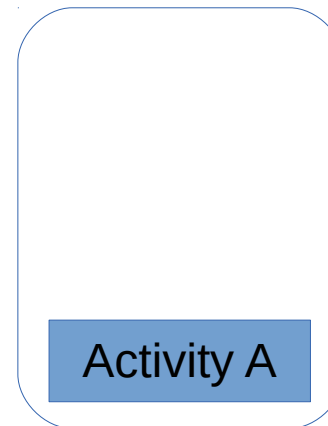
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Example

Manifest:

```
<activity android:name="ActivityA"  
    android:launchMode="singleTop">  
</activity>  
<activity android:name="ActivityB"  
    android:taskAffinity="com.something" >  
</activity>
```

- Activity A is launched
- User pulls the notification bar and clicks on notification that fires Activity intent to Activity A



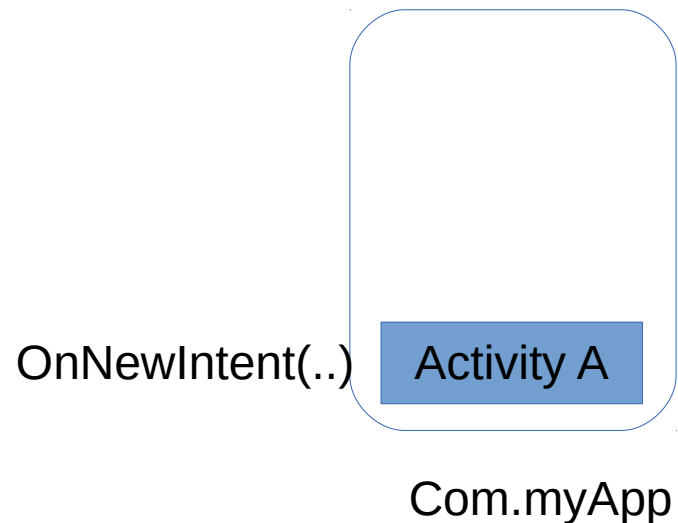
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Example

Manifest:

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<activity android:name="ActivityA"
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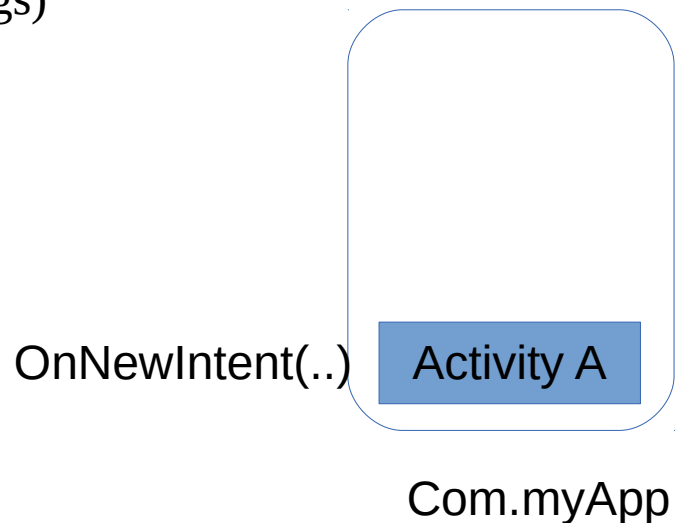


Example

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</activity>
<activity android:name="ActivityB"
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</activity>
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- Activity A is launched
- User pulls the notification bar and clicks on notification that fires Activity intent to Activity A
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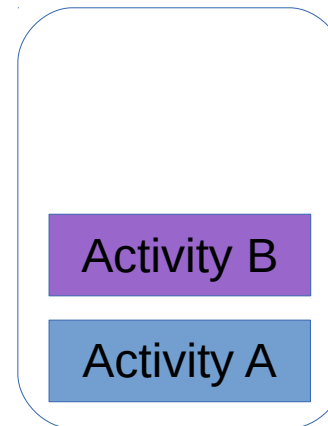


Example

Manifest:

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<activity android:name="ActivityA"
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</activity>
<activity android:name="ActivityB"
    android:taskAffinity="com.something" >
</activity>
```

- Activity A is launched
- User pulls the notification bar and clicks on notification that fires Activity intent to Activity A
- Activity A launches Activity B (no flags)



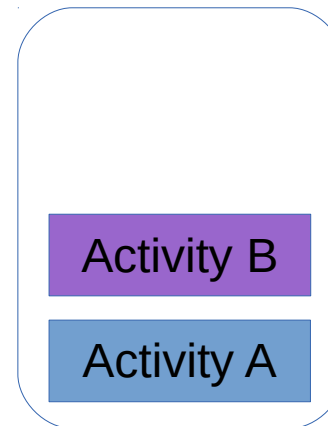
Com.myApp

Example

Manifest:

```
<activity android:name="ActivityA"
    android:launchMode="singleTop">
</activity>
<activity android:name="ActivityB"
    android:taskAffinity="com.something" >
</activity>
```

- Activity A is launched
- User pulls the notification bar and clicks on notification that fires Activity intent to Activity A
- Activity A launches Activity B (no flags)
- Activity B launches Activity A



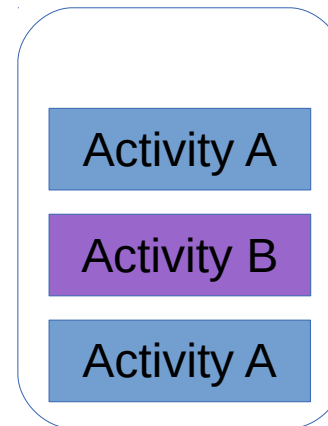
Com.myApp

Example

Manifest:

```
<activity android:name="ActivityA"
    android:launchMode="singleTop">
</activity>
<activity android:name="ActivityB"
    android:taskAffinity="com.something" >
</activity>
```

- Activity A is launched
- User pulls the notification bar and clicks on notification that fires Activity intent to Activity A
- Activity A launches Activity B (no flags)
- Activity B launches Activity A



Com.myApp

Launch Mode: Single Task

- New task is created for the Activity and the Activity is its root Activity
- If an instance of the Activity already exists – system will reroute the intent to onNewIntent() callback and won't create new instance.
- Activity can have only one instance
- Activity is always the root of the task

Example

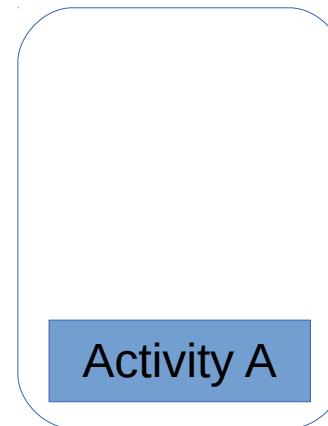
Manifest:

```
<activity android:name="ActivityA" android:launchMode="singleTask" />
```

```
<activity android:name="ActivityB" />
```

```
<activity android:name="ActivityC" android:taskAffinity="com.something" />
```

- Activity A is launched



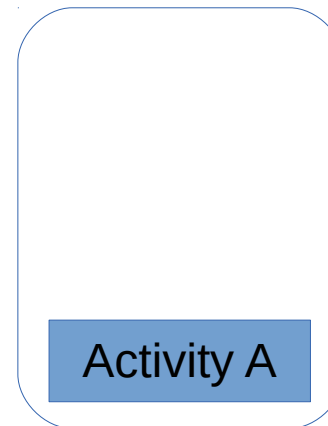
Com.myApp

Example

Manifest:

```
<activity android:name="ActivityA" android:launchMode="singleTask" />  
  
<activity android:name="ActivityB" />  
  
<activity android:name="ActivityC" android:taskAffinity="com.somthing" />
```

- Activity A is launched
- Activity A launches Activity B



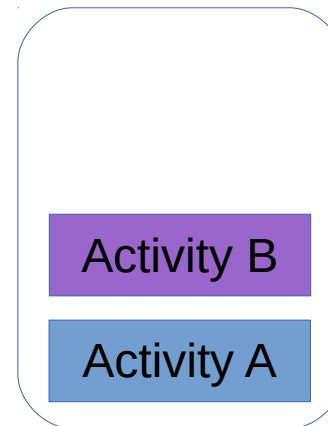
Com.myApp

Example

Manifest:

```
<activity android:name="ActivityA" android:launchMode="singleTask" />  
  
<activity android:name="ActivityB" />  
  
<activity android:name="ActivityC" android:taskAffinity="com.somthing" />
```

- Activity A is launched
- Activity A launches Activity B



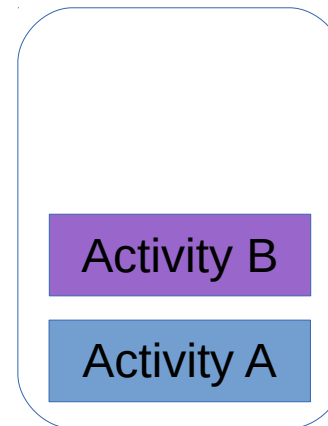
Com.myApp

Example

Manifest:

```
<activity android:name="ActivityA" android:launchMode="singleTask" />  
  
<activity android:name="ActivityB" />  
  
<activity android:name="ActivityC" android:taskAffinity="com.something" />
```

- Activity A is launched
- Activity A launches Activity B
- Activity B launches Activity C with FLAG_NEW_TASK



Com.myApp

Example

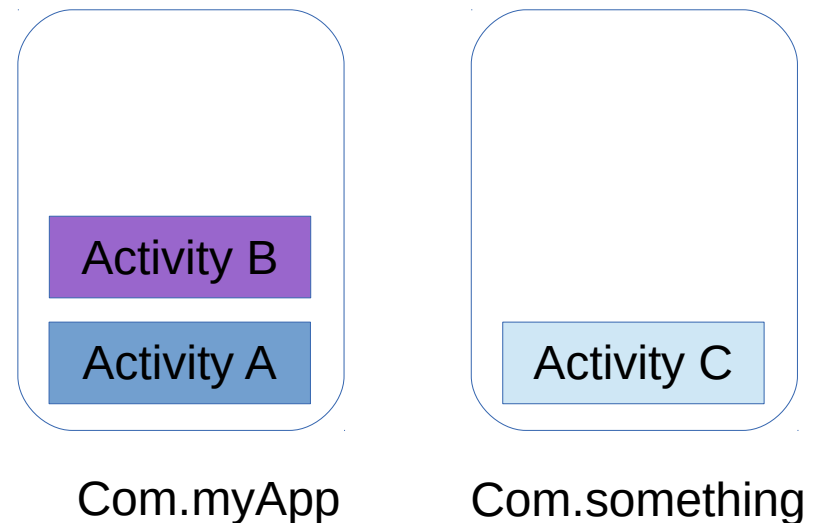
Manifest:

```
<activity android:name="ActivityA" android:launchMode="singleTask" />

<activity android:name="ActivityB" />

<activity android:name="ActivityC" android:taskAffinity="com.something" />
```

- Activity A is launched
- Activity A launches Activity B
- Activity B launches Activity C with FLAG_NEW_TASK

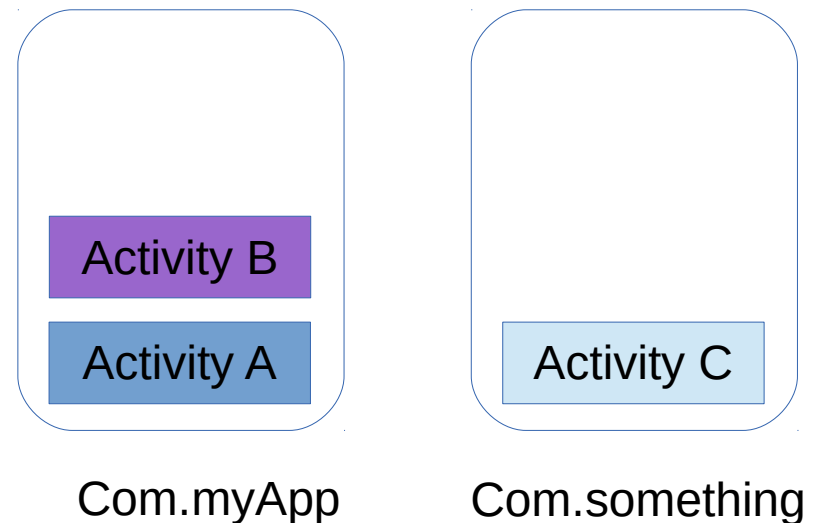


Example

Manifest:

```
<activity android:name="ActivityA" android:launchMode="singleTask" />  
  
<activity android:name="ActivityB" />  
  
<activity android:name="ActivityC" android:taskAffinity="com.something" />
```

- Activity A is launched
- Activity A launches Activity B
- Activity B launches Activity C with FLAG_NEW_TASK
- Activity C launches Activity A



Example

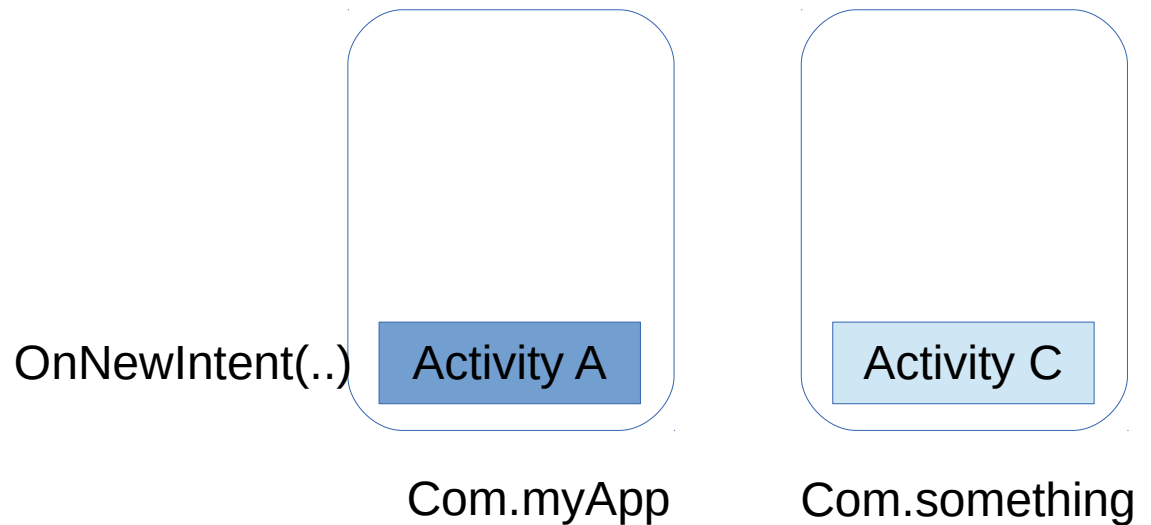
Manifest:

```
<activity android:name="ActivityA" android:launchMode="singleTask" />

<activity android:name="ActivityB" />

<activity android:name="ActivityC" android:taskAffinity="com.something" />
```

- Activity A is launched
- Activity A launches Activity B
- Activity B launches Activity C with FLAG_NEW_TASK
- Activity C launches Activity A



Launch Mode: Single Instance

- Same as Single Task except that it is the only activity in its task
 - New activities will be launched in different tasks.
- Activity can have only one instance
- Activity is always the root of the task
- Activity is the only member of its task

Example

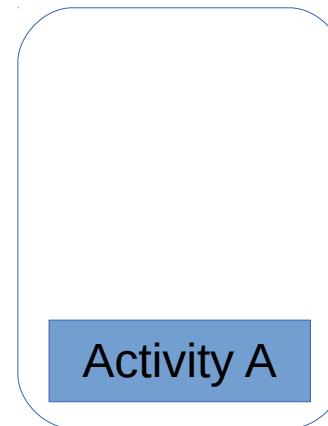
Manifest:

```
<activity android:name="ActivityA" android:launchMode="singleInstance" />
```

```
<activity android:name="ActivityB" />
```

```
<activity android:name="ActivityC" android:taskAffinity="com.somthing" />
```

- Activity A is launched



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Example

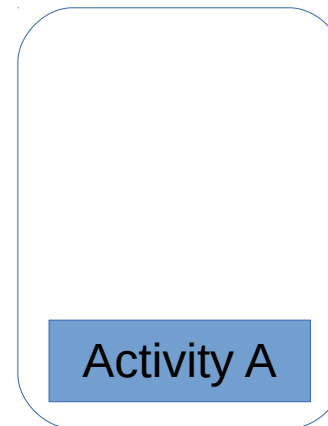
Manifest:

```
<activity android:name="ActivityA" android:launchMode="singleInstance" />
```

```
<activity android:name="ActivityB" />
```

```
<activity android:name="ActivityC" android:taskAffinity="com.somthing" />
```

- Activity A is launched
- Activity A launches Activity B



Com.myApp

Example

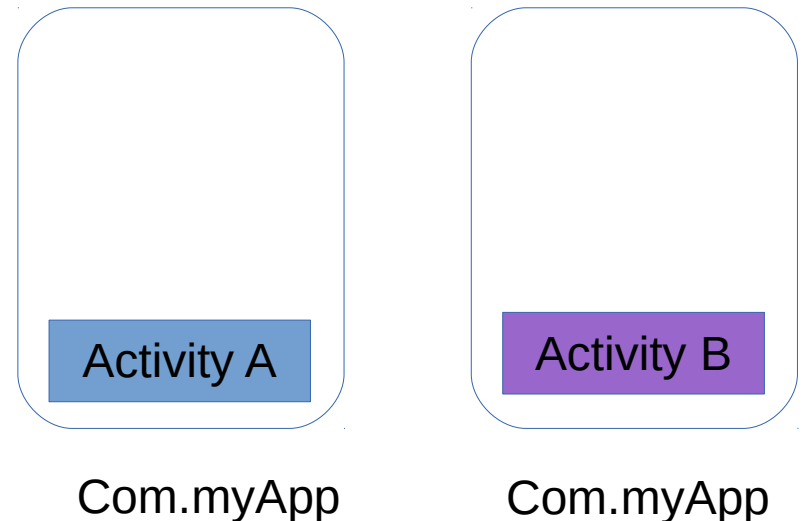
Manifest:

```
<activity android:name="ActivityA" android:launchMode="singleInstance" />
```

```
<activity android:name="ActivityB" />
```

```
<activity android:name="ActivityC" android:taskAffinity="com.something" />
```

- Activity A is launched
- Activity A launches Activity B



Example

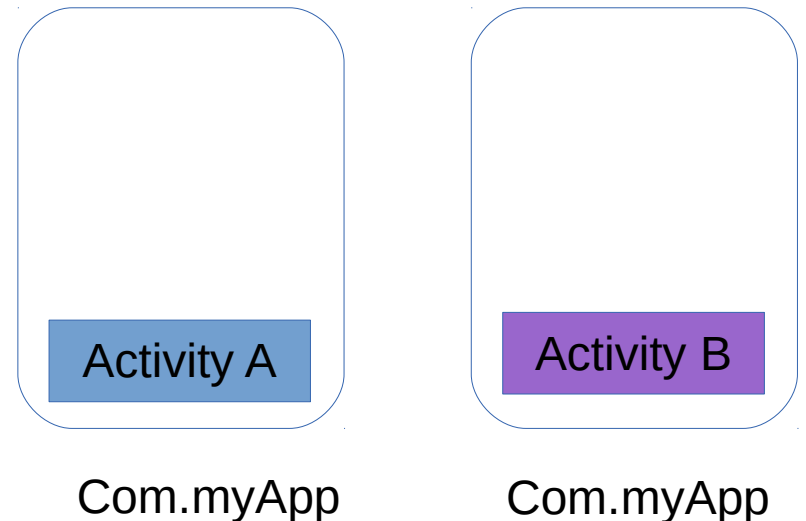
Manifest:

```
<activity android:name="ActivityA" android:launchMode="singleInstance" />
```

```
<activity android:name="ActivityB" />
```

```
<activity android:name="ActivityC" android:taskAffinity="com.something" />
```

- Activity A is launched
- Activity A launches Activity B
- Activity B launches Activity C



Example

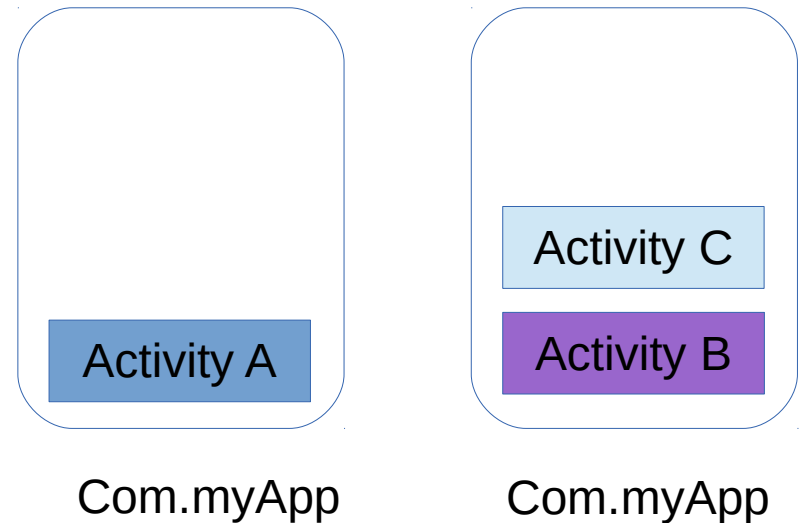
Manifest:

```
<activity android:name="ActivityA" android:launchMode="singleInstance" />
```

```
<activity android:name="ActivityB" />
```

```
<activity android:name="ActivityC" android:taskAffinity="com.something" />
```

- Activity A is launched
- Activity A launches Activity B
- Activity B launches Activity C



Example

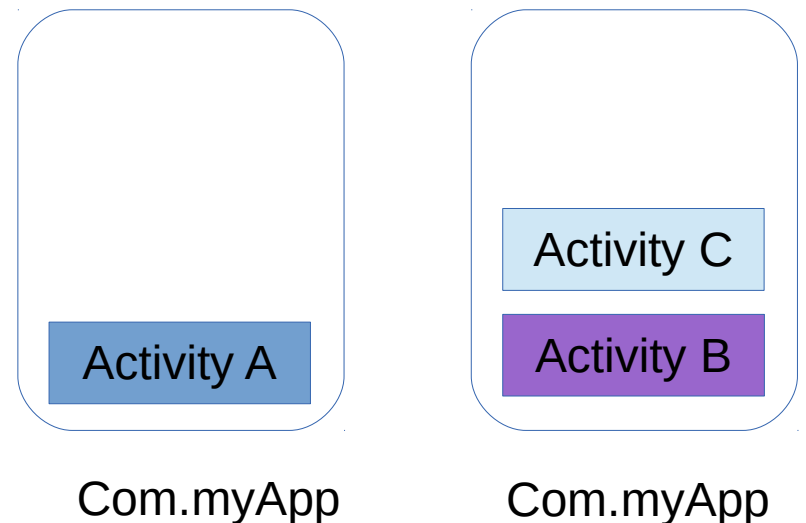
Manifest:

```
<activity android:name="ActivityA" android:launchMode="singleInstance" />
```

```
<activity android:name="ActivityB" />
```

```
<activity android:name="ActivityC" android:taskAffinity="com.something" />
```

- Activity A is launched
- Activity A launches Activity B
- Activity B launches Activity C
- Activity C launches Activity A



Example

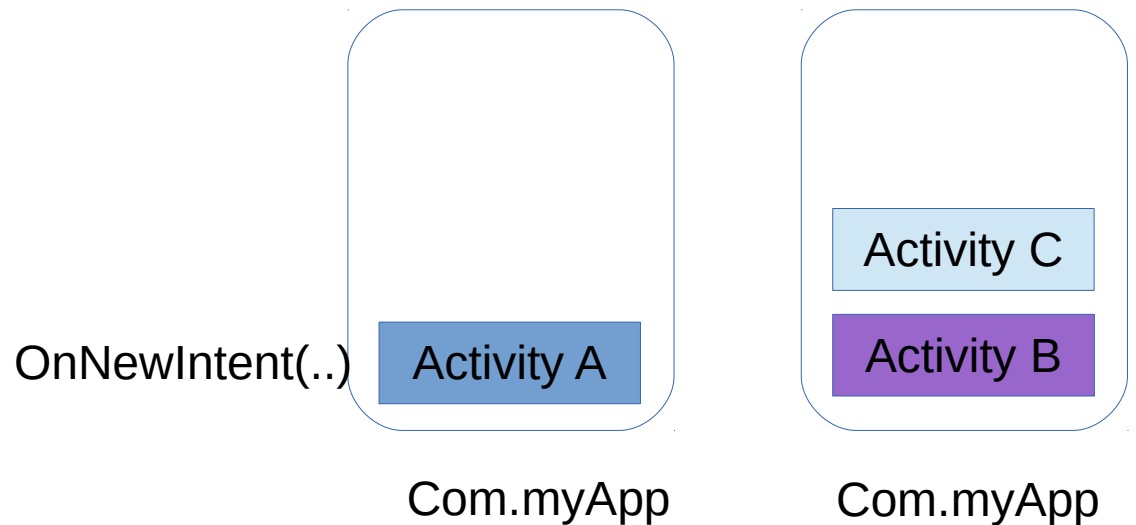
Manifest:

```
<activity android:name="ActivityA" android:launchMode="singleInstance" />
```

```
<activity android:name="ActivityB" />
```

```
<activity android:name="ActivityC" android:taskAffinity="com.something" />
```

- Activity A is launched
- Activity A launches Activity B
- Activity B launches Activity C
- Activity C launches Activity A



FLAG_ACTIVITY_NEW_TASK

- Start the activity in a new task. If a task is already running for the activity you are now starting, that task is brought to the foreground with its last state restored and the activity receives the new intent in `onNewIntent()`.

Example

Manifest:

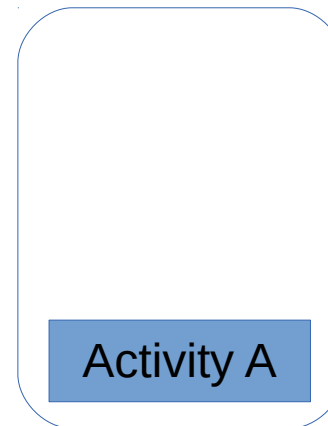
```
<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" />
```

```
<activity android:name="ActivityC" android:taskAffinity="com.somthing" />
```

```
<activity android:name="ActivityD" android:taskAffinity="com.somthing" />
```

- Activity A is launched



Com.myApp

Example

Manifest:

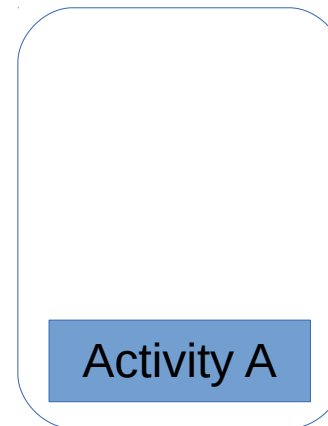
```
<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" />
```

```
<activity android:name="ActivityC" android:taskAffinity="com.somthing" />
```

```
<activity android:name="ActivityD" android:taskAffinity="com.somthing" />
```

- Activity A is launched
- Activity A launches Activity B



Com.myApp

Example

Manifest:

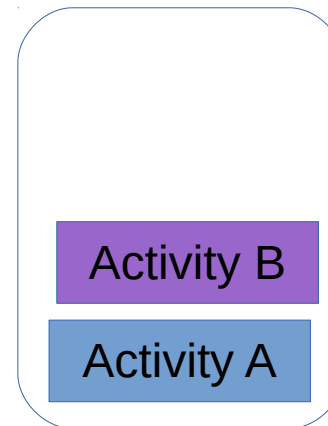
```
<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" />
```

```
<activity android:name="ActivityC" android:taskAffinity="com.somthing" />
```

```
<activity android:name="ActivityD" android:taskAffinity="com.somthing" />
```

- Activity A is launched
- Activity A launches Activity B



Com.myApp

Example

Manifest:

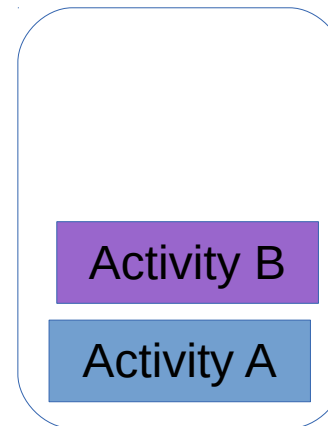
```
<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" />
```

```
<activity android:name="ActivityC" android:taskAffinity="com.somthing" />
```

```
<activity android:name="ActivityD" android:taskAffinity="com.somthing" />
```

- Activity A is launched
- Activity A launches Activity B
- Activity B launches Activity C with **FLAG_NEW_TASK**



Com.myApp

Example

Manifest:

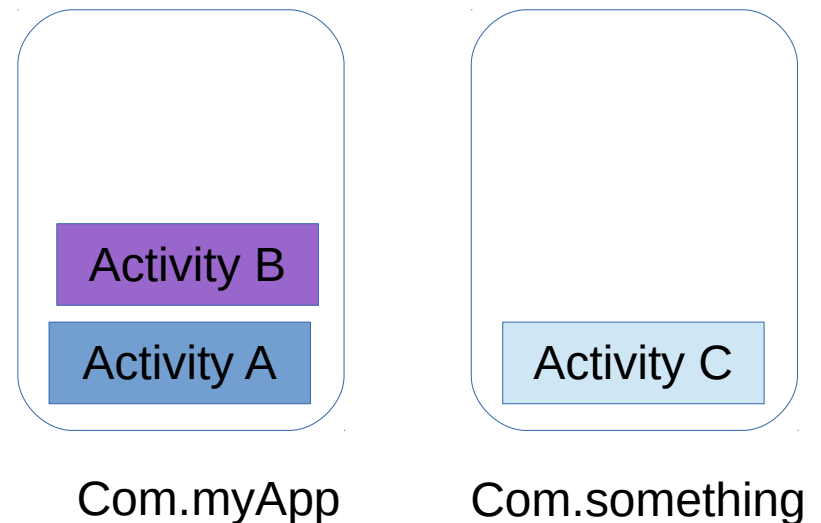
```
<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" />
```

```
<activity android:name="ActivityC" android:taskAffinity="com.something" />
```

```
<activity android:name="ActivityD" android:taskAffinity="com.something" />
```

- Activity A is launched
- Activity A launches Activity B
- Activity B launches Activity C with **FLAG_NEW_TASK**



Example

Manifest:

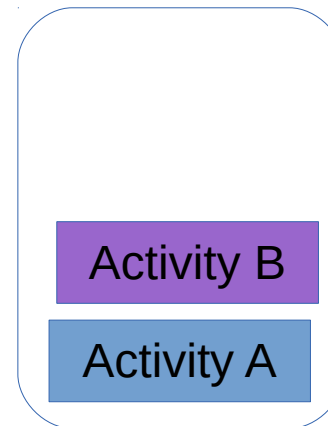
```
<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" />
```

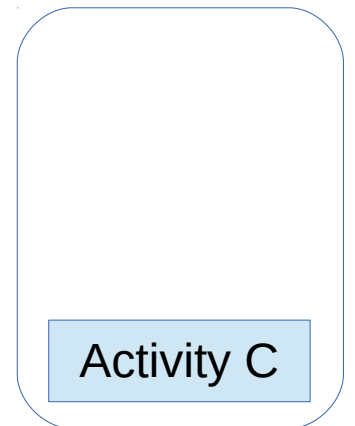
```
<activity android:name="ActivityC" android:taskAffinity="com.something" />
```

```
<activity android:name="ActivityD" android:taskAffinity="com.something" />
```

- Activity A is launched
- Activity A launches Activity B
- Activity B launches Activity C with **FLAG_NEW_TASK**
- Activity C launches Activity D



Com.myApp



Com.something

Example

Manifest:

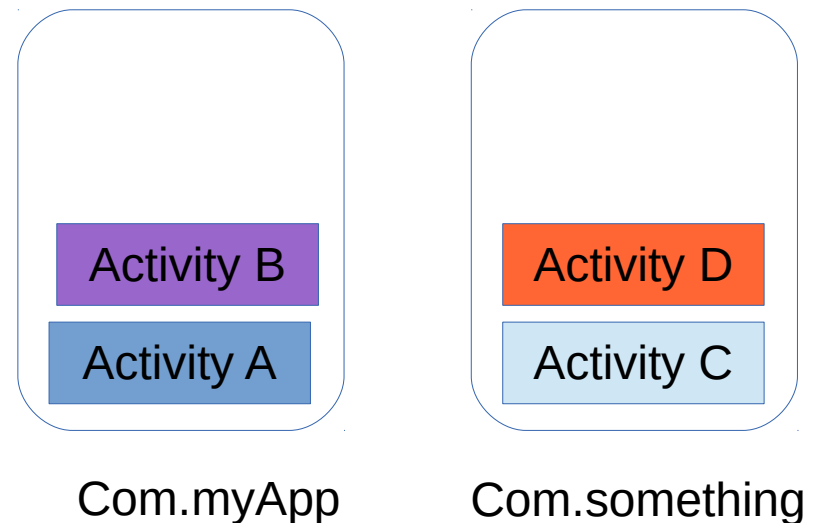
```
<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" />
```

```
<activity android:name="ActivityC" android:taskAffinity="com.something" />
```

```
<activity android:name="ActivityD" android:taskAffinity="com.something" />
```

- Activity A is launched
- Activity A launches Activity B
- Activity B launches Activity C with **FLAG_NEW_TASK**
- Activity C launches Activity D



Example

Manifest:

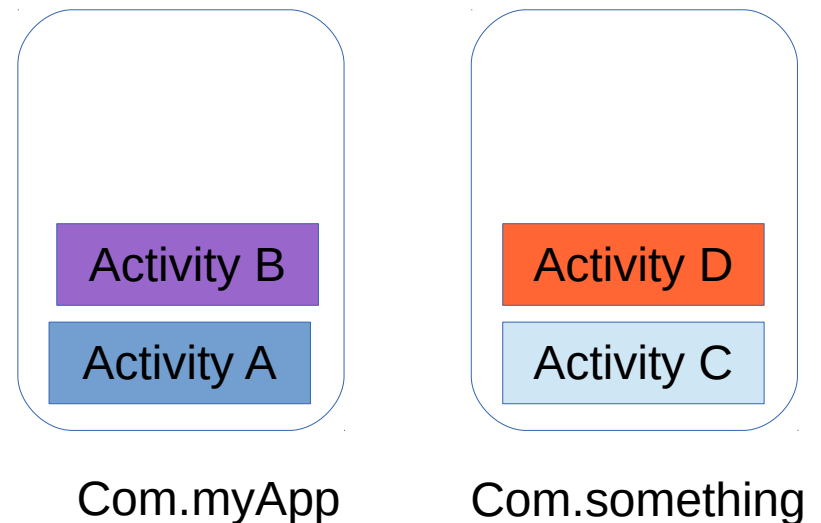
```
<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" />
```

```
<activity android:name="ActivityC" android:taskAffinity="com.somthing" />
```

```
<activity android:name="ActivityD" android:taskAffinity="com.somthing" />
```

- Activity A is launched
- Activity A launches Activity B
- Activity B launches Activity C with **FLAG_NEW_TASK**
- Activity C launches Activity D
- User switches to com.myApp



Example

Manifest:

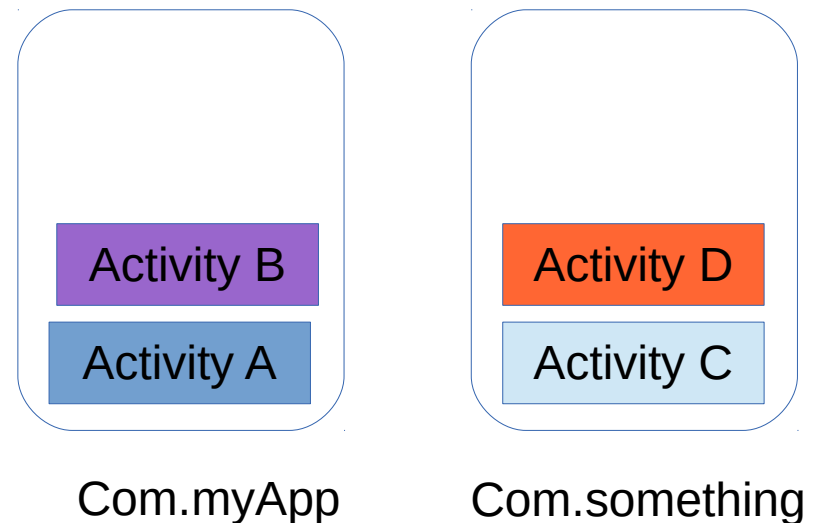
```
<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" />
```

```
<activity android:name="ActivityC" android:taskAffinity="com.somthing" />
```

```
<activity android:name="ActivityD" android:taskAffinity="com.somthing" />
```

- Activity A is launched
- Activity A launches Activity B
- Activity B launches Activity C with **FLAG_NEW_TASK**
- Activity C launches Activity D
- User switches to com.myApp
- Activity B launches Activity C with **FLAG_NEW_TASK**



Example

Manifest:

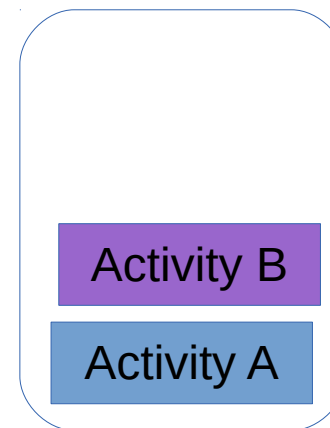
```
<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" />
```

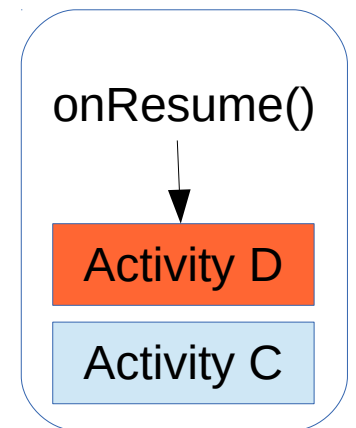
```
<activity android:name="ActivityC" android:taskAffinity="com.something" />
```

```
<activity android:name="ActivityD" android:taskAffinity="com.something" />
```

- Activity A is launched
- Activity A launches Activity B
- Activity B launches Activity C with **FLAG_NEW_TASK**
- Activity C launches Activity D
- User switches to com.myApp
- Activity B launches Activity C with **FLAG_NEW_TASK**



Com.myApp



Com.something

Easy – but may be tricky

Example

Manifest:

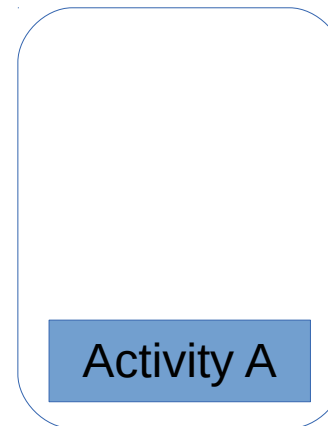
```
<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" />
```

```
<activity android:name="ActivityC" android:taskAffinity="com.somthing" />
```

```
<activity android:name="ActivityD" android:taskAffinity="com.somthing" />
```

- Activity A is launched



Com.myApp

Example

Manifest:

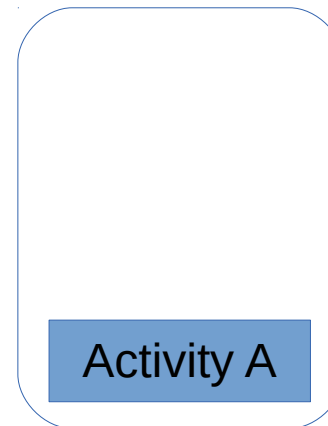
```
<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" />
```

```
<activity android:name="ActivityC" android:taskAffinity="com.somthing" />
```

```
<activity android:name="ActivityD" android:taskAffinity="com.somthing" />
```

- Activity A is launched
- Activity A launches Activity B



Com.myApp

Example

Manifest:

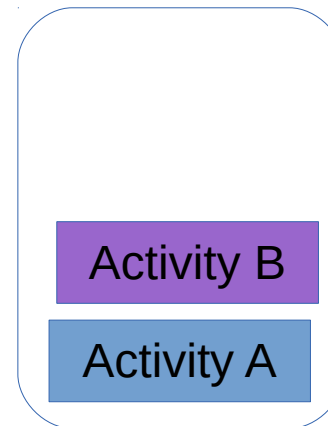
```
<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" />
```

```
<activity android:name="ActivityC" android:taskAffinity="com.somthing" />
```

```
<activity android:name="ActivityD" android:taskAffinity="com.somthing" />
```

- Activity A is launched
- Activity A launches Activity B



Com.myApp

Example

Manifest:

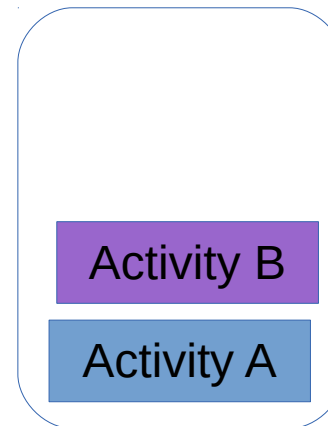
```
<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" />
```

```
<activity android:name="ActivityC" android:taskAffinity="com.somthing" />
```

```
<activity android:name="ActivityD" android:taskAffinity="com.somthing" />
```

- Activity A is launched
- Activity A launches Activity B
- Activity B launches Activity C with **FLAG_NEW_TASK**



Com.myApp

Example

Manifest:

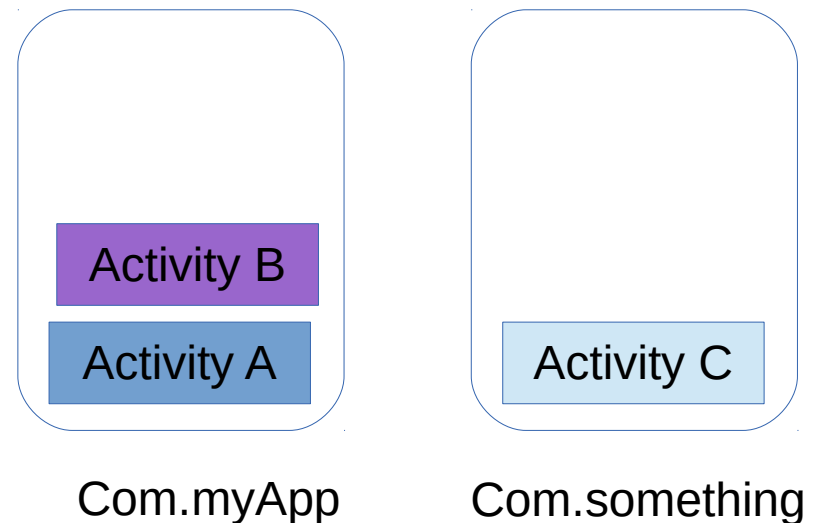
```
<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" />
```

```
<activity android:name="ActivityC" android:taskAffinity="com.something" />
```

```
<activity android:name="ActivityD" android:taskAffinity="com.something" />
```

- Activity A is launched
- Activity A launches Activity B
- Activity B launches Activity C with **FLAG_NEW_TASK**



Example

Manifest:

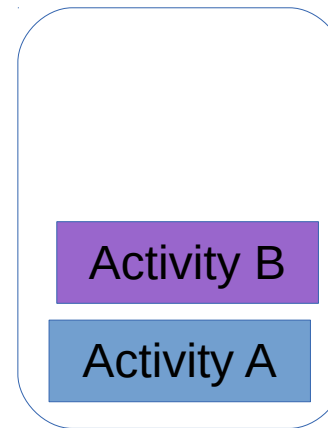
```
<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" />
```

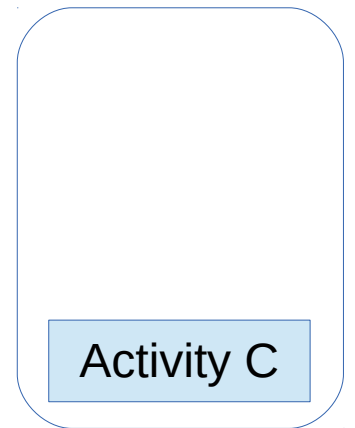
```
<activity android:name="ActivityC" android:taskAffinity="com.something" />
```

```
<activity android:name="ActivityD" android:taskAffinity="com.something" />
```

- Activity A is launched
- Activity A launches Activity B
- Activity B launches Activity C with **FLAG_NEW_TASK**
- Activity C launches Activity D



Com.myApp



Com.something

Example

Manifest:

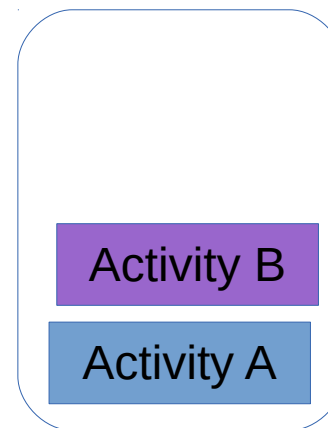
```
<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" />
```

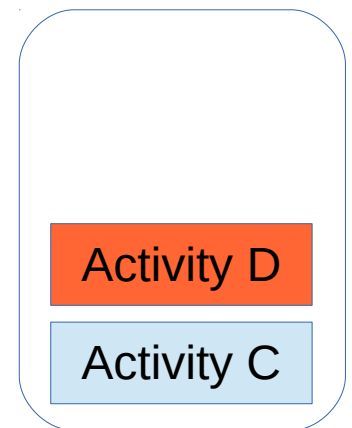
```
<activity android:name="ActivityC" android:taskAffinity="com.something" />
```

```
<activity android:name="ActivityD" android:taskAffinity="com.something" />
```

- Activity A is launched
- Activity A launches Activity B
- Activity B launches Activity C with **FLAG_NEW_TASK**
- Activity C launches Activity D



Com.myApp



Com.something

Example

Manifest:

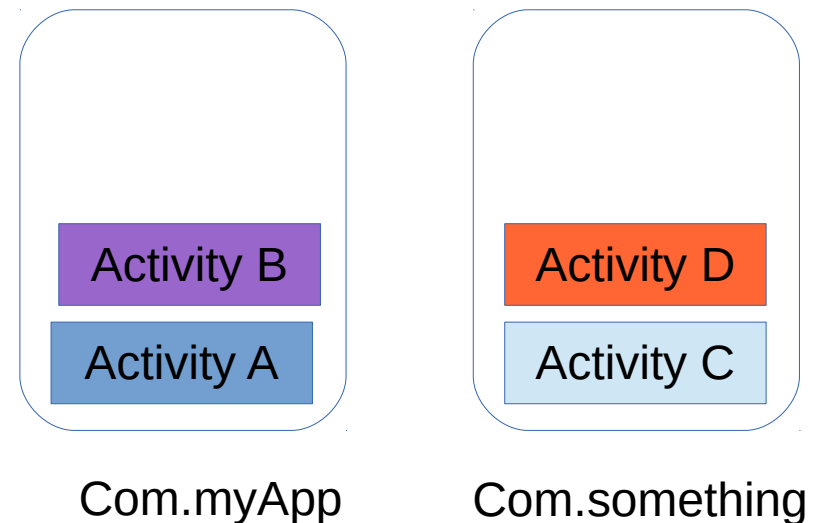
```
<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" />
```

```
<activity android:name="ActivityC" android:taskAffinity="com.somthing" />
```

```
<activity android:name="ActivityD" android:taskAffinity="com.somthing" />
```

- Activity A is launched
- Activity A launches Activity B
- Activity B launches Activity C with **FLAG_NEW_TASK**
- Activity C launches Activity D
- User switches to com.myApp



Example

Manifest:

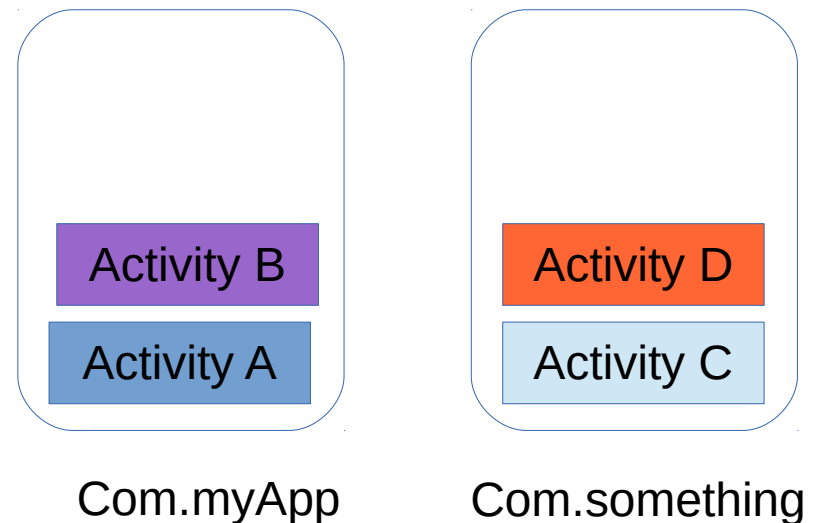
```
<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" />
```

```
<activity android:name="ActivityC" android:taskAffinity="com.somthing" />
```

```
<activity android:name="ActivityD" android:taskAffinity="com.somthing" />
```

- Activity A is launched
- Activity A launches Activity B
- Activity B launches Activity C with **FLAG_NEW_TASK**
- Activity C launches Activity D
- User switches to com.myApp
- Activity B launches **Activity D** with **FLAG_NEW_TASK**



Example

Manifest:

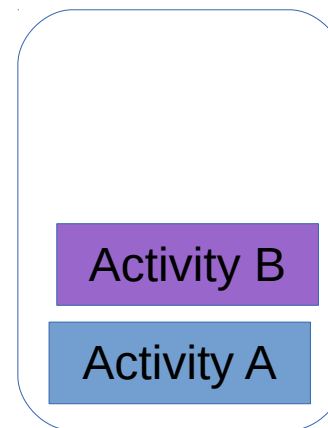
```
<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" />
```

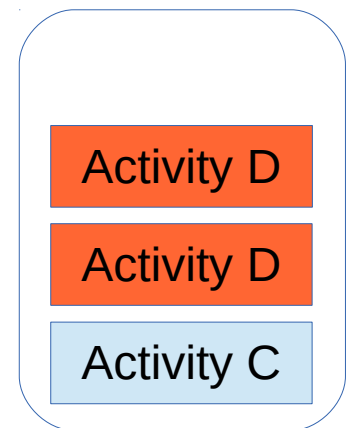
```
<activity android:name="ActivityC" android:taskAffinity="com.something" />
```

```
<activity android:name="ActivityD" android:taskAffinity="com.something" />
```

- Activity A is launched
- Activity A launches Activity B
- Activity B launches Activity C with **FLAG_NEW_TASK**
- Activity C launches Activity D
- User switches to com.myApp
- Activity B launches **Activity D** with **FLAG_NEW_TASK**



Com.myApp



Com.something

Example

Manifest:

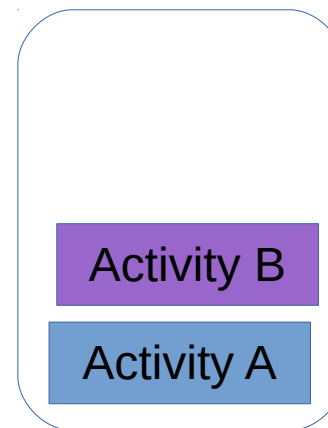
```
<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" />
```

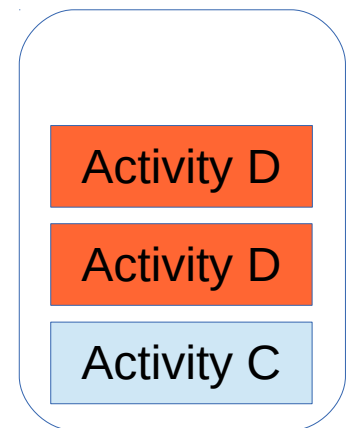
```
<activity android:name="ActivityC" android:taskAffinity="com.something" />
```

```
<activity android:name="ActivityD" android:taskAffinity="com.something" />
```

- Activity A is launched
- Activity A launches Activity B
- Activity B launches Activity C with **FLAG_NEW_TASK**
- Activity C launches Activity D
- User switches to com.myApp
- Activity B launches **Activity D** with **FLAG_NEW_TASK**



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New instance of D created!

Why another Instance was created?

- A matching task is a task that has the same launching intent as the intent used to launch the activity.
- Although Activity D has the same affinity as the task that was created by Activity C, the launching intent is different.
- The result: instead of onResume() - > new Instance.

Example

Manifest:

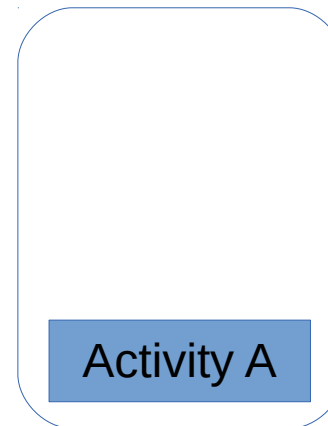
```
<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" />
```

```
<activity android:name="ActivityC" android:taskAffinity="com.somthing" />
```

```
<activity android:name="ActivityD" android:taskAffinity="com.somthing" />
```

- Activity A is launched



Com.myApp

Example

Manifest:

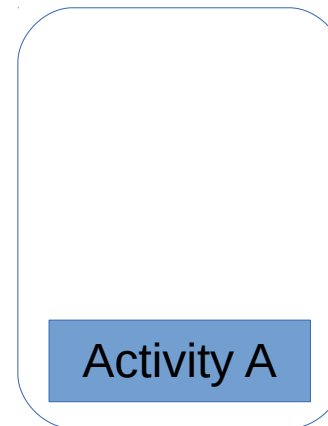
```
<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" />
```

```
<activity android:name="ActivityC" android:taskAffinity="com.somthing" />
```

```
<activity android:name="ActivityD" android:taskAffinity="com.somthing" />
```

- Activity A is launched
- Activity A launches Activity B



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Example

Manifest:

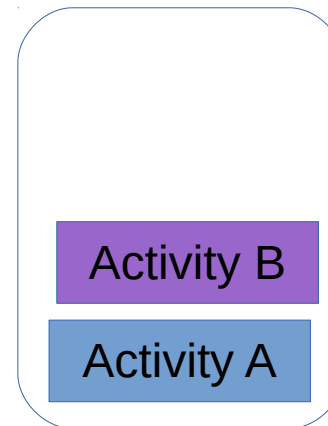
```
<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" />
```

```
<activity android:name="ActivityC" android:taskAffinity="com.somthing" />
```

```
<activity android:name="ActivityD" android:taskAffinity="com.somthing" />
```

- Activity A is launched
- Activity A launches Activity B



Com.myApp

Example

Manifest:

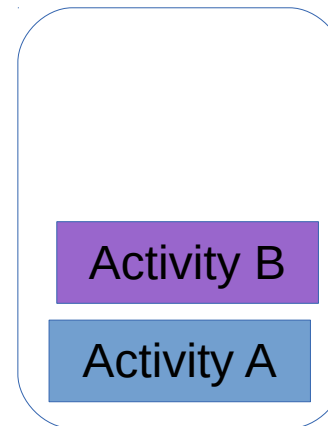
```
<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" />
```

```
<activity android:name="ActivityC" android:taskAffinity="com.somthing" />
```

```
<activity android:name="ActivityD" android:taskAffinity="com.somthing" />
```

- Activity A is launched
- Activity A launches Activity B
- Activity B launches Activity C with **FLAG_NEW_TASK**



Com.myApp

Example

Manifest:

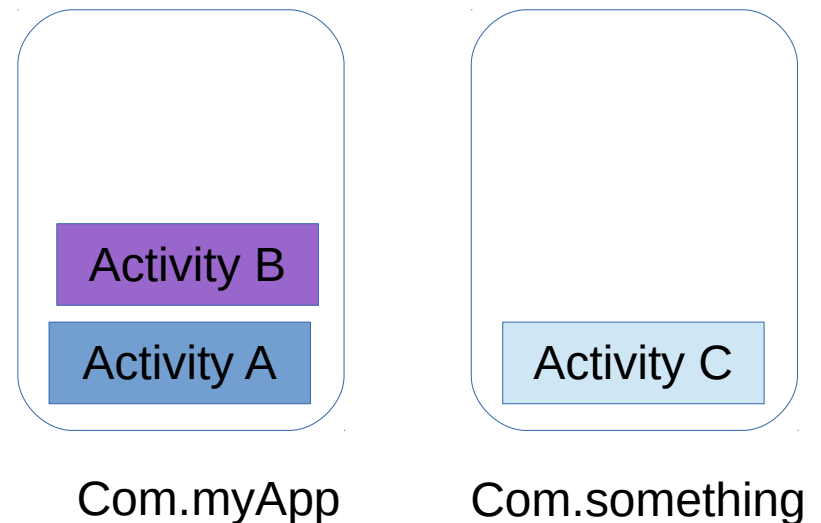
```
<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" />
```

```
<activity android:name="ActivityC" android:taskAffinity="com.something" />
```

```
<activity android:name="ActivityD" android:taskAffinity="com.something" />
```

- Activity A is launched
- Activity A launches Activity B
- Activity B launches Activity C with **FLAG_NEW_TASK**



Example

Manifest:

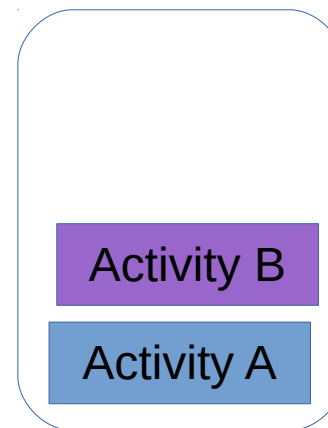
```
<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" />
```

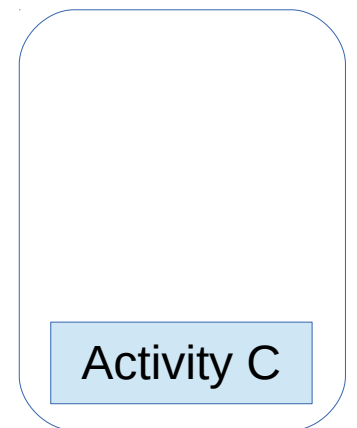
```
<activity android:name="ActivityC" android:taskAffinity="com.something" />
```

```
<activity android:name="ActivityD" android:taskAffinity="com.something" />
```

- Activity A is launched
- Activity A launches Activity B
- Activity B launches Activity C with **FLAG_NEW_TASK**
- Activity C launches Activity D and calls finish()



Com.myApp



Com.something

Example

Manifest:

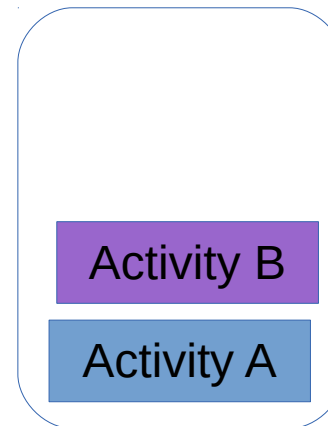
```
<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" />
```

```
<activity android:name="ActivityC" android:taskAffinity="com.something" />
```

```
<activity android:name="ActivityD" android:taskAffinity="com.something" />
```

- Activity A is launched
- Activity A launches Activity B
- Activity B launches Activity C with **FLAG_NEW_TASK**
- Activity C launches Activity D and calls finish()



Com.myApp



Com.something

Example

Manifest:

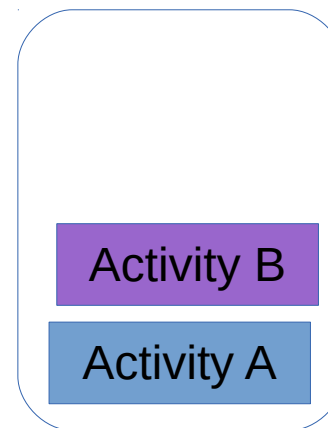
```
<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" />
```

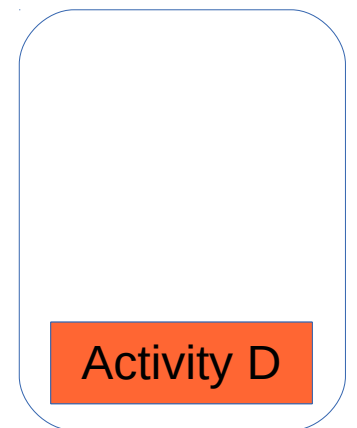
```
<activity android:name="ActivityC" android:taskAffinity="com.somthing" />
```

```
<activity android:name="ActivityD" android:taskAffinity="com.somthing" />
```

- Activity A is launched
- Activity A launches Activity B
- Activity B launches Activity C with **FLAG_NEW_TASK**
- Activity C launches Activity D and calls finish()
- User switches to com.myApp



Com.myApp



Com.somthing

Example

Manifest:

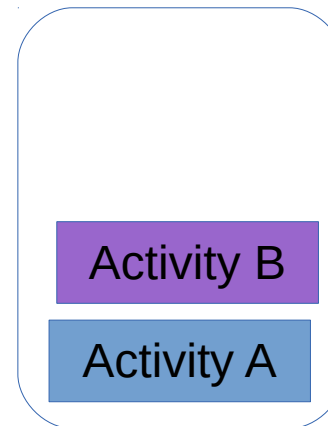
```
<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" />
```

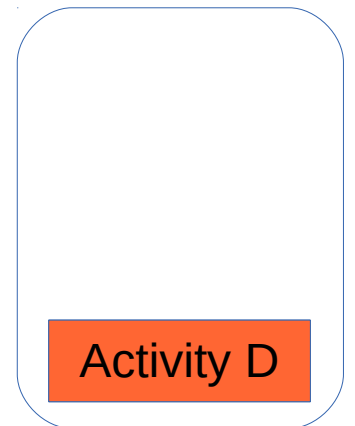
```
<activity android:name="ActivityC" android:taskAffinity="com.somthing" />
```

```
<activity android:name="ActivityD" android:taskAffinity="com.somthing" />
```

- Activity A is launched
- Activity A launches Activity B
- Activity B launches Activity C with **FLAG_NEW_TASK**
- Activity C launches Activity D and calls finish()
- User switches to com.myApp
- Activity B launches Activity C with **FLAG_NEW_TASK**



Com.myApp



Com.somthing

Example

Manifest:

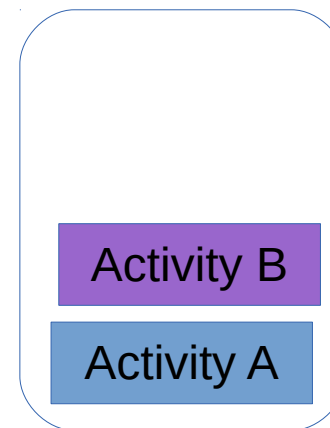
```
<activity android:name="ActivityA" />
```

```
<activity android:name="ActivityB" />
```

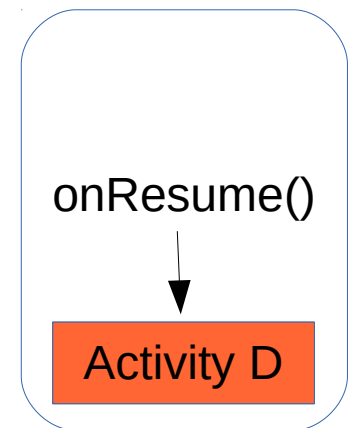
```
<activity android:name="ActivityC" android:taskAffinity="com.somthing" />
```

```
<activity android:name="ActivityD" android:taskAffinity="com.somthing" />
```

- Activity A is launched
- Activity A launches Activity B
- Activity B launches Activity C with **FLAG_NEW_TASK**
- Activity C launches Activity D and calls finish()
- User switches to com.myApp
- Activity B launches Activity C with **FLAG_NEW_TASK**



Com.myApp



Com.somthing

Asked for Activity C - > Got activiy D.

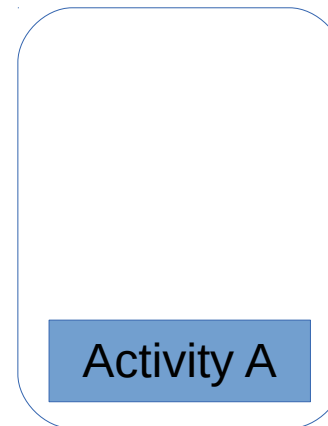
It is not over yet...

Example

Manifest:

```
<activity android:name="ActivityA" android:launchMode="singleInstance"/>  
<activity android:name="ActivityB" />
```

- Activity A is launched



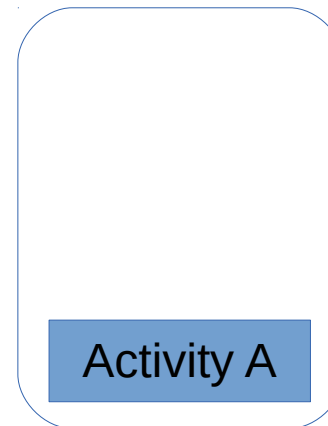
Com.myApp

Example

Manifest:

```
<activity android:name="ActivityA" android:launchMode="singleInstance"/>  
  
<activity android:name="ActivityB" />
```

- Activity A is launched
- Activity A launches Activity B with `startActivityForResult()`



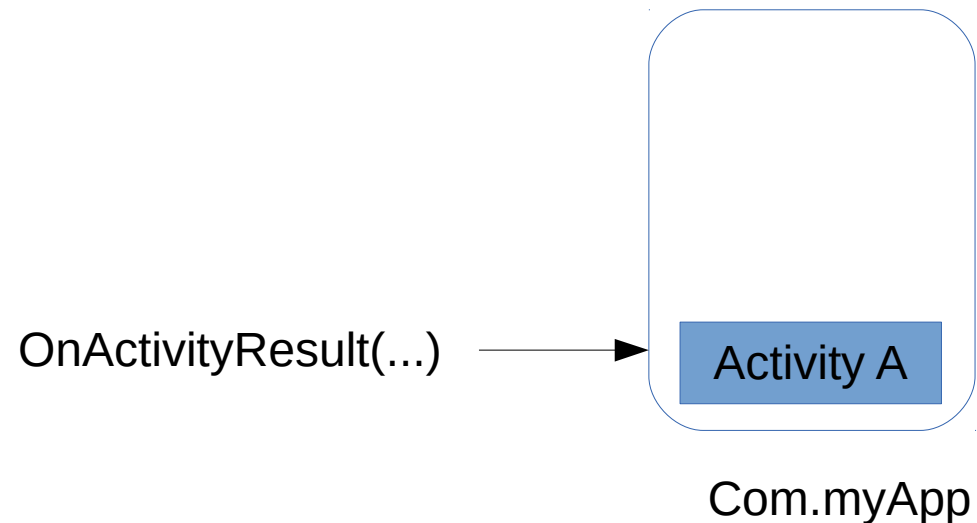
Com.myApp

Example

Manifest:

```
<activity android:name="ActivityA" android:launchMode="singleInstance"/>  
  
<activity android:name="ActivityB" />
```

- Activity A is launched
- Activity A launches Activity B with `startActivityForResult()`

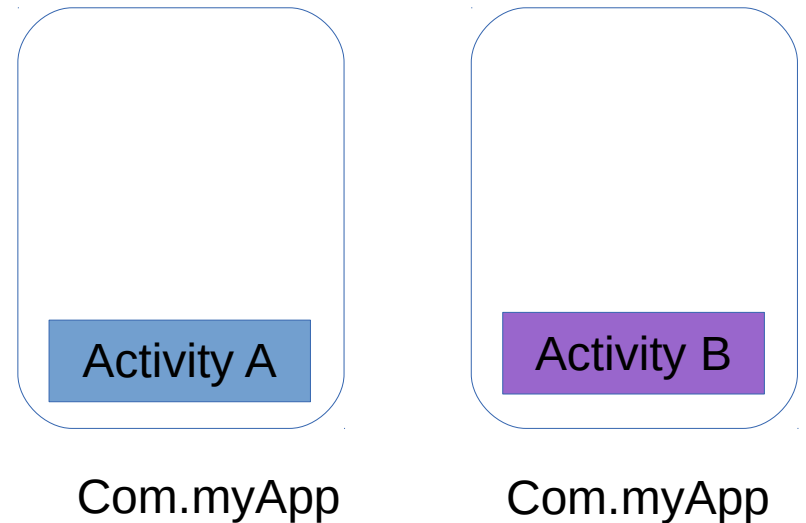


Example

Manifest:

```
<activity android:name="ActivityA" android:launchMode="singleInstance"/>  
  
<activity android:name="ActivityB" />
```

- Activity A is launched
- Activity A launches Activity B with `startActivityForResult()`



StartActivityForResult

- If an activity calls startActivityForResult and new task is created – onActivityResult is called immediately.
- “its not bug – its a feature” approach.

Tips

- Abd shell dumpsys activity
- Don't wait for the end of the development to apply flags, affinities and launch modes.
- It is iterative on-going process.

Questions?

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+Ran Nachmany