

Android Activity Lifecycle

Android Activity Lifecycle is controlled by 7 methods of `android.app.Activity` class. The `android.Activity` is the subclass of `ContextThemeWrapper` class.

An activity is the single screen in android. It is like window or frame of Java.

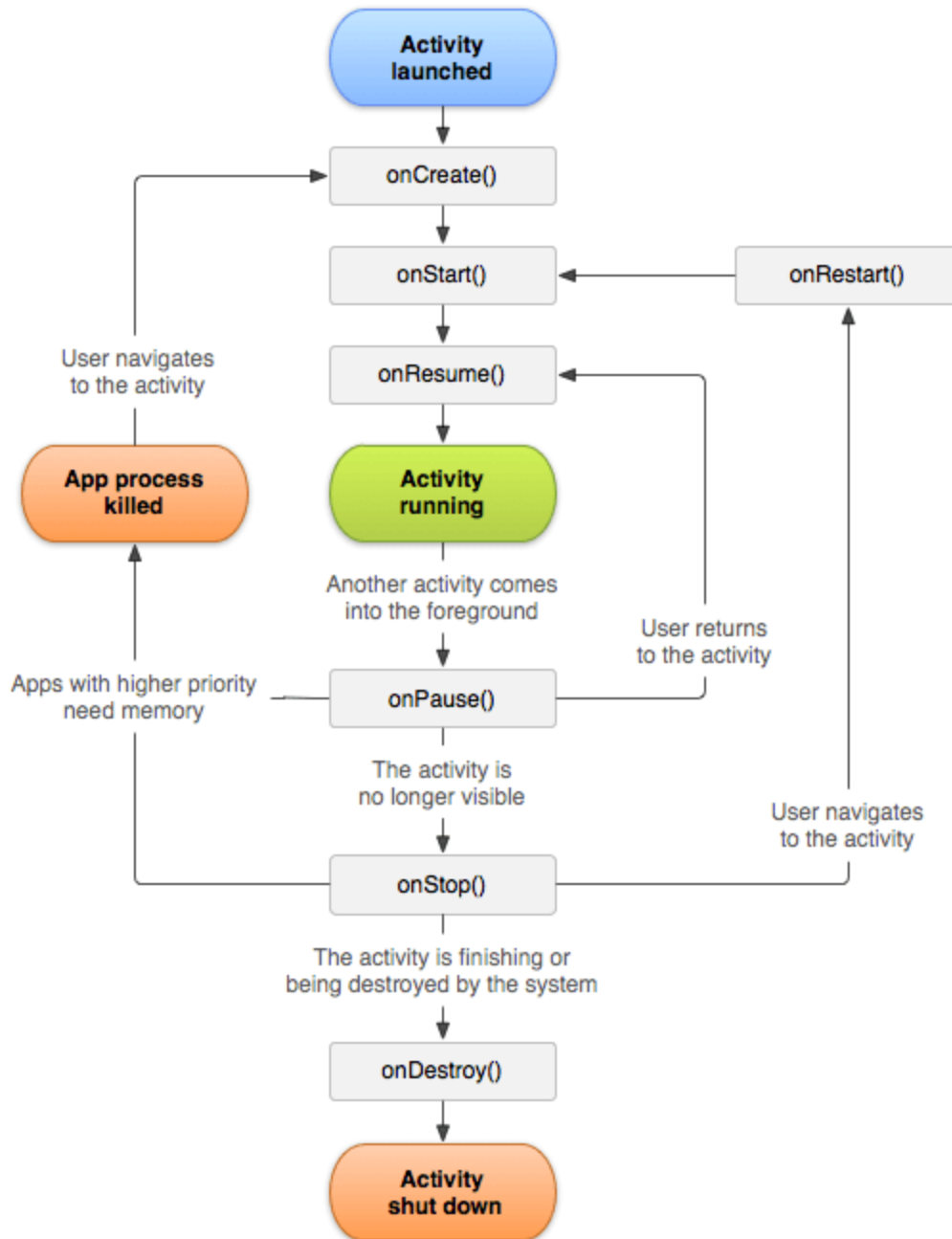
By the help of activity, you can place all your UI components or widgets in a single screen.

The 7 lifecycle method of Activity describes how activity will behave at different states.

Android Activity Lifecycle methods

Let's see the 7 lifecycle methods of android activity.

Method	Description
onCreate	called when activity is first created.
onStart	called when activity is becoming visible to the user.
onResume	called when activity will start interacting with the user.
onPause	called when activity is not visible to the user.
onStop	called when activity is no longer visible to the user.
onRestart	called after your activity is stopped, prior to start.
onDestroy	called before the activity is destroyed.



File: *activity_main.xml*

1. `<?xml version="1.0" encoding="utf-8"?>`
2. `<android.support.constraint.ConstraintLayout xmlns:android="http://schemas.android.com/apk/res/android"`
3. `xmlns:app="http://schemas.android.com/apk/res-auto"`
4. `xmlns:tools="http://schemas.android.com/tools"`

5. `android:layout_width="match_parent"`
6. `android:layout_height="match_parent"`
7. `tools:context="example.javatpoint.com.activitylifecycle.MainActivity">`
- 8.
9. `<TextView`
10. `android:layout_width="wrap_content"`
11. `android:layout_height="wrap_content"`
12. `android:text="Hello World!"`
13. `app:layout_constraintBottom_toBottomOf="parent"`
14. `app:layout_constraintLeft_toLeftOf="parent"`
15. `app:layout_constraintRight_toRightOf="parent"`
16. `app:layout_constraintTop_toTopOf="parent" />`
- 17.
18. `</android.support.constraint.ConstraintLayout>`

Android Activity Lifecycle Example

It provides the details about the invocation of life cycle methods of activity. In this example, we are displaying the content on the logcat.

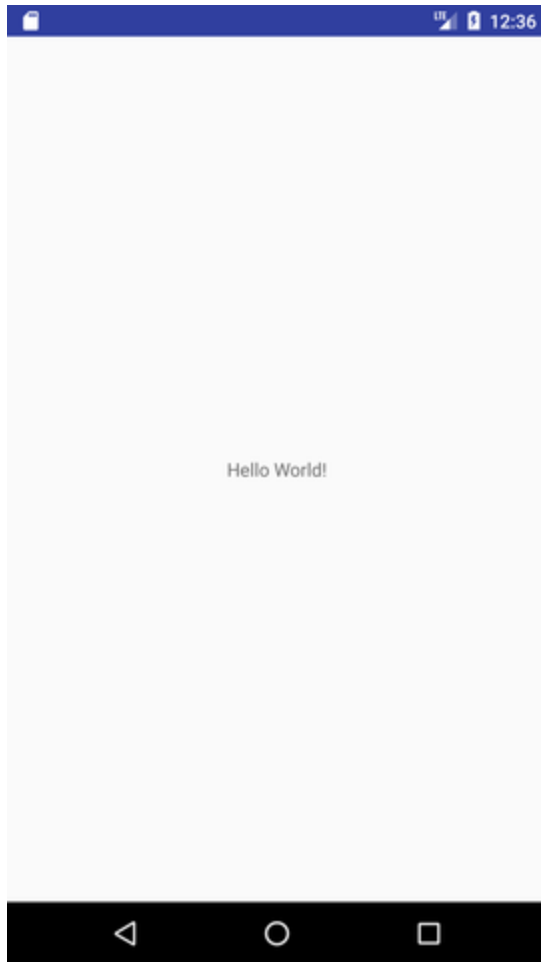
File: MainActivity.java

1. `package` example.javatpoint.com.activitylifecycle;
- 2.
3. `import` android.app.Activity;
4. `import` android.os.Bundle;
5. `import` android.util.Log;
- 6.
7. `public class` MainActivity `extends` Activity {
- 8.
9. `@Override`
10. `protected void` onCreate(Bundle savedInstanceState) {
11. `super`.onCreate(savedInstanceState);
12. `setContentView`(R.layout.activity_main);
13. `Log.d`("lifecycle","onCreate invoked");
14. }
15. `@Override`

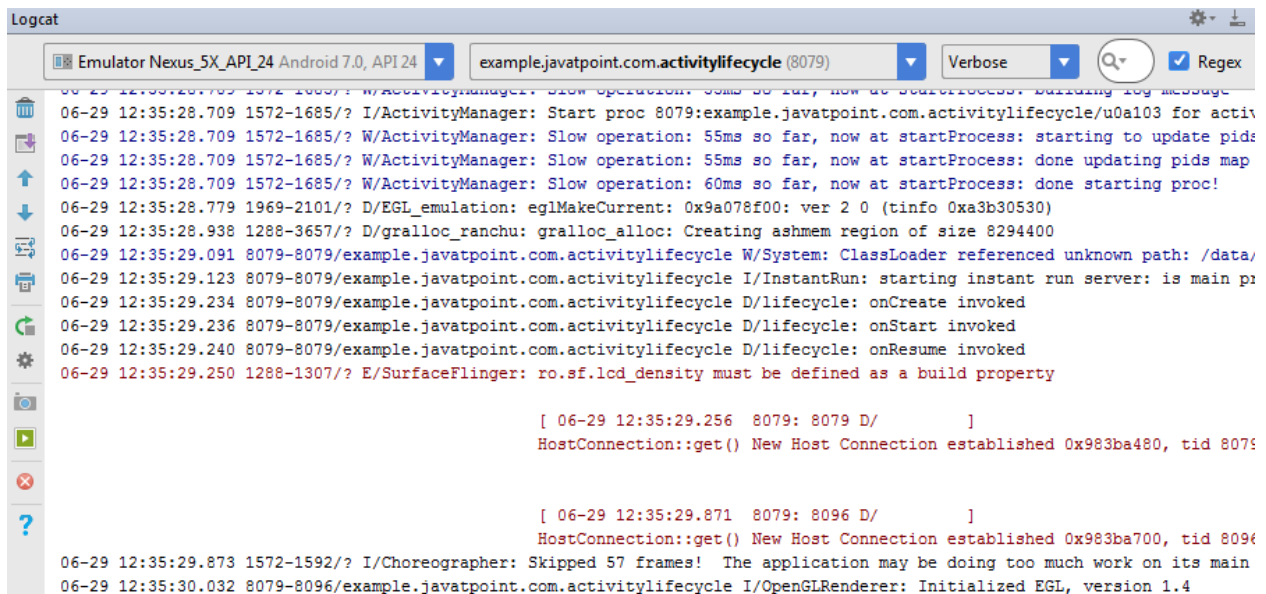
```
16. protected void onStart() {
17.     super.onStart();
18.     Log.d("lifecycle", "onStart invoked");
19. }
20. @Override
21. protected void onResume() {
22.     super.onResume();
23.     Log.d("lifecycle", "onResume invoked");
24. }
25. @Override
26. protected void onPause() {
27.     super.onPause();
28.     Log.d("lifecycle", "onPause invoked");
29. }
30. @Override
31. protected void onStop() {
32.     super.onStop();
33.     Log.d("lifecycle", "onStop invoked");
34. }
35. @Override
36. protected void onRestart() {
37.     super.onRestart();
38.     Log.d("lifecycle", "onRestart invoked");
39. }
40. @Override
41. protected void onDestroy() {
42.     super.onDestroy();
43.     Log.d("lifecycle", "onDestroy invoked");
44. }
45. }
```

Output:

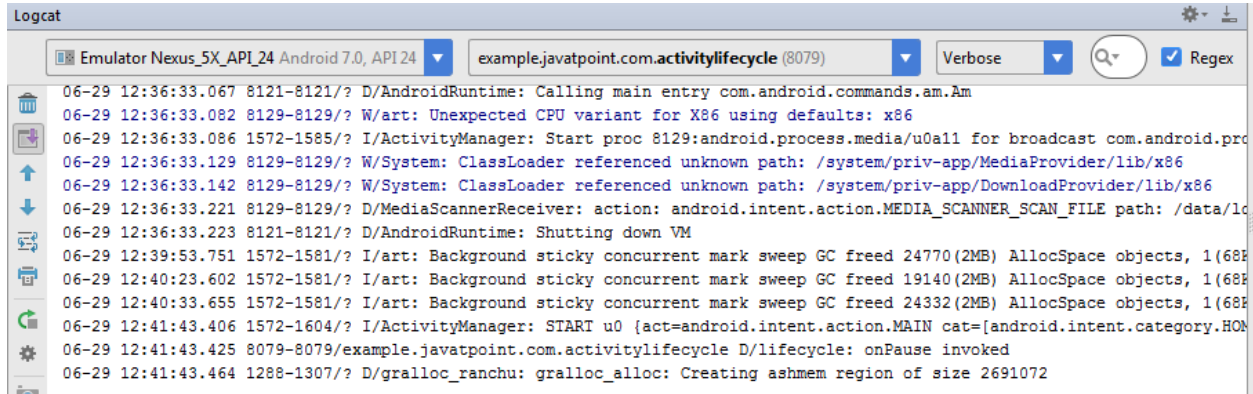
You will not see any output on the emulator or device. You need to open logcat.



Now see on the logcat: onCreate, onStart and onResume methods are invoked.



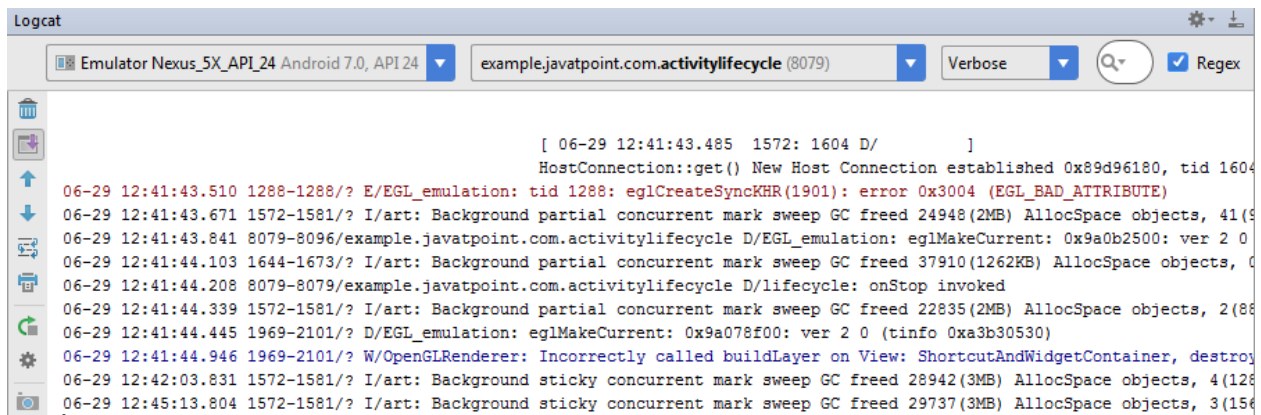
Now click on the HOME Button. You will see onPause method is invoked.



The screenshot shows the Logcat window in Android Studio. The filter is set to 'example.javatpoint.com.activitylifecycle (8079)' and the log level is 'Verbose'. The log messages show the following sequence of events:

```
06-29 12:36:33.067 8121-8121/? D/AndroidRuntime: Calling main entry com.android.commands.am.Am
06-29 12:36:33.082 8129-8129/? W/art: Unexpected CPU variant for X86 using defaults: x86
06-29 12:36:33.086 1572-1585/? I/ActivityManager: Start proc 8129:android.process.media/u0a11 for broadcast com.android.pro
06-29 12:36:33.129 8129-8129/? W/System: ClassLoader referenced unknown path: /system/priv-app/MediaProvider/lib/x86
06-29 12:36:33.142 8129-8129/? W/System: ClassLoader referenced unknown path: /system/priv-app/DownloadProvider/lib/x86
06-29 12:36:33.221 8129-8129/? D/MediaScannerReceiver: action: android.intent.action.MEDIA_SCANNER_SCAN_FILE path: /data/lo
06-29 12:36:33.223 8121-8121/? D/AndroidRuntime: Shutting down VM
06-29 12:39:53.751 1572-1581/? I/art: Background sticky concurrent mark sweep GC freed 24770(2MB) AllocSpace objects, 1(68K
06-29 12:40:23.602 1572-1581/? I/art: Background sticky concurrent mark sweep GC freed 19140(2MB) AllocSpace objects, 1(68K
06-29 12:40:33.655 1572-1581/? I/art: Background sticky concurrent mark sweep GC freed 24332(2MB) AllocSpace objects, 1(68K
06-29 12:41:43.406 1572-1604/? I/ActivityManager: START u0 {act=android.intent.action.MAIN cat=[android.intent.category.HOM
06-29 12:41:43.425 8079-8079/example.javatpoint.com.activitylifecycle D/lifecycle: onPause invoked
06-29 12:41:43.464 1288-1307/? D/gralloc_ranchu: gralloc_alloc: Creating ashmem region of size 2691072
```

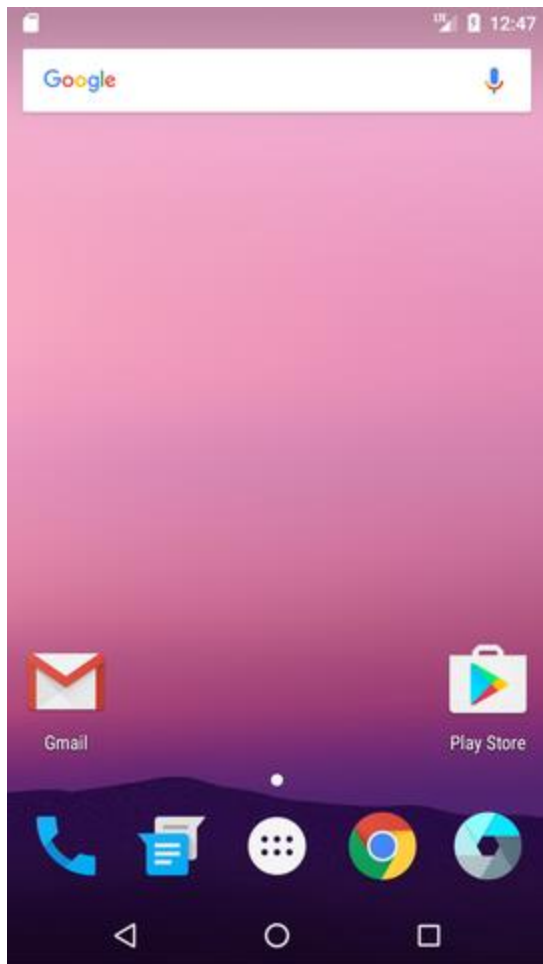
After a while, you will see onStop method is invoked.



The screenshot shows the Logcat window in Android Studio. The filter is set to 'example.javatpoint.com.activitylifecycle (8079)' and the log level is 'Verbose'. The log messages show the following sequence of events:

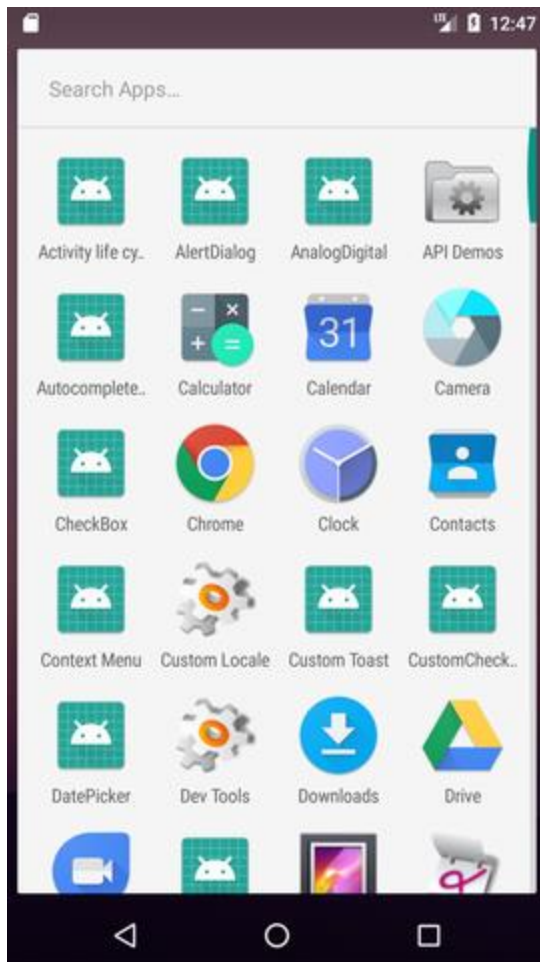
```
[ 06-29 12:41:43.485 1572: 1604 D/
HostConnection::get() New Host Connection established 0x89d96180, tid 1604
06-29 12:41:43.510 1288-1288/? E/EGL_emulation: tid 1288: eglCreateSyncKHR(1901): error 0x3004 (EGL_BAD_ATTRIBUTE)
06-29 12:41:43.671 1572-1581/? I/art: Background partial concurrent mark sweep GC freed 24948(2MB) AllocSpace objects, 41(9
06-29 12:41:43.841 8079-8096/example.javatpoint.com.activitylifecycle D/EGL_emulation: eglMakeCurrent: 0x9a0b2500: ver 2 0
06-29 12:41:44.103 1644-1673/? I/art: Background partial concurrent mark sweep GC freed 37910(1262KB) AllocSpace objects, 0
06-29 12:41:44.208 8079-8079/example.javatpoint.com.activitylifecycle D/lifecycle: onStop invoked
06-29 12:41:44.339 1572-1581/? I/art: Background partial concurrent mark sweep GC freed 22835(2MB) AllocSpace objects, 2(88
06-29 12:41:44.445 1969-2101/? D/EGL_emulation: eglMakeCurrent: 0x9a078f00: ver 2 0 (tinfo 0xa3b30530)
06-29 12:41:44.946 1969-2101/? W/OpenGLRenderer: Incorrectly called buildLayer on View: ShortcutAndWidgetContainer, destroy
06-29 12:42:03.831 1572-1581/? I/art: Background sticky concurrent mark sweep GC freed 28942(3MB) AllocSpace objects, 4(128
06-29 12:45:13.804 1572-1581/? I/art: Background sticky concurrent mark sweep GC freed 29737(3MB) AllocSpace objects, 3(156
```

Now see on the emulator. It is on the home. Now click on the center button to launch the app again.

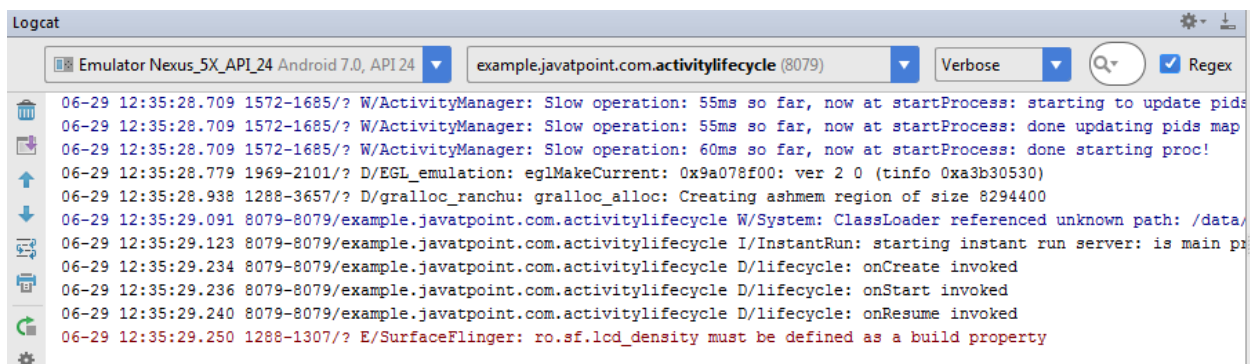


Now click on the lifecycleactivity icon.

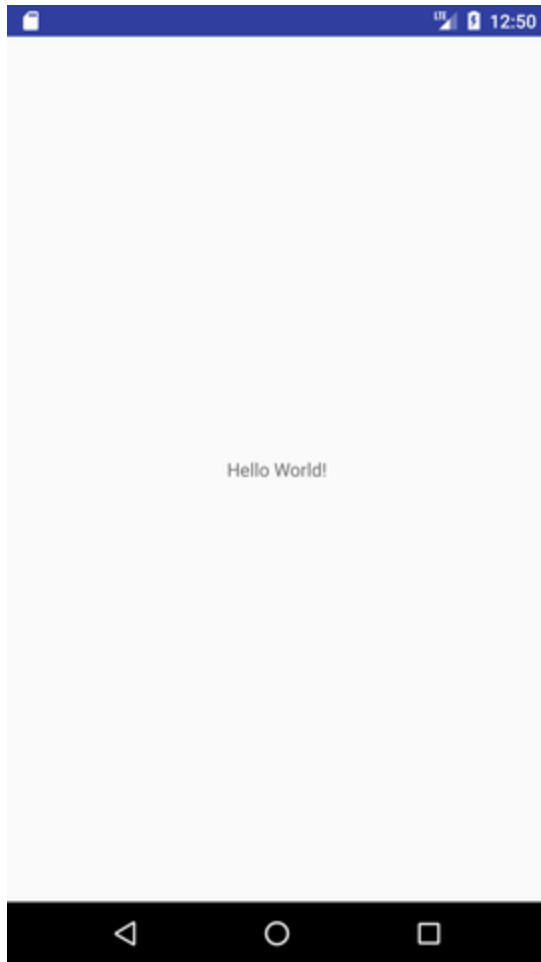
.



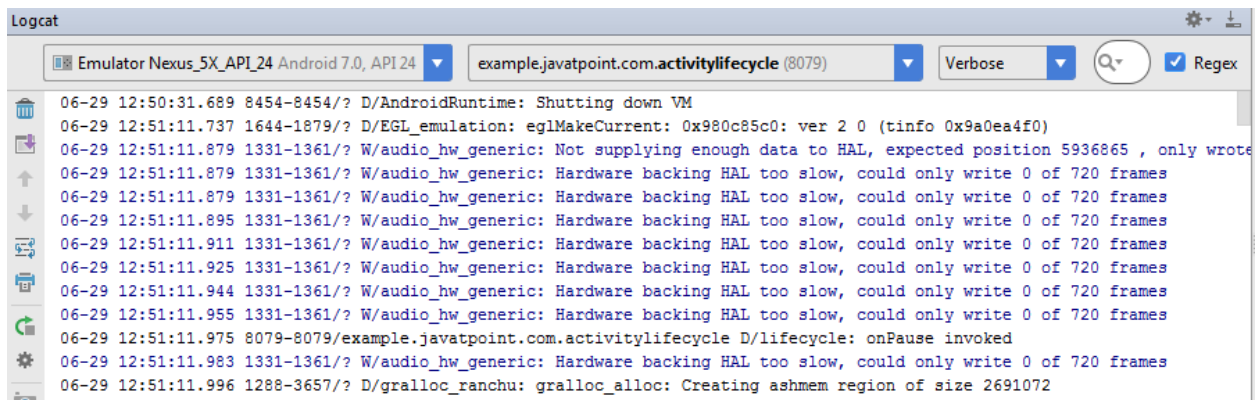
Now see on the logcat: onRestart, onStart and onResume methods are invoked.



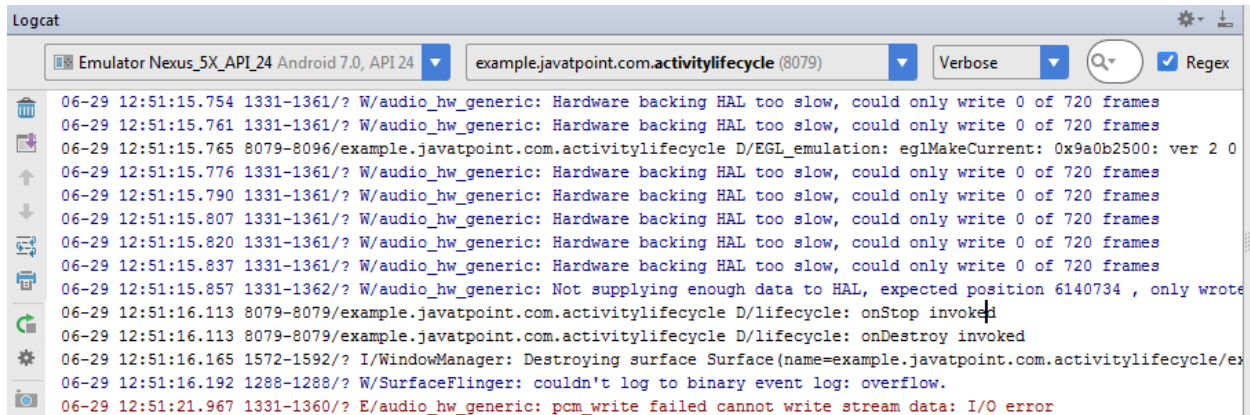
If you see the emulator, application is started again.



Now click on the back button. Now you will see onPause methods is invoked.



After a while, you will see onStop and onDestroy methods are invoked.



Logcat

Emulator Nexus_5X_API_24 Android 7.0, API 24 example.javatpoint.com.activitylifecycle (8079) Verbose Q Regex

```
06-29 12:51:15.754 1331-1361/? W/audio_hw_generic: Hardware backing HAL too slow, could only write 0 of 720 frames
06-29 12:51:15.761 1331-1361/? W/audio_hw_generic: Hardware backing HAL too slow, could only write 0 of 720 frames
06-29 12:51:15.765 8079-8096/example.javatpoint.com.activitylifecycle D/EGL_emulation: eglMakeCurrent: 0x9a0b2500: ver 2 0
06-29 12:51:15.776 1331-1361/? W/audio_hw_generic: Hardware backing HAL too slow, could only write 0 of 720 frames
06-29 12:51:15.790 1331-1361/? W/audio_hw_generic: Hardware backing HAL too slow, could only write 0 of 720 frames
06-29 12:51:15.807 1331-1361/? W/audio_hw_generic: Hardware backing HAL too slow, could only write 0 of 720 frames
06-29 12:51:15.820 1331-1361/? W/audio_hw_generic: Hardware backing HAL too slow, could only write 0 of 720 frames
06-29 12:51:15.837 1331-1361/? W/audio_hw_generic: Hardware backing HAL too slow, could only write 0 of 720 frames
06-29 12:51:15.857 1331-1362/? W/audio_hw_generic: Not supplying enough data to HAL, expected position 6140734 , only wrote
06-29 12:51:16.113 8079-8079/example.javatpoint.com.activitylifecycle D/lifecycle: onStop invoked
06-29 12:51:16.113 8079-8079/example.javatpoint.com.activitylifecycle D/lifecycle: onDestroy invoked
06-29 12:51:16.165 1572-1592/? I/WindowManager: Destroying surface Surface(name=example.javatpoint.com.activitylifecycle/ex
06-29 12:51:16.192 1288-1288/? W/SurfaceFlinger: couldn't log to binary event log: overflow.
06-29 12:51:21.967 1331-1360/? E/audio_hw_generic: pcm_write failed cannot write stream data: I/O error
```

The onCreate() and onDestroy() methods are calling only once throughout the activity lifecycle.