بسْمِ اللهِ الرَّحْمَنِ الرَّحِيمِ

قَالَ رَبِّ اشْرَحْ لِي صَدْرِي وَيَسِّرْ لِي أَمْرِي
وَاحْلُلْ عُقْدَةً مِّن لِّسَانِي يَفْقَهُوا قَوْلِي

وَقُل رَّبِّ زِدْنِي عِلْمًا

قَالُوا سُبْحَانَكَ
لَا عِلْمَ لَنَا إِلَّا مَا عَلَّمْتَنَا
إِنَّكَ أَنتَ الْعَلِيمُ الْحَكِيمُ

اللَّهمَّ إنِّي
أسألُكَ عِلمًا نافعًا
ورزقًا طيِّبًا وعملًا
متقبَّلًا

Activities, Intents and Activity Lifecycle

Mobile Computing

LECTURE 09-10

Activities, Intents and Activity LifeCycle

Instructor:

Maulana Haq Nawaz

دعا

يَا مُقَلِّبَ الْقُلُوبِ، ثَبِّتْ قَلْبِي عَلَى دِينِكَ

تصحیح نیت

حضرت محمد صلی اللہ علیہ وسلم نے فرمایا

اِنَّمَا الْاَعْمَالُ بِالنِّـیَّاتِ

ترج

اعمال کا دارومدار نیتوں پر

Little Efforts Daily Will Make You the Greatest

To systematically learn and get excellence in any concept / subject

- روز کا کام روز کریں
- اک مہینے کا کھانا ایک دن میں نہیں کھایا جا سکتا، ایسے ہی ایک مہینے کا کام ایک دن میں نہیں ہو سکتا

Little Efforts Daily Will Make You the Greatest

Importance of completing tasks on daily basis

Main Reason of Failure in Life

- یہ کام کل کریں گے
- جو کام کبھی بھی ہو سکتا ہے وہ کبھی نہیں ہوتا
- زندگی ایک دن ہے اور وہ ہے آج۔ زندگی میں کل نام کی کوئی چیز نہیں ہے
- جو دن آپ کی زندگی سے چلا گیا اب واپس نہیں آئے گا
- آج کا کام آج ہی ہوسکتا ہے
- جو گز گیا وہ آنا نہیں ، آنے والے دن کا پتہ نہیں ، آج میدان جما ہے تو اپنے جوہر دکھاؤ

How to Achieve BIG Goals in Life

Balanced Life is Ideal Life 😊

To achieve BIG Goals in Life

- ❑ **Make a Schedule of 24 Hours with a focus on Five main components of Human Life**
  - **Health**
    - **Physical Health**
    - **Mental Health**
    - **Social Health**
  - **Spirituality**
  - **Work**
  - **Family**
  - **Friends**

جو کام کریں دل سے کریں

- کام کرنا.
- خوشی خوشی کام کرنا.
- اللہ کو ساتھ لے کرخوشی خوشی کام کرنا.

آیت: إِيَّاكَ نَعْبُدُ وإِيَّاكَ نَسْتَعِينُ

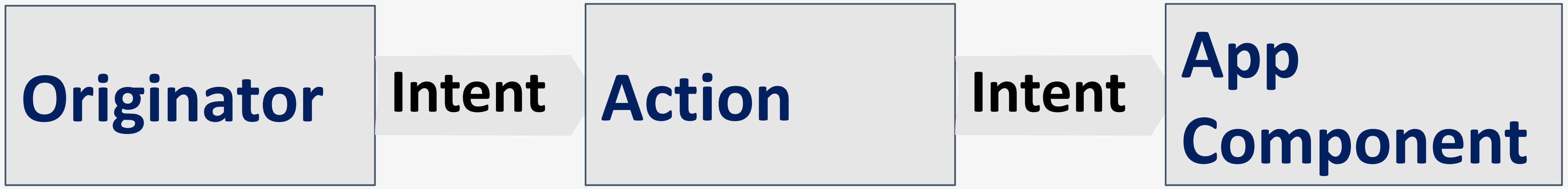
ترجمہ: یا اللہ ہم تیری ہی عبادت کرتے ہیں اور تجھ ہی سے مد د مانگتے ہیں

Lecture Outline

1. Revision
2. Activity
3. Function of Activity
4. Addition of New Activity
5. Manifest file
6. Intents
7. Explicit and implicit intents
8. Working of Activities
9. Activity Lifecycle
10. Stop Complaining! Stop Criticizing! Let's Start Contributing
11. Lecture Summary

Intent

- An Intent is a description of an operation to be performed. An Intent is an object used to request an action from another app component via the Android system.



Intent can do

- Start an Activity
  - A button click starts a new Activity for text entry
  - Clicking Share opens an app that allows you to post a photo
- Start a service
  - Fetching data in the background

Intent can do

- Deliver Broadcast
  - The system informs everybody that the phone is now charging
  - Battery level
  - Alarm

Explicit and implicit intents

- Explicit Intent
  - Starts a specific Activity
    - Main activity starts Surah Activity
    - Main activity starts Parah Activity
- Implicit Intent
  - Asks system to find an Activity that can handle this request
    - Multiple options for sharing

Send and Receive data

- Data—one piece of information whose data location can be represented by an URI
- Extras One or more pieces of information as a collection of key-value pair in a Bundle

Send and Receive data

- In the first (sending) Activity:
  - Create the Intent object
  - Put data or extras into that Intent
  - Start the new Activity with startActivity()

- In the second (receiving) Activity:
  - Get the Intent object, the Activity was started with
  - Retrieve the data or extras from the Intent object

Intent Structure

- The primary pieces of information in an intent are:
  - Action
    - The general action to be performed, such as ACTION_VIEW, ACTION_EDIT, ACTION_MAIN, etc.
  - Data
    - The data to operate on, such as a person record in the contacts database, expressed as a Uri.
  - Category
    - Gives additional information about the action to execute. For example, CATEGORY_LAUNCHER means it should appear in the Launcher as a top-level application

Intent Structure

Extras

- **This is a Bundle of any additional information. This can be used to provide extended information to the component. For example, if we have a action to send an e-mail message, we could also include extra pieces of data here to supply a subject, body, etc.**

زخم کا مرہم درد کا اپنے درماں بیچ

کے آئے ہیں

ہم لمحوں کا سودا کر کے صدیاں بیچ

کے آئے ہیں

بکنے پر جب آ ہی گئے تھے اونچے

مول تو بکتے ہم

ہم کو ہمارے رہبر لیکن ارزاں بیچ کے

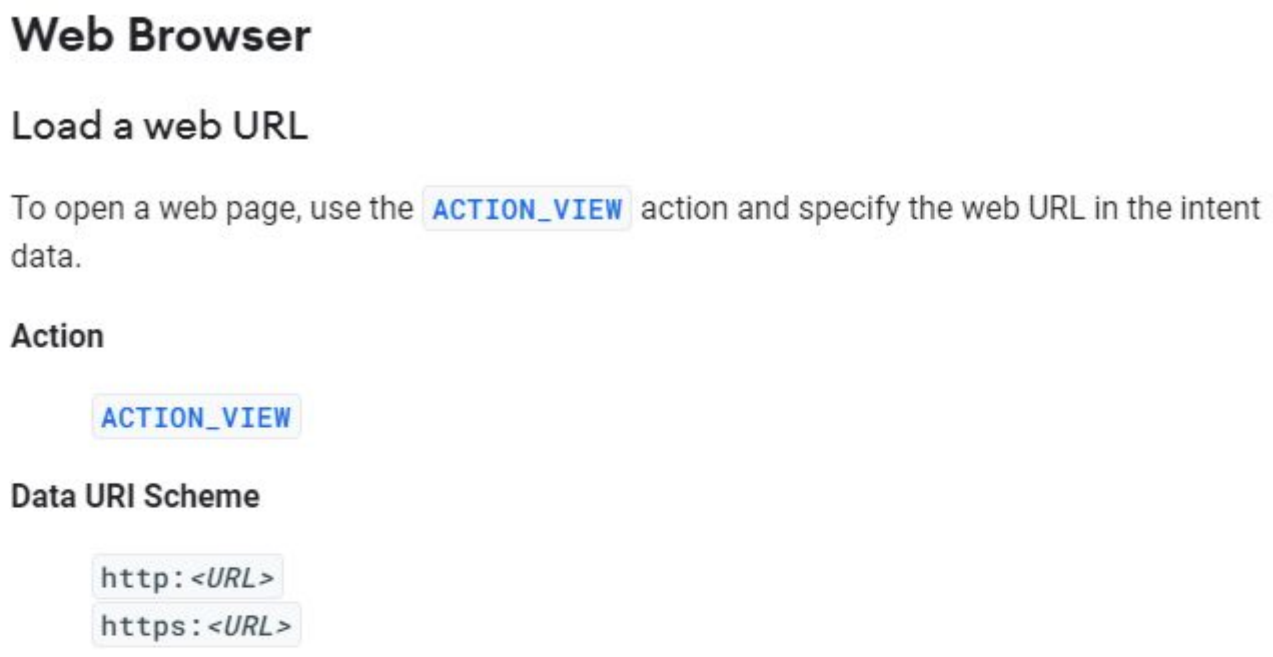
Explicit Intents – Dial a Number

```
public void CallingIntent(View view) {
        Uri uri =  Uri.parse("tel:+923001234567");
        Intent intent = new Intent(Intent.ACTION_DIAL, uri);
        startActivity(intent);
    }
```

Explicit Intents

```
 @Override
   public void onClick(View v) {
      Intent intent;
      switch (v.getId()) {
         case
R.id.buttonOpenSecodActivity:
            intent = new
Intent(MainActivity.this,
MainActivity2.class);
            startActivity(intent);
            break;
case R.id.buttonCallingIntent:
            Uri uri =
Uri.parse("tel:+923001234567");
            intent = new
Intent(Intent.ACTION_DIAL, uri);
            startActivity(intent);
            break;
         default:
            throw new
IllegalStateException("Unexpected
value: " + v.getId());
      } }
```

Intent Web Browser



Web Browser

Load a web URL

To open a web page, use the `ACTION_VIEW` action and specify the web URL in the intent data.

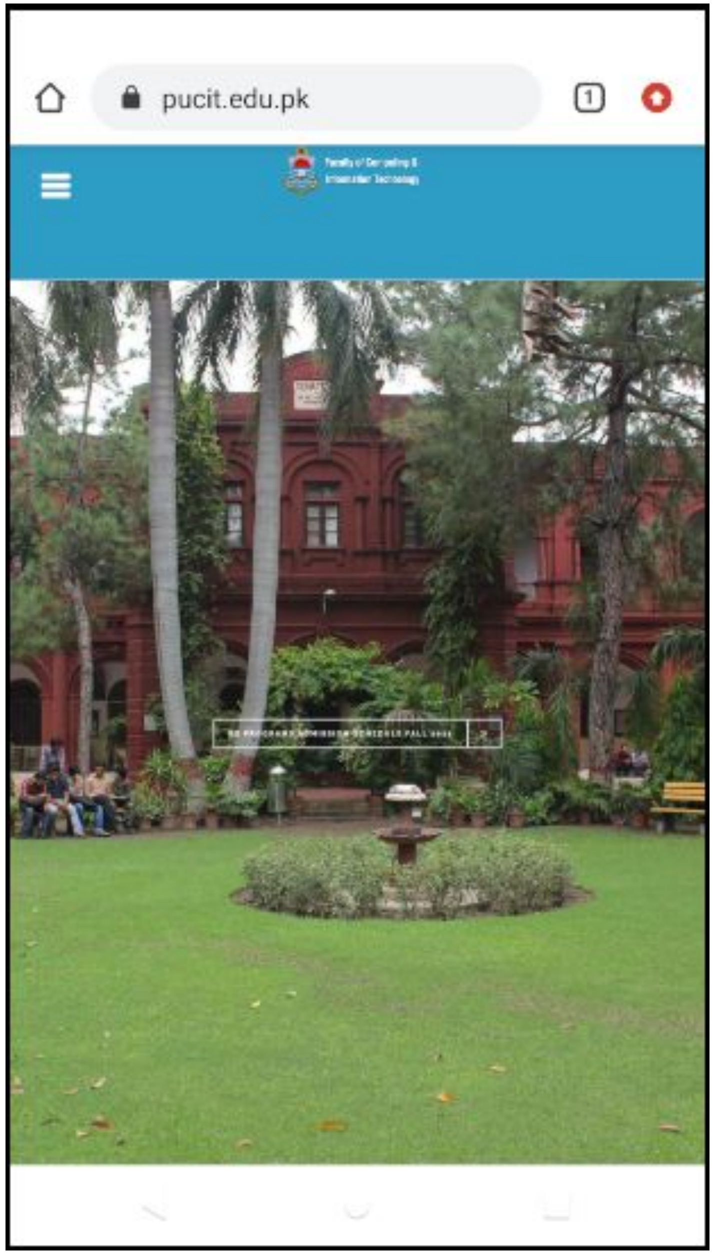
Action

`ACTION_VIEW`

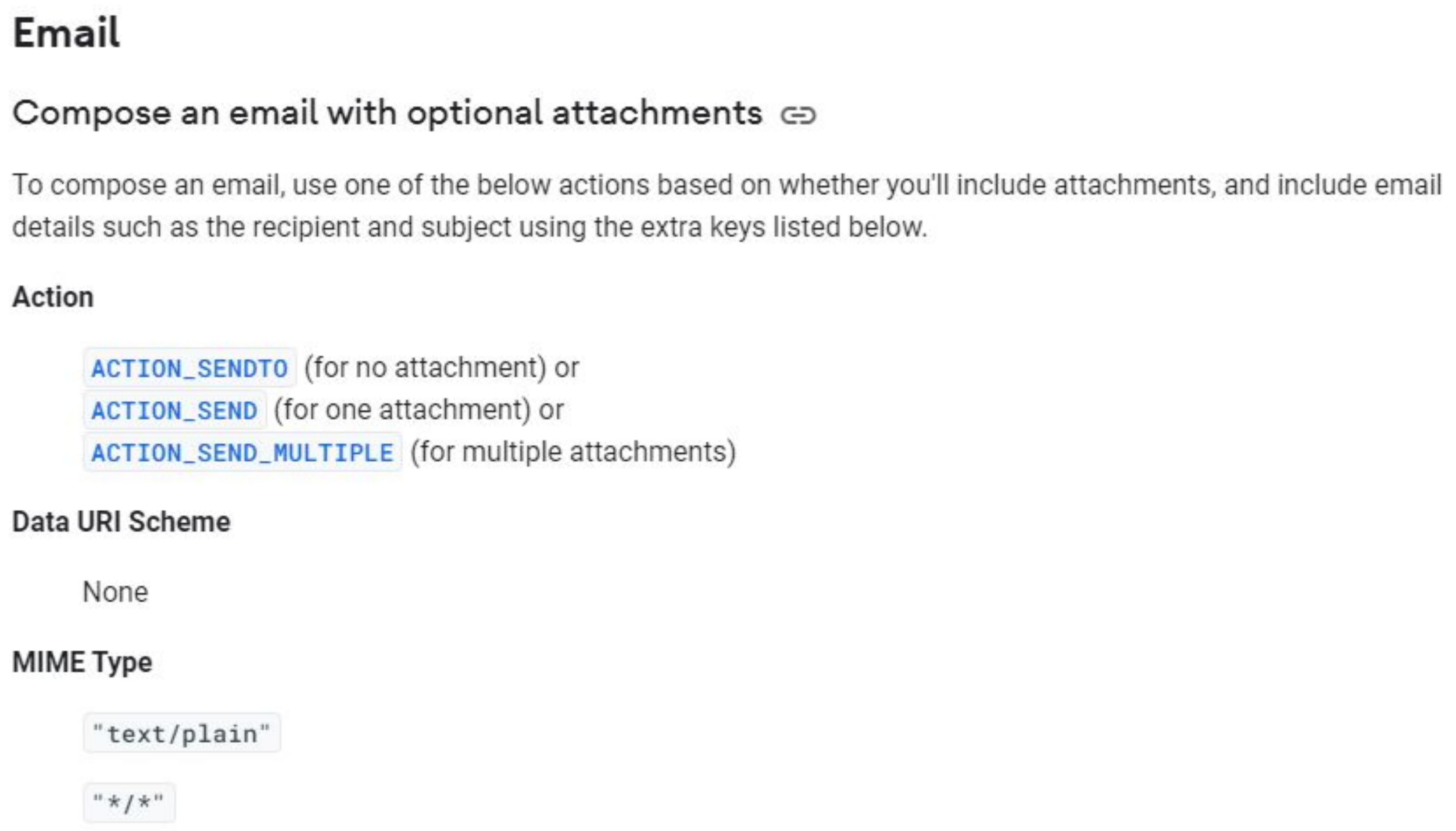
Data URI Scheme

`http:<URL>`
`https:<URL>`

```
public void openWebPage(String url) {
    Uri webpage = Uri.parse(url);
    Intent intent = new
Intent(Intent.ACTION_VIEW, webpage);
    startActivity(intent);
}
```



Intent Email



Email

Compose an email with optional attachments

To compose an email, use one of the below actions based on whether you'll include attachments, and include email details such as the recipient and subject using the extra keys listed below.

Action

`ACTION_SENDTO` (for no attachment) or
`ACTION_SEND` (for one attachment) or
`ACTION_SEND_MULTIPLE` (for multiple attachments)

Data URI Scheme

None

MIME Type

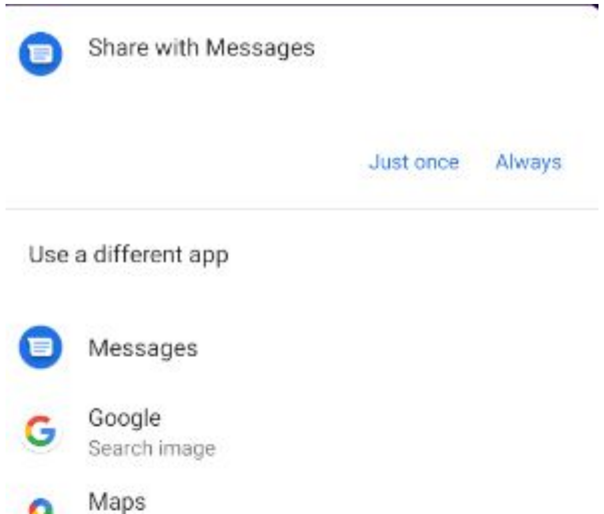
`"text/plain"`

`"*/*"`

https://developer.android.com/guide/components/intents-common#Email

Intent ACTION_SEND

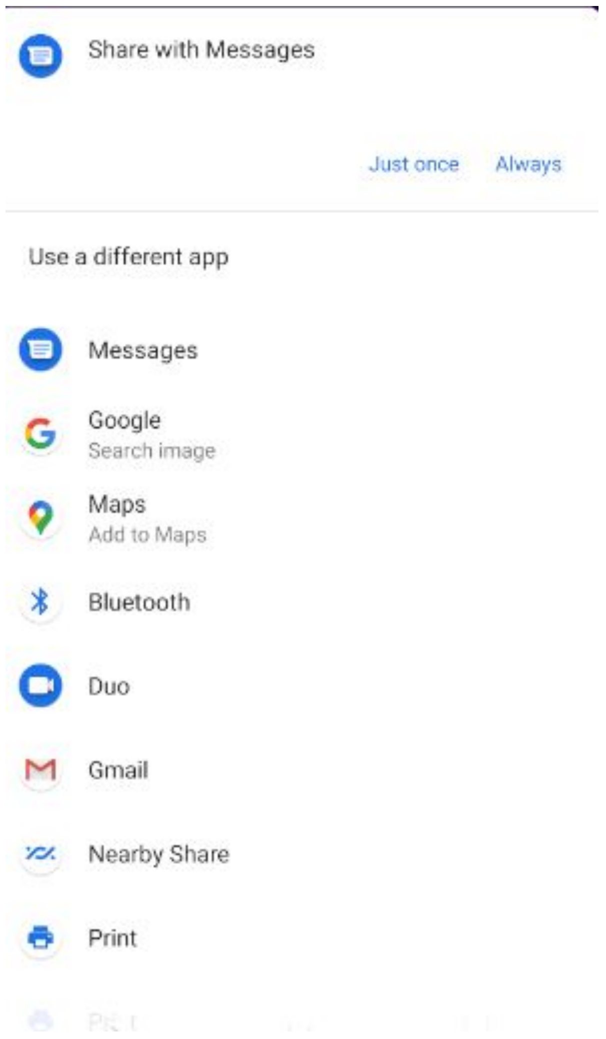
```
public void composeEmail(String address, String subject) {
    Intent intent = new Intent(Intent.ACTION_SEND);
    intent.setType("*/*");
    intent.putExtra(Intent.EXTRA_EMAIL, address);
    intent.putExtra(Intent.EXTRA_SUBJECT, subject);
    if (intent.resolveActivity(getPackageManager()) != null) {
        startActivity(intent);
    }
```



Intent Email

If you want to ensure that your intent is handled only by an email app (and not other text messaging or social apps), then use the ACTION_SENDTO action and include the "mailto:" data scheme.
For example:

```
intent.setData(Uri.parse("mailto:"));
 // only email apps should handle this
```



resolveActivity()

Caution: If there are no apps on the device that can receive the implicit intent, your app will crash when it calls startActivity(). To first verify that an app exists to receive the intent, call resolveActivity() on your Intent object. If the result is non-null, there is at least one app that can handle the intent and it's safe to call startActivity(). If the result is null, you should not use the intent and, if possible, you should disable the feature that invokes the intent.

Intent with Extra Features

```
String message = editTextNumber.getText().toString();
intent = new Intent();
intent.setAction(Intent.ACTION_SEND);
intent.setType("text/plain");
intent.putExtra(Intent.EXTRA_TEXT, message);
startActivity(intent);
```

Passing values between activities

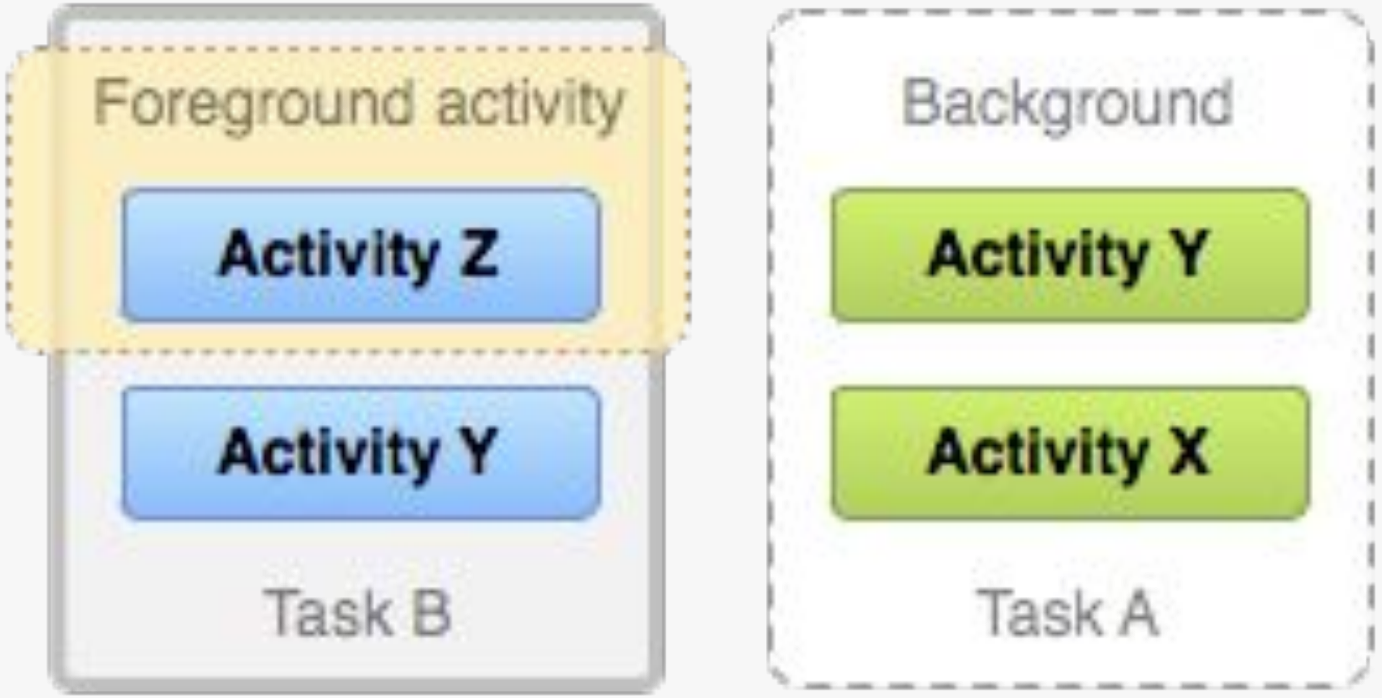
```
Intent intent = new Intent(ActivityMain.this, ActivityMain2.class);
startActivity(intent);
String message = editText.getText().toString();
intent.putExtra("ETM", message);

String staticString = "السلام عليكم";
intent.putExtra("SS", staticString);
intent.putExtra(“abc", “It is another text”);
```

```
Intent intent = getIntent();
textView.setText(intent.getStringExtra("value"));
```

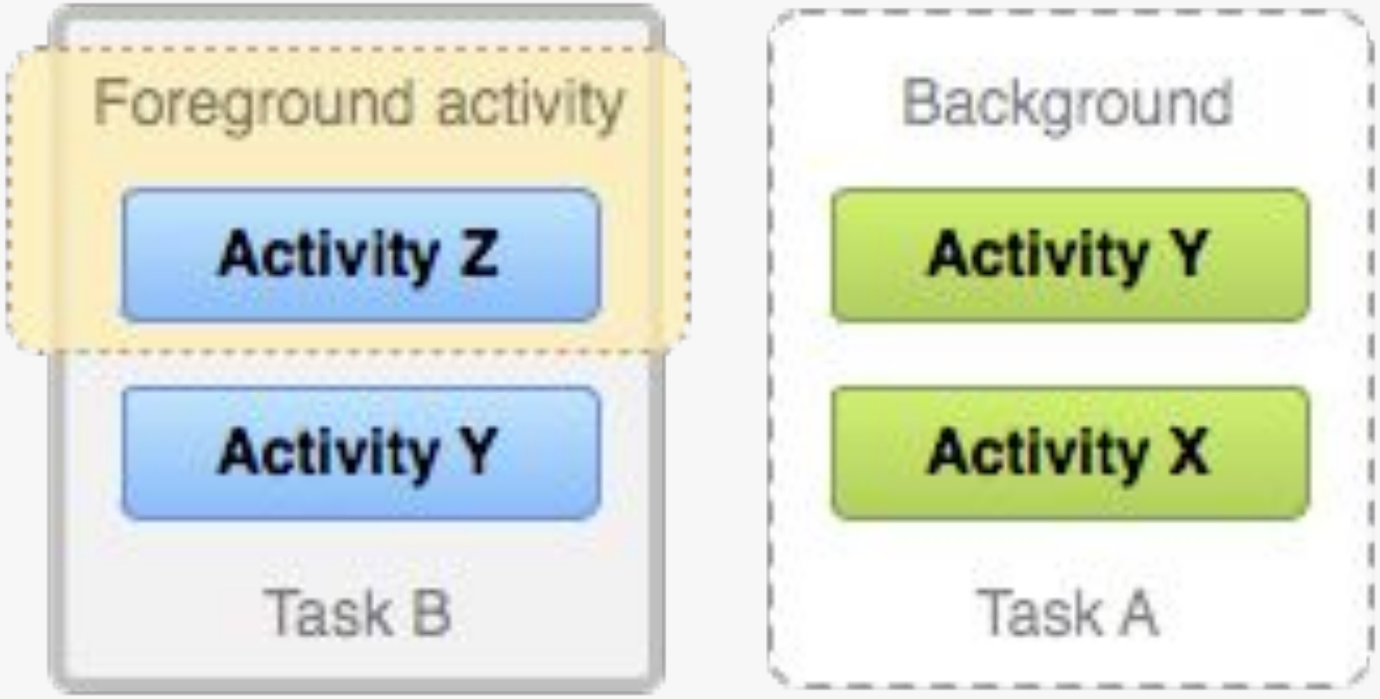
Background and foreground tasks

- The user uses the Home button or gesture, then starts a new app from the app launcher. When the Home screen appears, Task A goes into the background. When the new app starts, the system starts a task for that app (Task B) with its own stack of activities.



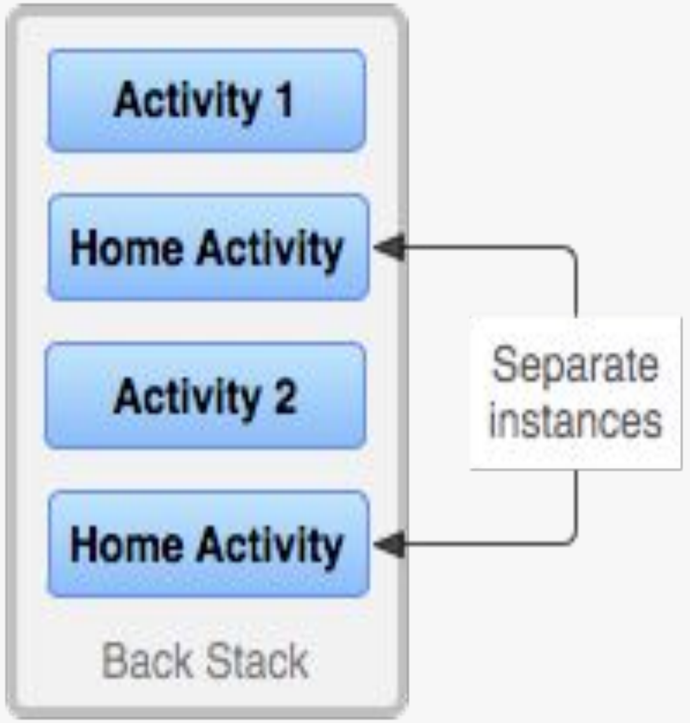
Background and foreground tasks

- After interacting with that app, the user returns Home again and selects the app that originally started Task A. Now, Task A comes to the foreground



Multiple activity instances

Because the activities in the back stack are never rearranged, if your app allows users to start a particular activity from more than one activity, a new instance of that activity is created and pushed onto the stack (rather than bringing any previous instance of the activity to the top). As such, one activity in your app might be instantiated multiple times (even from different tasks), as shown in figure 3. If the user navigates backward using the Back button or gesture, each instance of the activity is revealed in the order they were opened (each with their own UI state). However, you can modify this behavior if you do not want an activity to be instantiated more than once



Lifecycle recap

- When Activity A starts Activity B, Activity A is stopped, but the system retains its state (such as scroll position and text entered into forms). If the user uses the Back or gesture while in Activity B, Activity A resumes with its state restored. A button click starts a new Activity for text entry
- When the user leaves a task using the Home button or gesture, the current activity is stopped and its task goes into the background. The system retains the state of every activity in the task. If the user later resumes the task by selecting the launcher icon that began the task, the task comes to the foreground and resumes the activity at the top of the stack.

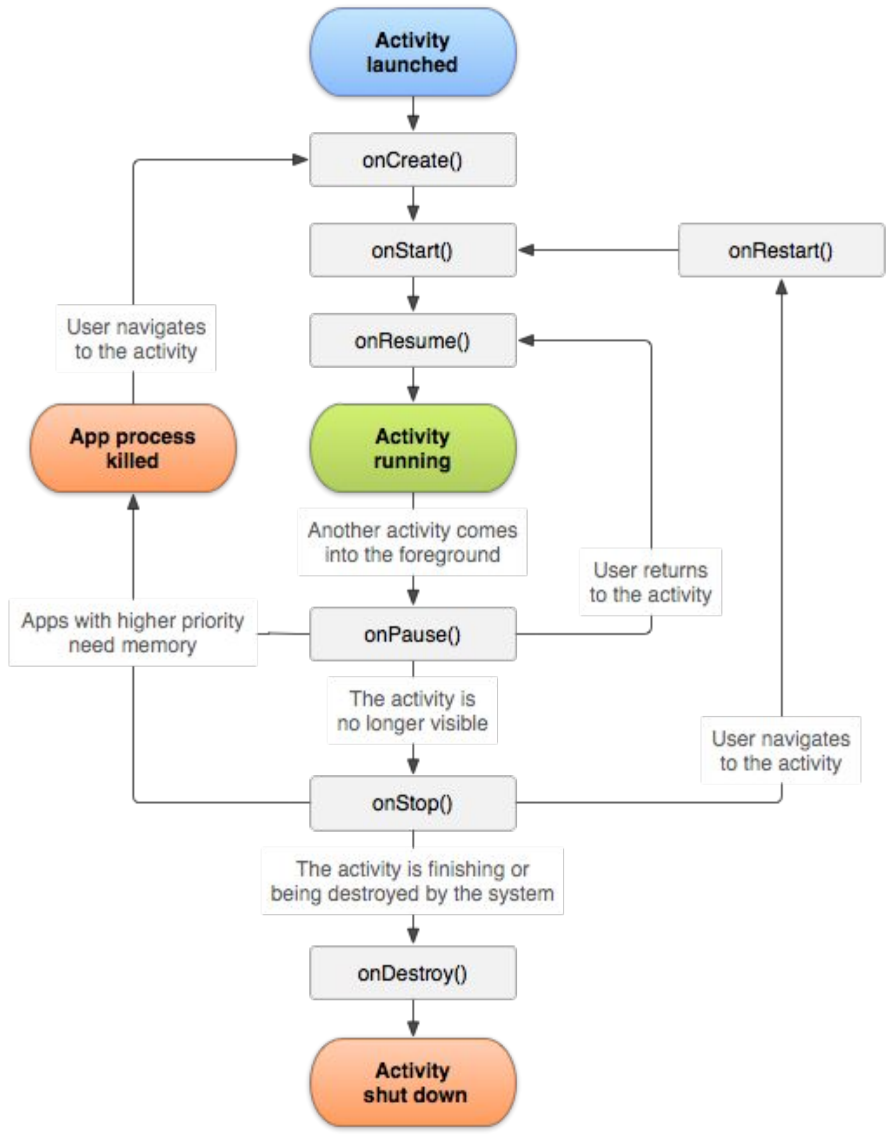
Define launch modes using the manifest file

- standard
  - Multiple Instances A-B-C-D-D-D current task
- singleTop
  - A-B-C-D current task
- singleTask
  - The system creates a new task and instantiates the activity at the root of the new task. Only one instance of the activity can exist at a time.
- singleInstance
  - Same as "singleTask", except that the system doesn't launch any other activities into the task holding the instance. The activity is always the single and only member of its task; any activities started by this one open in a separate task.

Activity Lifecycle

- To navigate transitions between stages of the activity lifecycle, the Activity class provides a core set of six callbacks:

-)onCreate
(
-)onStart
(
- onResum
()e
- onPause
()
-)onStop
(
- onDestroy
()



Activity launched
onCreate()
onStart()
onRestart()
User navigates to the activity
onResume()
App process killed
Activity running
Another activity comes into the foreground
User returns to the activity
Apps with higher priority need memory
onPause()
The activity is no longer visible
User navigates to the activity
onStop()
The activity is finishing or being destroyed by the system
onDestroy()
Activity shut down

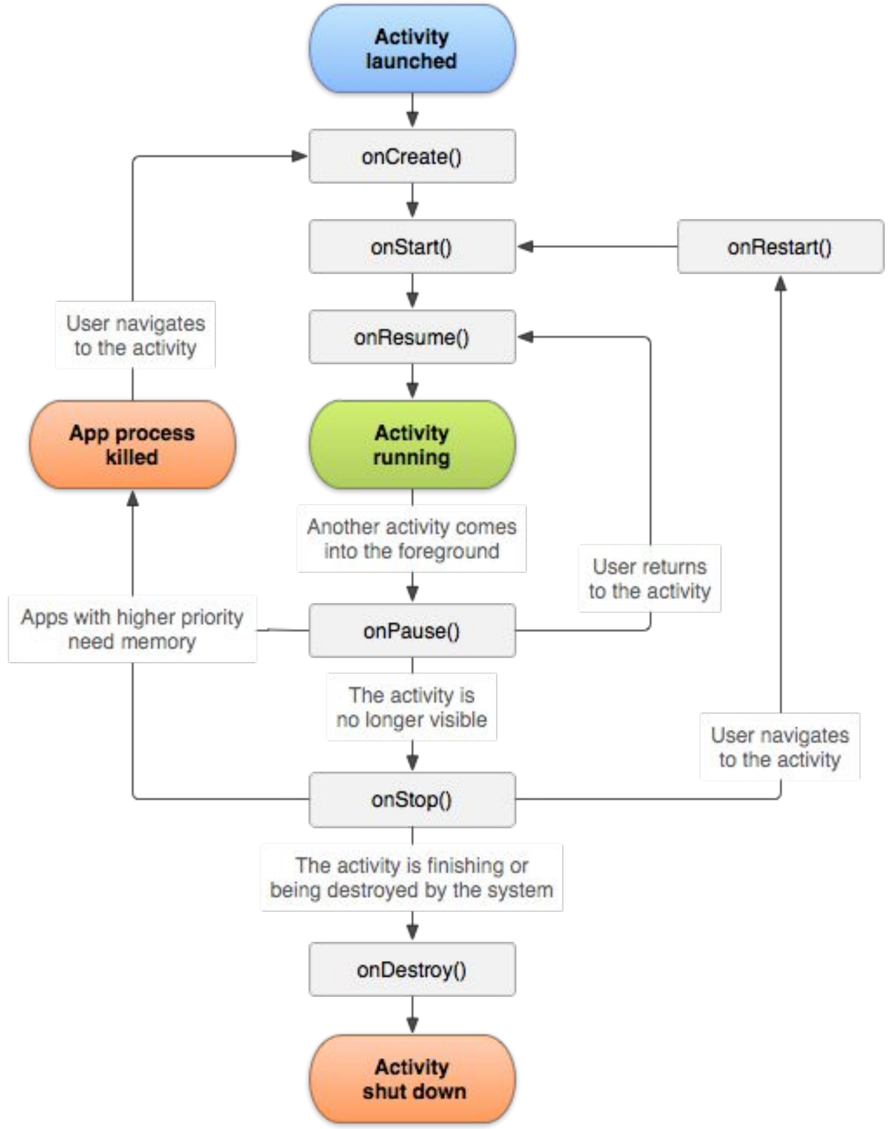
Working of Activities

- All Activity instances are managed by the Android runtime
- Started by an "Intent", a message to the Android runtime to run an activity

Activity Lifecycle

- To navigate transitions between stages of the activity lifecycle, the Activity class provides a core set of six callbacks:

- onCreate
- ()onStart
- onResume
-)onPause
- ()onStop
-)onRestart
-)onDestroy
(



Activity launched
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onStart()
onRestart()
User navigates to the activity
onResume()
App process killed
Activity running
Another activity comes into the foreground
User returns to the activity
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The activity is no longer visible
User navigates to the activity
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The activity is finishing or being destroyed by the system
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Activity Lifecycle

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- onCreat
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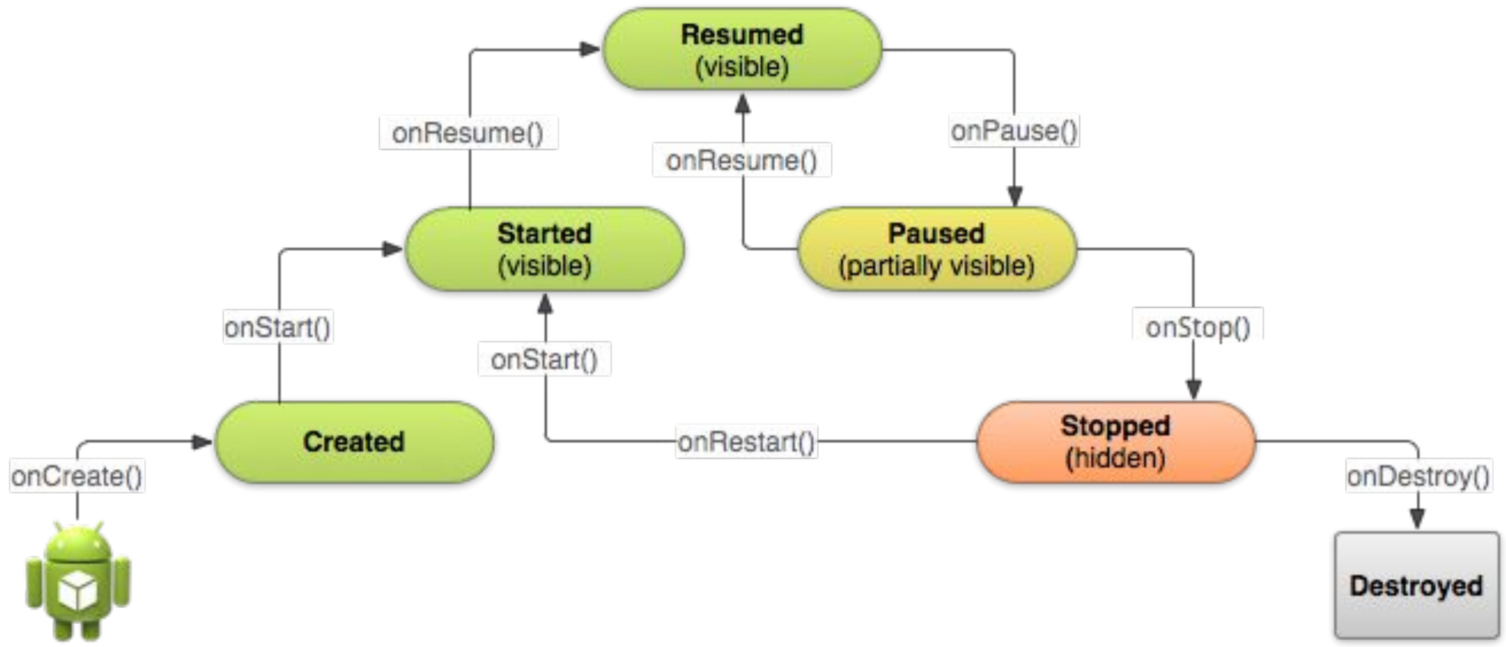
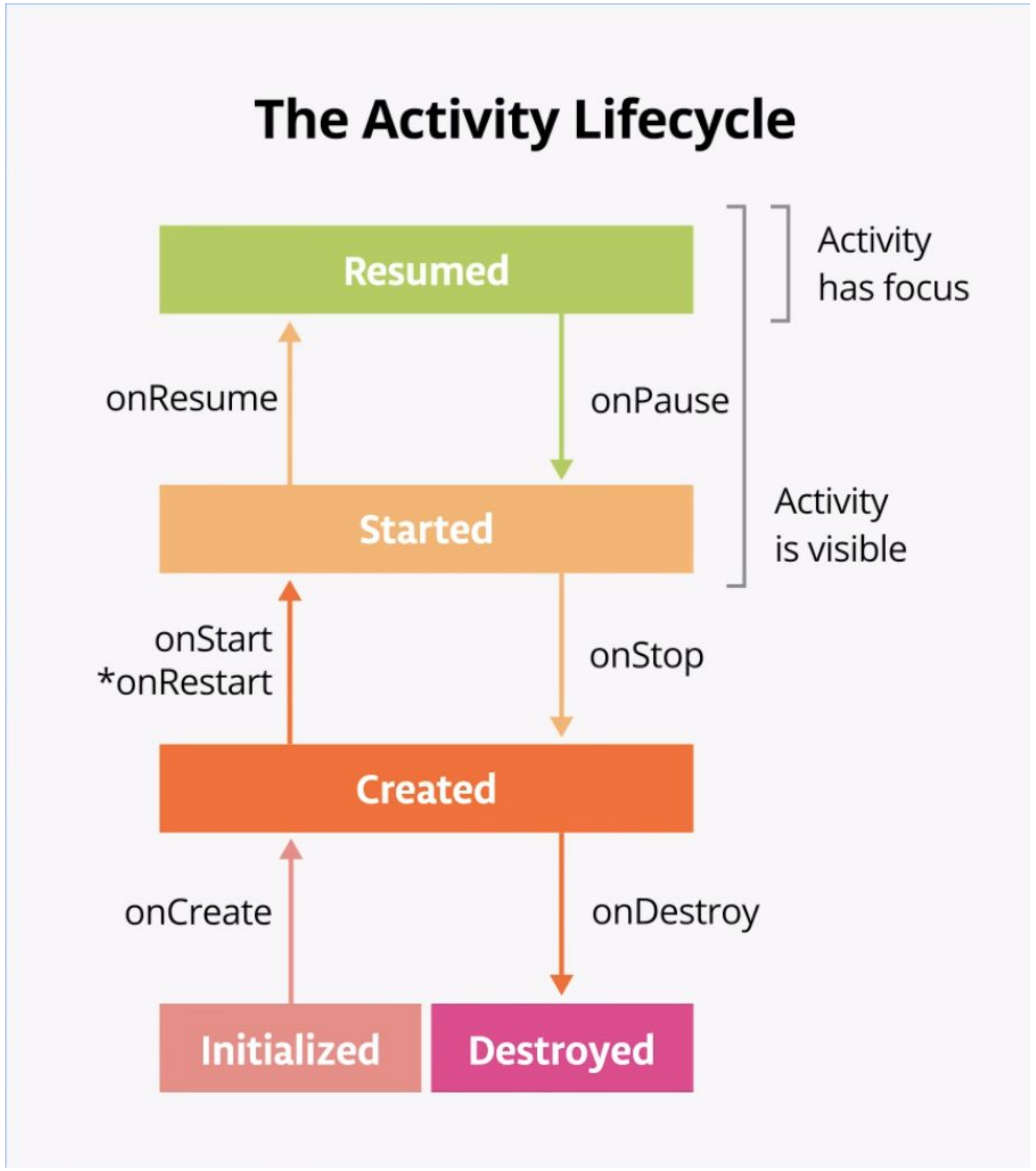
- onPaus
-)onStop
- onDestr

()oy



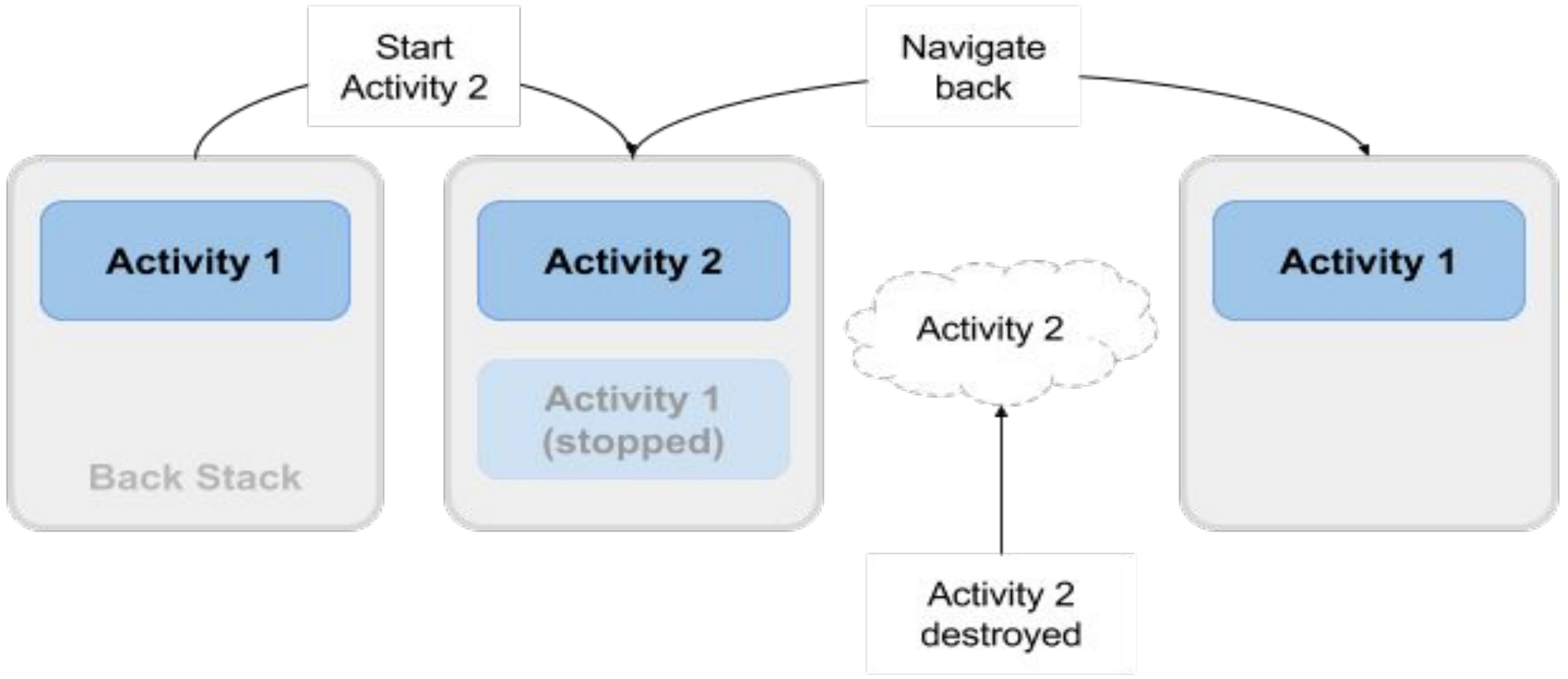
Activity Lifecycle



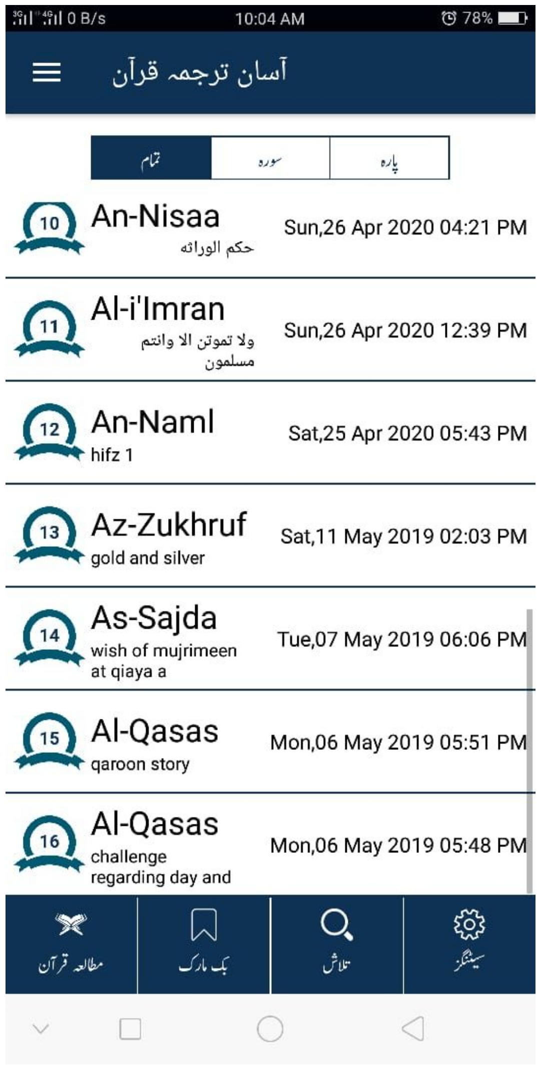
Activity Lifecycle

- To navigate transitions between stages of the activity lifecycle, the Activity class provides a core set of six callbacks:
- Created (not visible yet)
- Started (visible)
- Resume (visible)
- Paused(partially invisible)
- Stopped (hidden)
- Destroyed (gone from memory)

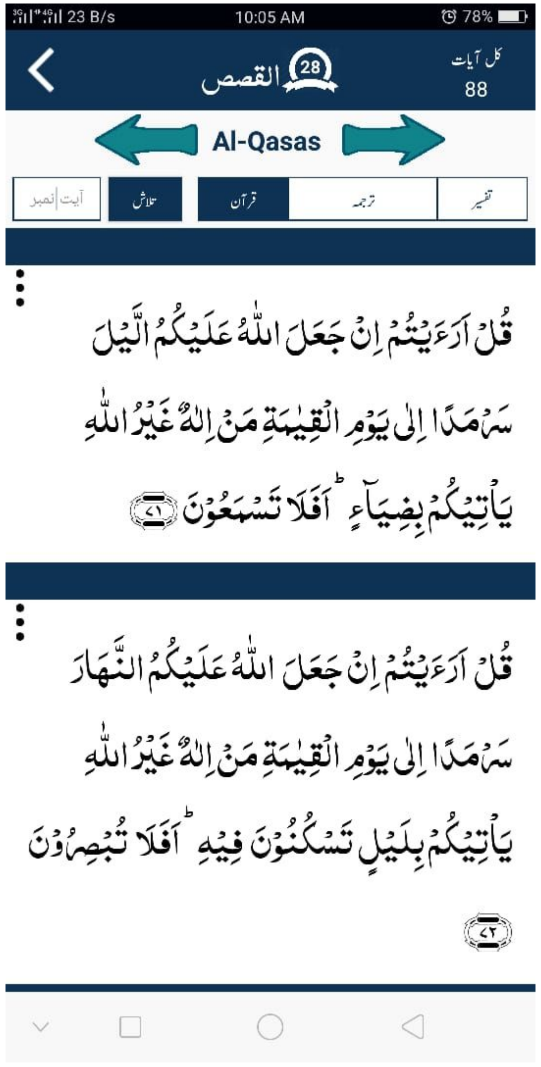
Activity Lifecycle



Activity Lifecycle

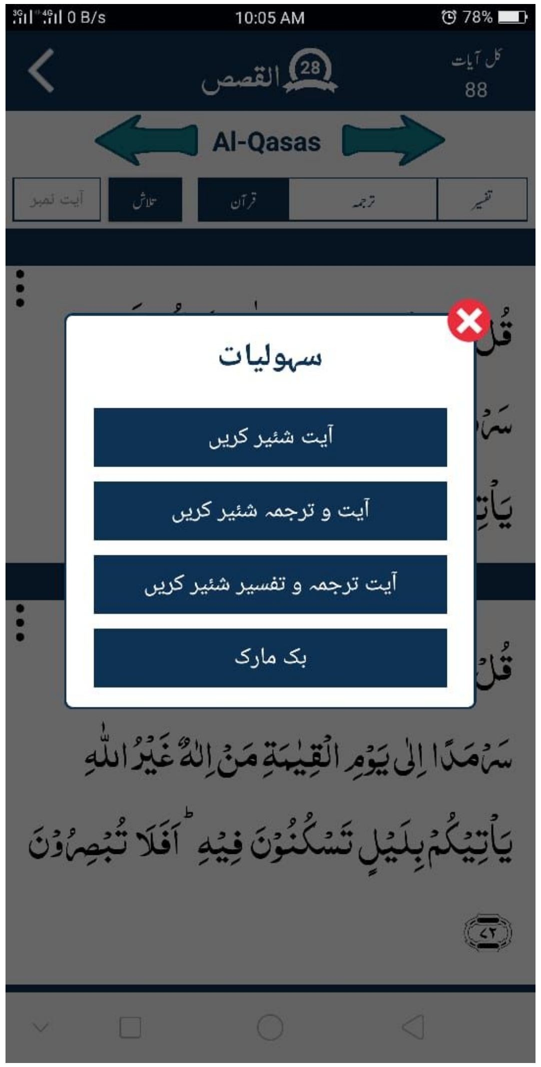


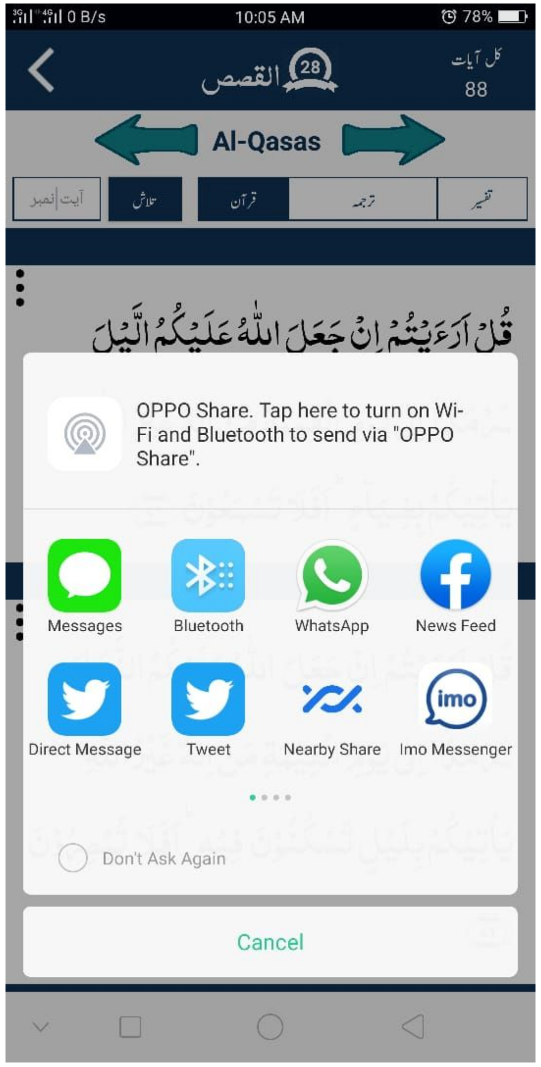
10	An-Nisaa حکم الوراثہ	Sun,26 Apr 2020 04:21 PM
11	Al-i'Imran ولا تموتن الا وانتم مسلمون	Sun,26 Apr 2020 12:39 PM
12	An-Naml hifz 1	Sat,25 Apr 2020 05:43 PM
13	Az-Zukhruf gold and silver	Sat,11 May 2019 02:03 PM
14	As-Sajda wish of mujrimeen at qiaya a	Tue,07 May 2019 06:06 PM
15	Al-Qasas qaroon story	Mon,06 May 2019 05:51 PM
16	Al-Qasas challenge regarding day and	Mon,06 May 2019 05:48 PM



قُلْ اَرَءَيْتُمْ اِنْ جَعَلَ اللّٰهُ عَلَيْكُمُ الَّيْلَ سَرْمَدًا اِلٰى يَوْمِ الْقِيٰمَةِ مَنْ اِلٰهٌ غَيْرُ اللّٰهِ يَاْتِيْكُمْ بِضِيَآءٍ ۭ اَفَلَا تَسْمَعُوْنَ ٧١

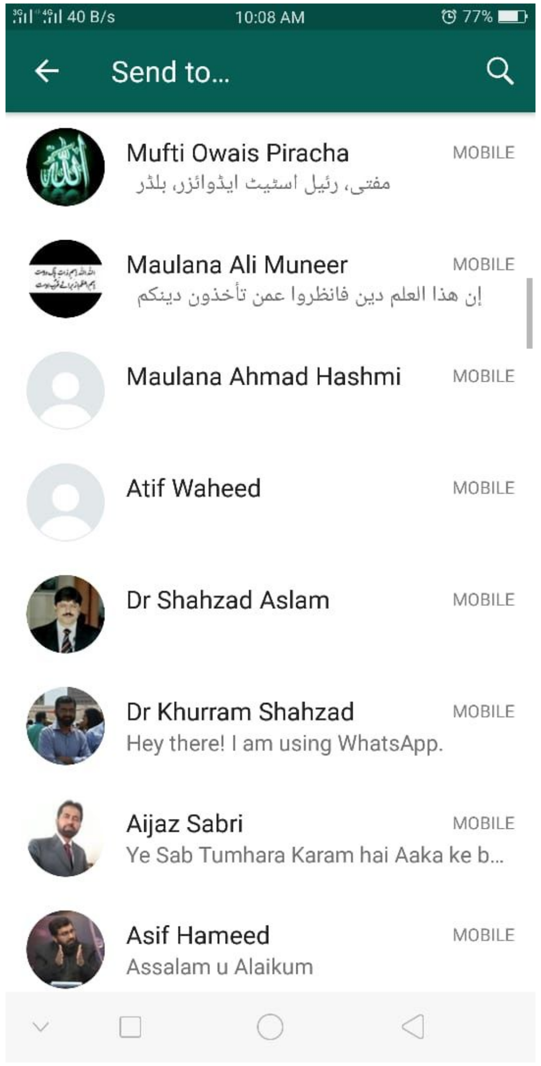
قُلْ اَرَءَيْتُمْ اِنْ جَعَلَ اللّٰهُ عَلَيْكُمُ النَّهَارَ سَرْمَدًا اِلٰى يَوْمِ الْقِيٰمَةِ مَنْ اِلٰهٌ غَيْرُ اللّٰهِ يَاْتِيْكُمْ بِلَيْلٍ تَسْكُنُوْنَ فِيْهِ ۭ اَفَلَا تُبْصِرُوْنَ ٧٢





OPPO Share. Tap here to turn on Wi-Fi and Bluetooth to send via "OPPO Share".

Activity Lifecycle


Send to...

Mufti Owais Piracha — MOBILE
مفتی، رئیل اسٹیٹ ایڈوائزر، بلڈر

Maulana Ali Muneer — MOBILE
إن هذا العلم دين فانظروا عمن تأخذون دينكم

Maulana Ahmad Hashmi — MOBILE

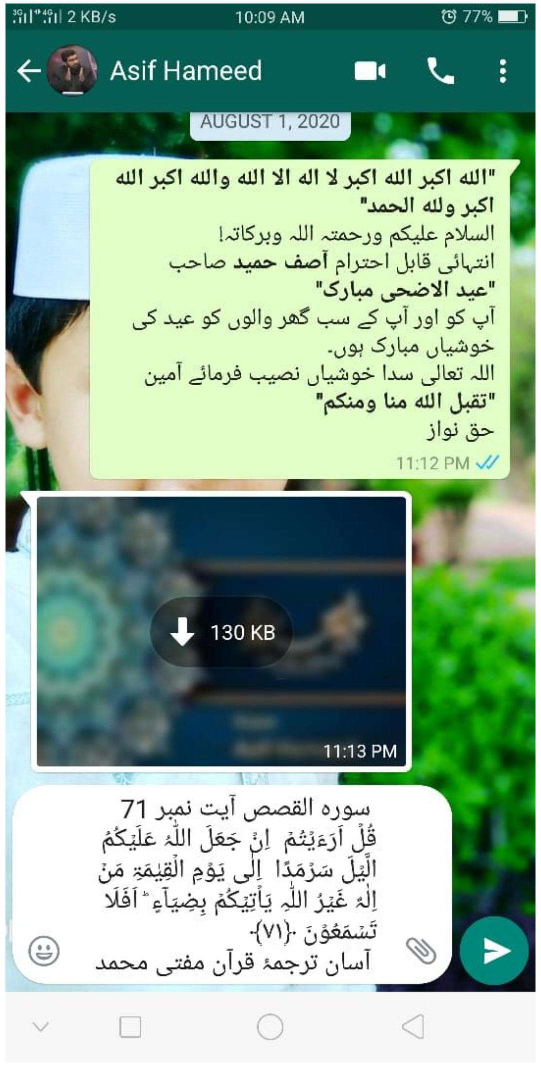
Atif Waheed — MOBILE

Dr Shahzad Aslam — MOBILE

Dr Khurram Shahzad — MOBILE
Hey there! I am using WhatsApp.

Aijaz Sabri — MOBILE
Ye Sab Tumhara Karam hai Aaka ke b...

Asif Hameed — MOBILE
Assalam u Alaikum

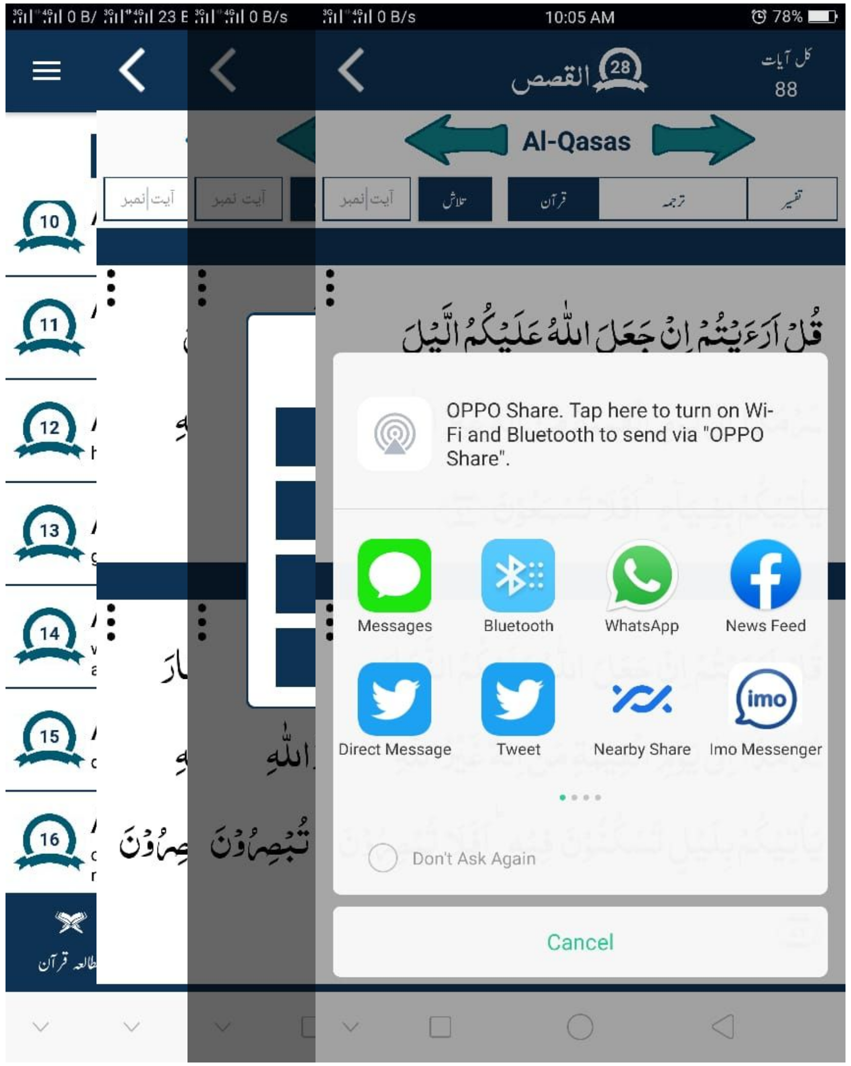

Asif Hameed

AUGUST 1, 2020

"الله اکبر الله اکبر لا اله الا الله والله اکبر الله اکبر ولله الحمد"
السلام علیکم ورحمتہ الله وبرکاتہ!
انتہائی قابل احترام **آصف حمید** صاحب
"عید الاضحی مبارک"
آپ کو اور آپ کے سب گھر والوں کو عید کی خوشیاں مبارک ہوں۔
اللہ تعالی سدا خوشیاں نصیب فرمائے آمین
"تقبل الله منا ومنكم"
حق نواز
11:12 PM

130 KB
11:13 PM

سوره القصص آیت نمبر 71
قُلْ اَرَءَيْتُمْ اِنْ جَعَلَ اللّٰهُ عَلَيْكُمُ الَّيْلَ سَرْمَدًا اِلٰى يَوْمِ الْقِيٰمَةِ مَنْ اِلٰهٌ غَيْرُ اللّٰهِ يَاْتِيْكُمْ بِضِيَآءٍ ۗ اَفَلَا تَسْمَعُوْنَ ۔{۷۱}۔
آسان ترجمۂ قرآن مفتی محمد


القصص 28 — کل آیات 88

Al-Qasas

آیت نمبر | تلاش | قرآن | ترجمہ | تفسیر

قُلْ اَرَءَيْتُمْ اِنْ جَعَلَ اللّٰهُ عَلَيْكُمُ الَّيْلَ

OPPO Share. Tap here to turn on Wi-Fi and Bluetooth to send via "OPPO Share".

Messages | Bluetooth | WhatsApp | News Feed
Direct Message | Tweet | Nearby Share | Imo Messenger

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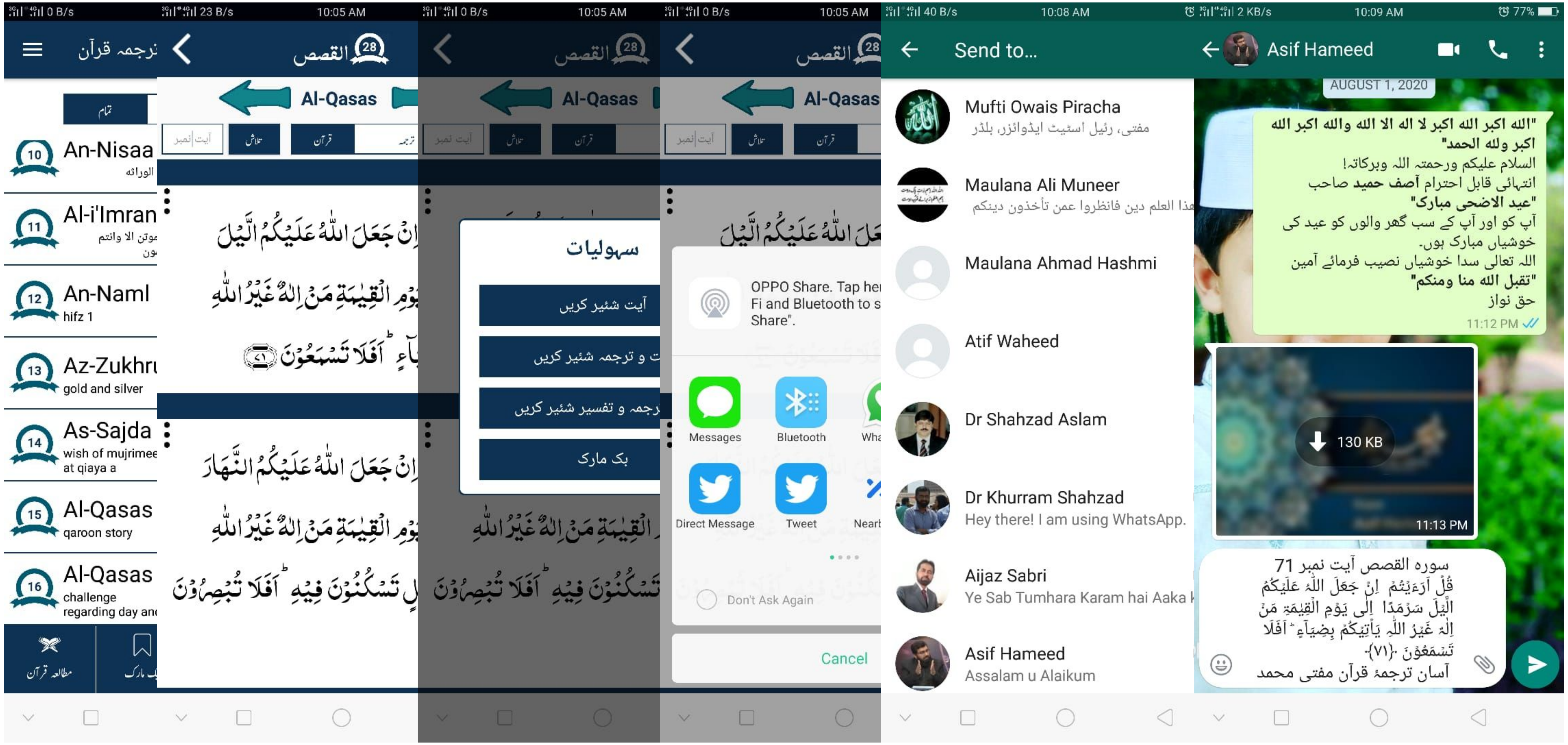
Activity **Lifecycle**



Mufti Owais Piracha
مفتی، رئیل اسٹیٹ ایڈوائزر، بلڈر

Maulana Ali Muneer
هذا العلم دين فانظروا عمن تأخذون دينكم

Maulana Ahmad Hashmi

Atif Waheed

Dr Shahzad Aslam

Dr Khurram Shahzad
Hey there! I am using WhatsApp.

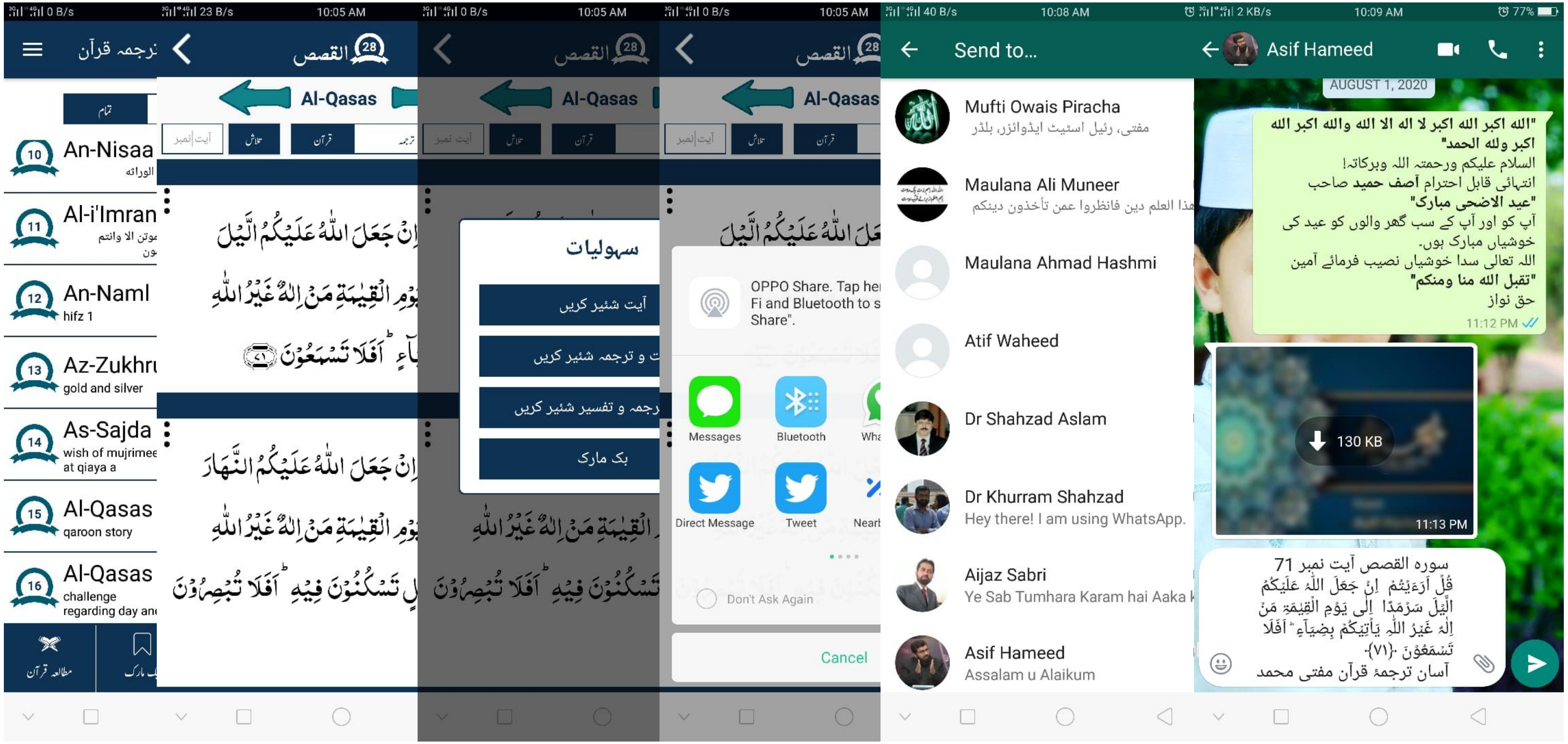
Aijaz Sabri
Ye Sab Tumhara Karam hai Aaka

Asif Hameed
Assalam u Alaikum

"اللہ اکبر اللہ اکبر لا الہ الا اللہ واللہ اکبر اللہ اکبر وللہ الحمد"
السلام علیکم ورحمتہ اللہ وبرکاتہ!
انتہائی قابل احترام آصف حمید صاحب
"عید الاضحی مبارک"
آپ کو اور آپ کے سب گھر والوں کو عید کی خوشیاں مبارک ہوں۔
اللہ تعالی سدا خوشیاں نصیب فرمائے آمین
"تقبل اللہ منا ومنکم"
حق نواز
11:12 PM

سورہ القصص آیت نمبر 71
قُلْ اَرَءَيْتُمْ اِنْ جَعَلَ اللّٰهُ عَلَيْكُمُ الَّيْلَ سَرْمَدًا اِلٰى يَوْمِ الْقِيٰمَةِ مَنْ اِلٰهٌ غَيْرُ اللّٰهِ يَاْتِيْكُمْ بِضِيَآءٍ ۭ اَفَلَا تَسْمَعُوْنَ ‎﴿٧١﴾
آسان ترجمہ قرآن مفتی محمد

Activity Lifecycle



ترجمہ قرآن

10 An-Nisaa الوراثہ

11 Al-i'Imran

12 An-Naml hifz 1

13 Az-Zukhru gold and silver

14 As-Sajda wish of mujrimee at qiaya a

15 Al-Qasas qaroon story

16 Al-Qasas challenge regarding day an

القصص 28

Al-Qasas

سہولیات

آیت شئیر کریں

بک مارک

OPPO Share. Tap here Fi and Bluetooth to s Share".

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AUGUST 1, 2020

"اللہ اکبر اللہ اکبر لا الہ الا اللہ واللہ اکبر اللہ اکبر وللہ الحمد"
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"تقبل اللہ منا ومنکم"
حق نواز
11:12 PM

130 KB
11:13 PM

سورہ القصص آیت نمبر 71
قُلْ اَرَءَيْتُمْ اِنْ جَعَلَ اللّٰهُ عَلَيْكُمُ الَّيْلَ سَرْمَدًا اِلٰى يَوْمِ الْقِيٰمَةِ مَنْ اِلٰهٌ غَيْرُ اللّٰهِ يَاْتِيْكُمْ بِضِيَآءٍ ؕ اَفَلَا تَسْمَعُوْنَ ﴿۷۱﴾
آسان ترجمہ قرآن مفتی محمد

Start an Activity

```
@Override
  public void onClick(View v) {
     switch(v.getId()) {
        case R.id.buttonOpenSecodActivity:
           Intent intent =  new Intent(MainActivity.this, MainActivity2.class);
           startActivity(intent);
           break;
     }
  }
```

آتے آتے مرا نام سا رہ گیا
اس کے ہونٹوں پہ کچھ کانپتا رہ گیا

رات مجرم تھی دامن بچا لے گئی
دن گواہوں کی صف میں کھڑا رہ گیا

وہ مرے سامنے ہی گیا اور میں
راستے کی طرح دیکھتا رہ گیا

جھوٹ والے کہیں سے کہیں بڑھ گئے
اور میں تھا کہ سچ بولتا رہ گیا

آندھیوں کے ارادے تو اچھے نہ تھے
یہ دیا کیسے جلتا ہوا رہ گیا

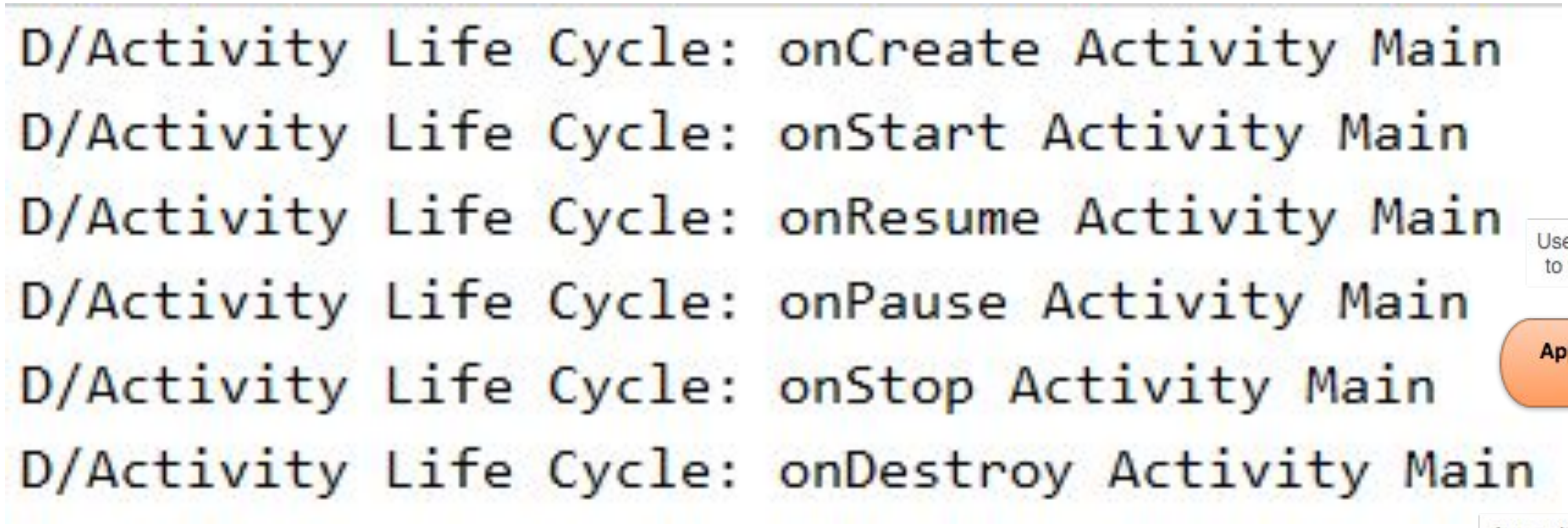
اس کو کاندھوں پہ لے جا رہے ہیں وسیمؔ
اور وہ جینے کا حق مانگتا رہ گیا

ActivityCycle for an Activity

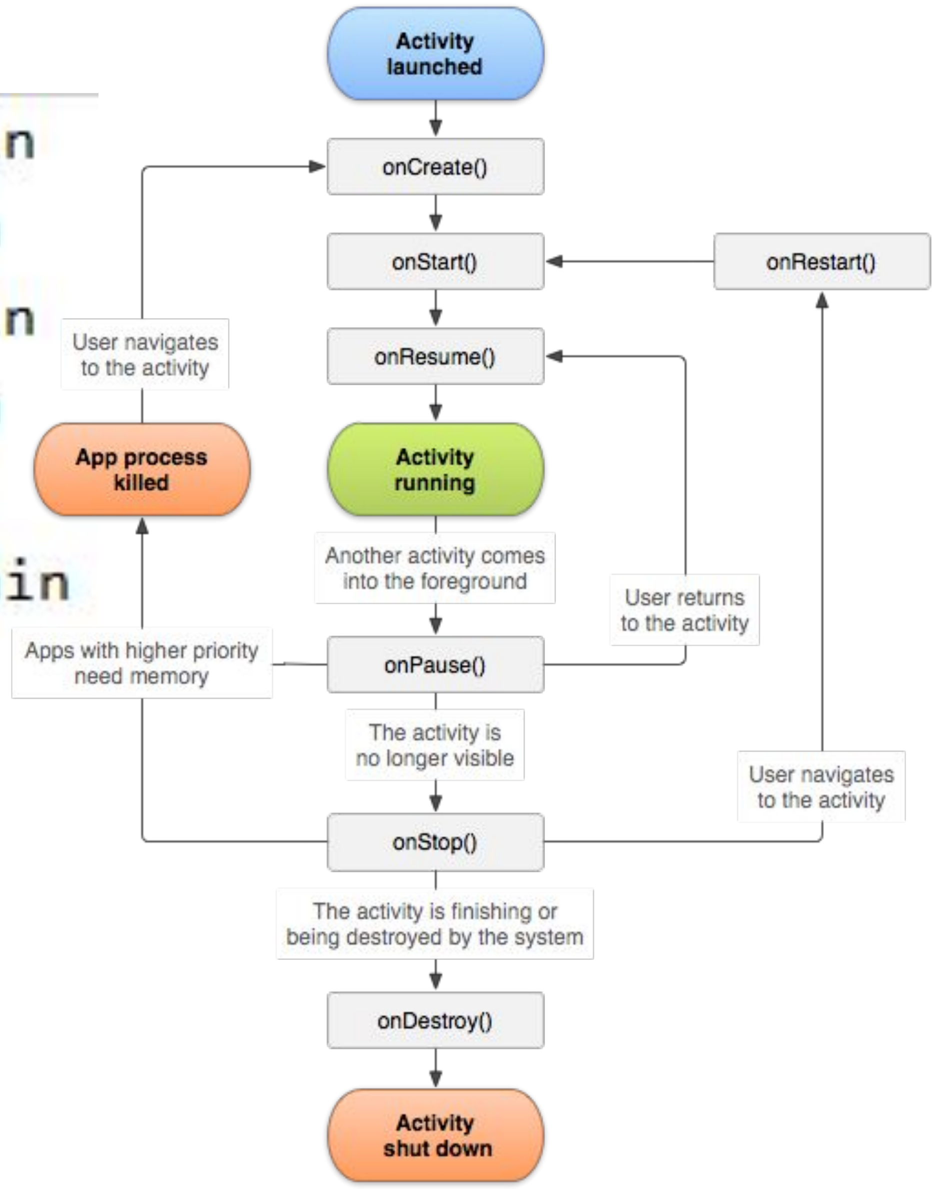
```
@Override
  protected void onCreate() {
     super. onCreate();
     Log.d(TAG, " onCreate Activity Main");
  }

@Override
  protected void onStart() {
     super.onStart();
     Log.d(TAG, "onStart Activity Main");
  }

@Override
  protected void onResume() {
     super. onResume();
     Log.d(TAG, " onResume Activity Main");
  }
```

```
@Override
  protected void onPause() {
     super. onPause();
     Log.d(TAG, " onPause Activity Main");
  }

@Override
  protected void onStop() {
     super. onStop();
     Log.d(TAG, " onStop Activity Main");
  }
@Override
  protected void onDestroy() {
     super. onDestroy();
     Log.d(TAG, " onDestroy Activity Main");
  }
```

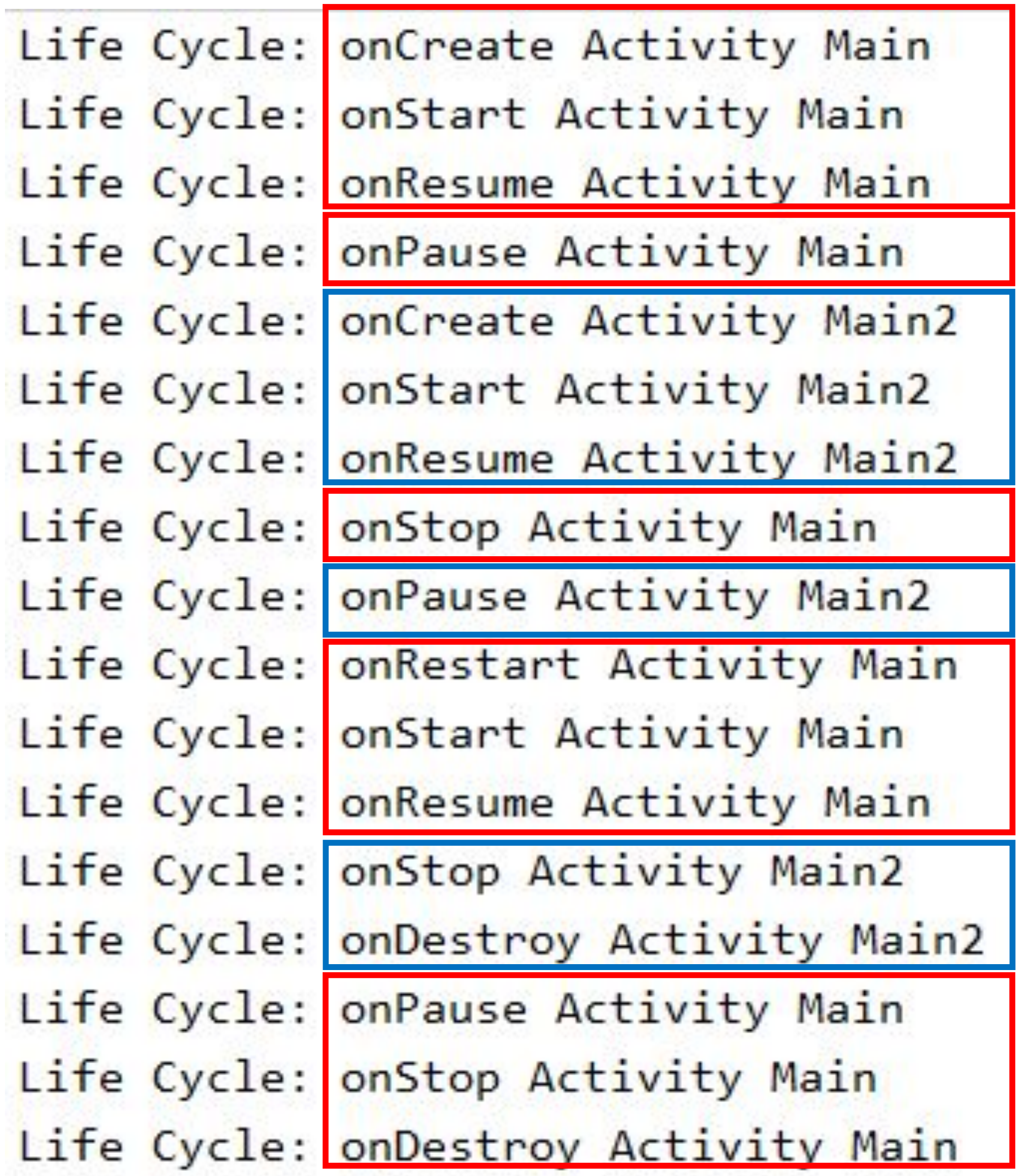
ActivityCycle for an Activity



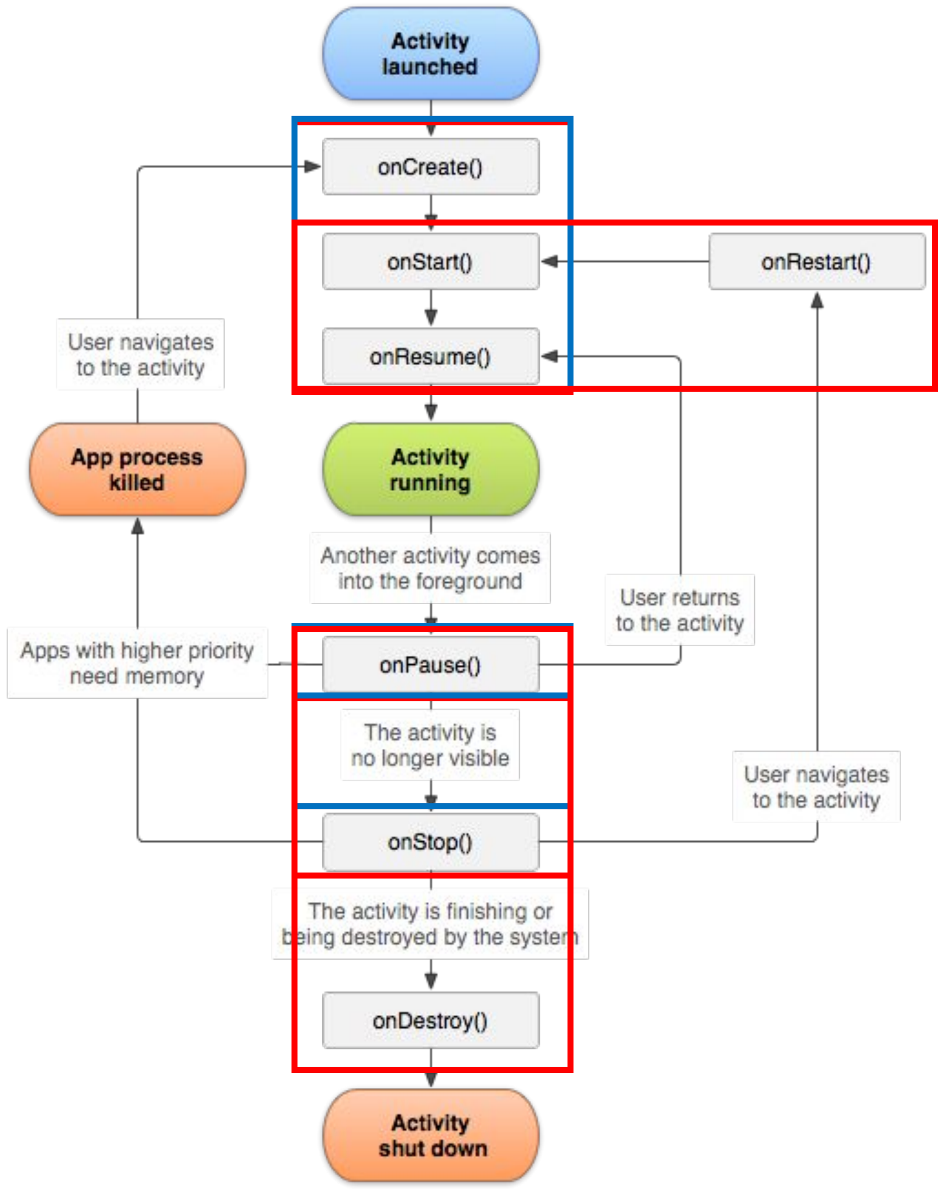
```
D/Activity Life Cycle: onCreate Activity Main
D/Activity Life Cycle: onStart Activity Main
D/Activity Life Cycle: onResume Activity Main
D/Activity Life Cycle: onPause Activity Main
D/Activity Life Cycle: onStop Activity Main
D/Activity Life Cycle: onDestroy Activity Main
```


Activity launched
onCreate()
onStart()
onRestart()
User navigates to the activity
onResume()
App process killed
Activity running
Another activity comes into the foreground
User returns to the activity
Apps with higher priority need memory
onPause()
The activity is no longer visible
User navigates to the activity
onStop()
The activity is finishing or being destroyed by the system
onDestroy()
Activity shut down

ActivityCycle for two Activities

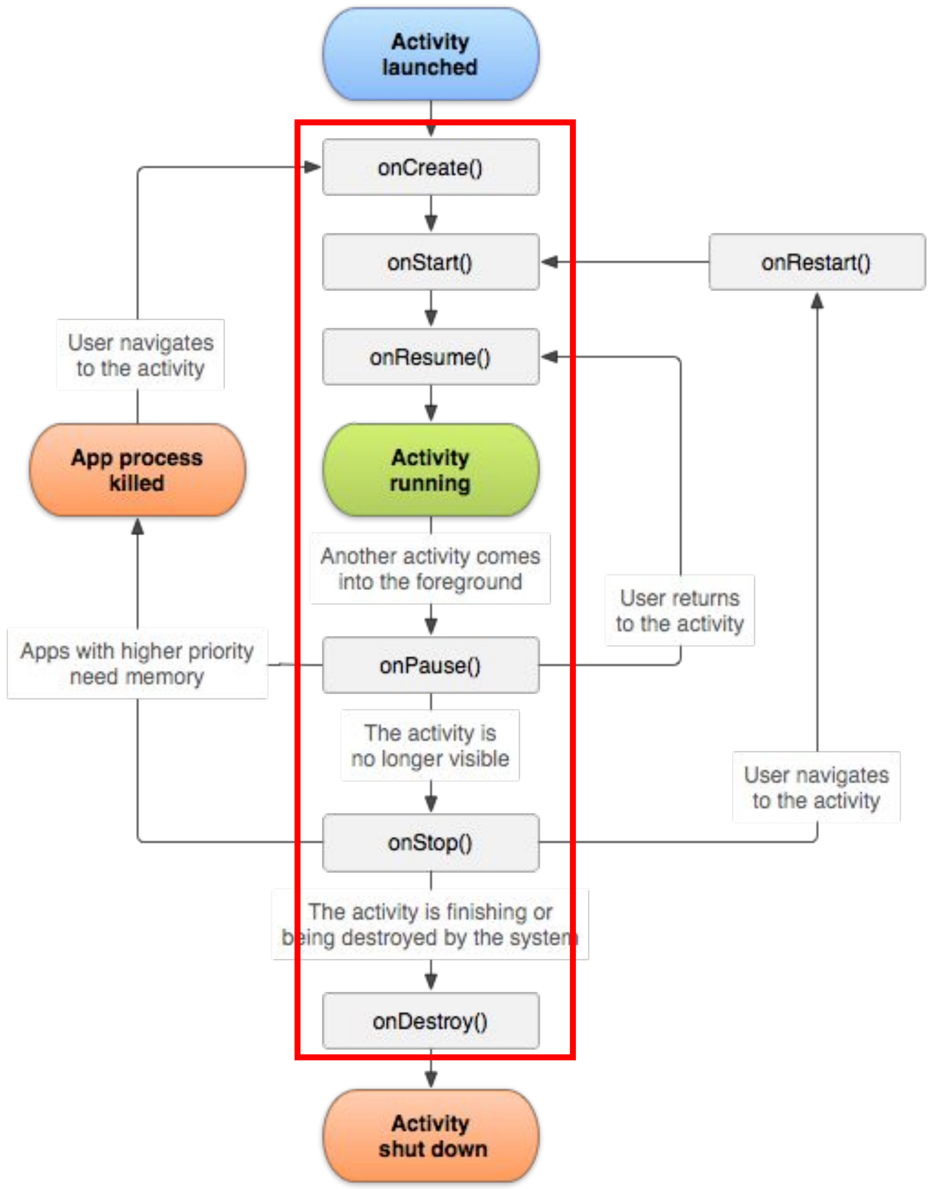


```
Life Cycle: onCreate Activity Main
Life Cycle: onStart Activity Main
Life Cycle: onResume Activity Main
Life Cycle: onPause Activity Main
Life Cycle: onCreate Activity Main2
Life Cycle: onStart Activity Main2
Life Cycle: onResume Activity Main2
Life Cycle: onStop Activity Main
Life Cycle: onPause Activity Main2
Life Cycle: onRestart Activity Main
Life Cycle: onStart Activity Main
Life Cycle: onResume Activity Main
Life Cycle: onStop Activity Main2
Life Cycle: onDestroy Activity Main2
Life Cycle: onPause Activity Main
Life Cycle: onStop Activity Main
Life Cycle: onDestroy Activity Main
```


Activity launched
onCreate()
onStart()
onRestart()
onResume()
User navigates to the activity
App process killed
Activity running
Another activity comes into the foreground
User returns to the activity
Apps with higher priority need memory
onPause()
The activity is no longer visible
User navigates to the activity
onStop()
The activity is finishing or being destroyed by the system
onDestroy()
Activity shut down

Entire Life for an Activity

- The entire lifetime of an activity happens between the first call to onCreate(Bundle) through to a single final call to onDestroy(). An activity will do all setup of "global" state in onCreate(), and release all remaining resources in onDestroy(). For example, if it has a thread running in the background to download data from the network, it may create that thread in onCreate() and then stop the thread in onDestroy()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The activity is no longer visible
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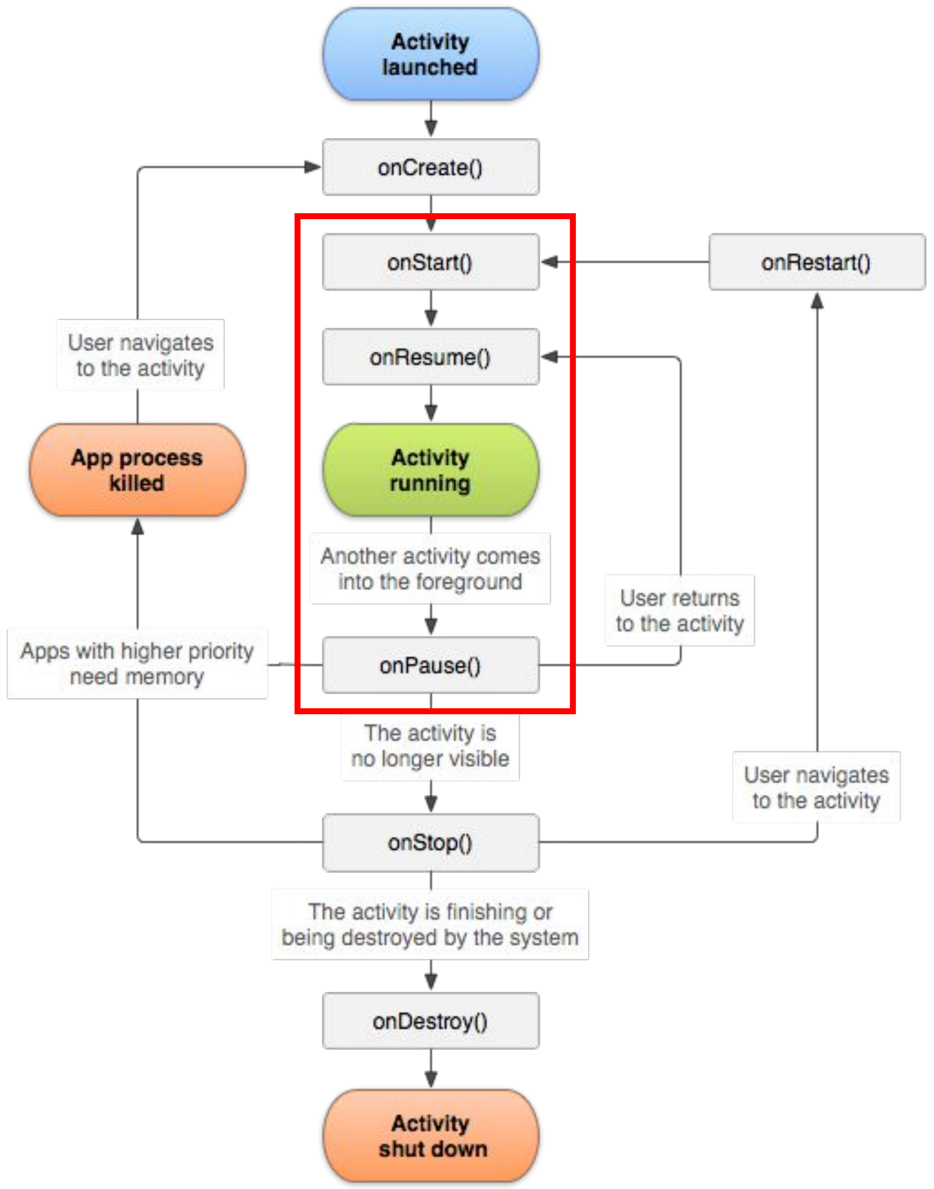
The activity is finishing or being destroyed by the system
onDestroy()
Activity shut down

visible lifetime for an Activity

The visible lifetime of an activity happens between a call to onStart() until a corresponding call to onStop(). During this time the user can see the activity on-screen, though it may not be in the foreground and interacting with the user. Between these two methods you can maintain resources that are needed to show the activity to the user. For example, you can register a BroadcastReceiver in onStart() to monitor for changes that impact your UI, and unregister it in onStop() when the user no longer sees what you are displaying. The onStart() and onStop() methods can be called multiple times, as the activity becomes visible and hidden to the user.



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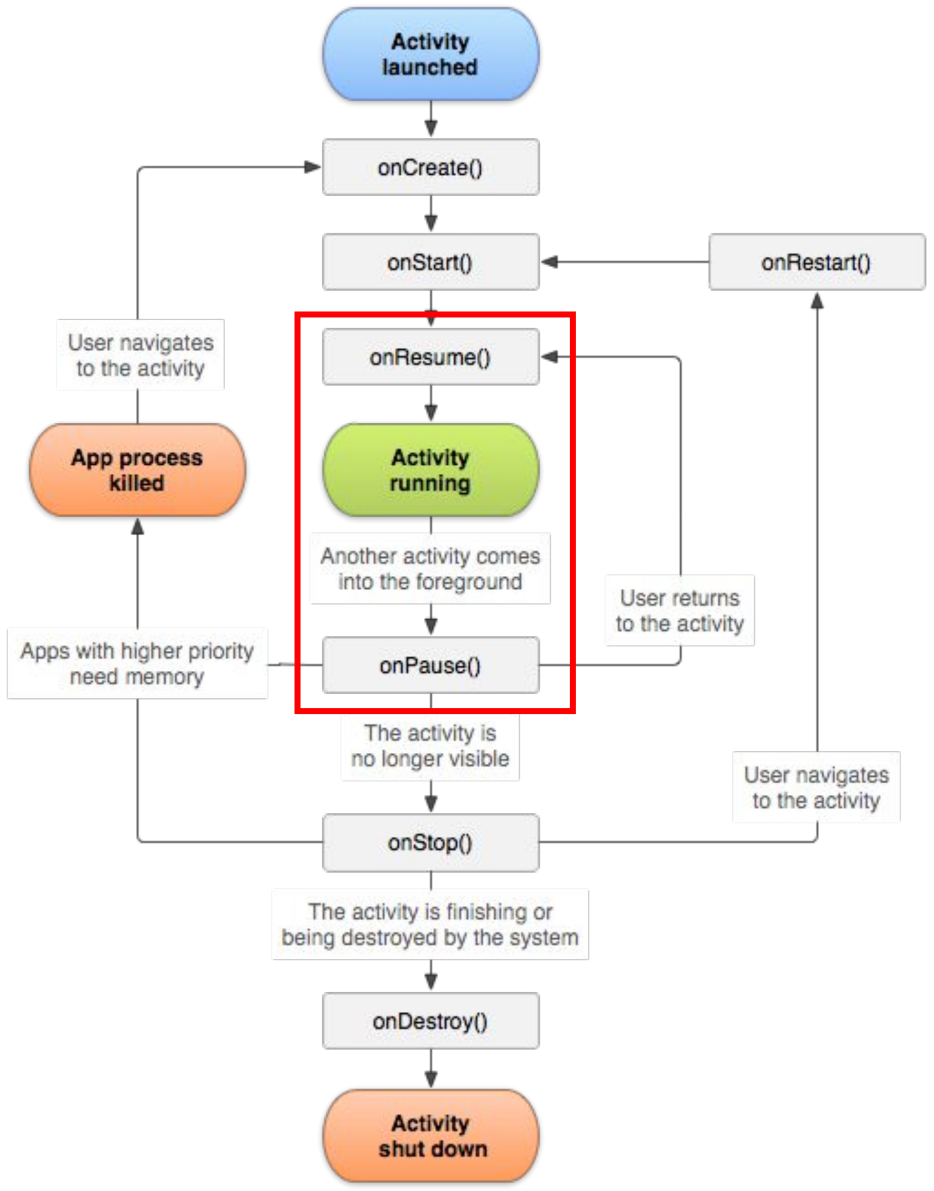
The activity is finishing or being destroyed by the system
onDestroy()
Activity shut down

foreground lifetime for an Activity

The foreground lifetime of an activity happens between a call to onResume() until a corresponding call to onPause(). During this time the activity is in visible, active and interacting with the user. An activity can frequently go between the resumed and paused states -- for example when the device goes to sleep, when an activity result is delivered, when a new intent is delivered -- so the code in these methods should be fairly lightweight.


Activity launched
onCreate()
onStart()
onRestart()
User navigates to the activity
onResume()
App process killed
Activity running
Another activity comes into the foreground
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Apps with higher priority need memory
onPause()
The activity is no longer visible
User navigates to the activity
onStop()
The activity is finishing or being destroyed by the system
onDestroy()
Activity shut down

Up navigation

- Back stack preserves history of recently viewed screens
- Back stack contains all the Activity instances that have been launched by the user in reverse order for the current task
- Each task has its own back stack
- Switching between tasks activates that task's back stack

```
@Override
  public void onSaveInstanceState(Bundle savedInstanceState) {
     super.onSaveInstanceState(savedInstanceState);
     savedInstanceState.putString("value", "asdf");
  }

  @Override
  protected void onRestoreInstanceState(Bundle savedInstanceState) {
     super.onRestoreInstanceState(savedInstanceState);
     String myString = savedInstanceState.getString("value");
     textView.setText(myString);
  }
```

Two forms of navigation

◁ Temporal or back navigation

- provided by the device's Back button
- controlled by the Android system's back stack

Ancestral or up navigation

- provided by the Up button in app's action bar
- controlled by defining parent-child relationships between activities in the Android manifest

Extract Resources

https://developer.android.com/guide/components/activities/intro-activities
https://medium.com/androiddevelopers/tasks-and-the-back-stack-dbb7c3b0f6d4#.g6dck3mde
https://developer.android.com/guide/components/activities/tasks-and-back-stack
https://developer.android.com/reference/android/app/Activity
https://developer.android.com/guide/components/intents-common
https://developer.android.com/reference/android/content/Intent