

## 18641 Mini 2 Assignment 1

### 1. Contrast an Android Project created with and without an Activity.

- **Definition of activity:** An activity is a single, focused thing that the user can do. Almost all activities interact with the user, so the Activity class takes care of creating a window for you in which you can place your UI. While activities are often presented to the user as full-screen windows, they can also be used as floating windows or embedded inside of another activity.
- **Android project with activity:** usually an android project has more than 1 Activity instance. The most useful one is the main activity, which is depicted as a main method at the launch time, providing the initiate code by invoking some callback methods that correspond to specific stages in the Activity's lifecycle. There is a sequence of callback methods that start up and tear down an activity. The creation of new activities, stop of old ones, the transition between different states will all report the changes in state and invoke callbacks in lifecycle. Such callback provides the opportunity of implementation.
- **Android project without activity:** android without activity is not front-end app, instead it could be a background process or service. It will not be able to interact with user and will not own the regular lifecycle or callbacks. One of the launching procedure from Internet is
  - In your Manifest, set the Activity theme to Theme.Translucent.NoTitleBar.
  - Don't bother with a layout for your Activity, and don't call setContentView().
  - In your Activity's onCreate(), start your Service with startService().
  - Exit the Activity with finish() once you've started the Service.Therefore, you can only start or stop it.

### 2. After watching video, what assumptions can you make about current mobile computing replacing desktop computing. Comment on current implementation(s) and what are your assumption about how mobile computing will continue to evolve.

Use the following references:

1. ..Android 6.0 features
2. ..Google Glass
3. ..iPhone 5
4. ..iPad 3
5. ..Gaming Consoles
6. ..TV and Autoapps.

- **Assumptions about current mobile computing replacing desktop computing:**
  - (1) The great mobility of mobile devices compared with desktop devices.
  - (2) The increasing computational power and distributed system of mobile devices.
  - (3) The desktop's I/O devices can be replaced by any surface like wall, newspaper or even human palm.
  - (4) The control based on human gestures has improved a lot and will keep proceed.
- **Comment on current implementations:**

### **(1) Android 6.0 features**

Contextual assistance allows getting assistance without leaving current job, and voice control. Battery life is extended since automatic doze is implemented and rarely used apps are limited in their battery usage. Android Runtime helps reduce memory overhead and productivity improvement allows better text selection experience. Other new features like connectivity and external storages also make android more user-friendly and convenient.

### **(2) Google Glass**

Google glass was designed to perform as a ubiquitous computer since it collects information from outside and displays results dramatically. Current google glass is more like a prototype since it is still in experimental phase. The public society still needs some time to accept it and provide outside support. The major features are touchpad, camera and display, which already allows a human to own a head of computer and can produce reflections to the environment. It connects human to the Internet tightly.

### **(3) iPhone 5**

The iPhone5 is a smartphone developed by Apple Inc and is the sixth generation. Compared with previous iPhones, it is thinner and taller in size, featuring LTE support and lightening charging. Multi-touch gestures are introduced and iOS 6 is equipped. This provides more convenience for users not only because of its faster speed but also because its Retina display and improvement in map and passbook which increases productivity.

### **(4) iPad 3**

The ipad3 is the 3<sup>rd</sup> generation tablet produced by Apple Inc. The new features are Retina display and 5X quad-core GPU chip. It is appealing not only because the Retina display and support for LTE, but because its extremely good performance in media playing, gaming, and reading. The speed is always satisfying while the size is never annoying.

### **(5) Gaming Console**

Video game consoles are teens and adults' fashion toys. Currently XBOX One and PlayStation4 are the most attractive brands. These devices not only provide gesture control but also can connect to Internet and TV to do stream playing entertainment. The attractivity in their functionality in catching gestures show out improvement in motion capture.

### **(6) TV and AutoApps**

Today's TV is more like a monitor connecting to the Internet. The digital TV can not only broadcast channels but also do video sharing through web channel providers. The AutoApps installed in most cars provide GPS functions, video/audio playing or even gaming. They make the driving journey enjoyable experience. They are all evidence for Internet of things.

### **➤ Assumption about how mobile computing will continue to evolve:**

As is mentioned in the video, the future computing will focus on the gesture, or the human interaction with the environment. It will again collect info from the user and

things the user is touching or pointing to and make connection then display processing result. The whole world will become “internet of things” and everything will have a digital label in the view of mobile device with the help of search engines.

Again there is no need of I/O hardware any more, since every surface like book, goods, wall, human palm, glass, will all become the I/O device.

Finally, the existence of mobile device may not be that visible, like in video, it is no longer a cellphone, but may be inside human body or just some pieces on finger but powerful enough to process information.

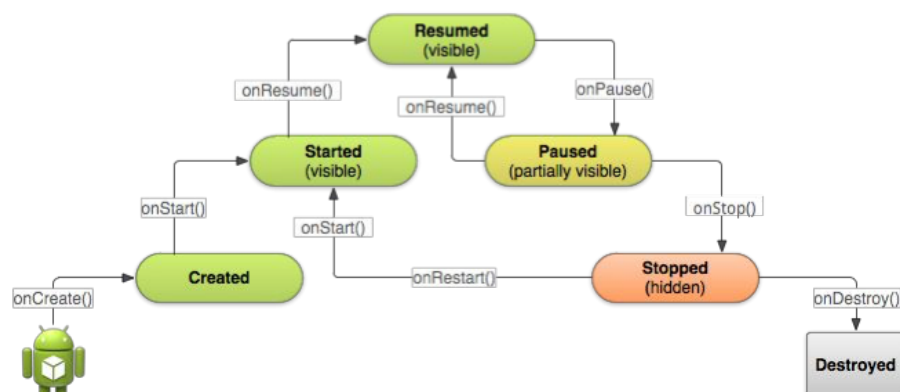
### 3. Describe the execution lifecycle for an Android App when running on a physical Android Device.

Activities in the system are managed as an activity stack. When a new activity is started, it is placed on the top of the stack and becomes the running activity -- the previous activity always remains below it in the stack, and will not come to the foreground again until the new activity exits.

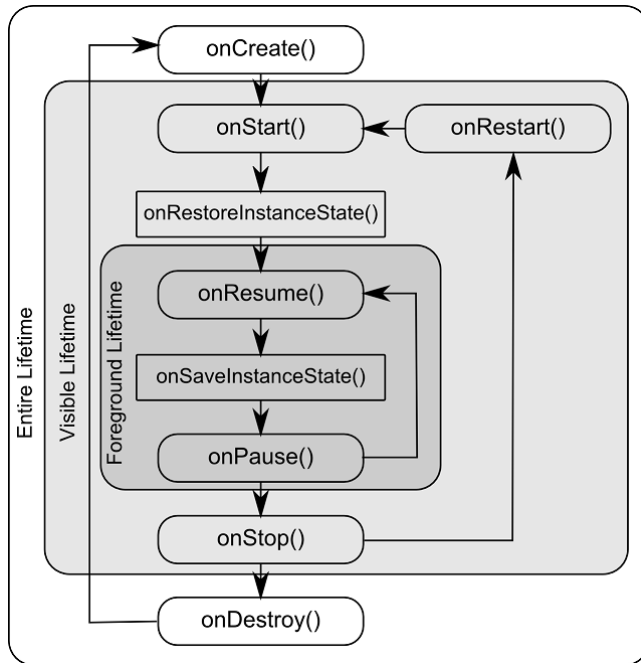
An activity has essentially four states:

- If an activity is in the foreground of the screen (at the top of the stack), it is active or running.
- If an activity has lost focus but is still visible (that is, a new non-full-sized or transparent activity has focus on top of your activity), it is paused. A paused activity is completely alive (it maintains all state and member information and remains attached to the window manager), but can be killed by the system in extreme low memory situations.
- If an activity is completely obscured by another activity, it is stopped. It still retains all state and member information, however, it is no longer visible to the user so its window is hidden and it will often be killed by the system when memory is needed elsewhere.
- If an activity is paused or stopped, the system can drop the activity from memory by either asking it to finish, or simply killing its process. When it is displayed again to the user, it must be completely restarted and restored to its previous state.

The following diagram shows the important state paths of an Activity. The square rectangles represent callback methods you can implement to perform operations when the Activity moves between states. The colored ovals are major states the Activity can



be in.



The launching of activity will call `onCreate()`, after `onStart()` the app is visible. However, it is still not active state. After `onResume()` it is on the top of stack and becomes active, allowing user interactive. When another activity is going to be resumed, `onPause()` will be called on the current activity to let it go into pause state. The system can choose to kill this activity especially when there is memory limitation and the user can also choose to resume it by `onResume()`. The method `onDestroy()` will lead the app to go into stop state. After that, no other methods could be called to resume it.

#### Reference:

1. <http://developer.android.com/reference/android/app/Activity.html>
2. <http://stackoverflow.com/questions/10909683/launch-android-application-without-main-activity-and-start-service-on-launching>
3. <https://www.android.com/versions/marshmallow-6-0/>
4. [https://en.wikipedia.org/wiki/Google\\_Glass](https://en.wikipedia.org/wiki/Google_Glass)
5. [https://en.wikipedia.org/wiki/IPhone\\_5](https://en.wikipedia.org/wiki/IPhone_5)
6. [https://en.wikipedia.org/wiki/IPad\\_\(3rd\\_generation\)](https://en.wikipedia.org/wiki/IPad_(3rd_generation))