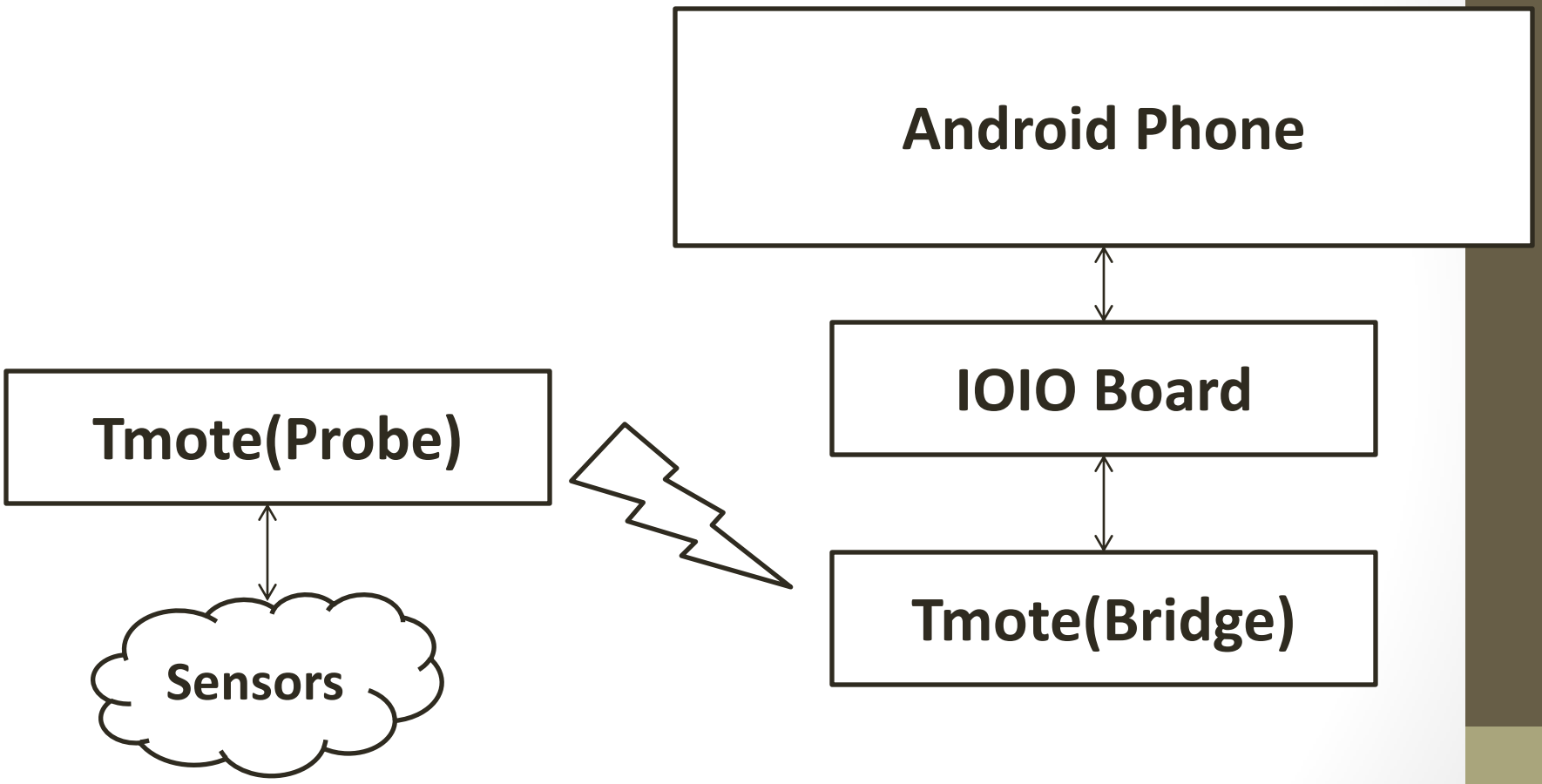
CS450 Tutorial Session 1

Android and IOIO Board

An Overview of Tricorder



*Tmote=telosb

*Android Phone=Droid

Why we need IOIO Board?

- A pervasive device: Android Phone
- Need a low power radio to control and communicate with a Tmote
- How? The answer is IOIO Board.

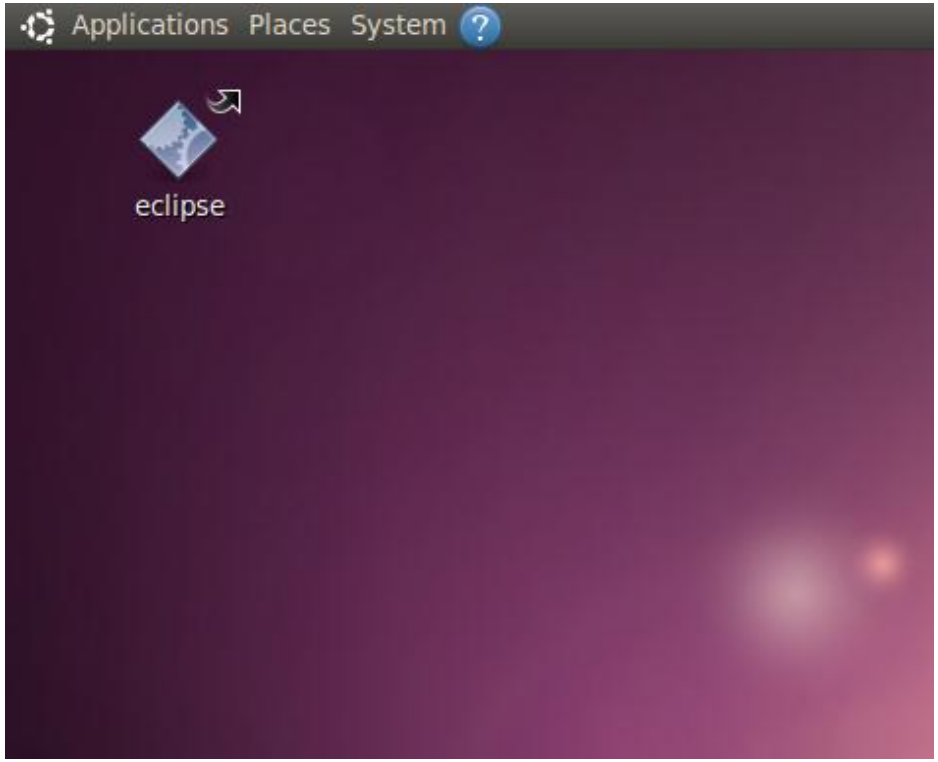
What is an IOIO Board

- The IOIO (pronounced "yo-yo") is a board specially designed to work with an Android device to provide extensive and robust connectivity to an Android device via a USB connection.
- In this semester we'll use IOIO Board to connect an Android phone and a Tmote through serial connections. (Android to IOIO Board through Android Debug Bridge(ADB) and IOIO Board to Tmote through Uart)
- *IOIO Board need a 5-15V 1A power supply. In this project we use both Droid and Tmote(bridge) to supply the power for IOIO Board. Since Tmote(bridge) only provide 500mA of maximum output current, you need to make sure your Droid is fully charged.

Create an Android Project

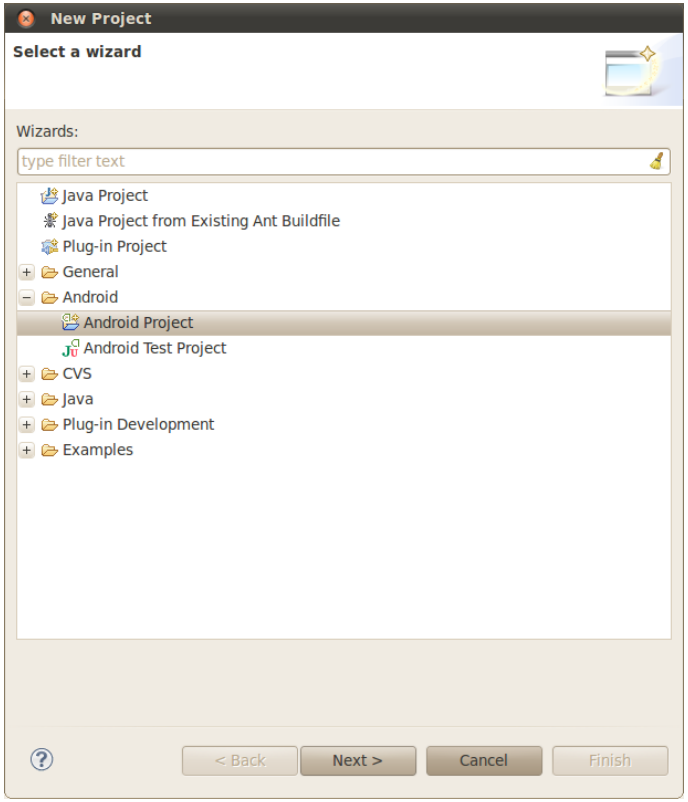
- While Learning to set up Eclipse-ADK and TinyOS Dev-Env is highly recommended, we provide a Ready-To-Use Vmware Image with which you can load onto your vmware player andAll those environment things are setup for you with one-click and tutorials already loaded into the Eclipse.

Start Eclipse on the desktop



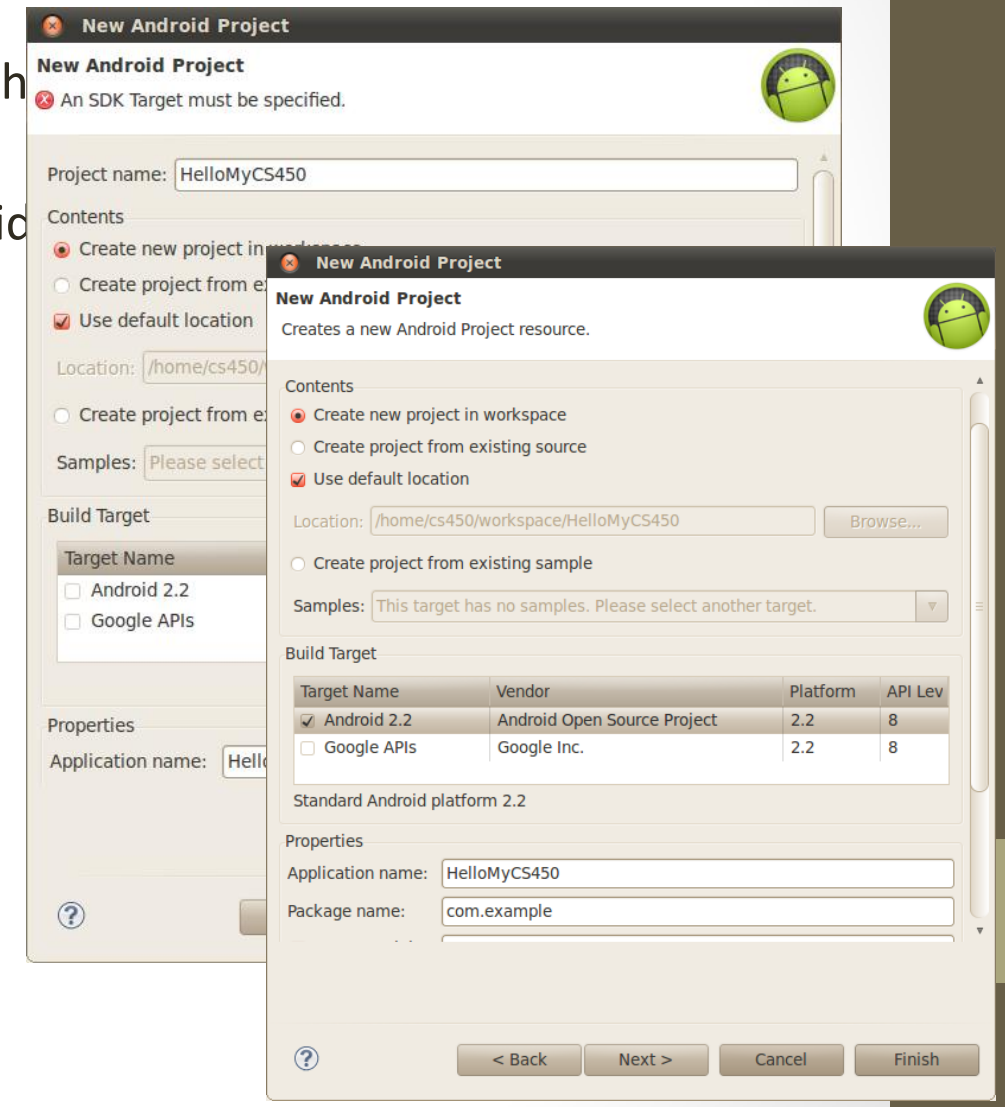
Create an Android Project

- Menu: File->New->Project
- From "Android" Select Android Project (Fig 1)

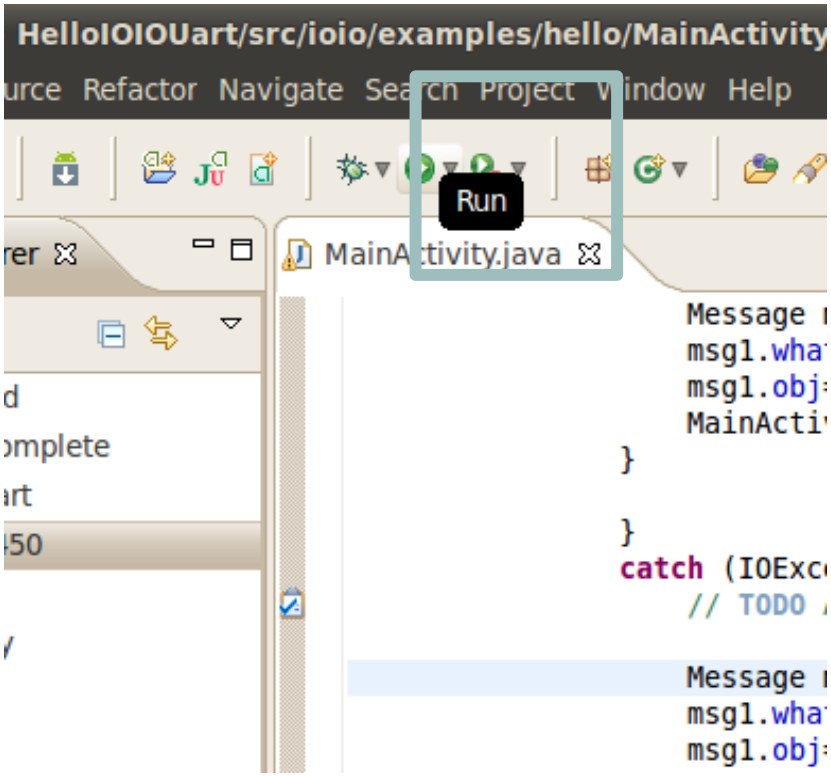


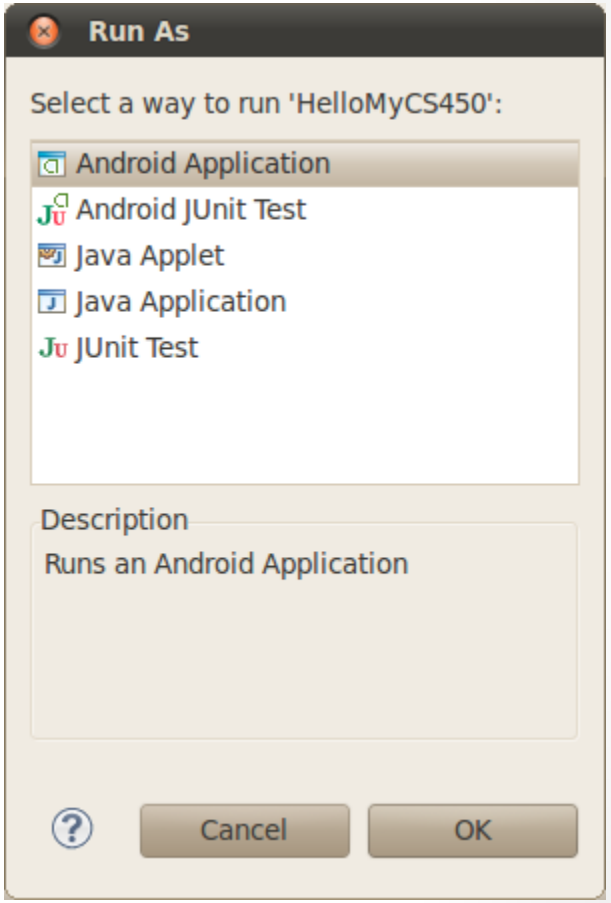
Create an Android Project

- Type in the "Project Name" with HelloMyCS450
- In "Build Target" Select "Android 2.2"
- Scroll Down the Window
- In "Properties" fill in "Package name" with "com.example"
- Click on "Finish"

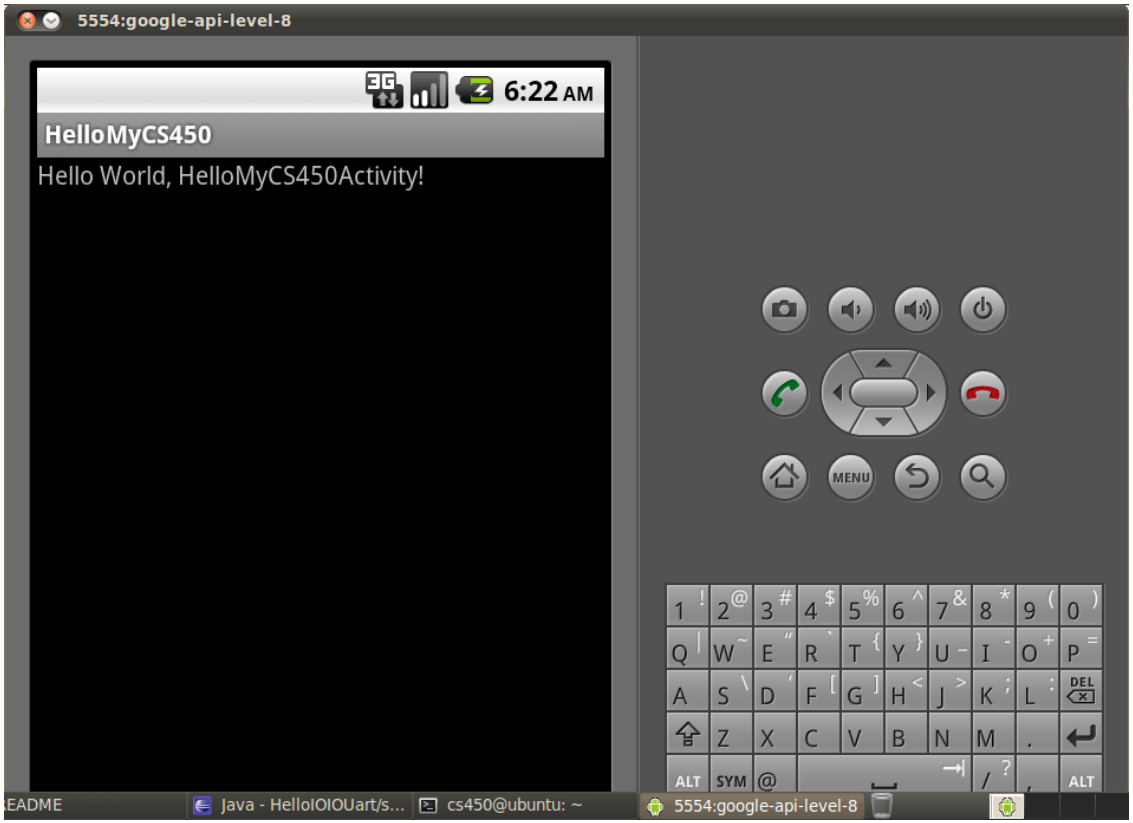


Run an Android Project



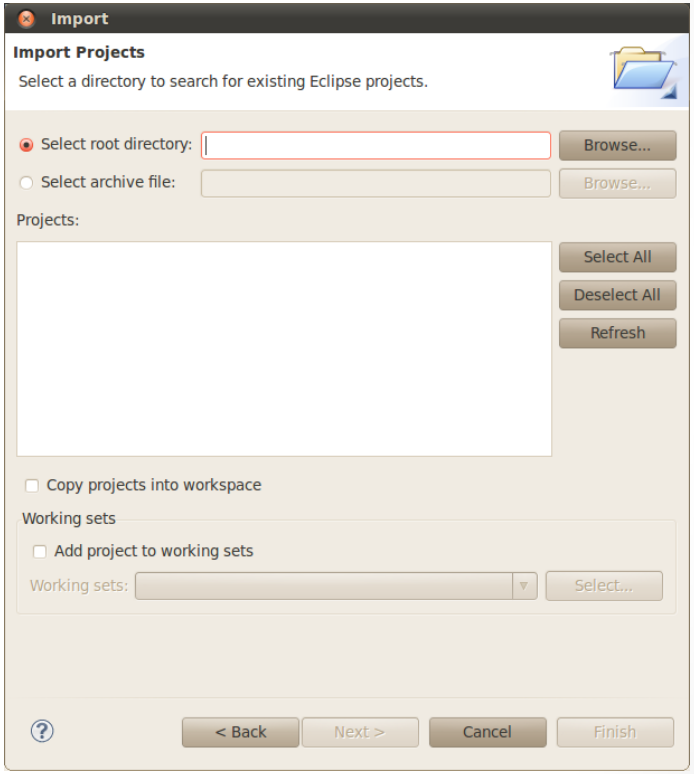


A glance at a Hello World



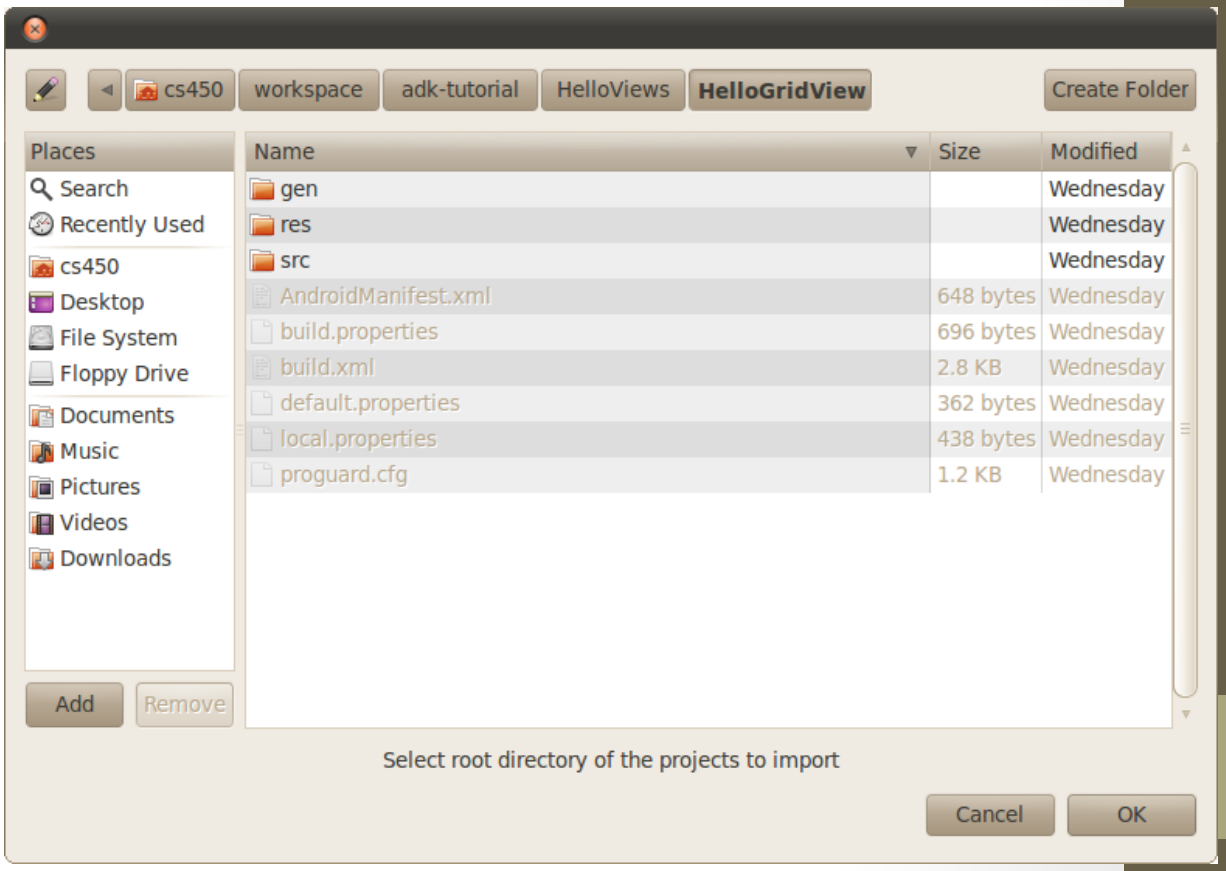
Import an Android Project

- In Java Perspective, Menu: File->Import
- In Window titled "Select" select "General->Existing Project into Workspace", Click on "Next"
- In "Select Root root directory" click on Browse and select the project your want to import. Click on "Finish"



Import an Android Project

Browse into the directory of an Android Project and Click on "OK"

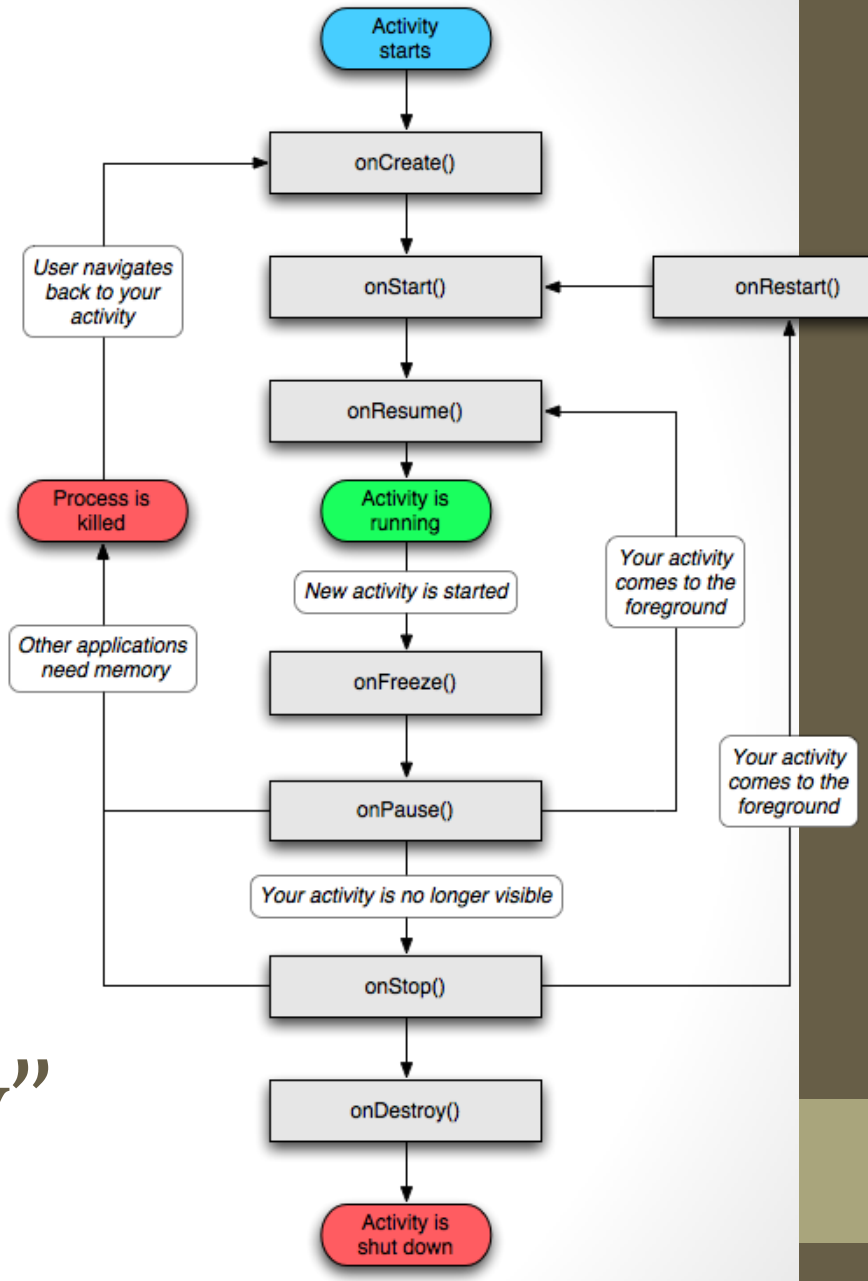


Basic UI components

- TextView
- Button and EditText
- Layouts

Android "Activity"

- What is an Activity
- Activity is the base class of a fundamental page in an Android application
- Runs like a thread, but...



Android “Message”

- How does an Activity talk to anther one?
  - Operating System maintain a Message Queue
  - Upon arrival of each message, do a “switch case”

In Activity A:

```
declare “Handler mHandler =new Handler(){
        public void handleMessage(Message msg){
                switch (Message msg.what)”
                {
                case I_AM_HUNGRY:
                        Make_some_food();
                        break;
                case I_AM_THIRSTY:
                        Get_some_drinks();
                        break;
                default:
                        do_nothing();
}       }       }
```

In Activity B:

```
...
Message msg=new Message();
msg.what=I_AM_HUNGRY;
msg.obj=new String(“What I want”);
A.mHandler.sendMessage(msg);
```

Launch HelloIOIO and HelloIOIOUart

- Classroom Demo
- Video Demo on Youtube
  - http://www.youtube.com/watch?v=PLlAtjLKtrQ
- 1. Connect a tmote to a USB port which is used as an external power supply for IOIO Board
- 2. Connect droid to the PC, click on the “run” icon
- 3. When the application is running on a droid, disconnect the PC and connect to the IOIO Board
- 4. You should be able to see LED on IOIO Board blinking and the command line on Droid is printing data.

Warming up exercise

- Implement an EditText with an “Enter” Button that user can type in and print it to a TextView like a command line

Quetions?

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