7B

# Android
# Hard & Soft Keyboards

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# Hard & Soft Keyboard

Android r1.5 introduced the notion of **Input Method Framework (IMF)**.

> *The idea is to let the IFM arbitrate the interaction between applications and the current input method chosen by the user.*

The motivation behind this framework is the realization that as Android matures, more hardware /software devices, and input techniques will appear in user's applications, for instance:

- real & virtual keyboards,
- voice recognition,
- hand writing,
- etc…

# Hard & Soft Keyboard

Keyboarding data into Android's applications is functionally dependent of the hardware present in the actual device.

**HTC – G1**
Sliding Window exposes (occasionally) a hard keyboard

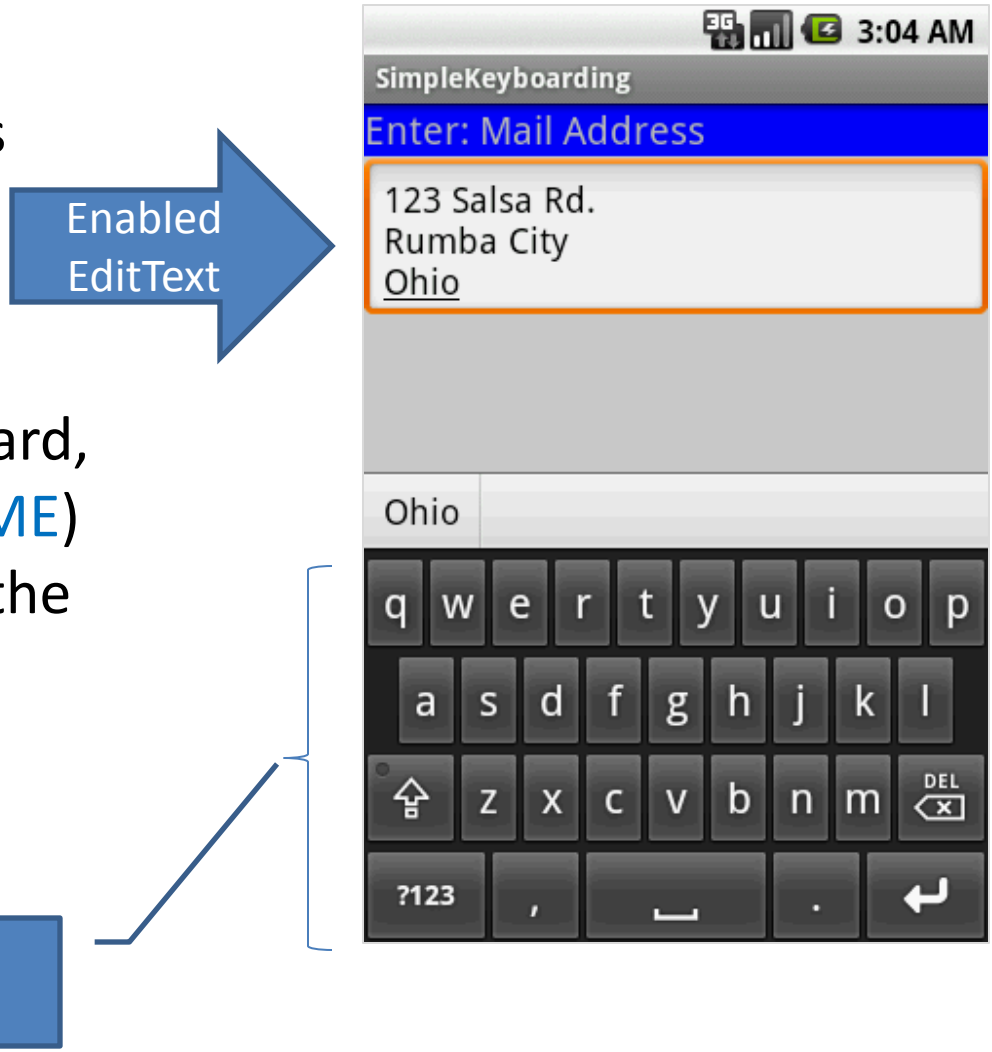

**Samsung**
Model shows a permanent hard keyboard

**HTC - Magic**
Model shown has no hard keyboard

# Hard & Soft Keyboard

The IMF is aware of the available hardware and its current state.

If there is no a readily available hardware keyboard, an *input method editor* (IME) will be made available to the user when they tap on an enabled *EditText*.




# Hard & Soft Keyboard

## Telling Android what data to expect

TextViews can indicate by *XML attribute* or *Java method* the expected type of a text field:

XML → `android:inputType="..."`

Java → `editTextBox.setRawInputType(int)`

This way Android knows the type of data to be placed in a text field.

Knowing the type is useful in deciding what appropriated input method could be applied to help the user enter text.


# Hard & Soft Keyboard

## Android:inputType Values

| Constant | Value | Description |
|---|---|---|
| `none` | 0x00000000 | There is no content type. The text is not editable. |
| `text` | 0x00000001 | Just plain old text. |
| `textCapCharacters` | 0x00001001 | Can be combined with *text* and its variations to request capitalization of all characters. |
| `textCapWords` | 0x00002001 | Can be combined with *text* and its variations to request capitalization of the first character of every word. |
| `textCapSentences` | 0x00004001 | Can be combined with *text* and its variations to request capitalization of the first character of every sentence. |
| `textAutoCorrect` | 0x00008001 | Can be combined with *text* and its variations to request auto-correction of text being input. |


# Hard & Soft Keyboard

## Android:inputType Values

| Constant | Value | Description |
|---|---|---|
| `textAutoComplete` | 0x00010001 | Can be combined with *text* and its variations to specify that this field will be doing its own auto-completion and talking with the input method appropriately. |
| `textMultiLine` | 0x00020001 | Can be combined with *text* and its variations to allow multiple lines of text in the field. If this flag is not set, the text field will be constrained to a single line. |
| `textImeMultiLine` | 0x00040001 | Can be combined with *text* and its variations to indicate that though the regular text view should not be multiple lines, the IME should provide multiple lines if it can. |


# Hard & Soft Keyboard

## Android:inputType Values

| Constant | Value | Description |
|---|---|---|
| `textUri` | 0x00000011 | Text that will be used as a URI. |
| `textEmailAddress` | 0x00000021 | Text that will be used as an e-mail address. |
| `textEmailSubject` | 0x00000031 | Text that is being supplied as the subject of an e-mail. |
| `textShortMessage` | 0x00000041 | Text that is the content of a short message. |
| `textLongMessage` | 0x00000051 | Text that is the content of a long message. |
| `textPersonName` | 0x00000061 | Text that is the name of a person. |
| `textPostalAddress` | 0x00000071 | Text that is being supplied as a postal mailing address. |
| `textPassword` | 0x00000081 | Text that is a password. |
| `textVisiblePassword` | 0x00000091 | Text that is a password that should be visible. |
| `textWebEditText` | 0x000000a1 | Text that is being supplied as text in a web form. |


# Hard & Soft Keyboard

## Android:inputType Values

| Constant | Value | Description |
|---|---|---|
| `textFilter` | 0x000000b1 | Text that is filtering some other data. |
| `textPhonetic` | 0x000000c1 | Text that is for phonetic pronunciation, such as a phonetic name field in a contact entry. |
| `number` | 0x00000002 | A numeric only field. |
| `numberSigned` | 0x00001002 | Can be combined with *number* and its other options to allow a signed number. |
| `numberDecimal` | 0x00002002 | Can be combined with *number* and its other options to allow a decimal (fractional) number. |
| `phone` | 0x00000003 | For entering a phone number. |
| `datetime` | 0x00000004 | For entering a date and time. |
| `date` | 0x00000014 | For entering a date. |
| `time` | 0x00000024 | For entering a time. |

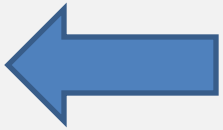
# Hard & Soft Keyboard

## **Example1:** Using android:text="*inputType: text|textCapWords*"

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
android:id="@+id/widget31"
android:layout_width="fill_parent"
android:layout_height="fill_parent"
android:background="#ffcccccc"
android:orientation="vertical"
xmlns:android="http://schemas.android.com/apk/res/android" >

<TextView
android:id="@+id/caption"
android:layout_width="fill_parent"
android:layout_height="wrap_content"
android:background="#ff0000ff"
android:text="inputType: text|textCapWords"
android:textStyle="bold"
android:textSize="22sp" />

<EditText
android:id="@+id/editTextBox"
android:layout_width="fill_parent"
android:layout_height="wrap_content"
android:padding="10px"
android:textSize="18sp"
android:inputType="text|textCapWords"   />
</LinearLayout>
```

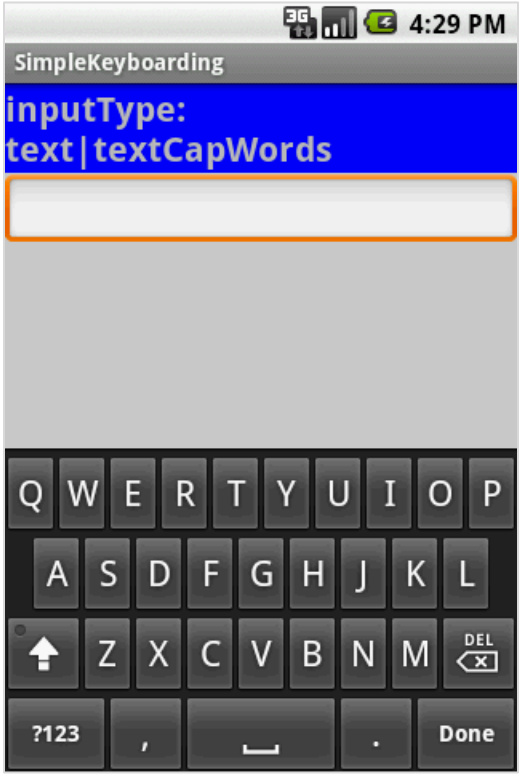


**Multiple types** of input methods could be combined. Use “pipe” symbol **|** to separate the options.

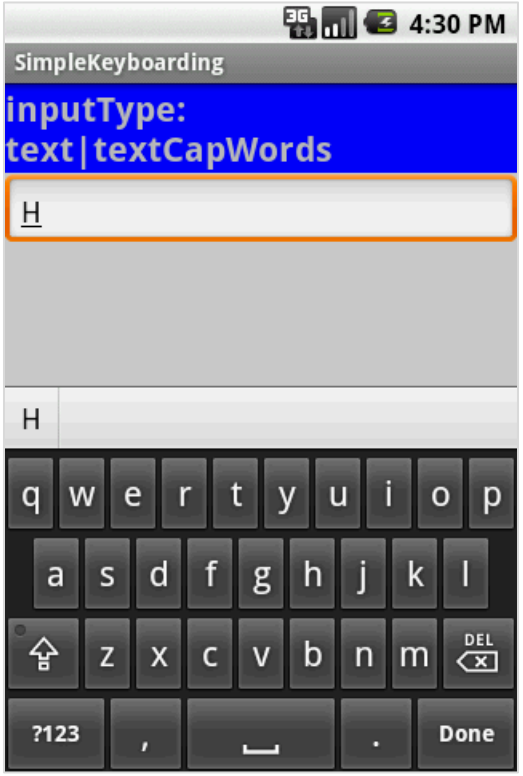
In the example a soft text keyboard is used, in addition it should *proper capitalize* each word

# Hard & Soft Keyboard

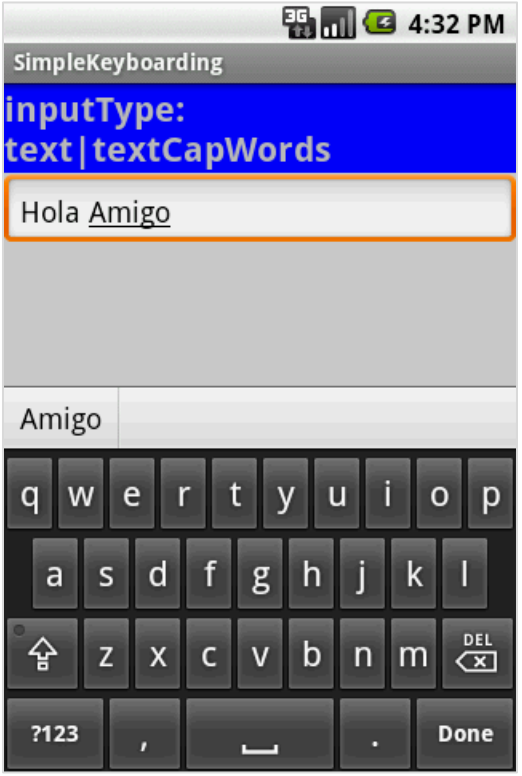
**Example1:** Using android:text="*inputType: text|textCapWords*"




After tapping the EditBox a soft keyboard appears showing CAPITAL letters



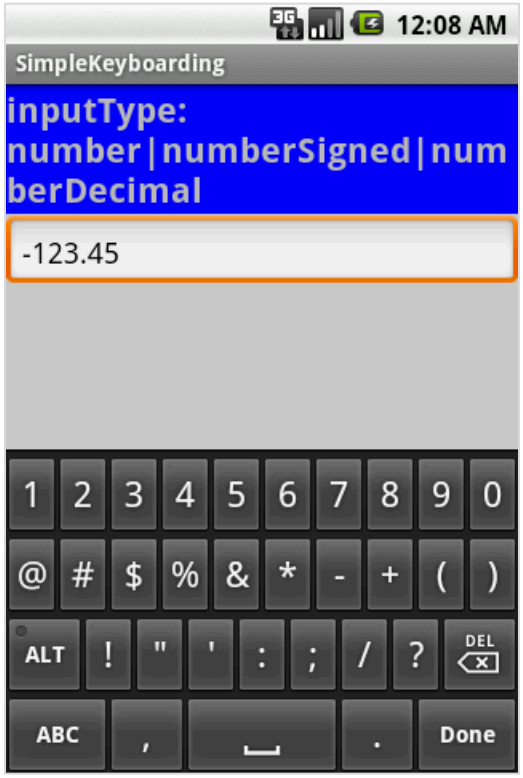

After first letter is typed the Keyboard switches automatically to LOWER case to complete the word.




After entering *space* the keyboard repeats cycle beginning with UPPER case, then LOWER case letters.

# Hard & Soft Keyboard

**Example2:** Using
android:inputType="*number|numberSigned|numberDecimal*"




1. The keyboard displays numbers.
2. In general other *non-numeric* keys are visible but disable.
3. Only valid numeric expressions can be entered.
4. Type **number|numberSigned** accepts integers.
5. Type **numberDecimal** accepts real numbers.

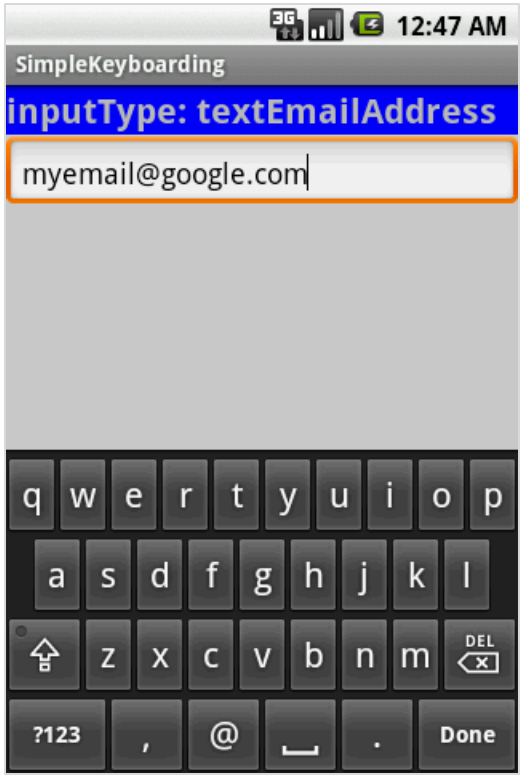
Assume the EditText field is named: **editTextBox**,
In Java code we could at run-time set the input method by issuing the command:

```
editTextBox.setRawInputType(
    android.text.InputType.TYPE_CLASS_PHONE );
```

# Hard & Soft Keyboard

**Example2:** Using android:inputType=*"textPassword"*


**Example3:** Using android:inputType=*"textEmailAddress"*

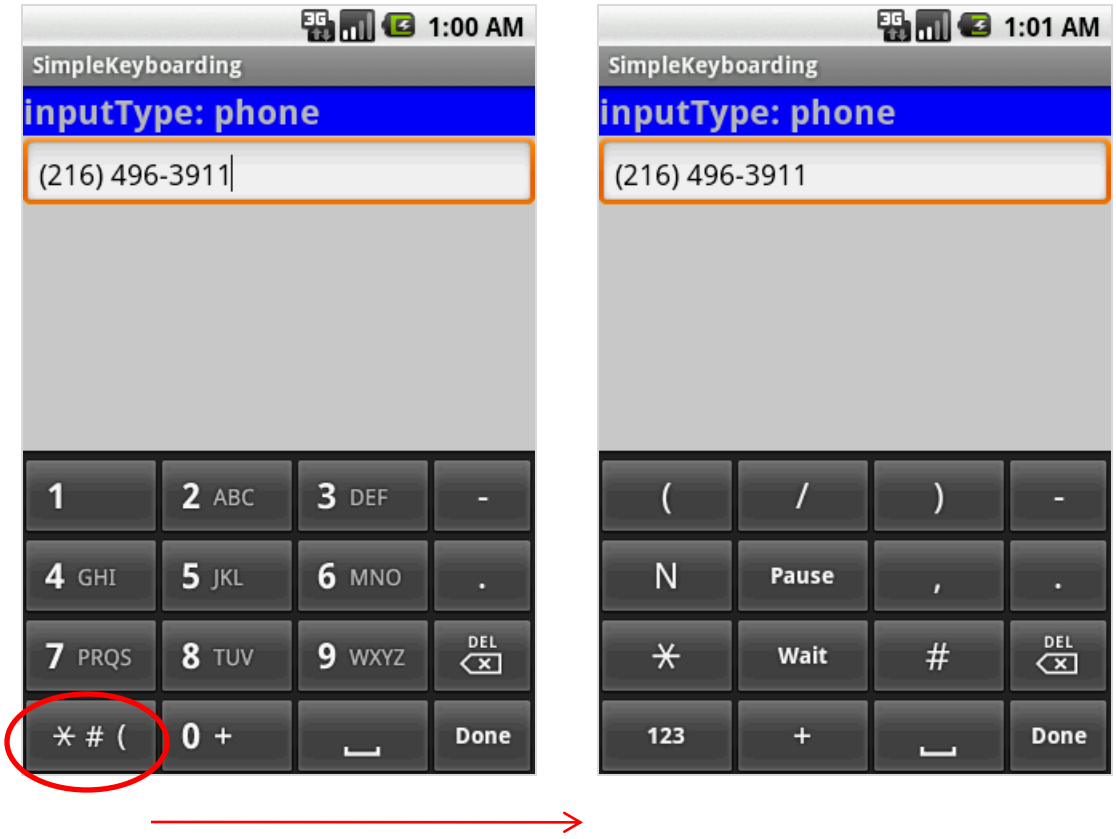



Soft keyboard favors characters commonly used in email addresses such as letters, **@**

- The keyboard displays all possible keys.
- Current character is briefly displayed for verification purposes.
- The current character is hidden and a *heavy-dot* is displayed.

# Hard & Soft Keyboard

**Example4:** Using android:inputType= *"phone"*

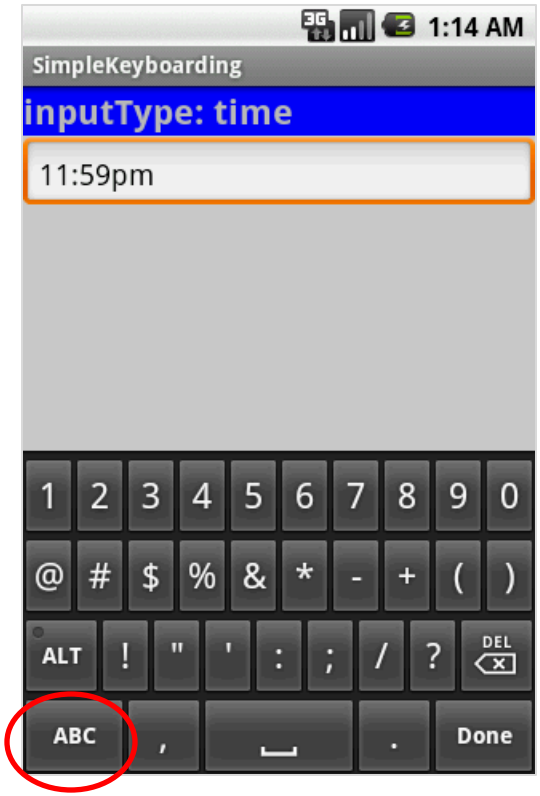



Soft keyboard displays the layout of a typical *phone keypad* plus additional non digit symbols such as:

**( ) . / Pause Wait # - +**

# Hard & Soft Keyboard

**Example5:** Using android:inputType=*"time"*



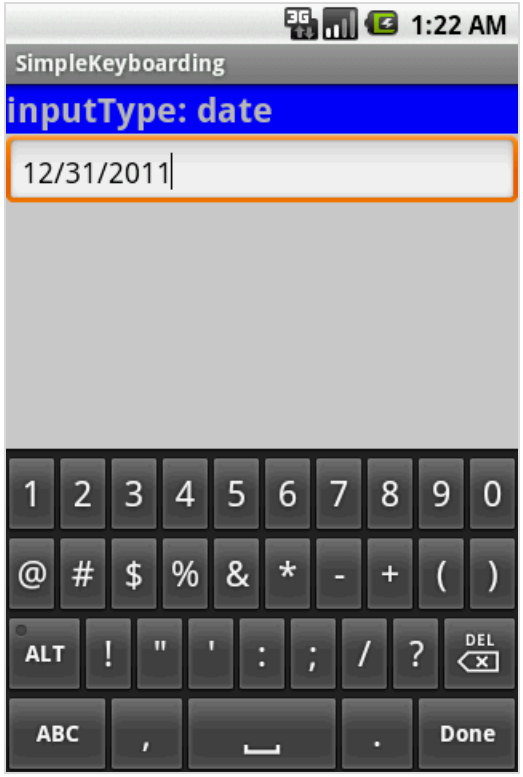

Soft keyboard displays a numerical layout.

Only digits and colon-char **:** can be used.

When clicking on alphabetic choice ***ABC*** only character to make **am** and **pm** are allowed.

# Hard & Soft Keyboard

**Example6:** Using android:inputType="*date*"




Soft keyboard displays a numerical layout.

Only digits and date valid characters are allowed.

Examples of valid dates are:
12/31/2011
12-31-2011
12.31.2011

# Hard & Soft Keyboard

## Disable Soft Keyboarding on an EditText View

Assume *txtBox1* is an EditText box. To **disable** the action of the soft keyboard on an EditText you should set its input type to null, as indicated below:

```
txtBox.setInputType( InputType.TYPE_NULL );
```

You may also try (deaf touch listener)

```
txtBox.setOnTouchListener(new OnTouchListener() {
        @Override
        public boolean onTouch(View arg0, MotionEvent arg1) {
        // return true to consume the touch event without
        // allowing virtual keyboard to be called
        return true;
        }
});
```


# Hard & Soft Keyboard

## Close SoftKeyboard Window

Close the virtual keyboard by tapping the hardware ***BackArrow*** key or issuing the following commands:

```
InputMethodManager imm =
       (InputMethodManager) getSystemService(Context.INPUT_METHOD_SERVICE);

imm.hideSoftInputFromWindow (theEditTextField.getWindowToken(), 0);
```


# Hard & Soft Keyboard

## TextWatcher Control

Assume *txtBox1* is an **Editable** box. A listener of the type **onKeyListener** could be used to follow the actions made by the hardware keyboard; however *it will not properly work with the **Virtual Keyboard***.

A solution to this problem is to attach to the Editable control a **TextWatcher** and let its methods be called when the Editable text is changed.

The main methods of a **TextWatcher** are:

```
public void afterTextChanged (Editable theWatchedText)
public void beforeTextChanged ( … )
public void onTextChanged ( … )
```

# Hard & Soft Keyboard

## Example 7: TextWatcher Demo


EditText uses .addTextChangedListener

IMF suggestions


# Hard & Soft Keyboard

## Example 7: TextWatcher Demo

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
   android:orientation="vertical"
   android:layout_width="fill_parent"
   android:layout_height="fill_parent"
   android:background="#ffaabbcc"
   >
<EditText
android:id="@+id/txtInput"
   android:layout_width="fill_parent"
   android:layout_height="wrap_content"
   android:layout_margin="10px"
   android:padding="4px"
   android:textStyle="bold"
   />

<TextView
android:id="@+id/txtMsg"
   android:layout_width="fill_parent"
   android:layout_height="wrap_content"
   android:layout_margin="10px"
   android:padding="4px"
   android:background="#ff0000ff"
   android:textStyle="bold"
   />
</LinearLayout>
```


# Hard & Soft Keyboard

## Example 7: TextWatcher Demo

```
// demonstrate the use of a simple TEXTWATCHER control
package cis493.keyboarding;
…
public class TextWatcherDemo extends Activity  {
   EditText txtInput;
   TextView txtMsg;
   int keyCount = 0;
   @Override
   public void onCreate (Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.main);
        txtMsg = (TextView)findViewById(R.id.txtMsg);
        txtInput = (EditText)findViewById(R.id.txtInput);

        txtInput.addTextChangedListener(new TextWatcher() {
            public void afterTextChanged (Editable theWatchedText) {
                String msg = "count: " + txtInput.getText().toString().length() + " " + theWatchedText.toString();
                txtMsg.setText( msg );
            }
            public void beforeTextChanged (CharSequence arg0, int arg1, int arg2, int arg3) {
                //Toast.makeText(getApplicationContext(), "BTC " + arg0, 1).show();
            }
            public void onTextChanged (CharSequence arg0, int arg1, int arg2, int arg3) {
                //Toast.makeText(getApplicationContext(), "OTC " + arg0, 1).show();
            }
        }); //addTextChangedListener

    } //onCreate
}
```


# Hard & Soft Keyboard

Questions?