Android 3
Threads, Handlers, AsyncTask
UI Thread

- Also called Main Thread.
- A thread that updates UI.
  - Ex) TextView.setText(), View.setBackground()

- UI Thread should not be blocked.
  - Ex) I/O, sleep, …
Update UI from another thread?

- android.view.ViewRoot$CalledFromWrongThreadException: Only the original thread that created …

```java
Main Thread

void tv.setText("Main");

TextView tv

Thread #1

void tv.setText("#1");
```
How to do IO without blocking UI thread?

- Do blocking job in another **Thread**.
- Using **Handler**, update UI in UI Thread.
How to do IO without blocking UI thread?
Example: Text Downloader

- Let's make an Application that shows downloaded data into a TextView when a Button is clicked.

- You can download data from
AsyncTask

- AsyncTask = Thread + Handler
- Do a job in background
- After the job is finished, update UI in UI Thread.

```java
private class MyTask extends AsyncTask<Params, Progress, Result>{ ... }
```

- Params : Type of parameters sent to Thread.
- Progress : While running thread, type of parameter when progress update. (Usually Integer)
- Result : Type of result of Thread.
AsyncTask

```java
private class DownloadFilesTask extends AsyncTask<URL, Integer, Long> {
    protected Long doInBackground(URL... urls) {
        int count = urls.length;
        long totalSize = 0;
        for (int i = 0; i < count; i++) {
            totalSize += Downloader.downloadFile(urls[i]);
            publishProgress((int) ((i / (float) count) * 100));
            // Escape early if cancel() is called
            if (isCancelled()) break;
        }
        return totalSize;
    }

    protected void onProgressUpdate(Integer... progress) {
        setProgressPercent(progress[0]);
    }

    protected void onPostExecute(Long result) {
        showDialog("Downloaded " + result + " bytes");
    }
}
```
AsyncTask

• protected void onCreate(Bundle b) {
  super.onCreate(b);
  setContentView(R.layout.activity_some);
  ...
  
  new DownloadFilesTask().execute(url1, url2, url3);
}

public final AsyncTask<Params, Progress, Result> execute (Params... params)
Example: Text Downloader 2

• Let’s make a Application that shows downloaded data into a TextView when a Button is clicked.

• You can download a data from
Assignment : Weather Checking 2

• Using ListView, make a weather checking app.

• Get data from API request dynamically. Use json or xml.
  – [Link](http://api.openweathermap.org/data/2.5/forecast?id=1835848&appid=0265ef0250d1aa902196f4b164c0ad86&mode=json)
  – [Link](http://api.openweathermap.org/data/2.5/forecast?id=1835848&appid=0265ef0250d1aa902196f4b164c0ad86&mode=xml)

• Weather information should contain
  – date
  – Symbol name
  – max/min temperature (°C)
  – Humidity (%)
  – wind speed (m/s)

• Archive the project folder. Not the workspace.

• File name : Asn03_2014313131_홍길동.zip

• Due : 4/3 23:59
Assignment : Weather Checking 2


THANK YOU!!!