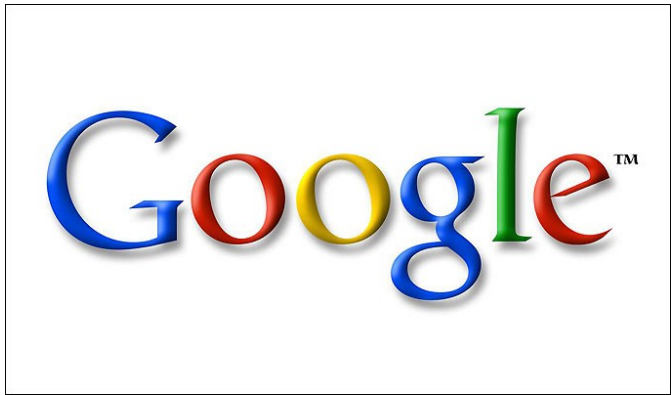
Introduction to Android File system

CS 436 Software Development on Mobile

By Dr.Paween Khoenkaw



File Access

Android File Systems

Internal NAND flash file system support

Type	Name	Vender
exFAT	extended File Allocation Table	Microsoft
F2FS	Flash-Friendly File System	Samsung
JFFS	Journal Flash File System	Axis Communications
YAFFS	Yet Another Flash File System	Charles Manning

SD card file system support

Type	Name	Vender
EXT2 / EXT3 / EXT4	EXTended file system	Linux
FAT12/ FAT16/FAT32	File Allocation Table	Microsoft
VFAT	Virtual FAT	Microsoft

Android File Hierarchy

C:\>adb shell

```
shell@android:/ $ ls -al
ls -al
drwxr-xr-x root     root              2013-05-27 15:36 acct
drwxrwx--- system   cache             2013-05-27 19:54 cache
dr-x------ root     root              2013-05-27 15:36 config
lrwxrwxrwx root     root              2013-05-27 15:36 d -> /sys/kernel/debug
drwxrwx--x system   system            2013-05-27 15:40 data
-rw-r--r-- root     root          116 1970-01-01 07:00 default.prop
drwxr-xr-x root     root              2013-05-27 15:36 dev
drwxrwxr-x radio    system            2012-10-29 09:10 efs
lrwxrwxrwx root     root              2013-05-27 15:36 etc -> /system/etc
lrwxrwxrwx root     root              2013-05-27 15:36 factory -> /efs
-rwxr-x--- root     root       131480 1970-01-01 07:00 init
-rwxr-x--- root     root        15055 1970-01-01 07:00 init.espresso.rc
-rwxr-x--- root     root         3106 1970-01-01 07:00 init.espresso.usb.rc
-rwxr-x--- root     root         2344 1970-01-01 07:00 init.goldfish.rc
-rwxr-x--- root     root        20800 1970-01-01 07:00 init.rc
drwxr-xr-x root     root              1970-01-01 07:00 lib
drwxrwxr-x root     system            2013-05-27 15:36 mnt
drwxrwx--x system   system            2013-05-27 15:36 preload
dr-xr-xr-x root     root              1970-01-01 07:00 proc
drwx------ root     root              2012-08-23 21:41 root
drwxr-x--- root     root              1970-01-01 07:00 sbin
lrwxrwxrwx root     root              2013-05-27 15:36 sdcard -> /mnt/sdcard
drwxr-xr-x root     root              2013-05-27 15:36 sys
drwxr-xr-x root     root              2012-10-29 09:09 system
-rw-r--r-- root     root         1324 1970-01-01 07:00 ueventd.espresso.rc
-rw-r--r-- root     root          272 1970-01-01 07:00 ueventd.goldfish.rc
-rw-r--r-- root     root         3921 1970-01-01 07:00 ueventd.rc
lrwxrwxrwx root     root              2013-05-27 15:36 vendor -> /system/vendor
shell@android:/ $
```

Android File Hierarchy

File	Note
acct	User accouting
cache	Link to /dev/block/mtdblock2 partition
d	A symbolic link to /sys/kernel/debug
data	The mount point for the /dev/block/mtdblock1 partition.
default.prop	default properties
dev	The devices available to applications
etc	A symbolic link to /system/etc
init	A binary program that processes the init.rc file
mnt	**mount point for internal and external SD card**
proc	Mount point for the procfs file system

Android File Hierarchy

File	Note
root	home directory for the root account
sbin	Linux binary
sdcard	A symbolic link to /mnt/sdcard.
sys	The mount point for the sysfs pseudo file system
system	This directory is the mount point for the /dev/block/mtdblock0 (Standard Linux directory)
ueventd.goldfish.rc	configuration rules
ueventd.rc	configuration rules
vendor	A symbolic link to /system/vendor.

Working with file

-Read/Write small configuration data
    -Private
    -Public
-Read text file resource
    -Asset
    -Resource
    -SD card
-Write text file
    -SD card

Working with file

Write small configuration data using preference

```
SharedPreferences settings = getSharedPreferences(“file name",
Context.MODE_PRIVATE);
    SharedPreferences.Editor editor = settings.edit();
    editor.putString("key", “string to save”);
editor.commit();
```

Data is stored as XML in /data/data/package name/shared_pref/filename.xml

Working with file

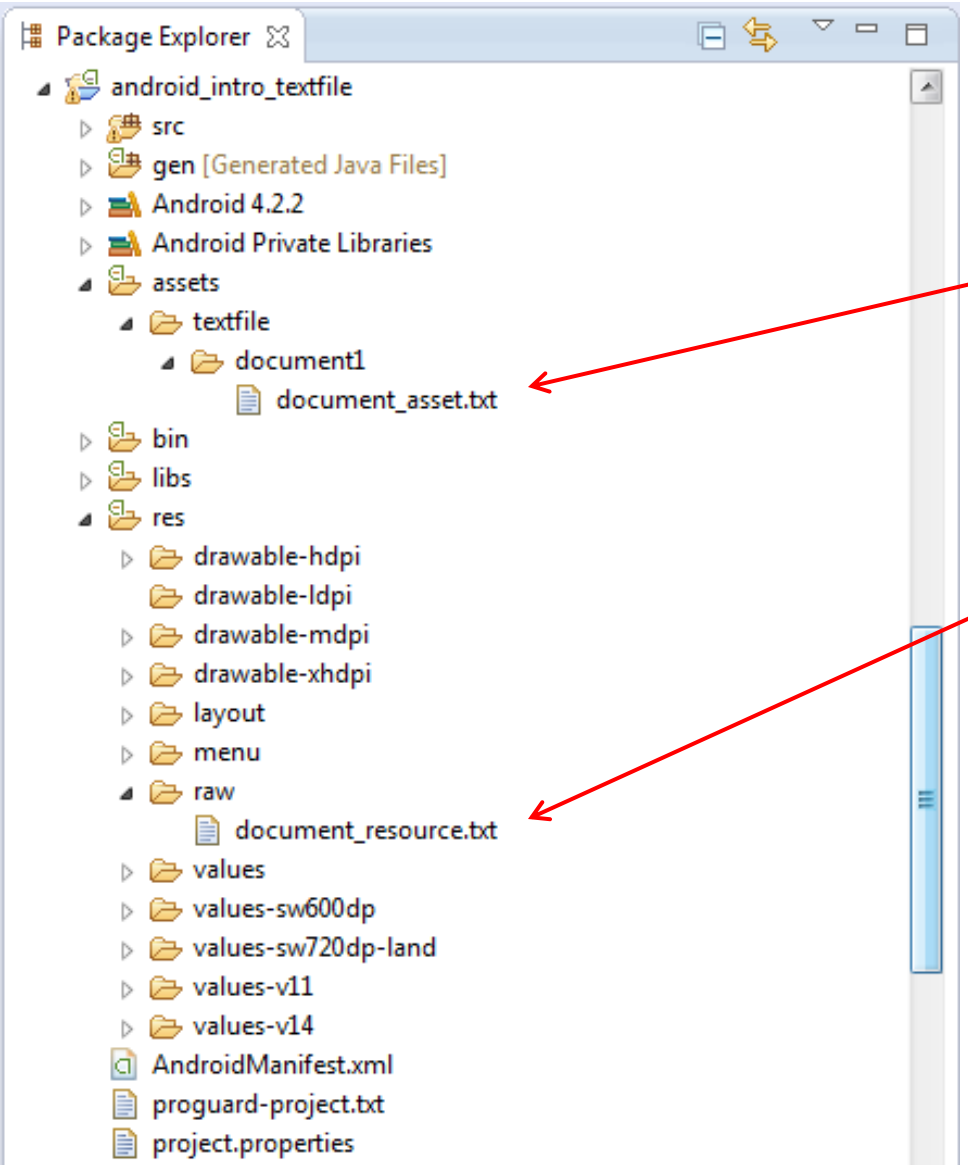
Read small configuration data using preference

```
SharedPreferences settings = getSharedPreferences(“filename", Context.MODE_PRIVATE);
 String data1 = settings.getString(”key", ”default value");
```

Working with file

Project:Android_intro_preference

Read text file



Assets

Resource

SD card

Read text file

	Assets	Resource	SD card
Data size	Small	Small	Large
Providing alternative	No	Yes	No
Sub folder support	Yes	No	Yes
Runtime compute	Easy	Hard	Easy
Read-only	Yes	Yes	Yes
Private	Yes	Yes	No
Storage location	APK	APK	External memory

Read text file

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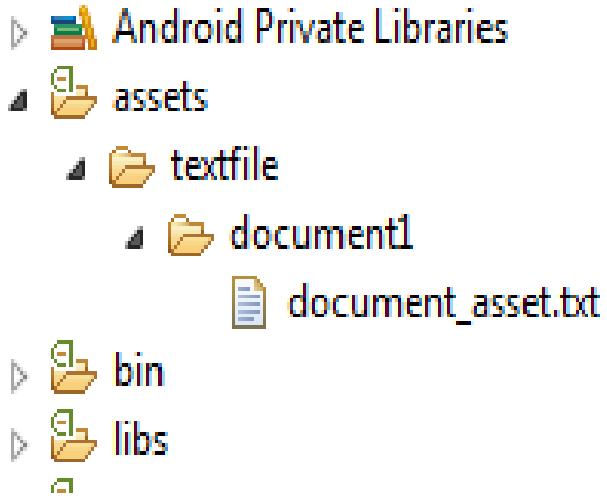
Storage location	APK	APK	External memory

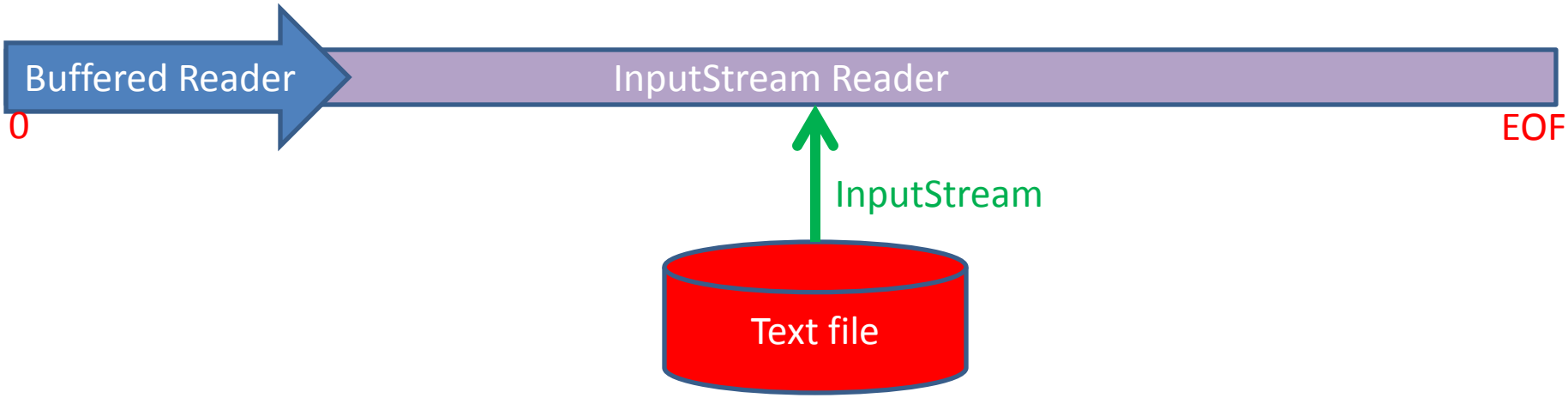
Read text file from assets/res/SD card

Project:Android_intro_textfile

Read text file from assets

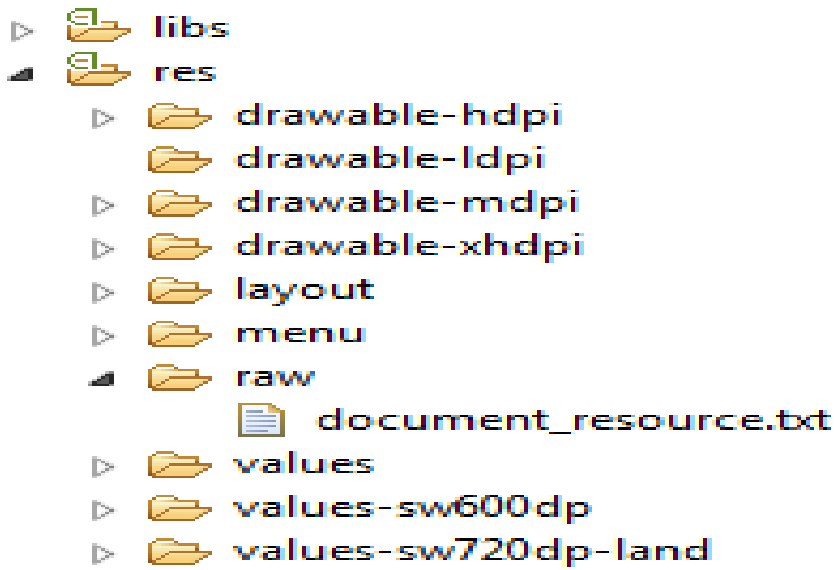
```
InputStream inputStream = getAssets().open(
"textfile/document1/document_asset.txt");
 BufferedReader reader = new BufferedReader(
new InputStreamReader(inputStream));
 String line,msg="";
       while ((line = reader.readLine()) != null) {
    msg=msg+line+"\n";
       }
       textview1.setText(msg);
```





Read text file from resource

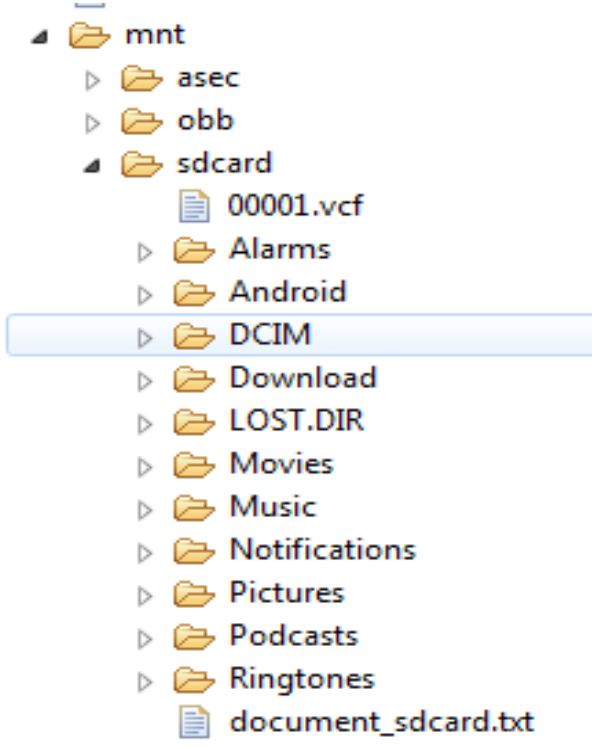
```
InputStream inputStream =
getResources().openRawResource(R.raw.document_resource);
 BufferedReader reader = new BufferedReader(
new InputStreamReader(inputStream));
 String line,msg="";
      while ((line = reader.readLine()) != null) {
    msg=msg+line+"\n";
      }
      textview1.setText(msg);
```

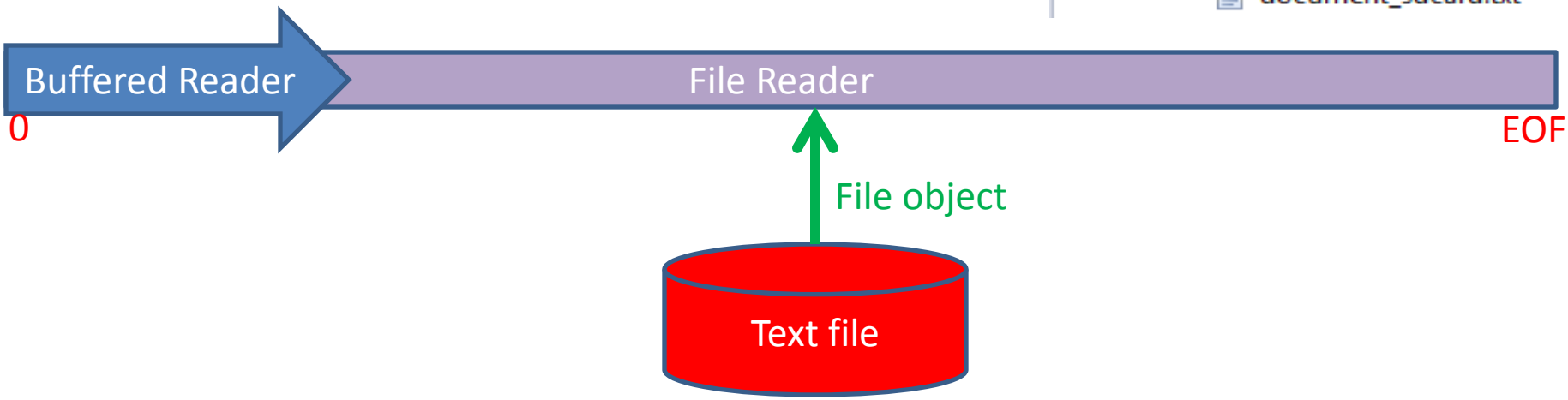


Read text file from SD card

```
File dir = Environment.getExternalStorageDirectory();
File file = new File(dir,"document_sdcard.txt");

BufferedReader reader = new
BufferedReader(new  FileReader(file));
String line,msg="";
      while ((line = reader.readLine()) != null) {
    msg=msg+line+"\n";
      }
```





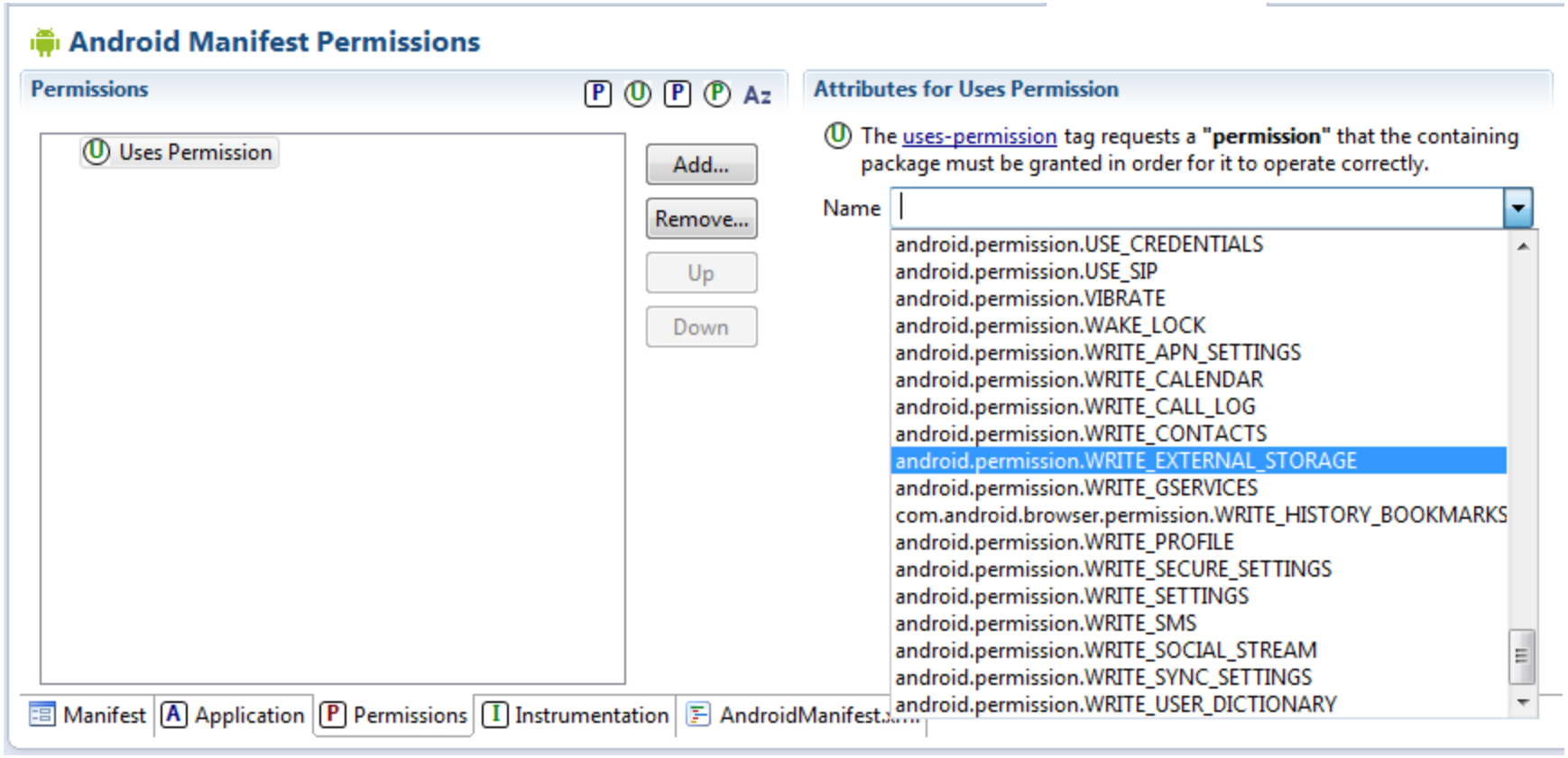
Write text file

Write text file

Project:Android_intro_writetext

Write text file

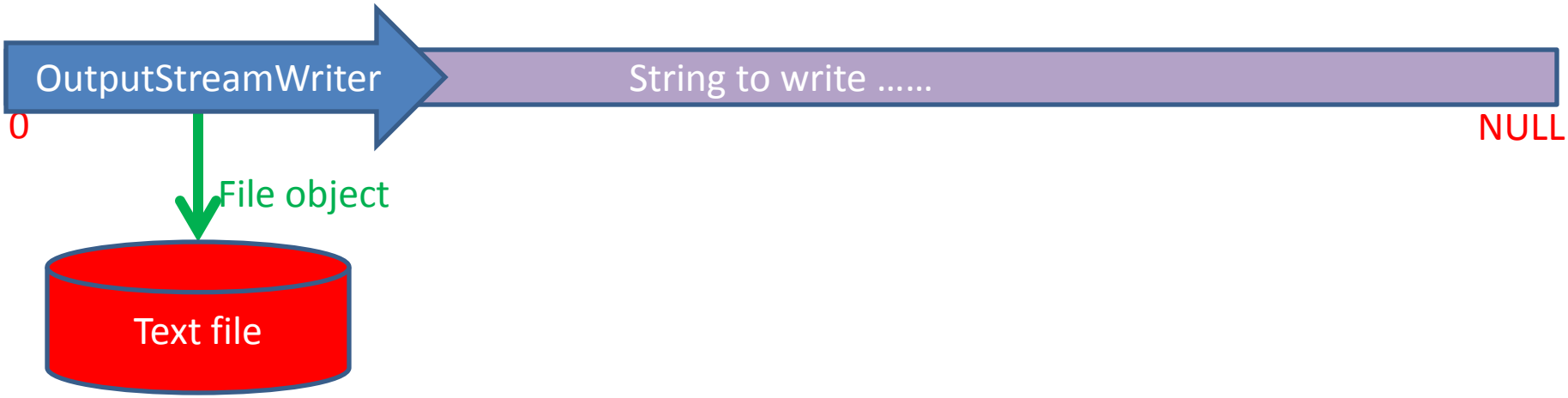
First, you need write external storage permission




```
<uses-permission android:name="android.permission.WRITE_EXTERNAL_STORAGE"/>
```

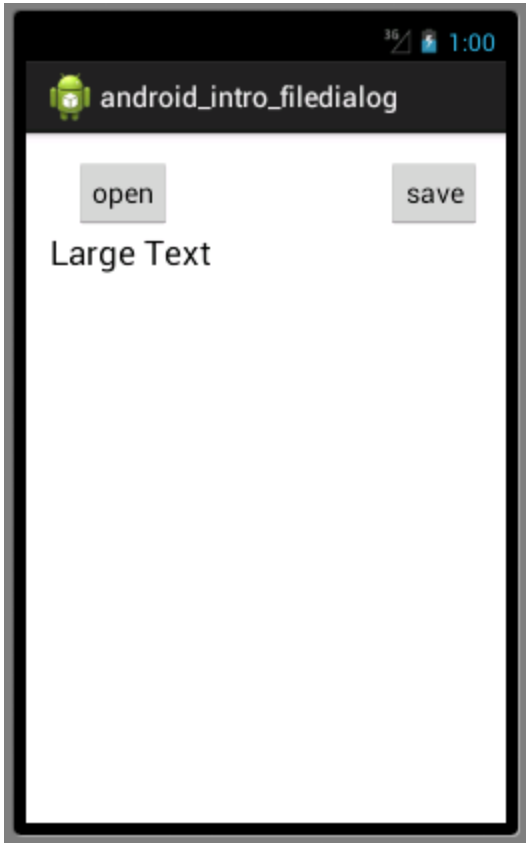
Read text file from SD card

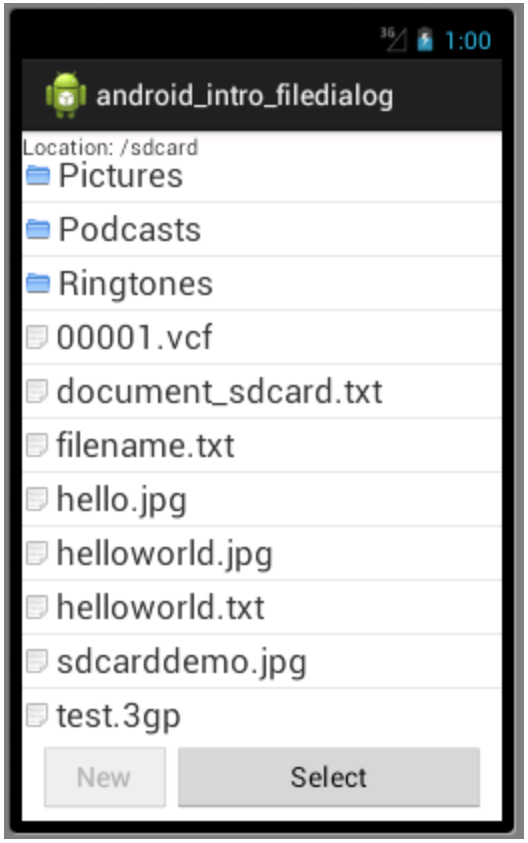
```
File dir = Environment.getExternalStorageDirectory();
File file = new File(dir,"filename.txt");
OutputStreamWriter outputStreamWriter = new
OutputStreamWriter(
new FileOutputStream(file));
outputStreamWriter.write("string to write");
outputStreamWriter.flush();
outputStreamWriter.close();
```



File open & save dialog

File open & save dialog





Project:Android_intro_filedialog

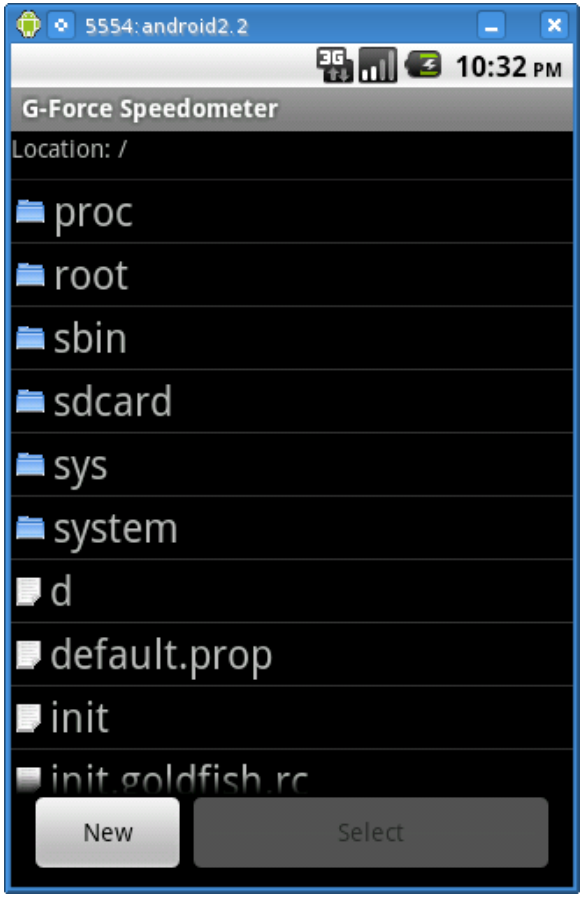
File open & save dialog

Android File Dialog

written by: alexander.ponomarev.1

Code license: New BSD License

Download from: https://code.google.com/p/android-file-dialog/

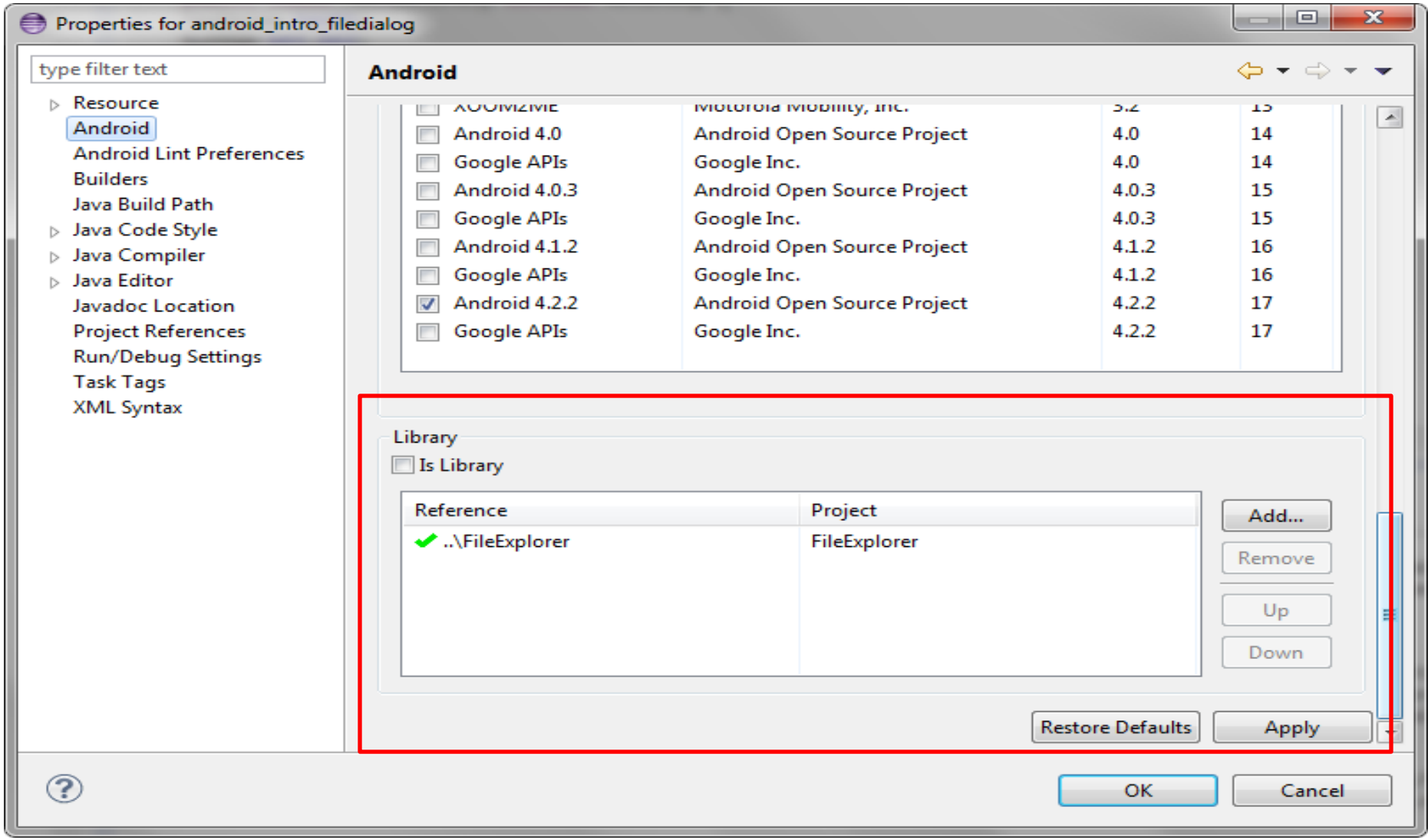


File open & save dialog

1) Import FileExplorer project to workspace
2) Add FileExplorer Library to working project
3) Register FileExplorer Activity in AndroidManifest
4) Activate FileExplorer using intent

File open & save dialog

Add FileExplorer Library to working project



File open & save dialog

Register FileExplorer Activity

```
<application
    android:allowBackup="true"
    android:icon="@drawable/ic_launcher"
    android:label="@string/app_name"
    android:theme="@style/AppTheme" >
    <activity
      android:name="com.example.android_intro_filedialog.MainActivity"
      android:label="@string/app_name" >
      <intent-filter>
        <action android:name="android.intent.action.MAIN" />

        <category android:name="android.intent.category.LAUNCHER" />
      </intent-filter>
    </activity>
  <activity android:name="com.lamerman.FileDialog" />
  </application>
```

File open & save dialog

Activate FileExplorer Open dialog Activity

```
Intent intent = new Intent(getBaseContext(), FileDialog.class);
intent.putExtra(FileDialog.START_PATH, "/sdcard");
intent.putExtra(FileDialog.CAN_SELECT_DIR,false);
intent.putExtra(FileDialog.SELECTION_MODE,
                SelectionMode.MODE_OPEN);
intent.putExtra(FileDialog.FORMAT_FILTER, new String[] {
                "jpg","png" });
startActivityForResult(intent, 4321);
```

File open & save dialog

Activate FileExplorer Save dialog Activity

```
Intent intent = new Intent(getBaseContext(), FileDialog.class);
intent.putExtra(FileDialog.START_PATH, "/sdcard");
intent.putExtra(FileDialog.CAN_SELECT_DIR,false);
intent.putExtra(FileDialog.SELECTION_MODE,
                SelectionMode.MODE_CREATE);
intent.putExtra(FileDialog.FORMAT_FILTER, new String[] {
                "jpg","png" });
startActivityForResult(intent, 1234);
```

File open & save dialog

Get the result

```
@Override
protected void onActivityResult(int requestCode, int resultCode, Intent data) {
super.onActivityResult(requestCode, resultCode, data);

if (resultCode == Activity.RESULT_OK) {
        if(requestCode==1234){
        text1.setText(data.getStringExtra(FileDialog.RESULT_PATH));
        }
        if(requestCode==4321){
         text1.setText( data.getStringExtra(FileDialog.RESULT_PATH));
         }
    }
}
```

Thank you ☺