

Android and Bitmaps: How hard could it be?

Maksim Lin

Manichord Mobile Solutions

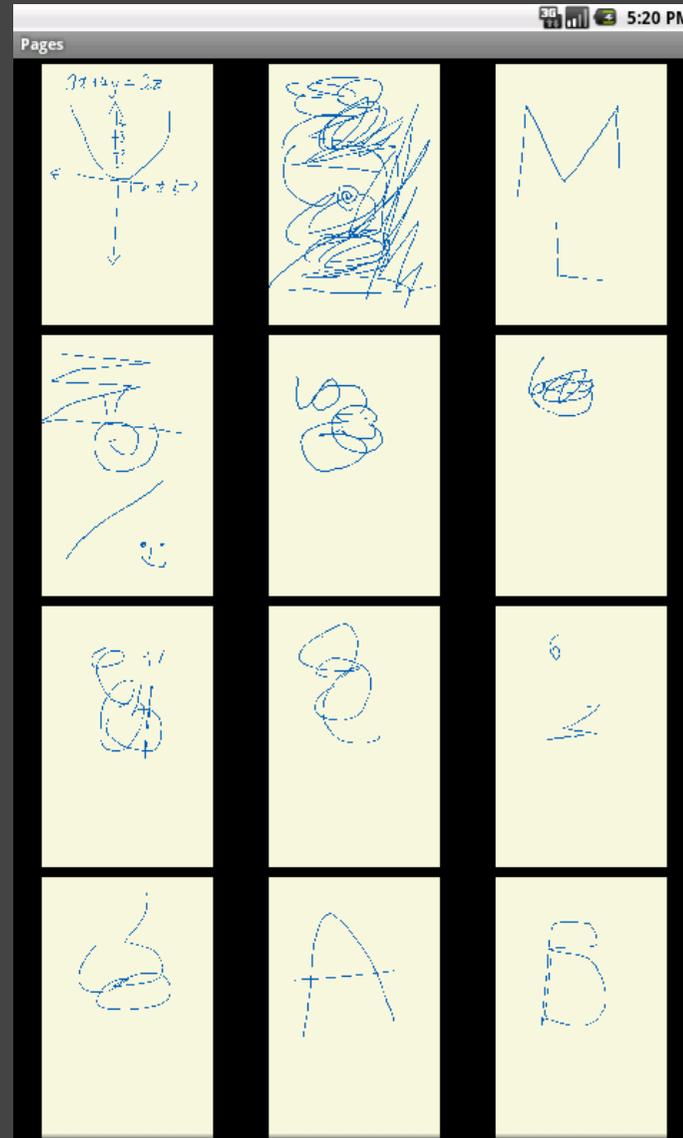
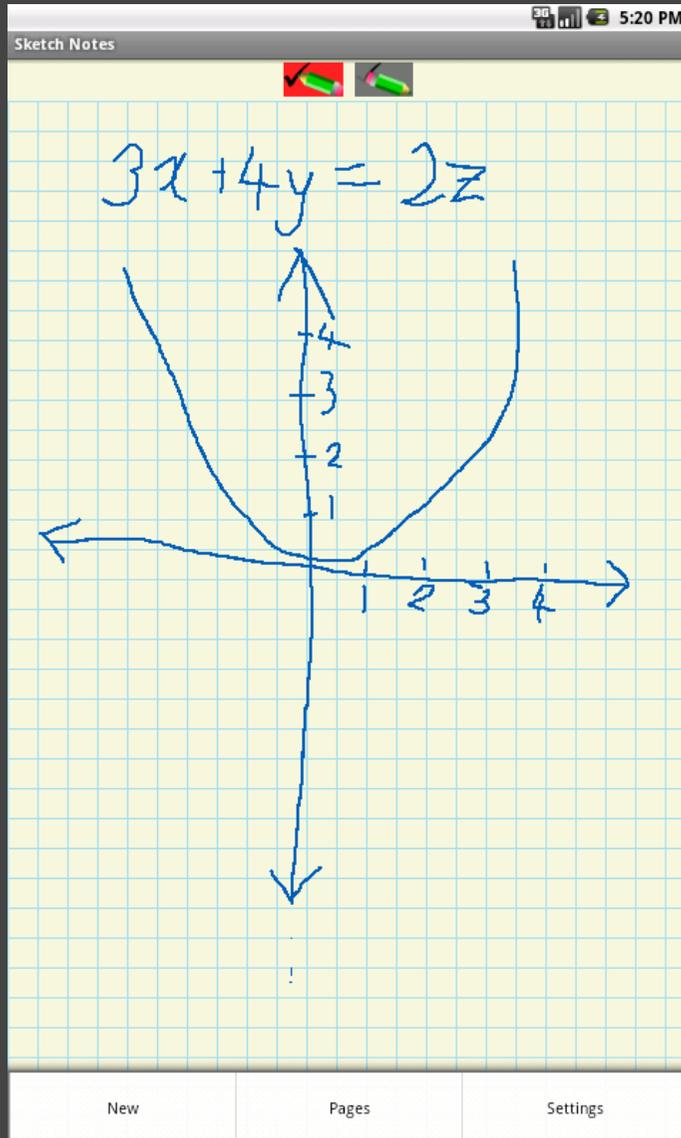
Intro

I'm an old time Java dev (serverside and J2ME), but a Android apprentice...

I'll talk about my experiences recently writing and ***debugging*** my "apprentice piece" Android App.

Specifically what I learnt about debugging memory issues with Bitmaps

My App uses Bitmaps *alot*



Bitmaps

- Bitmaps make life just that little bit more interesting...
- Up until Honeycomb Bitmap objects "data" memory is allocated in native code, "outside" Dalvik VM object map **BUT** still count towards your applications heap quota
- The heap quota is not very big...
- Android 2.1 = 16MB, 2.2 = 24MB, 2.3 = 32MB
- On Optus v9 Tablet: 732x480x4 ~ 1.4MB per "screen" !!
- Because its **native** allocated memory, the SDKs Allocation Tracker tool is not very helpful :-)

The Dreaded OOM !

`java.lang.OutOfMemoryError:
bitmap size exceeds VM budget`

- That's the helpful exception you get when you run out of heap when trying to create a new Bitmap without enough heap space...

"All this has happened before, and all this will happen again."

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bitmap size exceeds VM budget

... s. 03-08 10:41:35.793: ERROR/GraphicsJNI(1159): VM won't let us allocate 4707316 bytes 03-08 10:41 ...
iew(1159): Caused by: java.lang.OutOfMemoryError: **bitmap size exceeds VM budget** 03-08 10:41:35.793:
WARN ... /AppWidgetHostView(1159): at android.graphics.Bitmap.nativeCreate(Native Method) 03-08
10:41:35.793: ... /AppWidgetHostView(1159): at android.graphics.Bitmap.createBitmap(Bitmap.java:468) 03-
08 10:41:35.79 ... /AppWidgetHostView(1159): at android.graphics.Bitmap.createBitmap(Bitmap.java:435) 03-
08 10:41:35.79 ... /AppWidgetHostView(1159): at
android.graphics.Bitmap.createScaledBitmap(Bitmap.java:340) 03-08 10:41 ...

asked Jan 18 at 14:15

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OutOfMemoryError: bitmap size exceeds VM budget :- Android

... download time it is giving out of memory error : **bitmap size exceeds VM budget**. I am using drawable.
Code ... putStream instream = bufHttpEntity.getContent(); **Bitmap** bm =
BitmapFactory.decodeStream(instream); **Bitmap** ... useThisBitmap =

Old School Debugging

So after a bit of Googling you come up with this:

```
public static String getMemUsageString() {  
    int usedNativeKbs = (int)  
        (Debug.getNativeHeapAllocatedSize() / 1024L);  
  
    return String.format("SKNotes Memory Used: %d KB",  
                        usedNativeKbs);  
}
```

And then lots of Log.d() ...

theres lots of other interesting methods on Debug...

To reason why...

- So why is this happening in the first place?
- Answer in [bug 8488](#) in AOSP bug tracker if you have time to read through it...
- basically GC it seems does not get around to calling the native code in the Bitmaps finaliser before your app hits the out of memory condition
- But should we really follow the advice in that bug report of lots of call to `System.gc()` ?!?!?
- **NO!**
- A good blog post: <http://goo.gl/PpQua> elaborates further (all the way down into native c++ code!) to basically point out the need for calling:
`mybitmap.recycle()`
due to async nature of GC whether or not you call `.gc()`

One more helpful hint...

Use the `BitmapFactory.Options.inSampleSize` !

e.g.

```
static {
    private static BitmapFactory.Options
        mBitmapFactoryOpts =
            new BitmapFactory.Options();
    mBitmapFactoryOpts.inSampleSize = THUMB_SCALE_FACTOR;
}

...

//Decode with inSampleSize
Bitmap loadedBM =
    BitmapFactory.decodeFile(filePath, mBitmapFactoryOpts);
```

Lessons Learnt



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References

Sketch Notes App in Android Market :-)

Sketch Notes App source code available on Github: <http://github.com/maks/Sketch-Notes>

The Android Developers Blog: <http://android-developers.blogspot.com/>

Romain Guy blog: <http://www.curious-creature.org/>

Questions?