1 Content:

2 Introduction.

Tuesday, November 4 - 2014

This document is based on **"Lazarus and Android.pdf"** dated 2014-10-22 created by **Delphifreak71**.

I used his document to install LazToApk on my Windows 8 system. And made screenshots during the process to help others installing it on Windows 8.
Because I am dutch, some screenshots contain dutch words. Here and there I translated button or message texts in English for better understanding.

The text of my document, is the original text of **"Lazarus and Android.pdf"**, it was only changed where necessary. Where relevant my comments are with yellow background. Screenshots are all from my installation.

First my system:

Informatie over de computer weergeven

Windows-versie

Windows 8.1 Pro

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Meer onderdelen verkrijgen met een andere editie van Windows

Systeem

Processor:	Intel(R) Core(TM) i7-4770 CPU @ 3.40GHz 3.40 GHz
Geïnstalleerd geheugen (RAM):	16,0 GB
Type systeem:	64-bits besturingssysteem, x64-processor
Pen en aanraken:	Pen- of aanraakinvoer is niet beschikbaar voor dit beeldscherm

Important Note:
- A)Please remove previous versions before installing a new version.
  I Did not do that, everything seems to work. The Demo app runned fine!
- B)Installation path containing "SPACE" char's do still not work.

Lazarus and Android

To create Android Apps with Lazarus (on windows), you need to download and install the following packages. (Warning, this will take at least **5GByte** of disk space).

The whole installation&compile process can take up to **one hour** depending on your hardware and internet connection.

Please **precisely** follow this instructions, otherwise there is a big change that your final app will not work!

I tested it on **Windows 8.1 PRO** as **administrator**.

Thanks for all your work Delphifreak71!

Tineke, aka Mother10.

3 Step 01: Download & Install JDK

I used the Java SE Development Kit 8u25 from page

http://www.oracle.com/technetwork/java/javase/downloads/jdk8-downloads-2133151.html
I used file: **jdk-8u25-windows-x64.exe** for windows x64.

It will be installed as a subdir from <**C:\Program Files\Java**>.

My Configurationscreen before I start:

Naam	Uitgever	Geïnstalleerd op	Grootte	Versie	Locatie
Java 7 Update 25 (64-bit)	Oracle	11-10-2014	128 MB	7.0.250	C:\Program Files\Java\jre7\
Java 7 Update 55	Oracle	31-12-2013	118 MB	7.0.550	C:\Program Files (x86)\Java\jre7\
Java 8 Update 20 (64-bit)	Oracle Corporation	14-09-2014	88,8 MB	8.0.200	
Java SE Development Kit 7 Update 25 (64-bit)	Oracle	11-10-2014	190 MB	1.7.0.250	C:\Program Files\Java\jdk1.7.0_25\
Java SE Development Kit 8 Update 20 (64-bit)	Oracle Corporation	14-09-2014	314 MB	8.0.200.26	C:\Program Files\Java\jdk1.8.0_20\

As you can see there are already SDK's present on my system, which I did not remove before I started. Each one gets installed into its own subdirectory automatically.
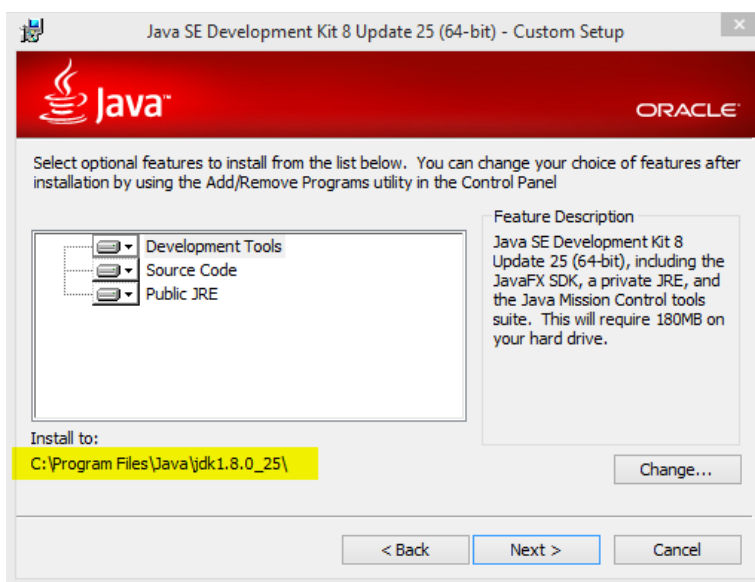
It installs in a subdirectory

After the installation, Close this screen.

Now my Configurationscreen looks like this:

Naam	Uitgever	Geïnstalleerd op	Grootte	Versie	Locatie
Java 7 Update 25 (64-bit)	Oracle	11-10-2014	128 MB	7.0.250	C:\Program Files\Java\jre7\
Java 7 Update 55	Oracle	31-12-2013	118 MB	7.0.550	C:\Program Files (x86)\Java\jre7\
Java 8 Update 20 (64-bit)	Oracle Corporation	14-09-2014	88,8 MB	8.0.200	
Java 8 Update 25 (64-bit)	Oracle Corporation	01-11-2014	85,3 MB	8.0.250	
Java SE Development Kit 7 Update 25 (64-bit)	Oracle	11-10-2014	190 MB	1.7.0.250	C:\Program Files\Java\jdk1.7.0_25\
Java SE Development Kit 8 Update 20 (64-bit)	Oracle Corporation	14-09-2014	314 MB	8.0.200.26	C:\Program Files\Java\jdk1.8.0_20\
Java SE Development Kit 8 Update 25 (64-bit)	Oracle Corporation	01-11-2014	311 MB	8.0.250.18	C:\Program Files\Java\jdk1.8.0_25\

As you can see I have now 3 SDK's installed. The last one (Update 25, installed on 01-11-2014) is the one we will use. The other 2 came from a Delphi install and an install of AndroidStudio. Those had different versions.

4 Step 02: Download&Install LazToApk

LazToApk → Download the setup from here. (sourceforge.net)

When started the setup will automatically:
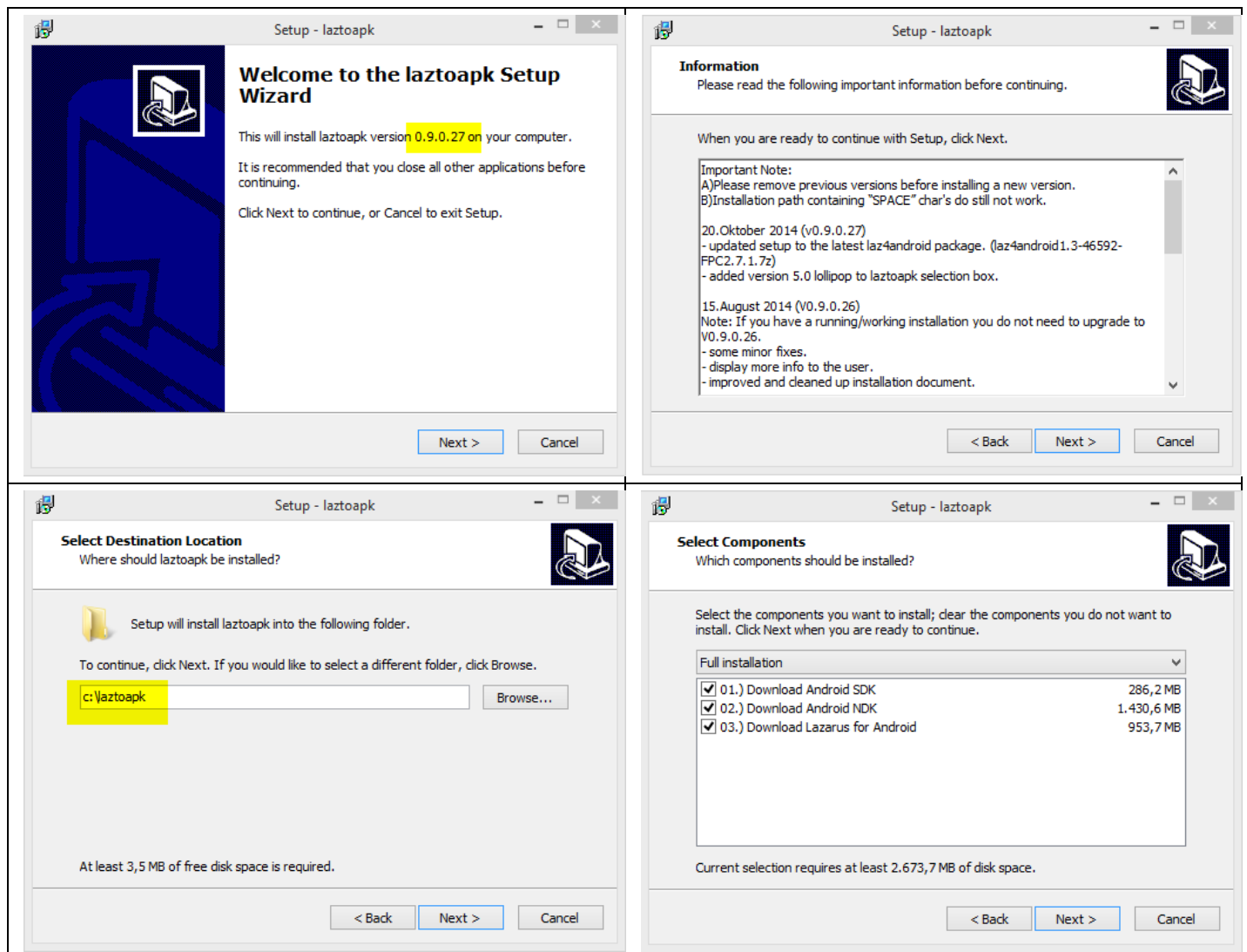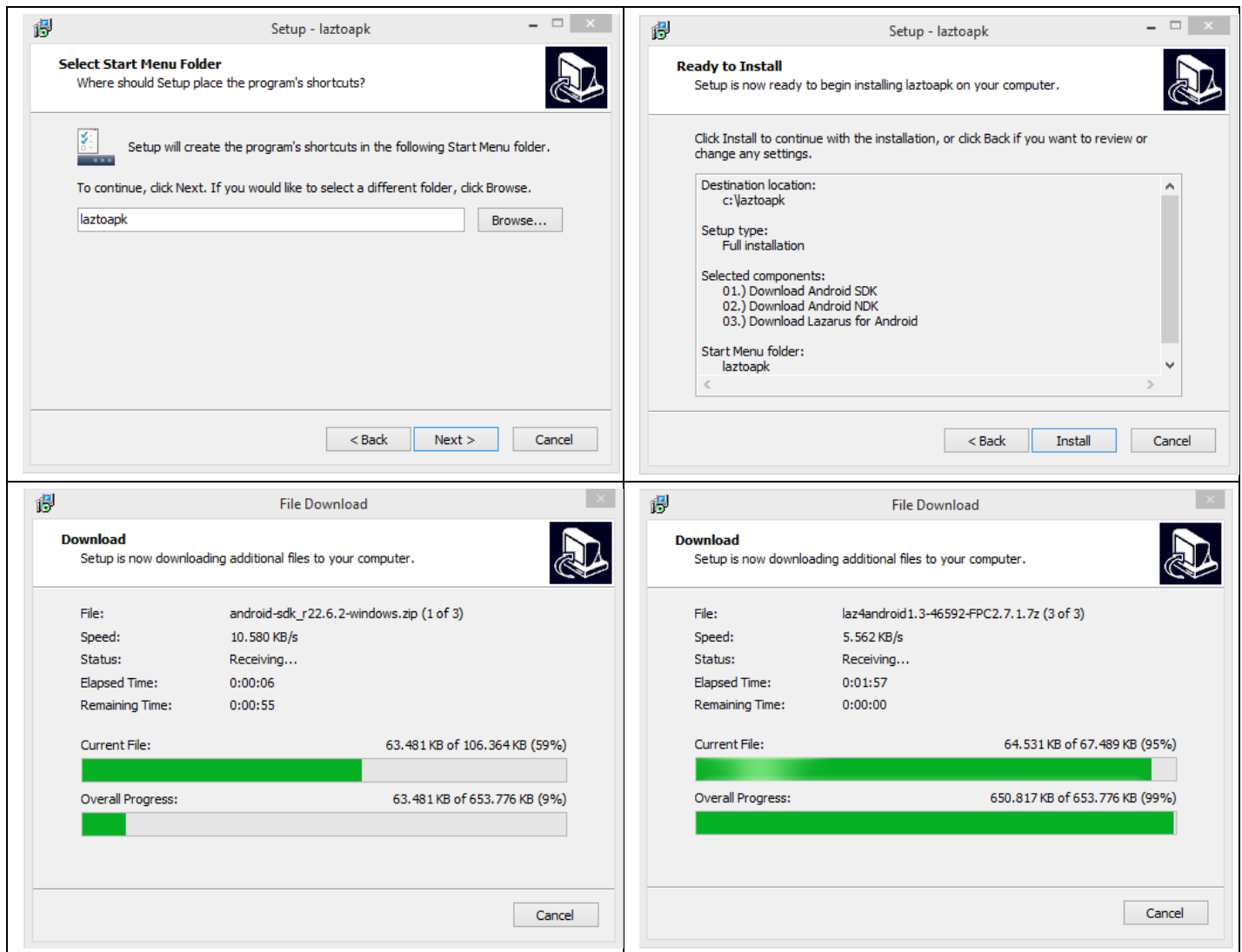
1.) download ndk.zip to \laztoapk\downloads and then unpack it to \laztoapk\downloads\ndk

2.) download sdk.zip to \laztoapk\downloads and then unpack it to \laztoapk\downloads\sdk

3.) download laz4android-43585-New.7z to \laztoapk\downloads and then unpack to \laztoapk\downloads\laz4android

4.) run \laztoapk\downloads\laz4android\build.bat to recompile Lazarus.

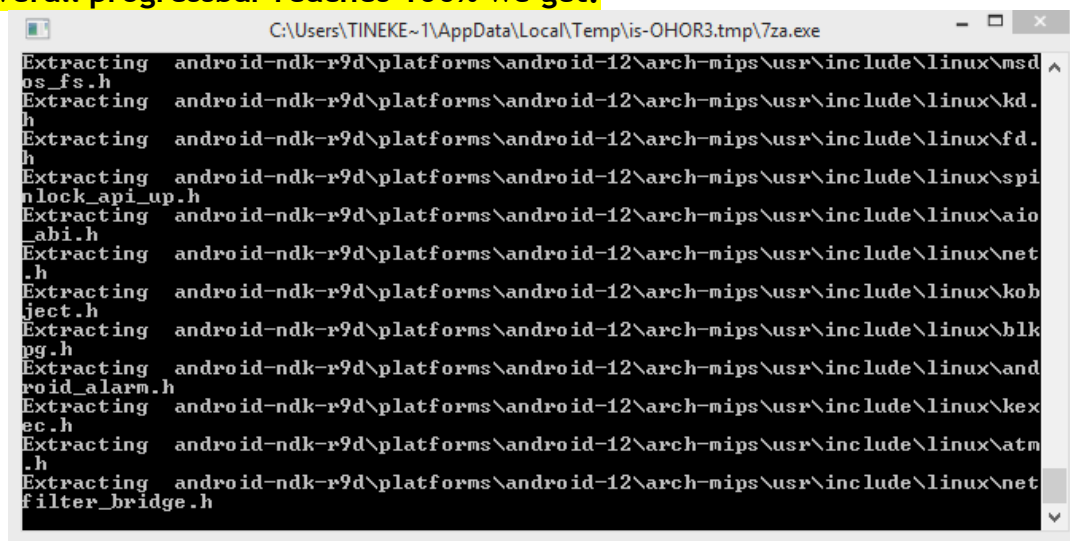First find your downloaded file, my version was: "**setup_laztoapk_alpha_011_experimental.exe**" (yellow in the next screen):

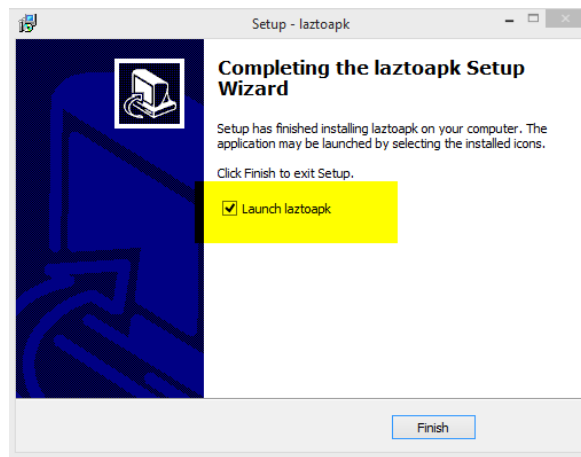|			
setup_laztoapk_alpha_011_experimental.exe	01-11-2014 09:31	Toepassing	1.187 kB
Lazarus and Android.pdf	01-11-2014 09:31	Adobe Acrobat D…	779 kB
jdk-8u25-windows-x64-demos.zip	01-11-2014 09:30	Gecomprimeerde …	61.882 kB
jdk-8u25-windows-x64.exe	01-11-2014 09:29	Toepassing	173.689 kB

Dubbelclick to start it.

Setup - laztoapk

Select Start Menu Folder
Where should Setup place the program's shortcuts?

Setup will create the program's shortcuts in the following Start Menu folder.

To continue, click Next. If you would like to select a different folder, click Browse.

laztoapk   Browse...

< Back   Next >   Cancel

Setup - laztoapk

Ready to Install
Setup is now ready to begin installing laztoapk on your computer.

Click Install to continue with the installation, or click Back if you want to review or change any settings.

Destination location:
    c:\laztoapk

Setup type:
    Full installation

Selected components:
    01.) Download Android SDK
    02.) Download Android NDK
    03.) Download Lazarus for Android

Start Menu folder:
    laztoapk

< Back   Install   Cancel

File Download

Download
Setup is now downloading additional files to your computer.

File: android-sdk_r22.6.2-windows.zip (1 of 3)
Speed: 10.580 KB/s
Status: Receiving...
Elapsed Time: 0:00:06
Remaining Time: 0:00:55

Current File: 63.481 KB of 106.364 KB (59%)

Overall Progress: 63.481 KB of 653.776 KB (9%)

Cancel

File Download

Download
Setup is now downloading additional files to your computer.

File: laz4android1.3-46592-FPC2.7.1.7z (3 of 3)
Speed: 5.562 KB/s
Status: Receiving...
Elapsed Time: 0:01:57
Remaining Time: 0:00:00

Current File: 64.531 KB of 67.489 KB (95%)

Overall Progress: 650.817 KB of 653.776 KB (99%)

Cancel

When the overall progressbar reaches 100% we get:

C:\Users\TINEKE~1\AppData\Local\Temp\is-OHOR3.tmp\7za.exe

```
Extracting  android-ndk-r9d\platforms\android-12\arch-mips\usr\include\linux\msd
os_fs.h
Extracting  android-ndk-r9d\platforms\android-12\arch-mips\usr\include\linux\kd.
h
Extracting  android-ndk-r9d\platforms\android-12\arch-mips\usr\include\linux\fd.
h
Extracting  android-ndk-r9d\platforms\android-12\arch-mips\usr\include\linux\spi
nlock_api_up.h
Extracting  android-ndk-r9d\platforms\android-12\arch-mips\usr\include\linux\aio
_abi.h
Extracting  android-ndk-r9d\platforms\android-12\arch-mips\usr\include\linux\net
.h
Extracting  android-ndk-r9d\platforms\android-12\arch-mips\usr\include\linux\kob
ject.h
Extracting  android-ndk-r9d\platforms\android-12\arch-mips\usr\include\linux\blk
pg.h
Extracting  android-ndk-r9d\platforms\android-12\arch-mips\usr\include\linux\and
roid_alarm.h
Extracting  android-ndk-r9d\platforms\android-12\arch-mips\usr\include\linux\kex
ec.h
Extracting  android-ndk-r9d\platforms\android-12\arch-mips\usr\include\linux\atm
.h
Extracting  android-ndk-r9d\platforms\android-12\arch-mips\usr\include\linux\net
filter_bridge.h
```

This takes a while before its finished and we get:

After you press button <Finish>, laz4android get's automatically compiled. This may take a while and look's something like this:
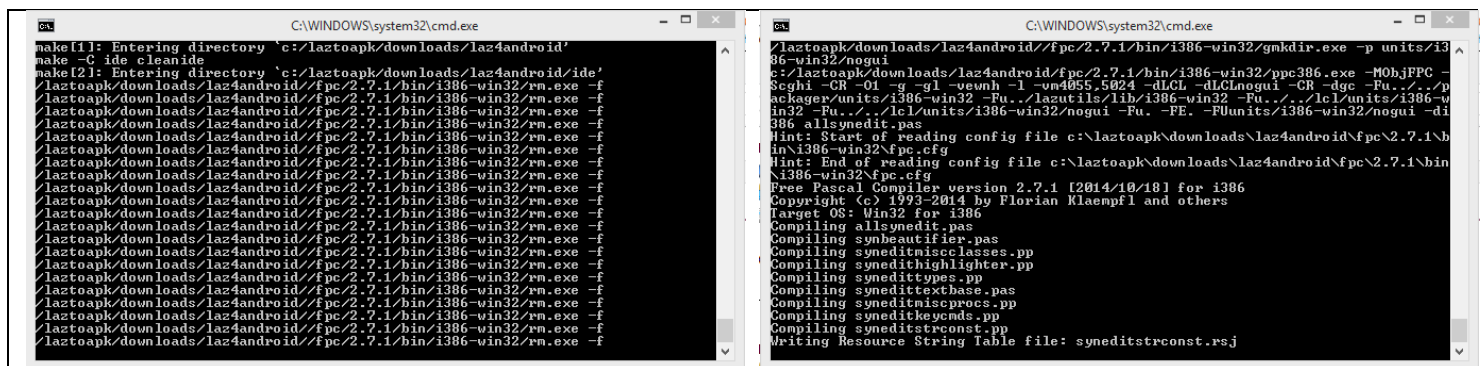
After compiling laz4android on windows 8, my Configurationscreen says about Lazarus itself:

Naam	Uitgever	Geïnstalleerd op	Grootte	Versie	Locatie
Lazarus 1.2.4	Lazarus Team	06-09-2014	805 MB	1.2.4	C:\lazarus\

So that means my original Lazarus, installed on 06-09-2014, is still installed and not changed by the new installation and the compilation of laz4android on 1-11-2014.

5 Step 03: Start & Configure LazToApk for the first time

Now the application LazToApk will be started.
LazToApk will verify if the folder's for JDK,SDK,NDK and the tool lazbuild.exe are available. If not, then path setup dialogs will show up and you must select the correct path manually.

On the first start of LazToApk, you will be asked to select the path to JDK.

According to the configurationscreen my JDK (01-11-2014) was put in the Program files directory:

Naam	Uitgever	Geïnstalleerd op	Grootte	Versie	Locatie
Java 7 Update 25 (64-bit)	Oracle	11-10-2014	128 MB	7.0.250	C:\Program Files\Java\jre7\
Java 7 Update 55	Oracle	31-12-2013	118 MB	7.0.550	C:\Program Files (x86)\Java\jre7\
Java 8 Update 20 (64-bit)	Oracle Corporation	14-09-2014	88,8 MB	8.0.200	
Java 8 Update 25 (64-bit)	Oracle Corporation	01-11-2014	85,3 MB	8.0.250	
Java SE Development Kit 7 Update 25 (64-bit)	Oracle	11-10-2014	190 MB	1.7.0.250	C:\Program Files\Java\jdk1.7.0_25\
Java SE Development Kit 8 Update 20 (64-bit)	Oracle Corporation	14-09-2014	314 MB	8.0.200.26	C:\Program Files\Java\jdk1.8.0_20\
Java SE Development Kit 8 Update 25 (64-bit)	Oracle Corporation	01-11-2014	311 MB	8.0.250.18	C:\Program Files\Java\jdk1.8.0_25\

Setup path to JDK:
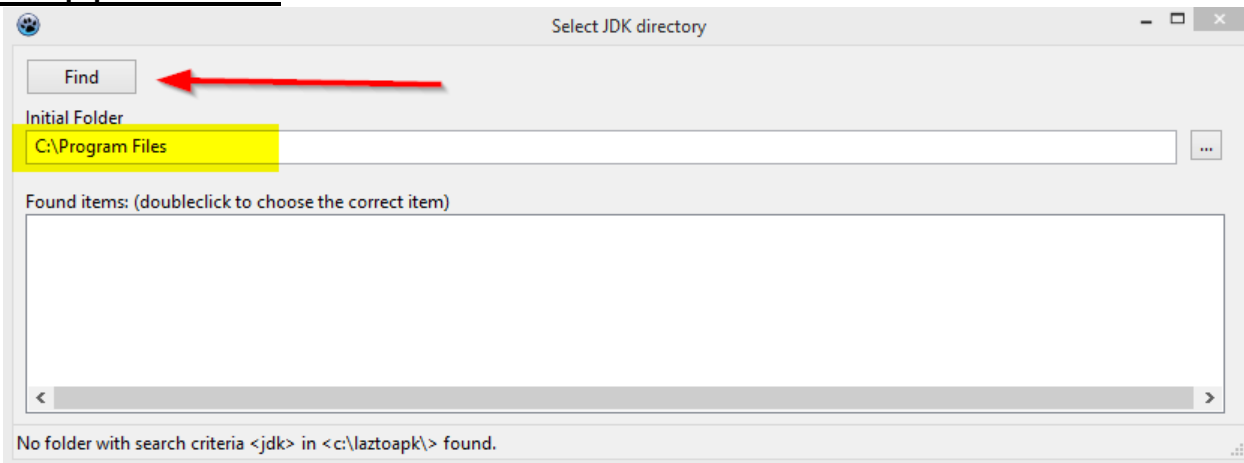
First set the <Initial Folder> (here to my C:\Program Files directory) and then press button <Find>.

On my drive it finds more than one:
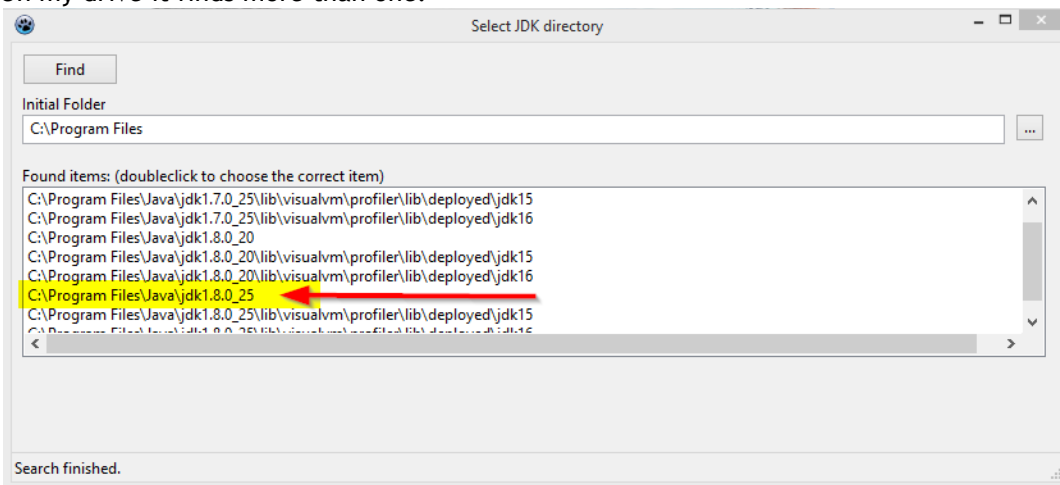
Double-click on the marked entry, the newly installed version, here version 1.8.0_25.

The following path's (for NDK and SDK) should be set automatically by LazToApk. So in most cases it's not needed to set them up manually.

If not, the next screen might popup and you have to

Setup NDK:
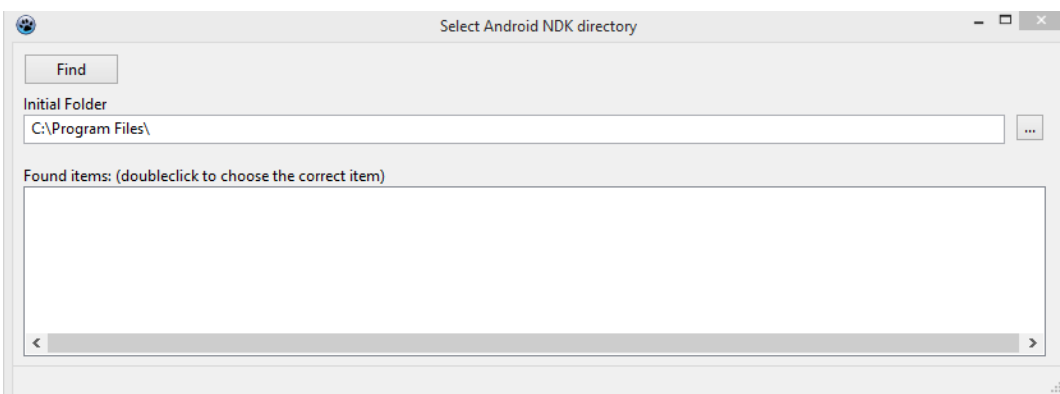
First point it to the **download directory of laztoapk** like so:
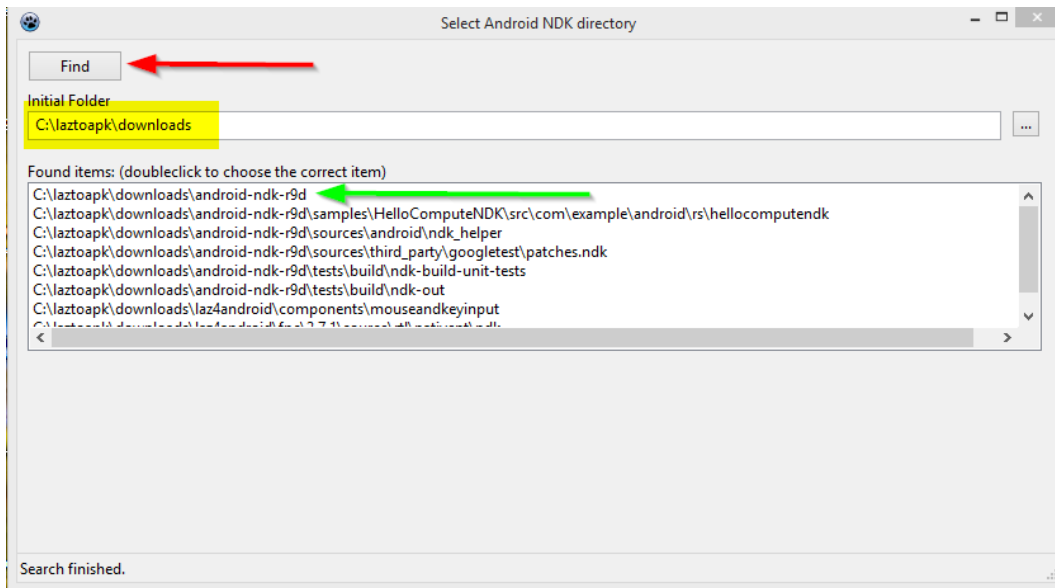
Press find and when the box is filled double-click the one with the green arrow.

Setup SDK:

This path is usually setup automatically. Only the first time you will see the following message.
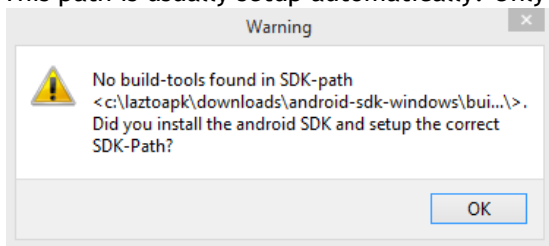
This is fine for now. Just press <OK>.
Finally LazToApk should show up and look like this:
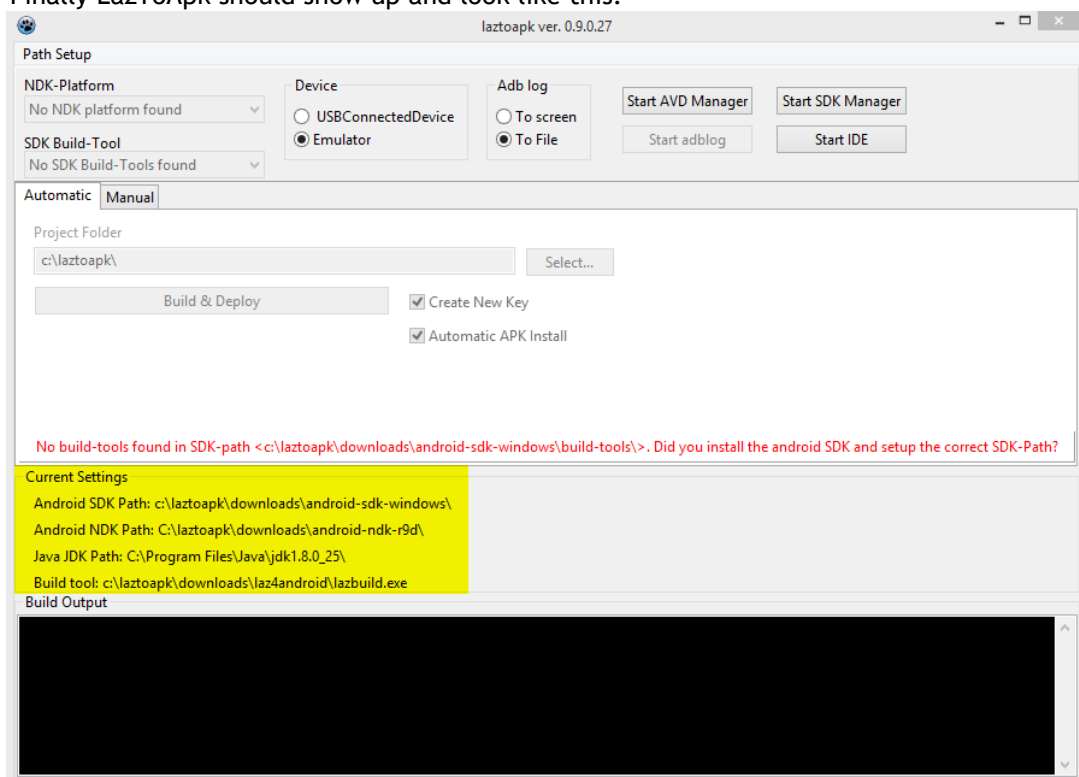
6   Step 04: Start Lazarus and install package „CustomDrawn"

On the LaztoApk screen press button <Start IDE>.
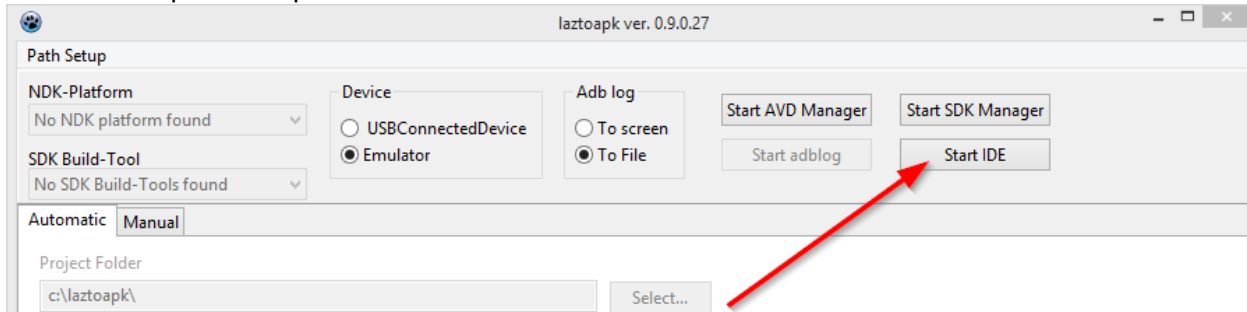
And again on the Lazarus IDE screen:
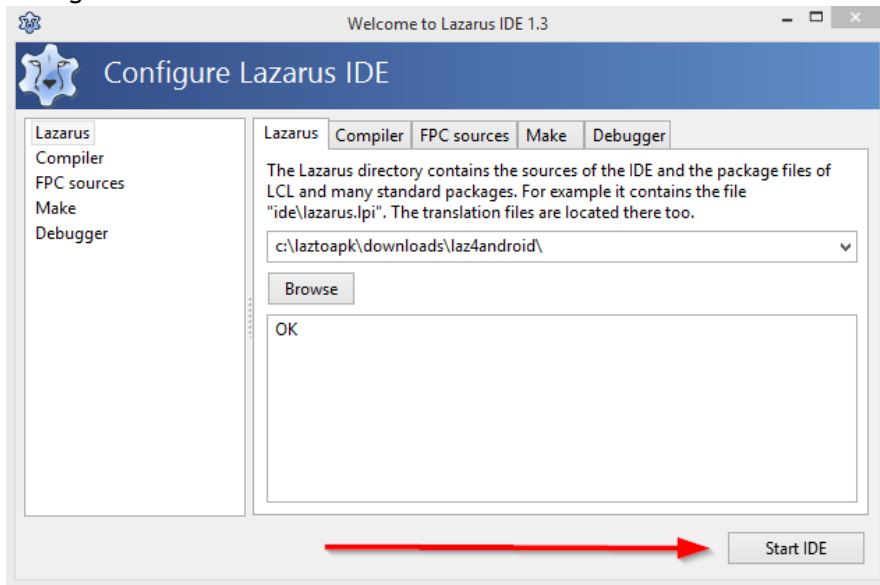
The IDE opens.
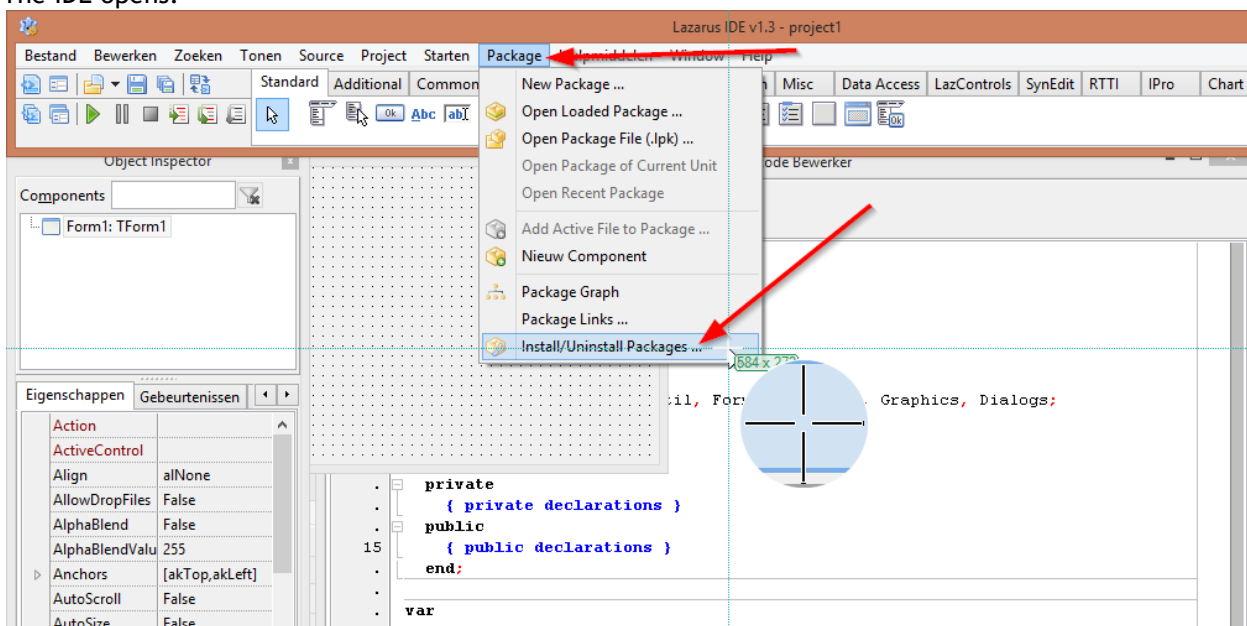
Now we need to install package „CustomDrawn". Select <Package>   <Install/Uninstall Packages>.
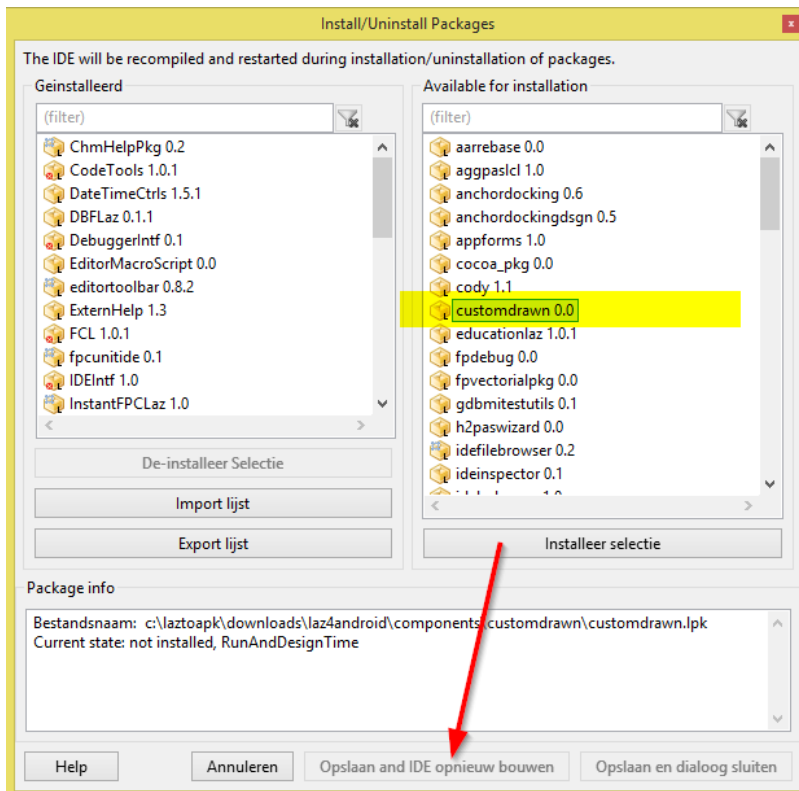
Double-Click on „CustomDrawn" Package (The "Save and Rebuild IDE" -button is still disabled, see arrow)
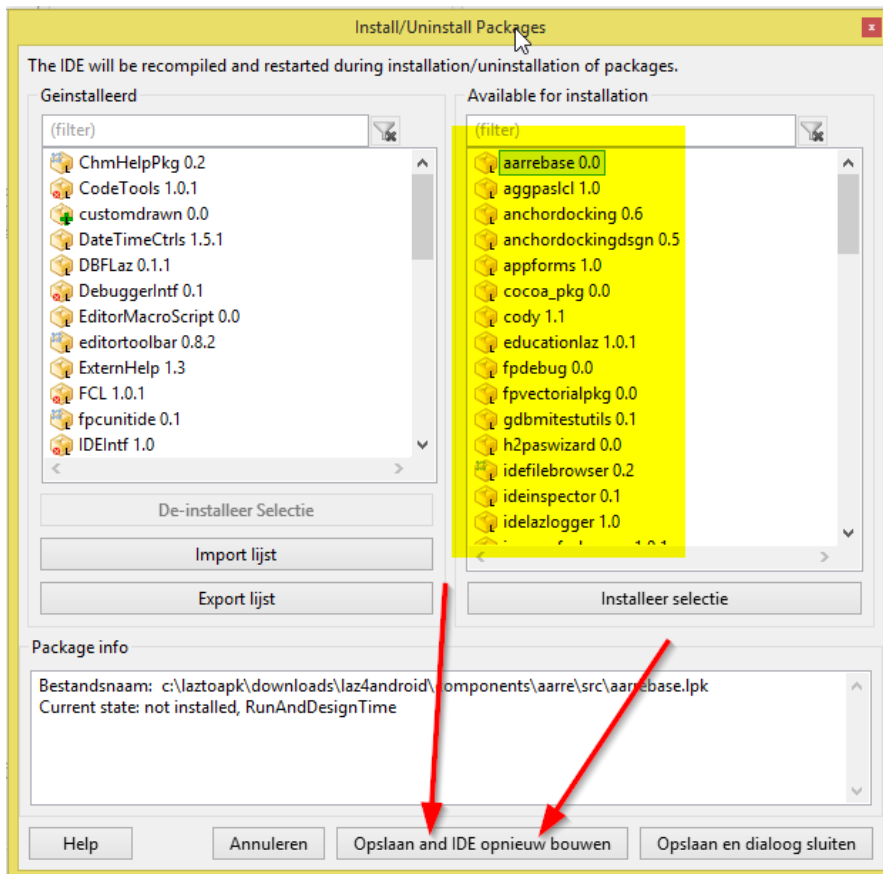
Now the button is enabled so click <**Save and rebuild IDE**>. (which is "**Opslaan en IDE opnieuw bouwen**" in dutch)
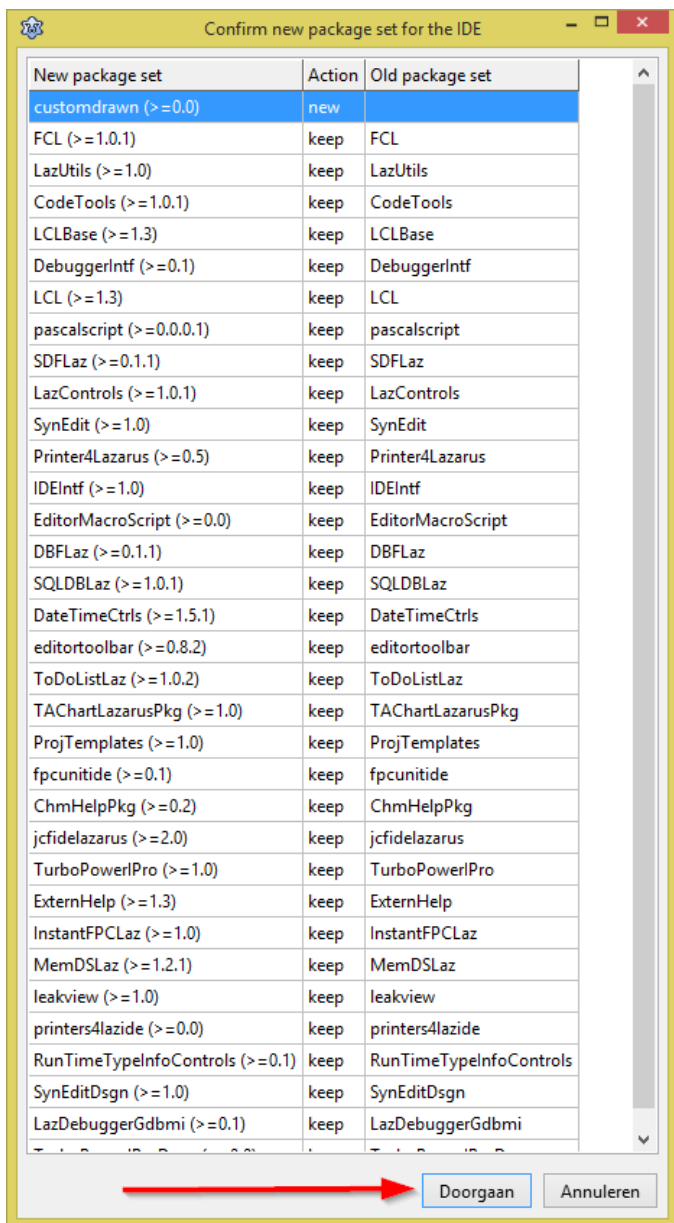
It wants you to Confirm ("Doorgaan"). Press Confirm and wait for it to finish.

After the IDE has been rebuilt, you have to exit Lazarus, but on my system, after compiling, it looks like Lazarus closes and opens itself automatically. To be sure I explicitly exited the Lazarus IDE.

7 Step 05: Start SDK-Manager and install API's

Now LazToApk will look like this.
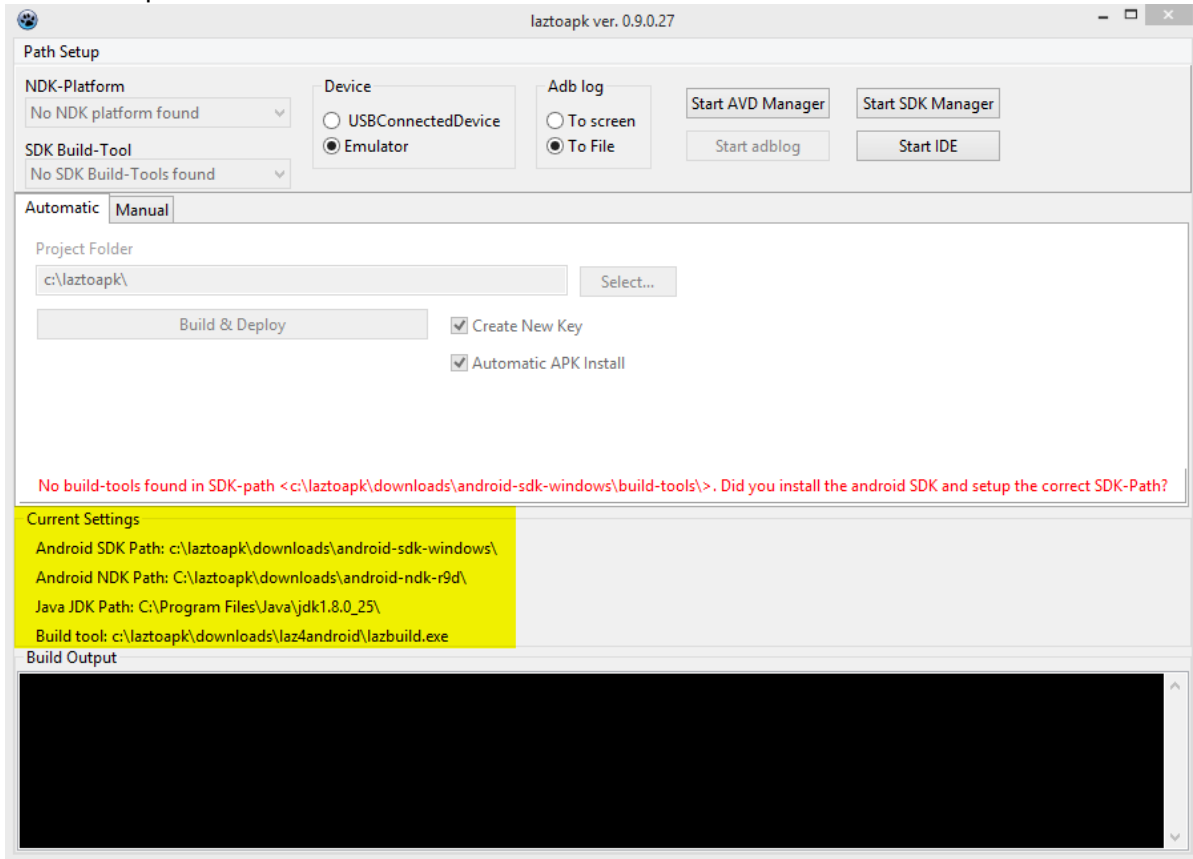
It's time to start the <SDK Manager> by pressing its button.
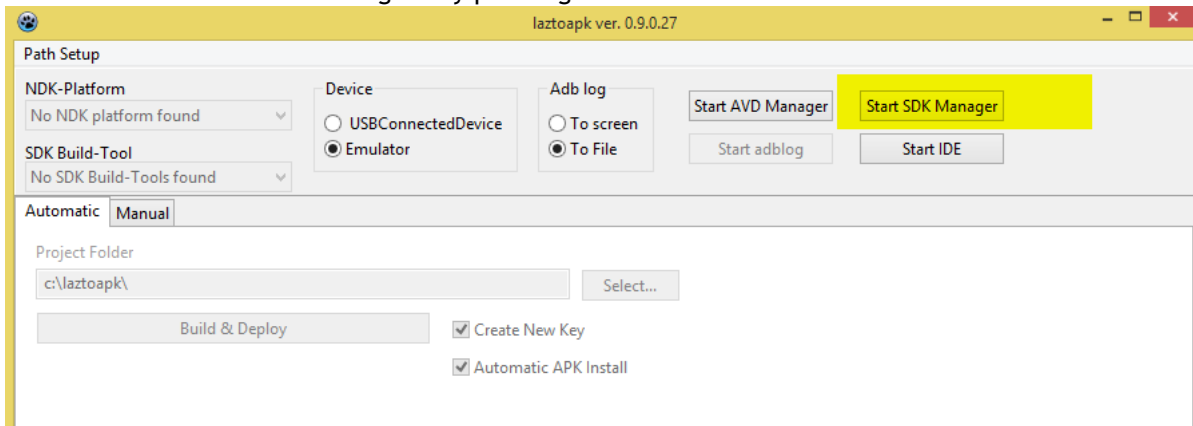
When the Android SDK manager opens, you can shortly see a green bar at the bottom of the screen where it is loading / updating SDK package **statuses**.

When it is finished my screen looked like this:
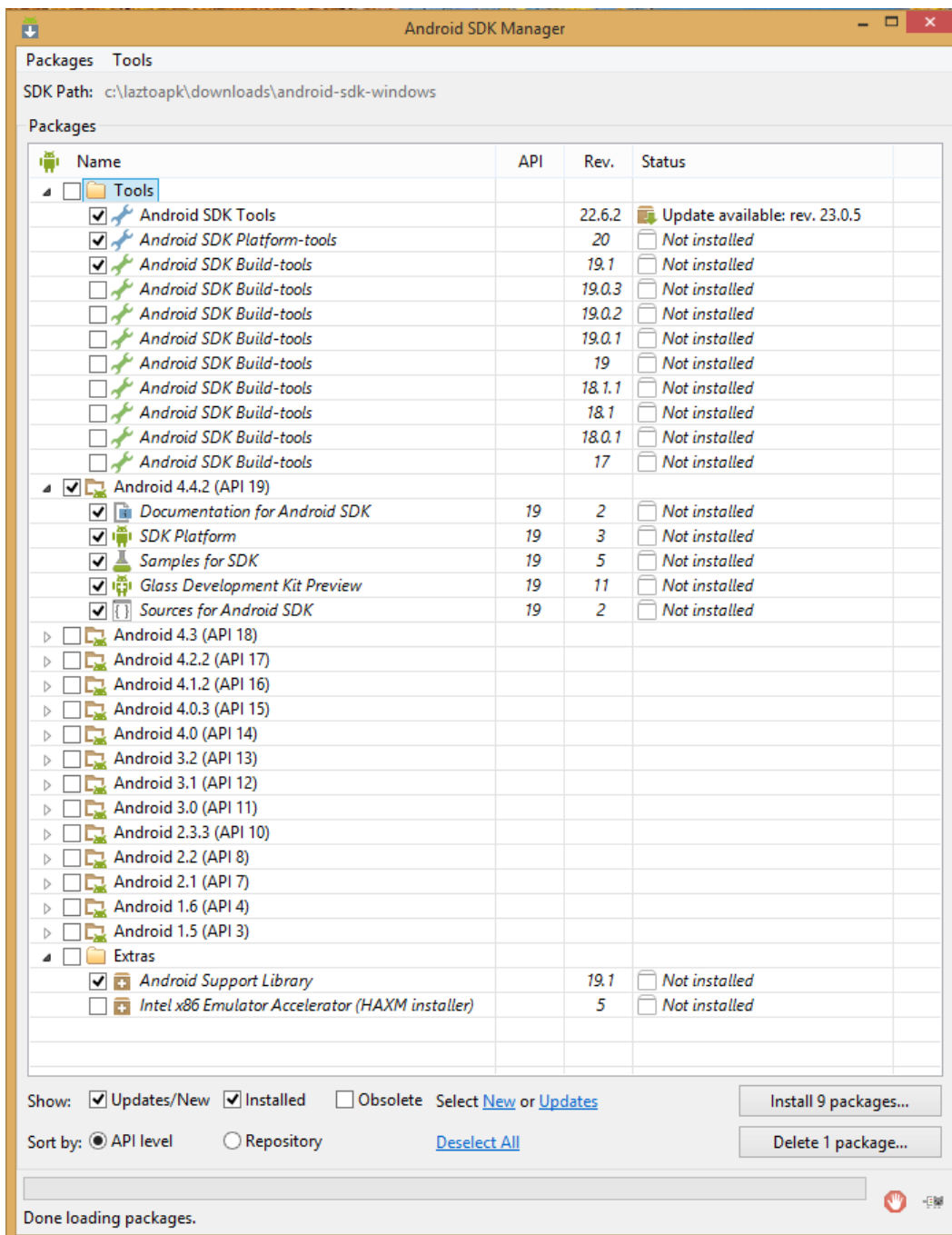
Now make sure the yellow selections are as follows: (the green ones were already selected when the screen opened for the first time)

(you can try some other's but I did not test with other version's!!!!)
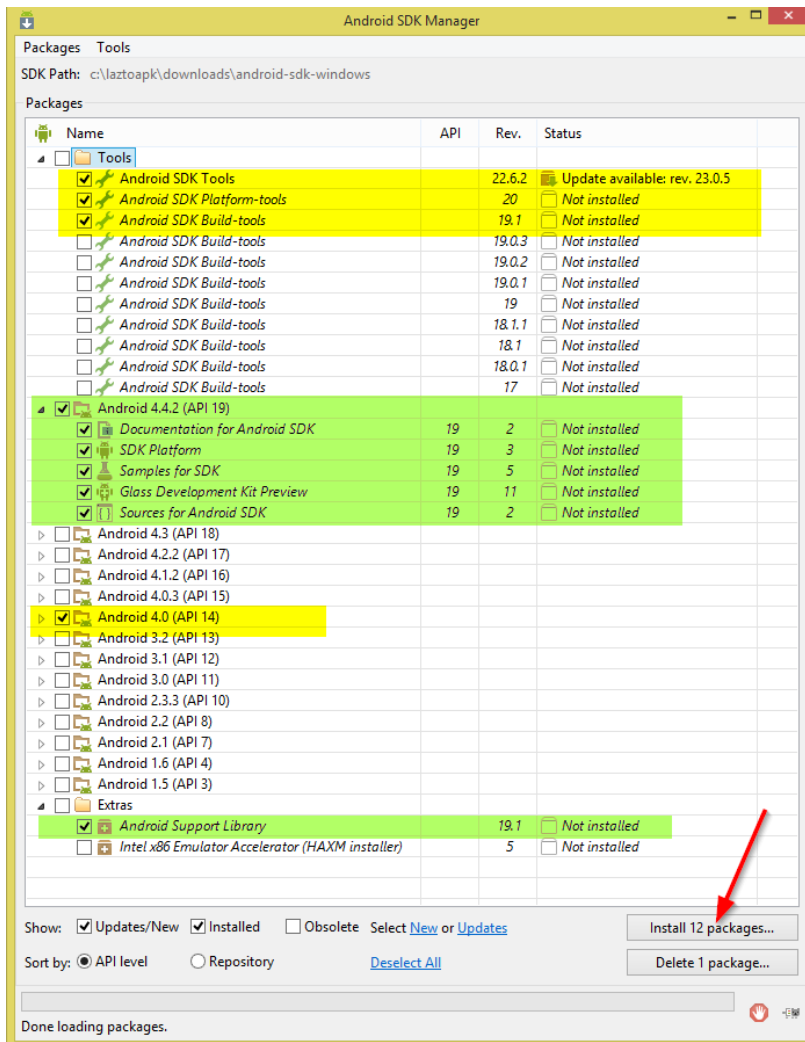
The number of packages on the install button may vary depending on your system)
Now press that install button.
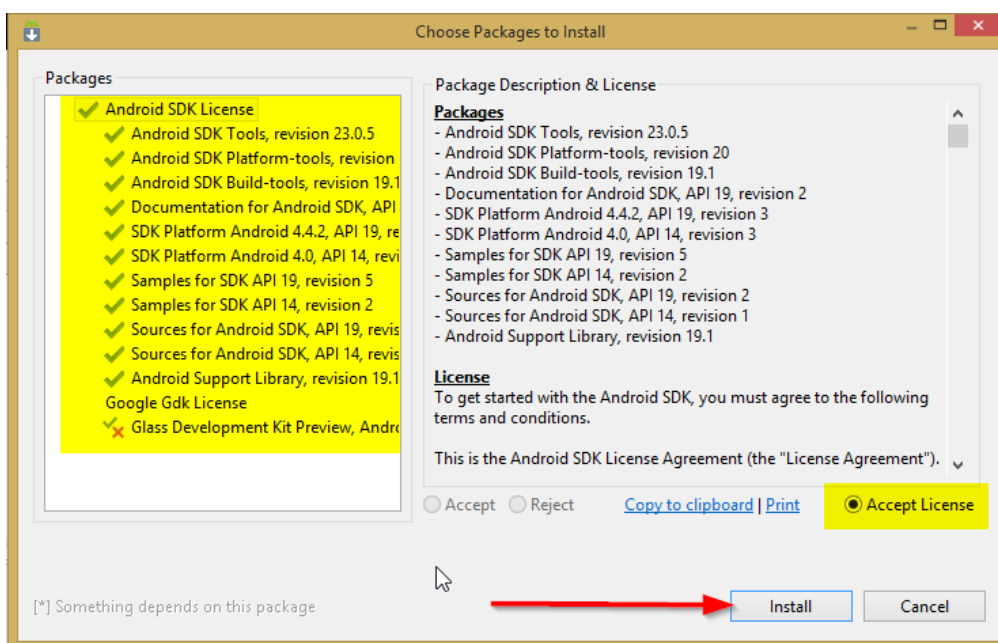
Make sure you accept the Licenses and press Install.

This will take a while.

Some of the screens you might see:
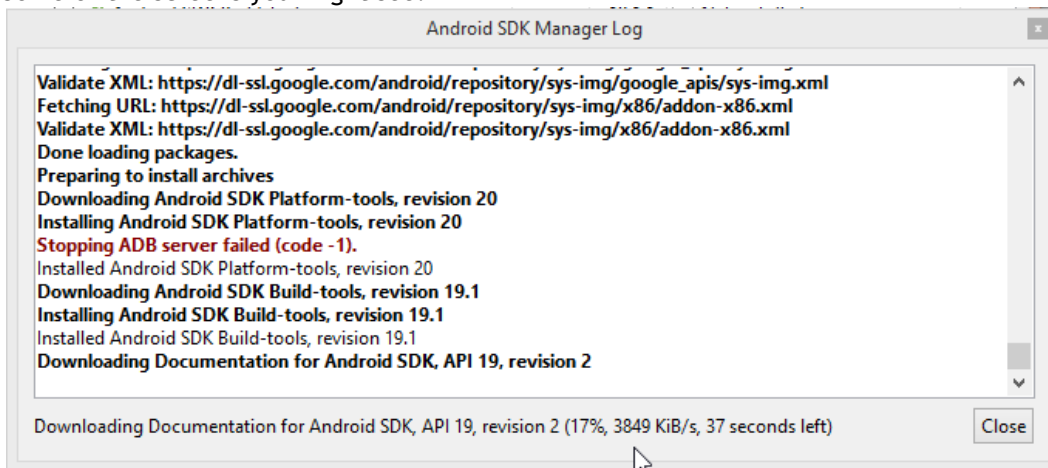
<mark>This is the logscreen.</mark>
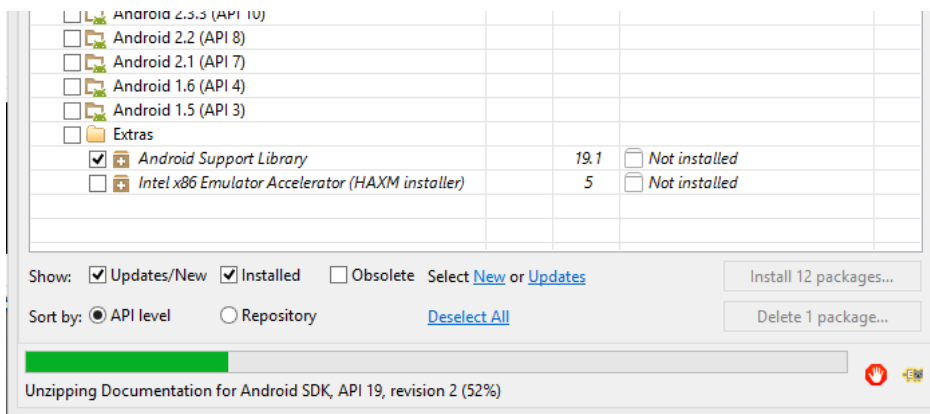
The progress bar on the Android SDK Manager screen.
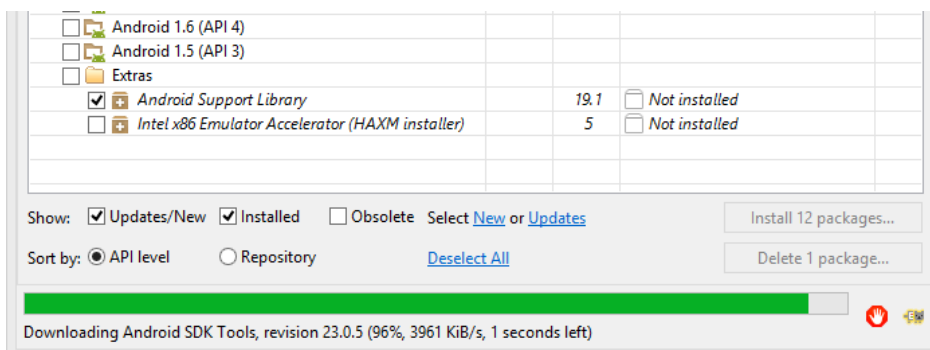
Almost done.

The installation is finished, when the following Dialog shows up.
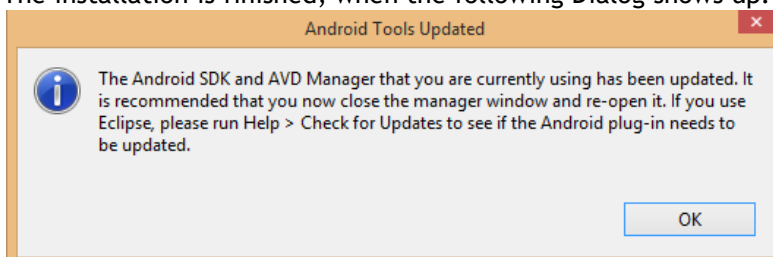
Attention:

Before continuing, I first saved the logfile windows contents, so in case of trouble I could see if and where things might have gone wrong!!:
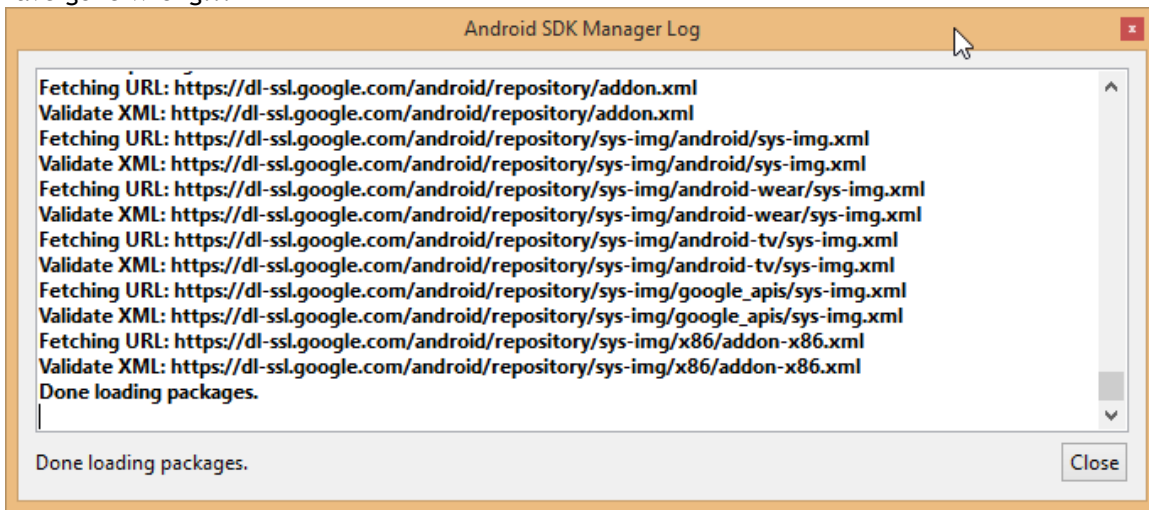
The screen has no save button:
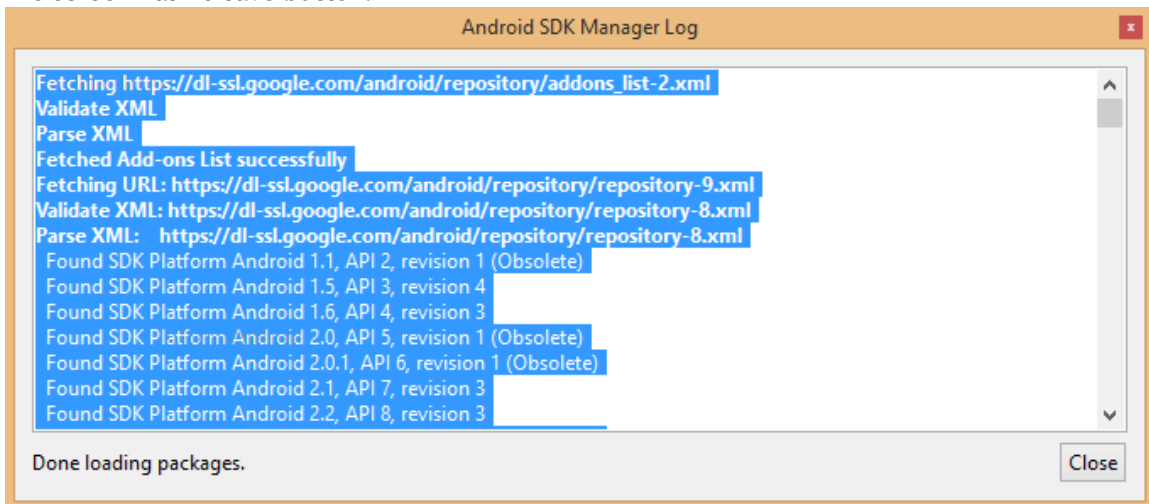
But selecting it with the mouse and giving CTRL+C, and pasting in notepad did the trick. Save it from there.
Now close the Android SDK Manager **Log window**.

Close SDK Manager and start again:
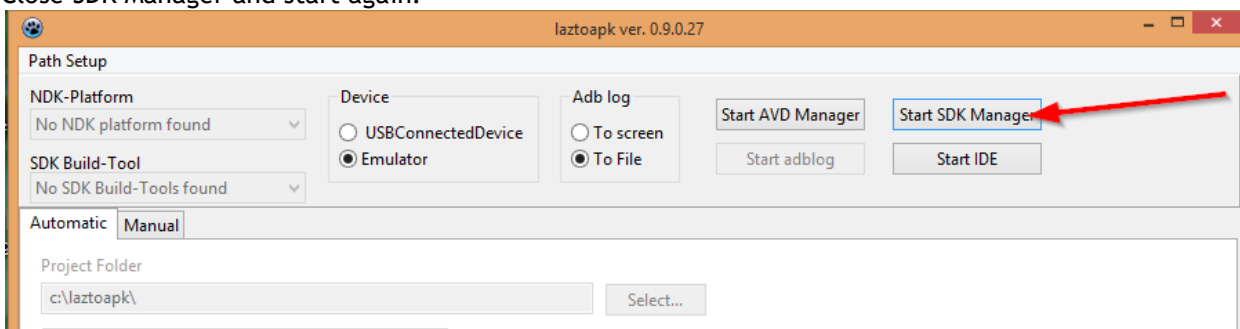
This is how it looks before I did anything:
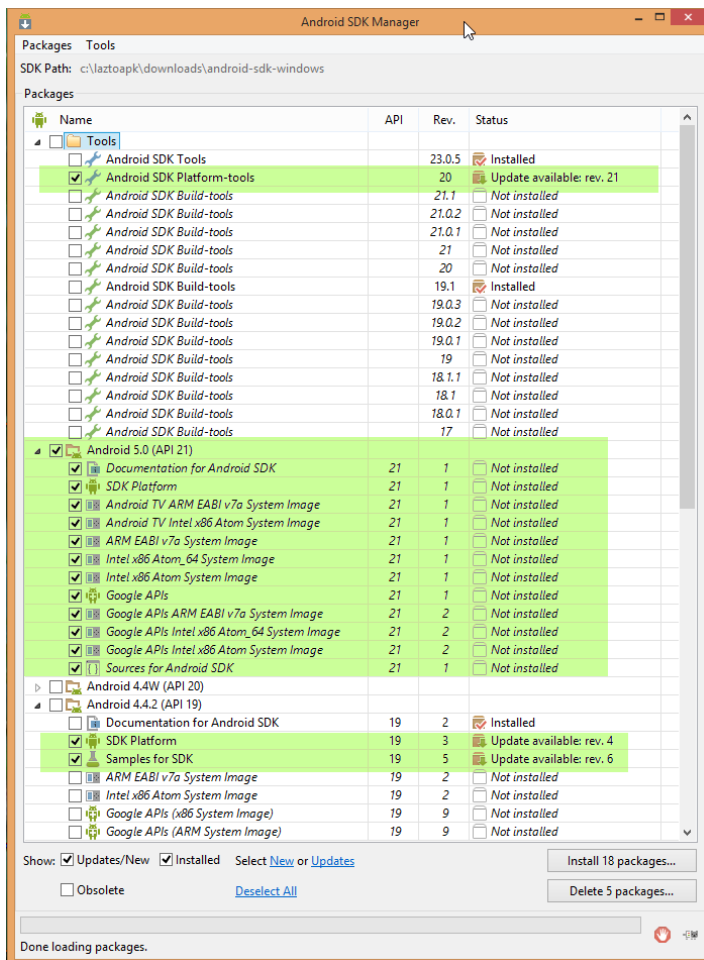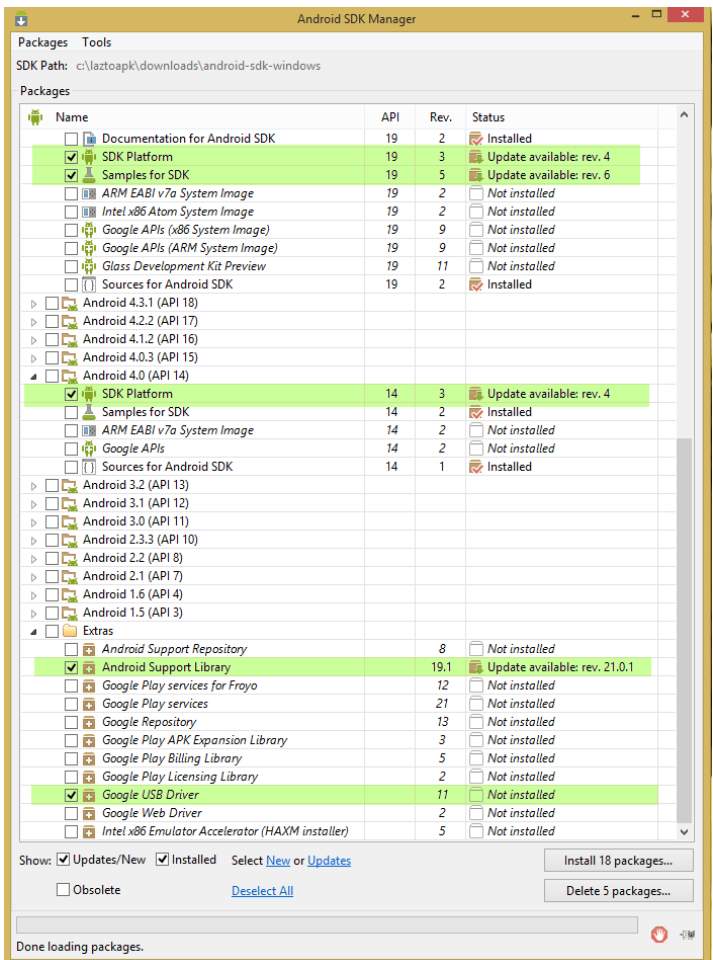
Upper half....   and the lower screen half after some scrolling...:

The green ones were selected for me already. In the next screen shots the one I selected is in yellow:
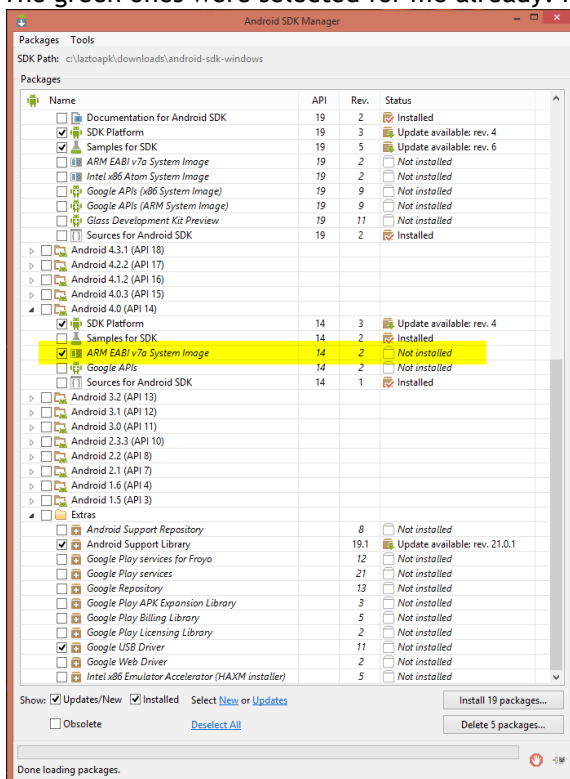
Leave the others deselected.

Press the Install button.
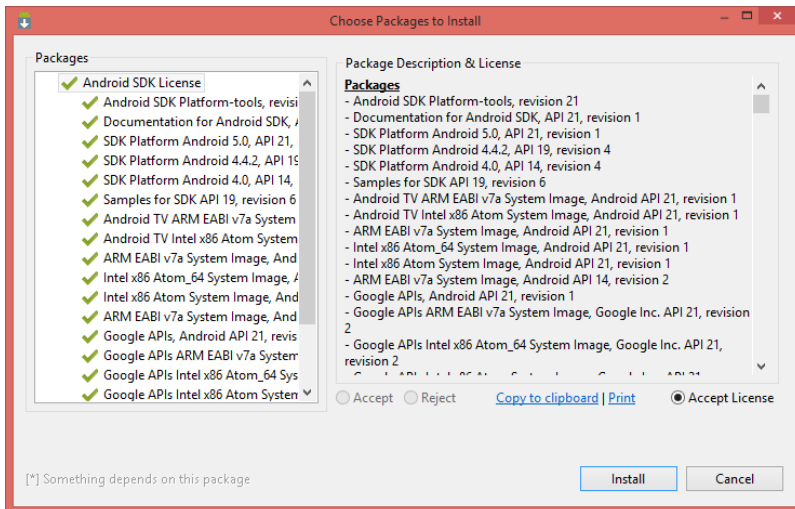
Accept the licenses and Install.
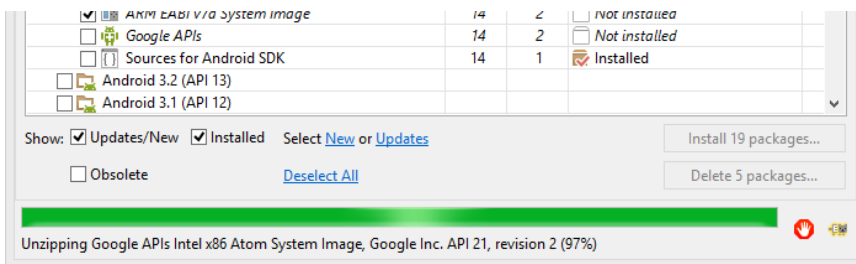
Almost done......

After everything is installed there is no message just this updated screen:
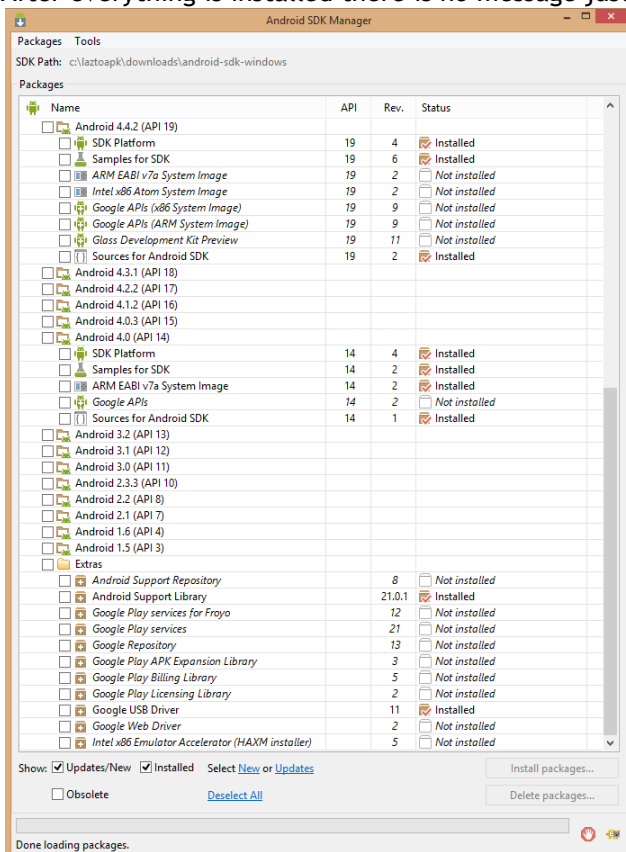
Installation of SDK tools is now finished. **Please close the SDK Manager**.

8 Step 06: Restart LazToApk and start AVD-Manager

Close LazToApk and start LazToApk again. (you find the icon for LazToApk on your desktop)
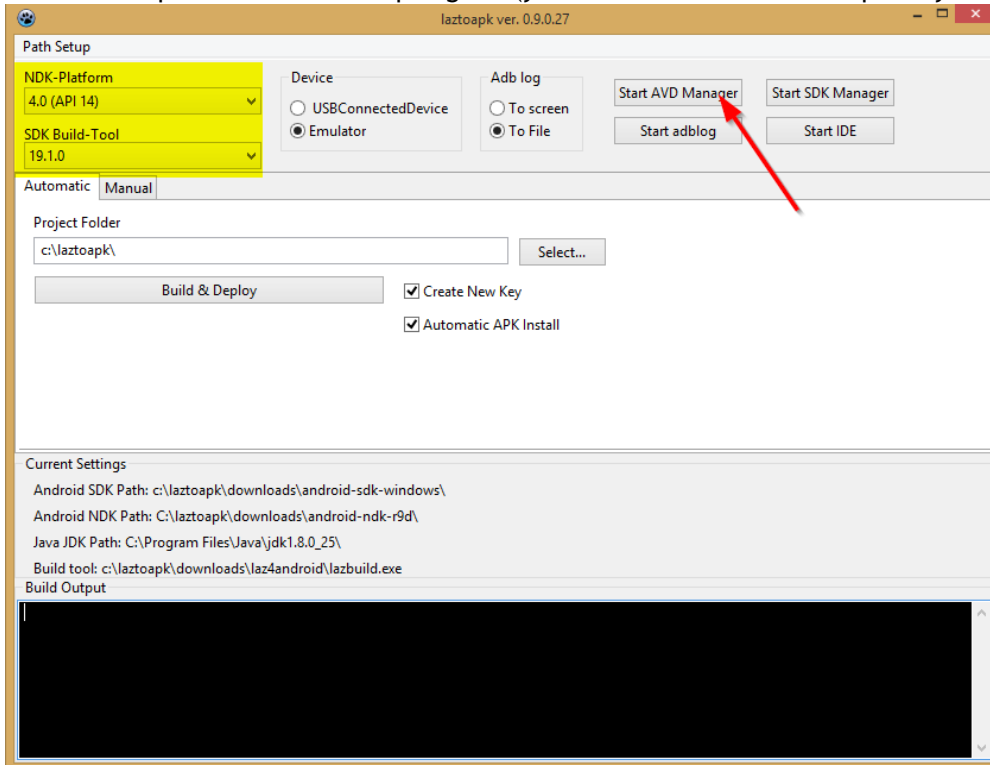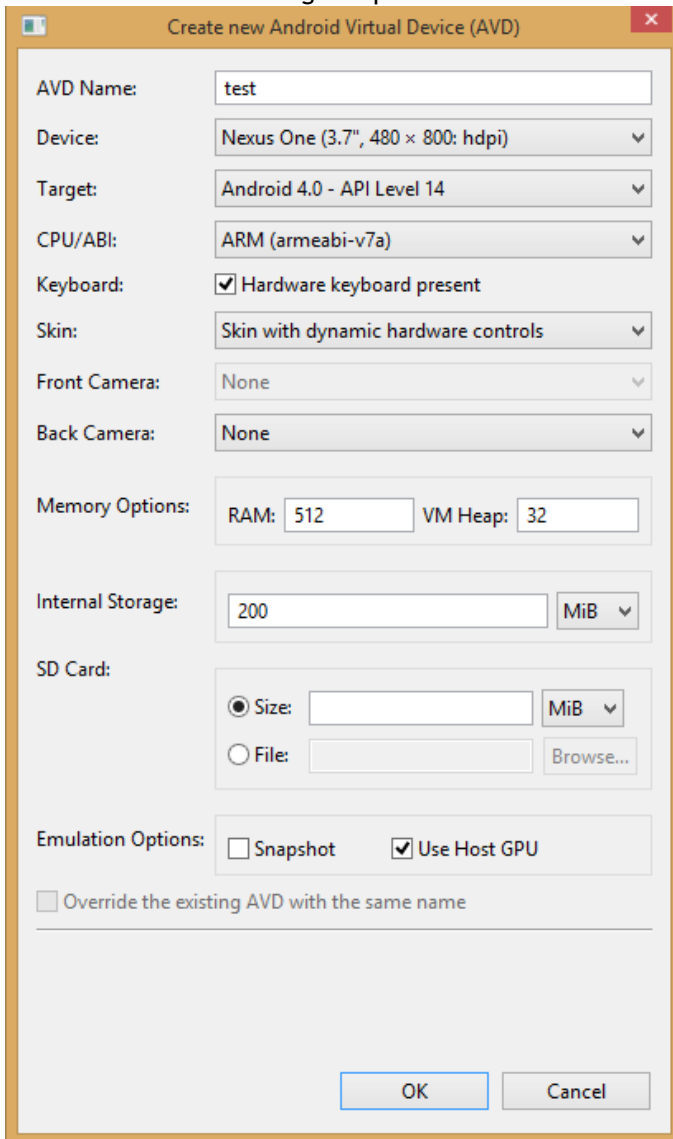
Select <NDK-Platform> 4.0(API14) and press button <Start AVD Manager>

Setup a new virtual android device.
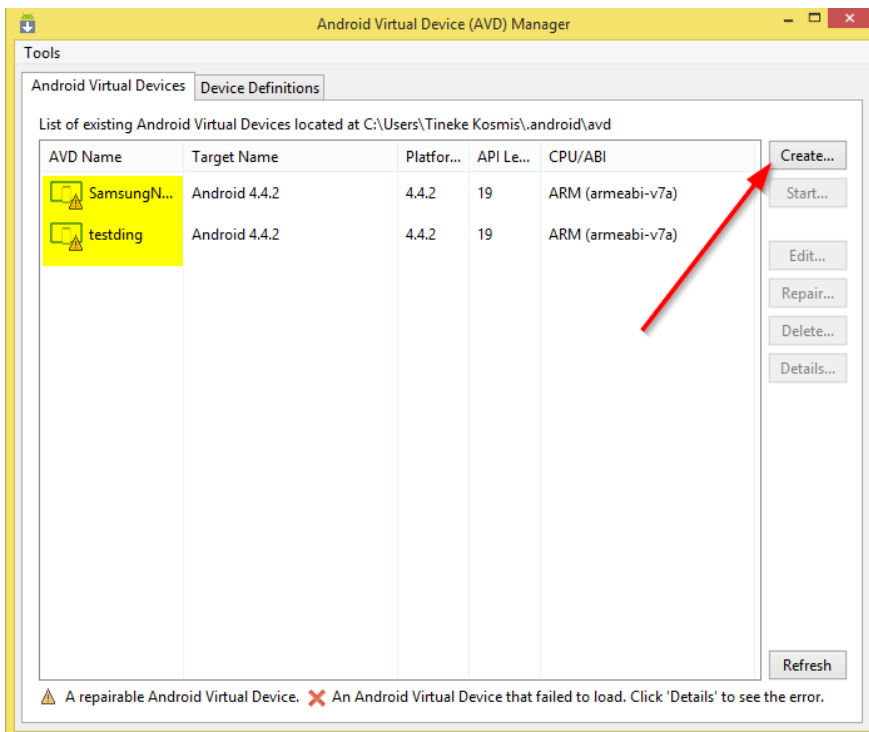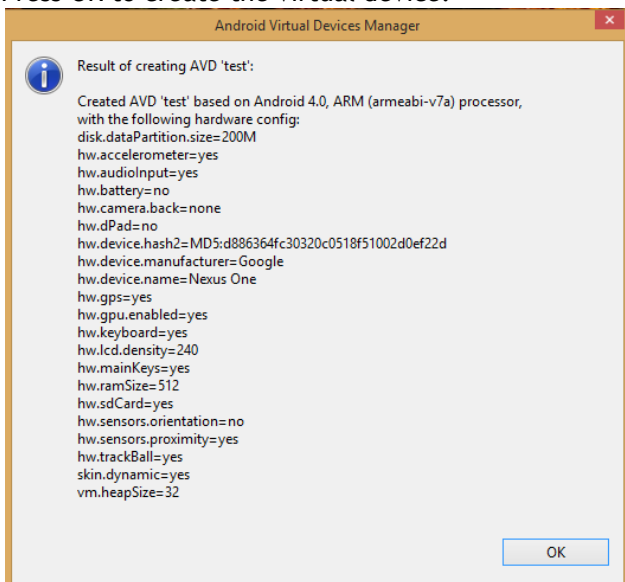
I already had 2 Virtual devices from some other experiments.
Press button Create:

Then choose the following setup:

Press OK to create the virtual device.

Press OK on this status screen.
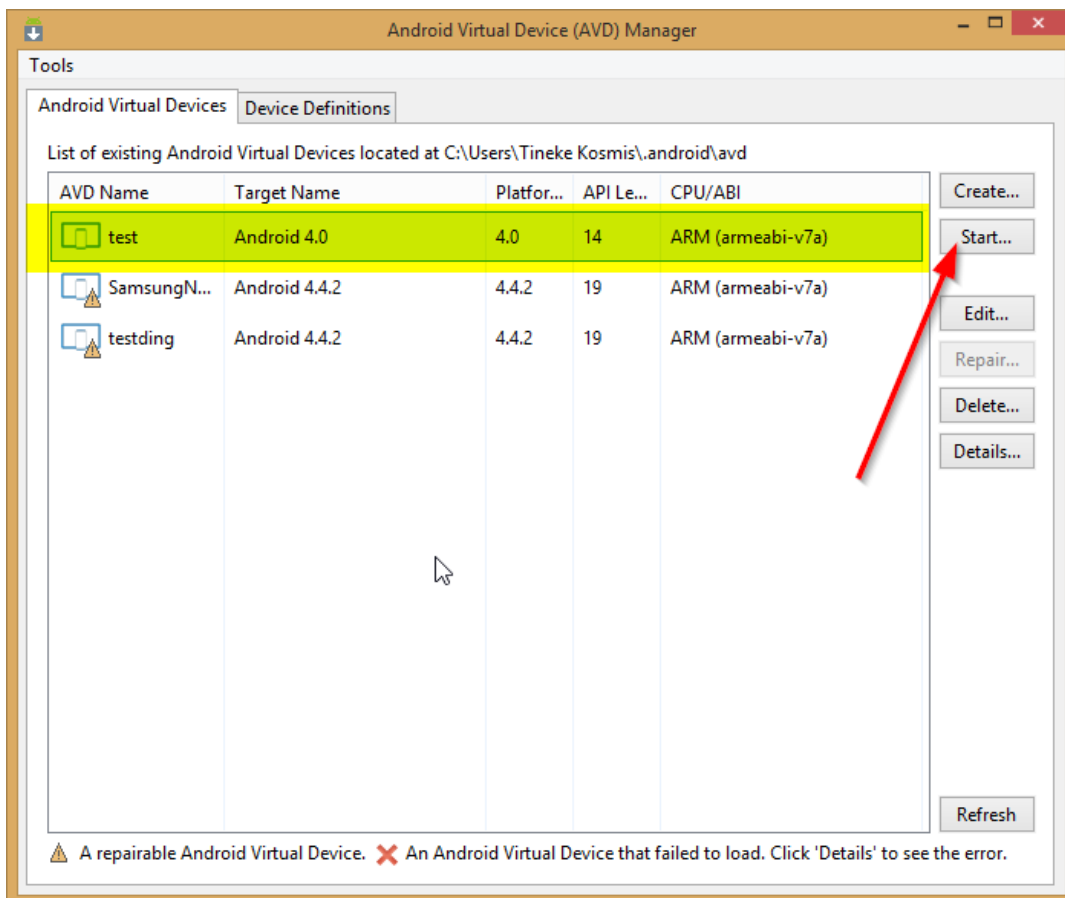
**Select the device we just created and press button <Start> to start the virtual android device.
Another screen pops up.**
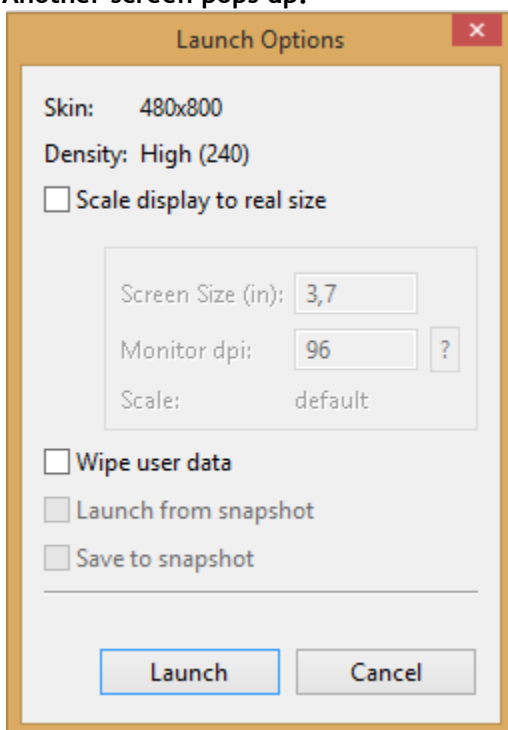
Just press Launch.
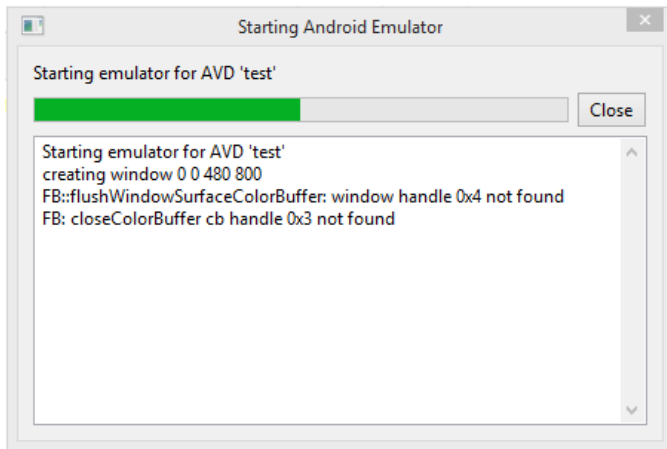
A screen pops up. At that moment I did not realize this screen had errors. That's because it was immediately covered with the following starting emulated device screen:
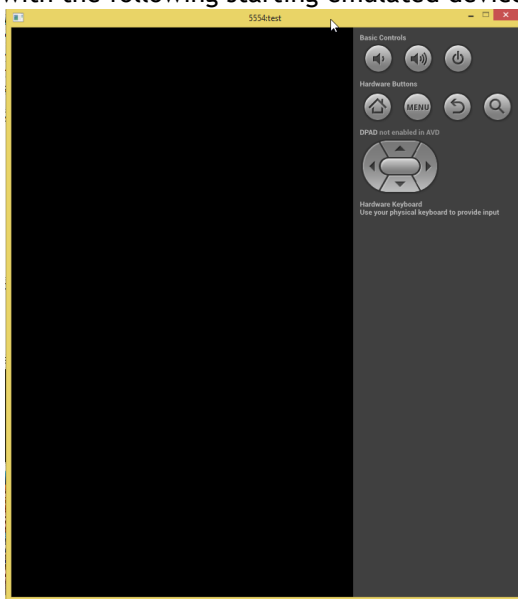
I had read elsewhere that it might take some minutes to start an emulated device so even when the screen did not look as expected, I went on with step 7. **The screen should have looked like this:**
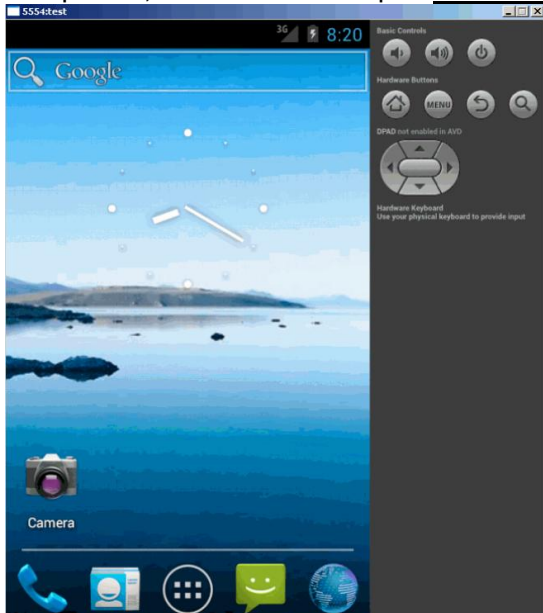
So if yours does not look like it should at this point, go back and correct it first.

9   Step 07: Build your first android app

Go back to the LazTo Apk screen, and press button „Select".
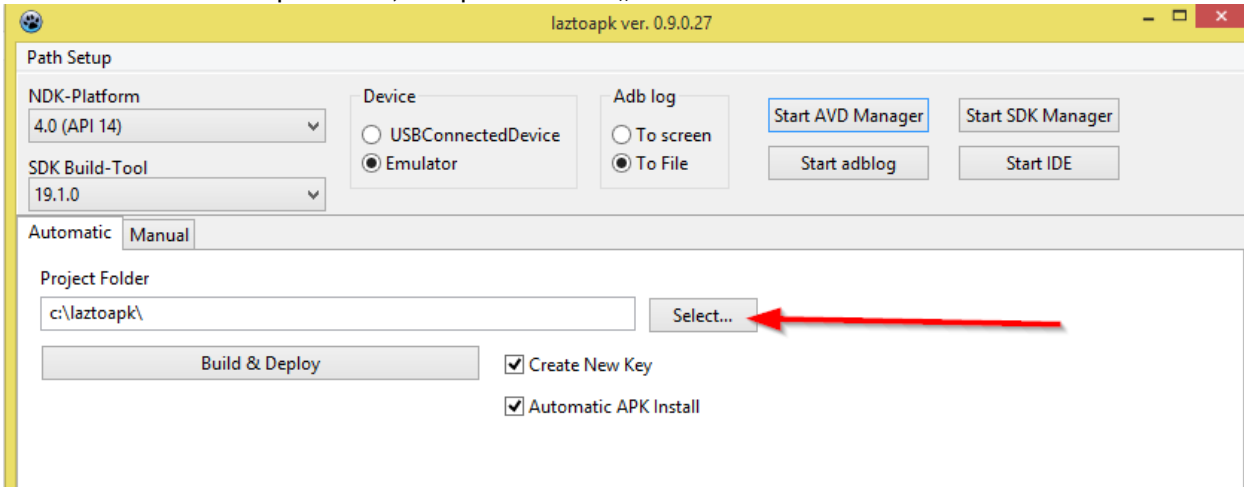
Select the folder „projects" and press button „Create new folder".
<mark>**But on my system there seemed to be no folder Projects under "laztoapk", so I first had to create one, then it looked like this:**</mark>
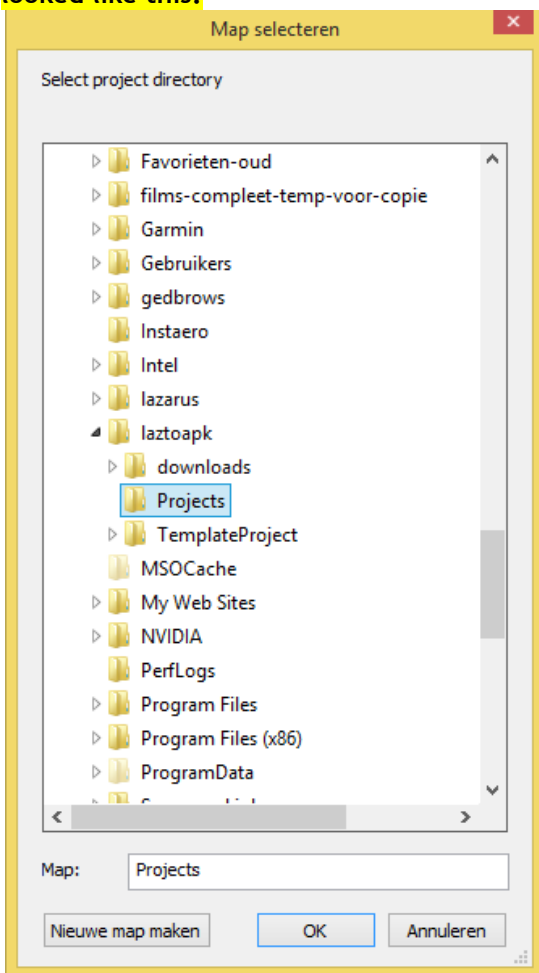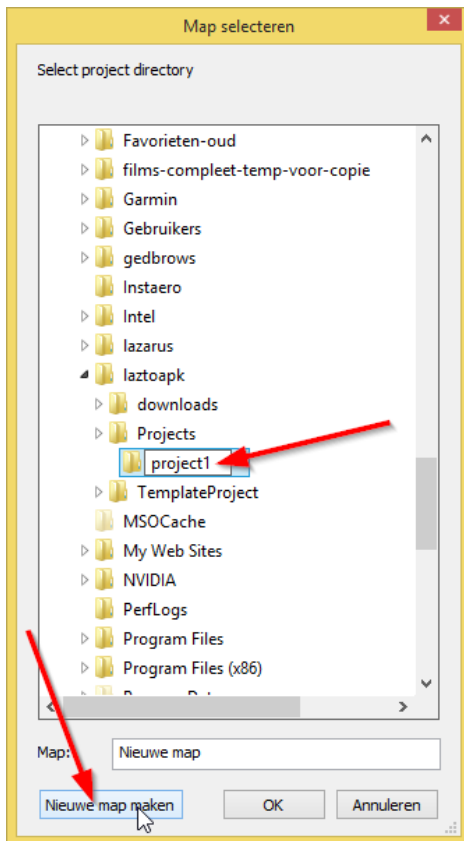
Now create a new folder „project1" inside "Projects".
("**Nieuwe map maken**" is the dutch version of the button "**Create new folder**")
Now select this new folder and press button <OK>. Your screen should look like this now:
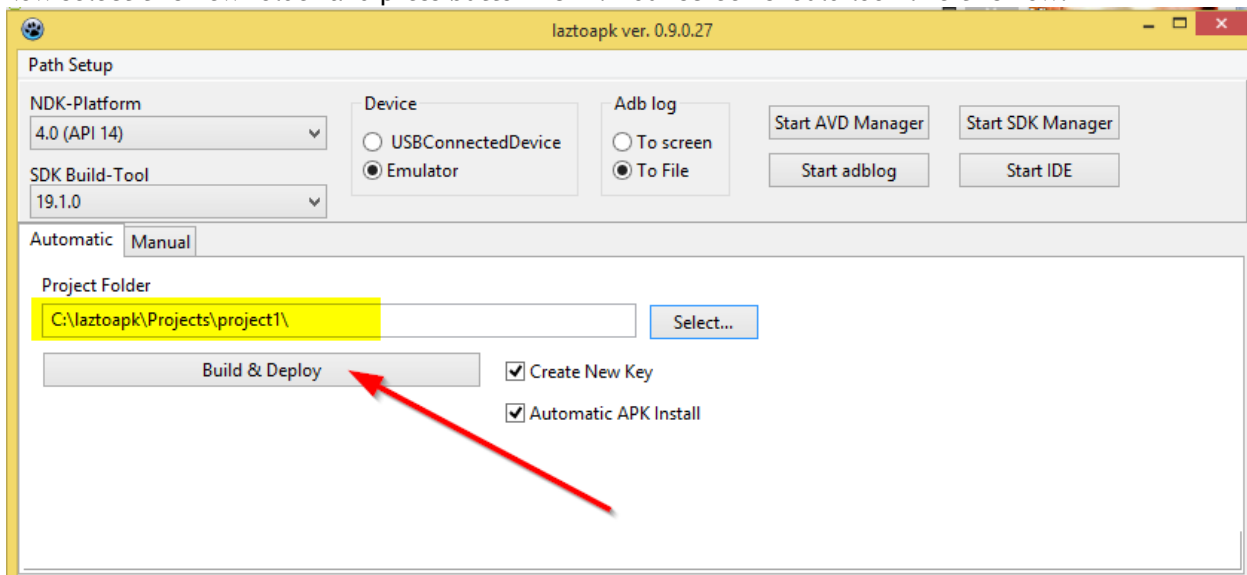
Field "**Project Folder**" now has the correct path to project1, click **Build & Deploy**.

The following screen appeared:
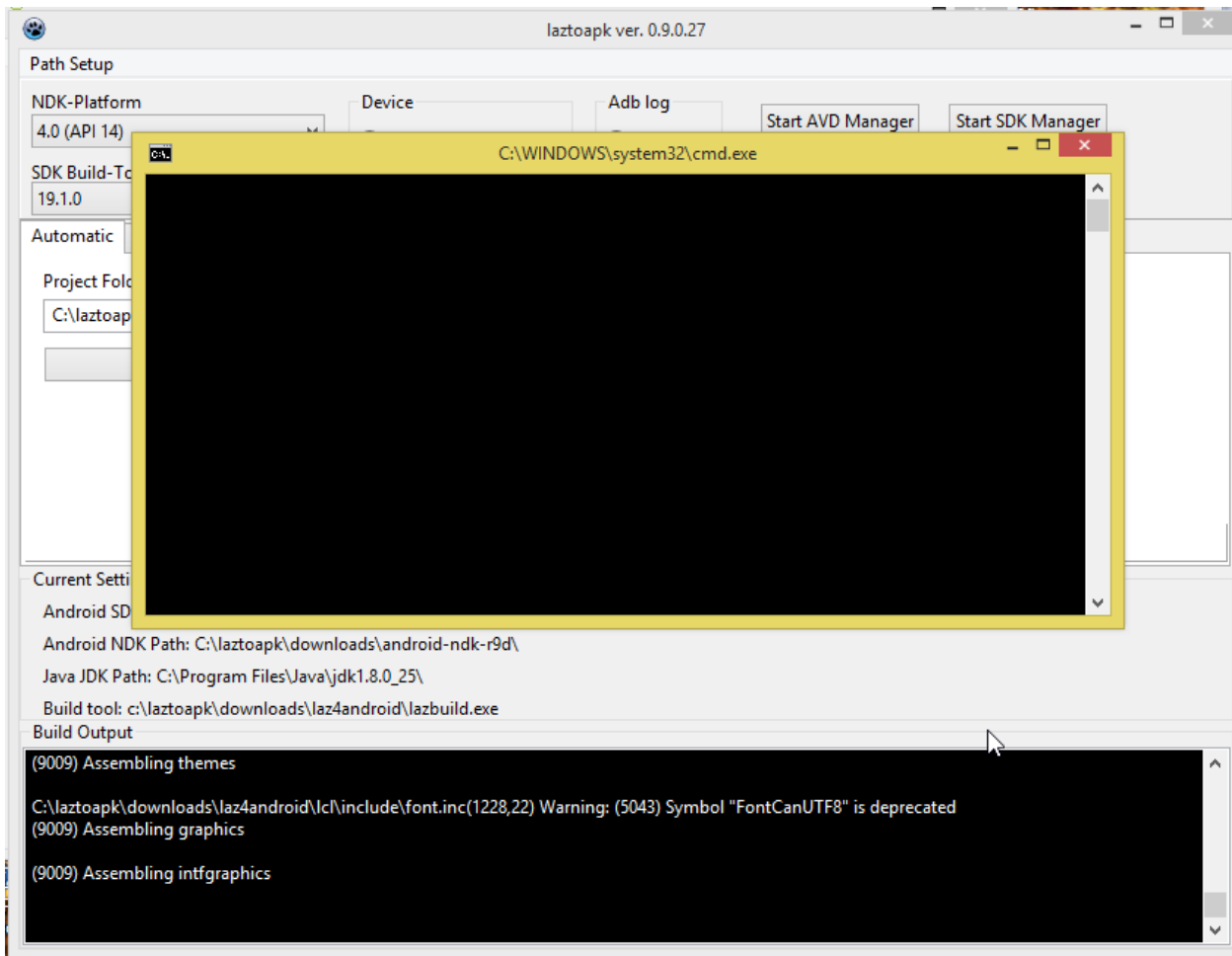
After a short while I got:
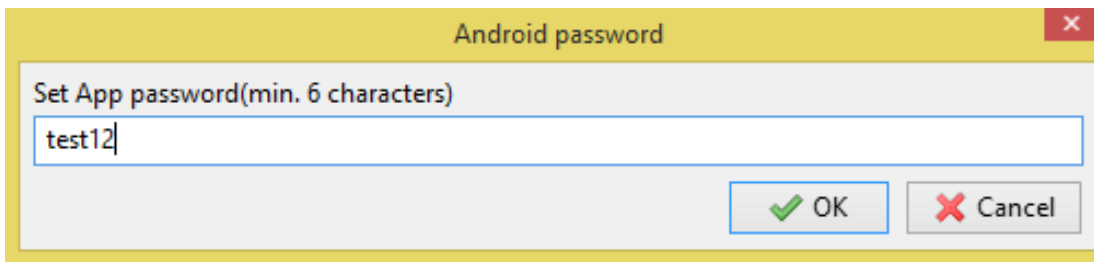
On this screen define a password for your app and press button <OK>.

Instead of the expected information screen I got:
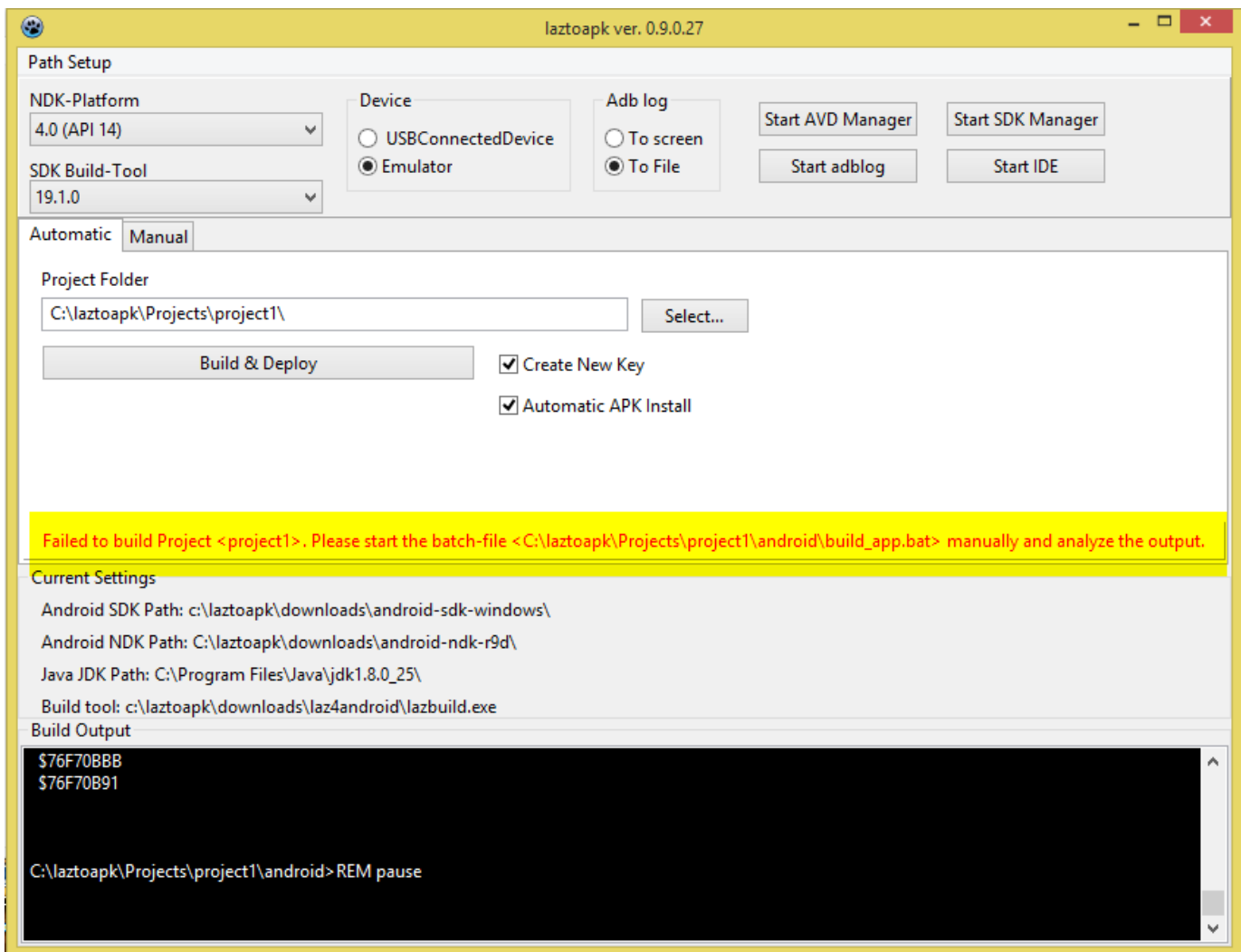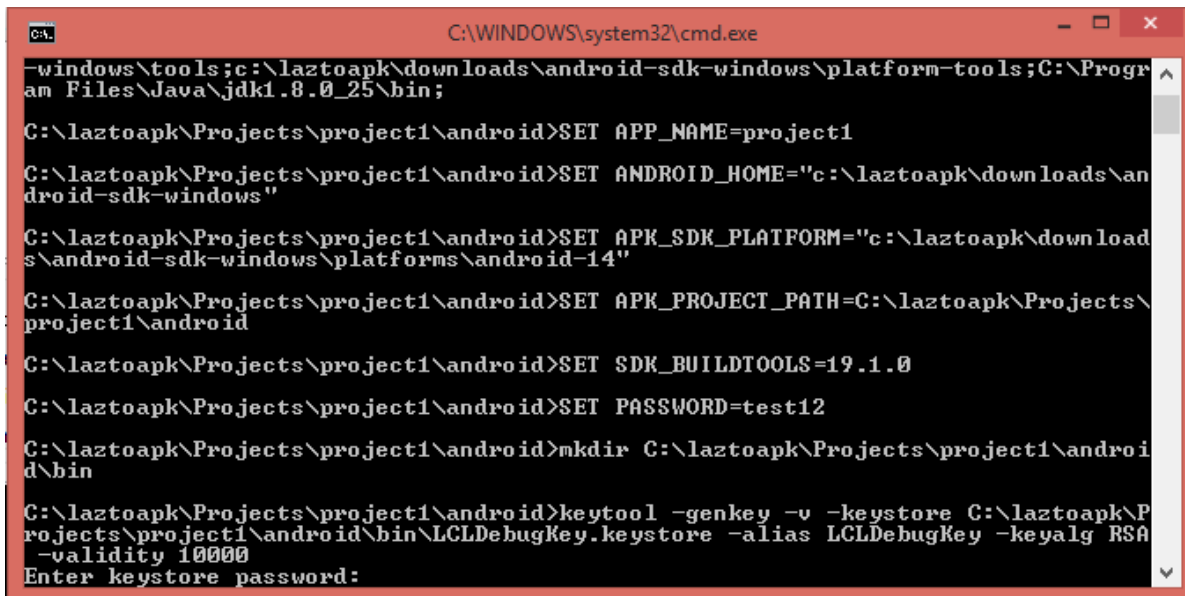
An Errormessage appears telling me I have to manually run a batfile.

I don't do that, I just clicked "Build & Deploy" again.

Now I get the correct informationscreen:

I press OK and get:

Enter password and press enter. (password stays hidden)

It wants you to fill in much more things...... so I did with some fancy information.

Now the emulator on my system did not finish as it should. Because I had no idea why it went wrong, I got back to laztoapk and pressed "Build & Deploy" again. Then this is what I see:
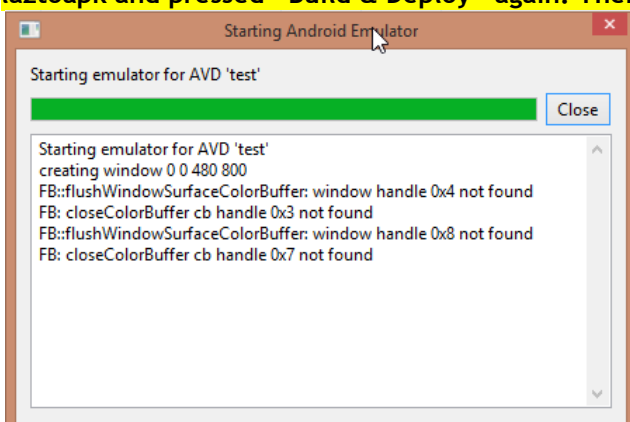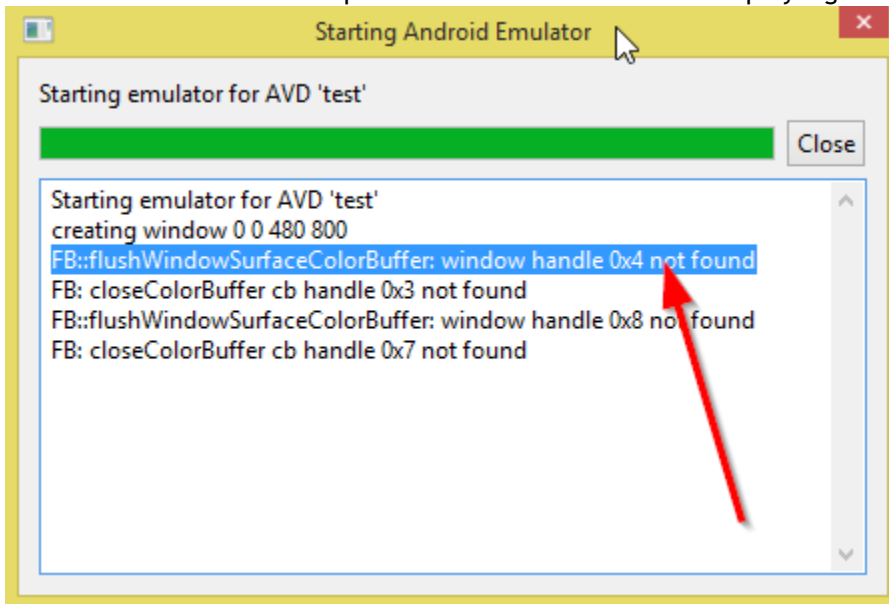
==I checked the SDK manager from the laztoapk screen. Compared it to another SDK manager on my pc (the Delphi one) and saw that the yellow line in the screen below is not installed for laztoapk:==

☐ Android 4.2.2 (API 17)			
☐ Android 4.1.2 (API 16)			
☐ Android 4.0.3 (API 15)			
☐ Android 4.0 (API 14)			
☐ SDK Platform	14	4	✓ Installed
☐ Samples for SDK	14	2	✓ Installed
☐ ARM EABI v7a System Image	14	2	✓ Installed
☑ *Google APIs*	*14*	*2*	☐ *Not installed*
☐ Sources for Android SDK	14	1	✓ Installed
☐ Android 3.2 (API 13)			
☐ Android 3.1 (API 12)			
☐ Android 3.0 (API 11)			
☐ Android 2.3.3 (API 10)			

It seems the **Google apis voor API 14** are missing. So I mark the line and install it from the SDK manager.

Now I exit and restart laztoapk to be sure and do "build en deploy"again:


```
Starting emulator for AVD 'test'
creating window 0 0 480 800
FB::flushWindowSurfaceColorBuffer: window handle 0x4 not found
FB: closeColorBuffer cb handle 0x3 not found
FB::flushWindowSurfaceColorBuffer: window handle 0x8 not found
FB: closeColorBuffer cb handle 0x7 not found
```
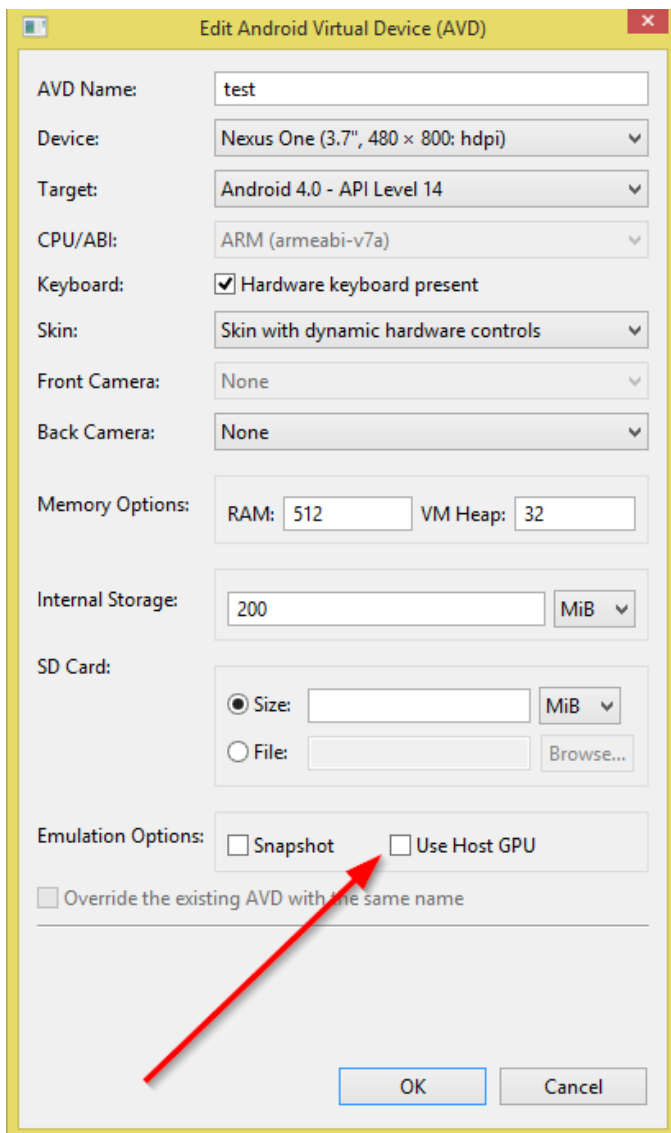
Because during the actions above, this logscreen was hidden underneath another one all the time, now for the first time I see there is an error message.
Pasting the blue text in Googles search box I find:

Host GPU is only supported for AVD devices that are using API 15 or later.

I remember there was a "HOST GPU" checkmark when creating the virtual test device with AVD manager and the test is meant for API**14**.
So I go back to AVD manager (from the laztoapk screen), to change the testdevice we just created, but I make sure the parameters now are as follows:

Edit Android Virtual Device (AVD)

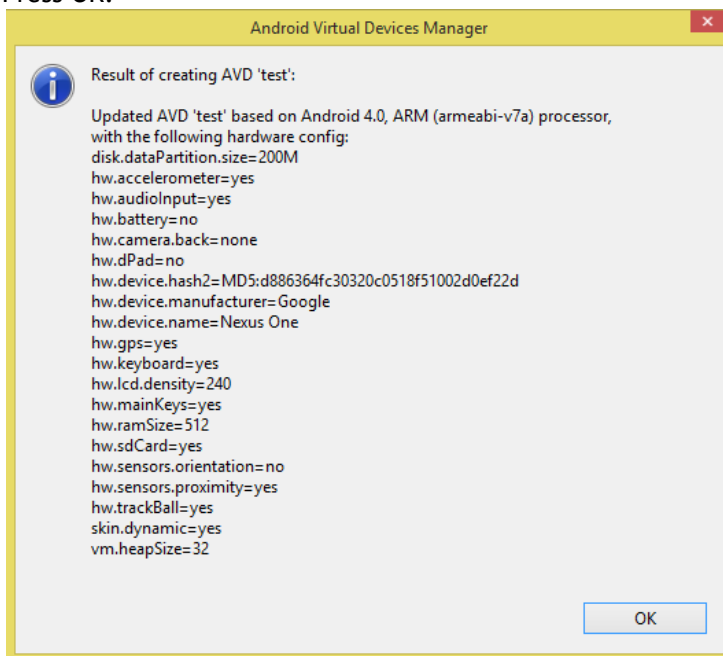|	
AVD Name:	test
Device:	Nexus One (3.7", 480 × 800: hdpi)
Target:	Android 4.0 - API Level 14
CPU/ABI:	ARM (armeabi-v7a)
Keyboard:	☑ Hardware keyboard present
Skin:	Skin with dynamic hardware controls
Front Camera:	None
Back Camera:	None
Memory Options:	RAM: 512 VM Heap: 32
Internal Storage:	200 MiB
SD Card:	⦿ Size: MiB ○ File: Browse...
Emulation Options:	☐ Snapshot ☐ Use Host GPU
	☐ Override the existing AVD with the same name

OK   Cancel

NO checkmark for Host GPU.
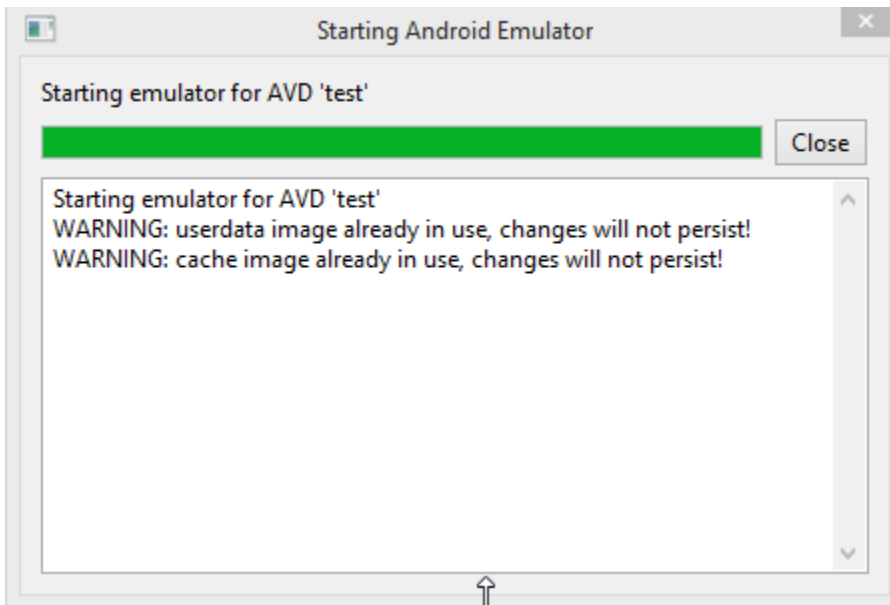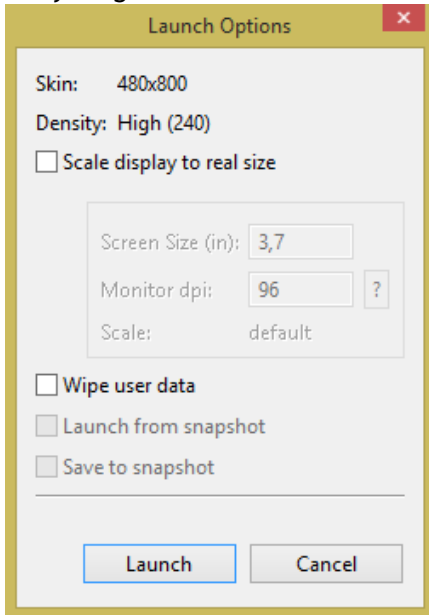
Press OK:

Android Virtual Devices Manager

Result of creating AVD 'test':

Updated AVD 'test' based on Android 4.0, ARM (armeabi-v7a) processor,
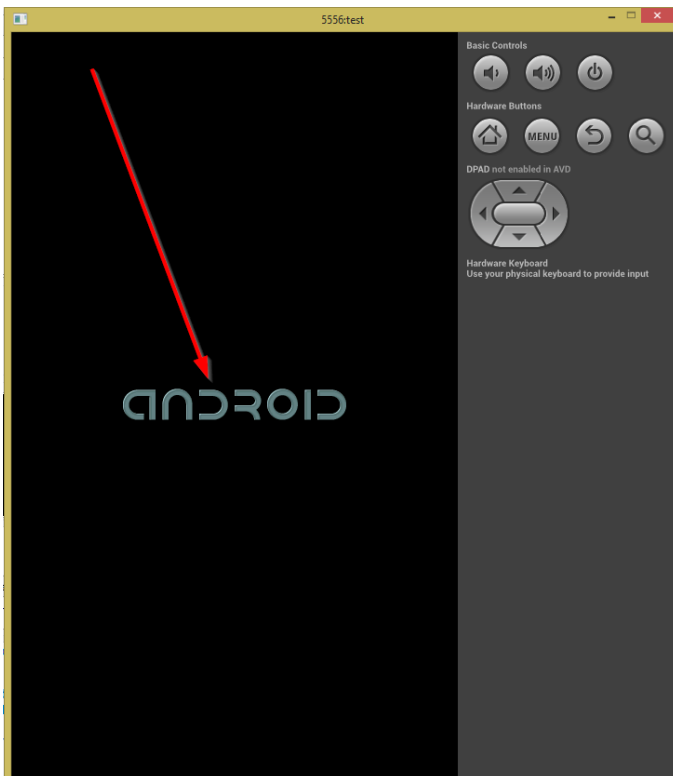with the following hardware config:
disk.dataPartition.size=200M
hw.accelerometer=yes
hw.audioInput=yes
hw.battery=no
hw.camera.back=none
hw.dPad=no
hw.device.hash2=MD5:d886364fc30320c0518f51002d0ef22d
hw.device.manufacturer=Google
hw.device.name=Nexus One
hw.gps=yes
hw.keyboard=yes
hw.lcd.density=240
hw.mainKeys=yes
hw.ramSize=512
hw.sdCard=yes
hw.sensors.orientation=no
hw.sensors.proximity=yes
hw.trackBall=yes
skin.dynamic=yes
vm.heapSize=32

OK

Everything seems fine. So I start the changed testdevice:

Launch Options

Skin: 480x800

Density: High (240)

☐ Scale display to real size

Screen Size (in): 3,7

Monitor dpi: 96   ?

Scale: default

☐ Wipe user data

☐ Launch from snapshot

☐ Save to snapshot

Launch   Cancel

Starting Android Emulator

Starting emulator for AVD 'test'

Close

Starting emulator for AVD 'test'
WARNING: userdata image already in use, changes will not persist!
WARNING: cache image already in use, changes will not persist!

I make sure I can see this LOG screen. NO MORE ERRORS.

Now Look it seems to start! But this is how far it gets. Still not right.
What I forgot was to close the already running other device so I get an error message in a popup screen.
I close both emulated devices. And start the testdevice again. (From AVD manager)
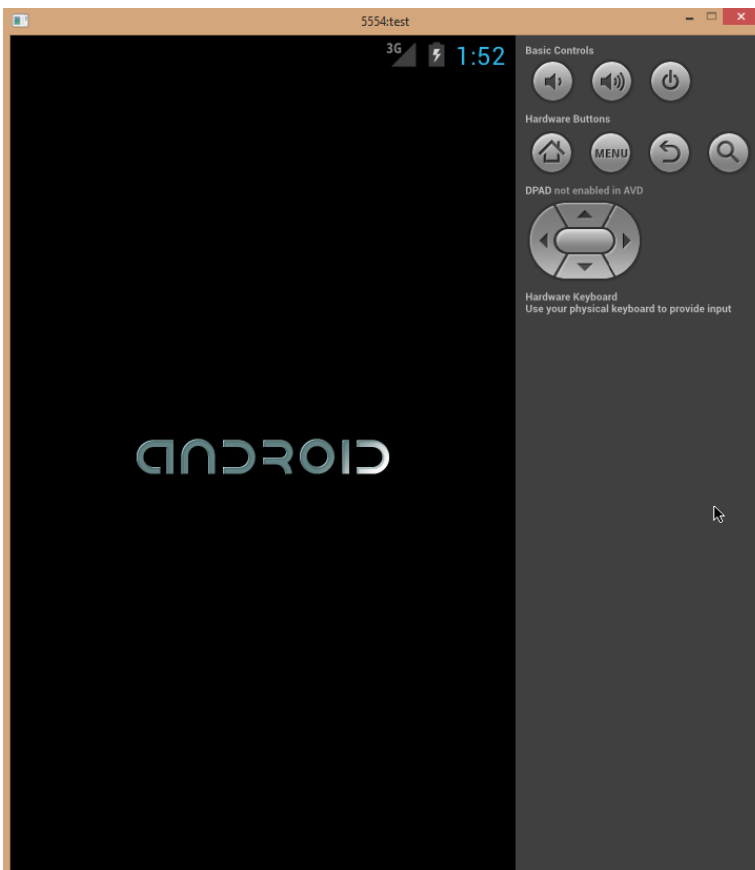
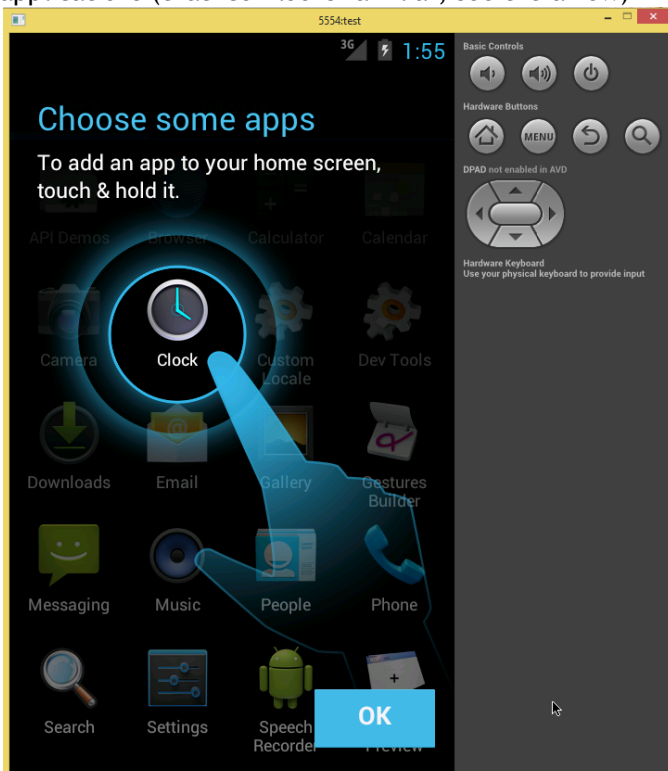**There we are, even a little clock is now visible. But this is how far it gets.**

I click the little grey Home button on the right side of the emulator......
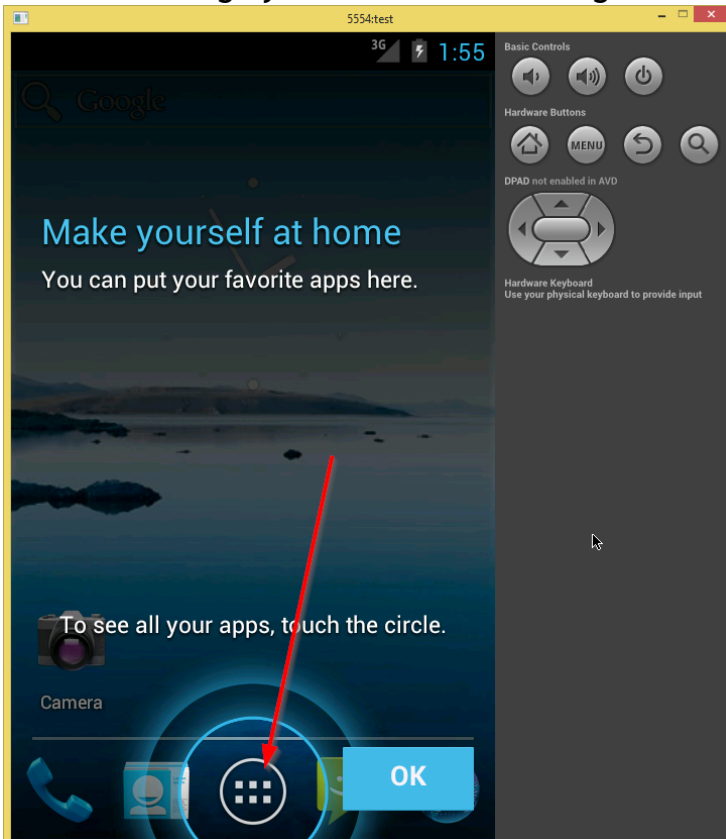

**Finally...... the emulator is running fine now!**

The demo-icon is not visible. Because I don't know this device I try swiping left and right. No demo app. Then I click applications (that icon looks familiar, see the arrow)
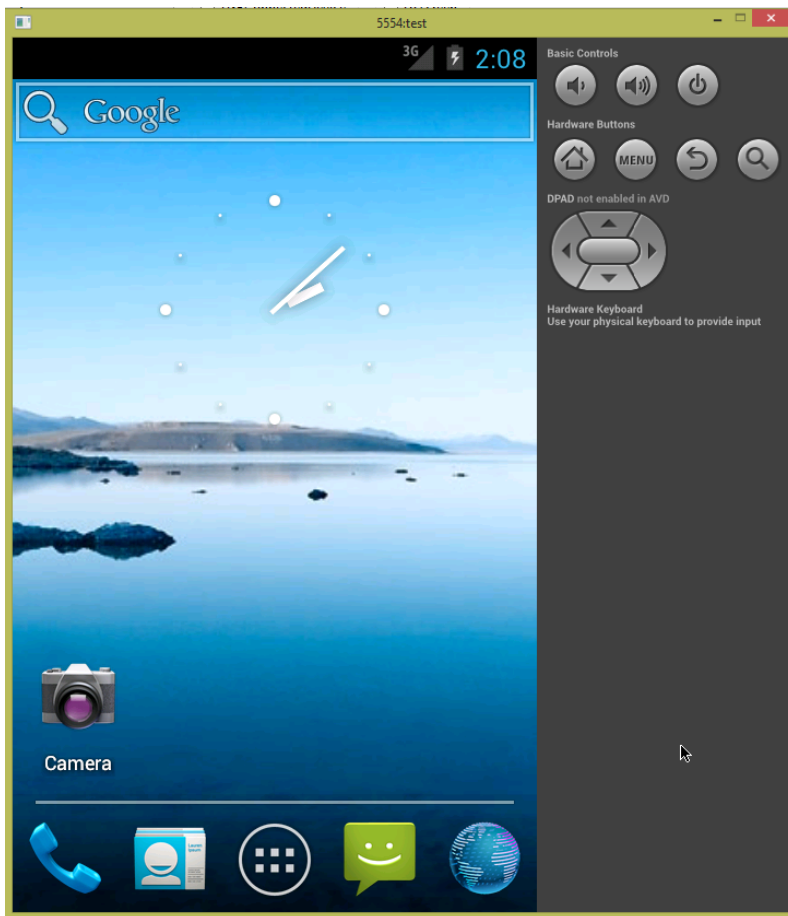

Cant find the demo app anywhere.

So I am going to try another sequence. First I close the virtual test device.

Next I do "Build en Deploy" again. Only when that is finished, I start the emulated virtual test device.
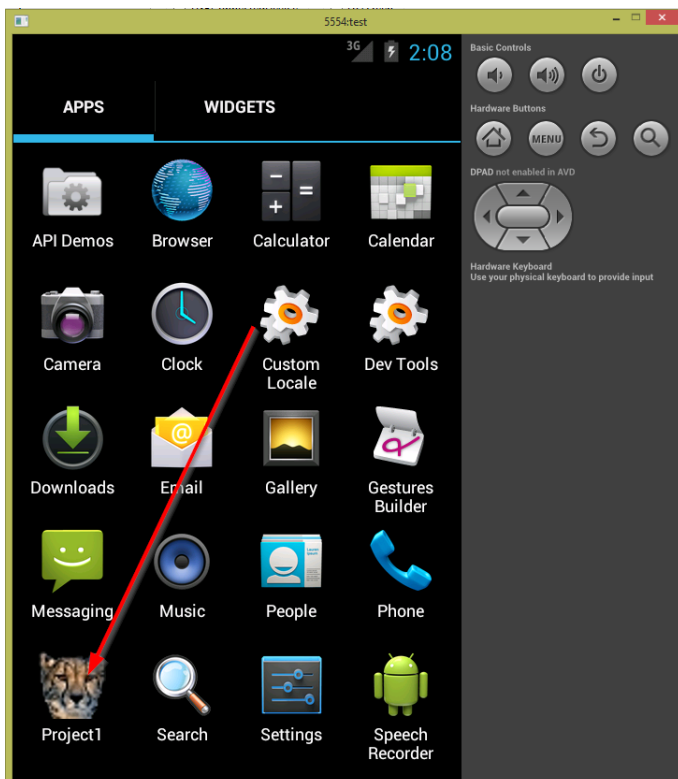YES it seems to work, because now I get the correct screen but its locked:
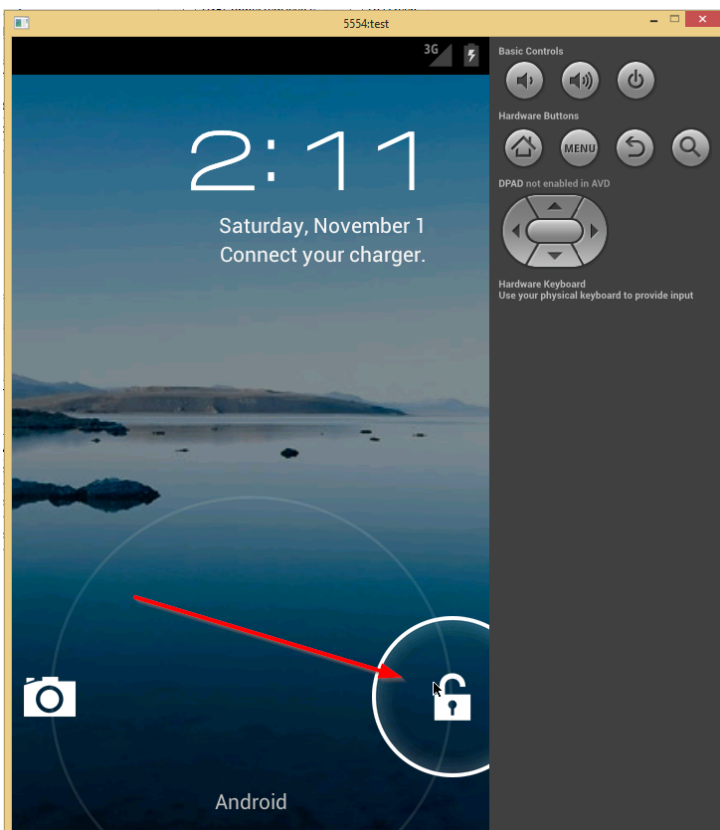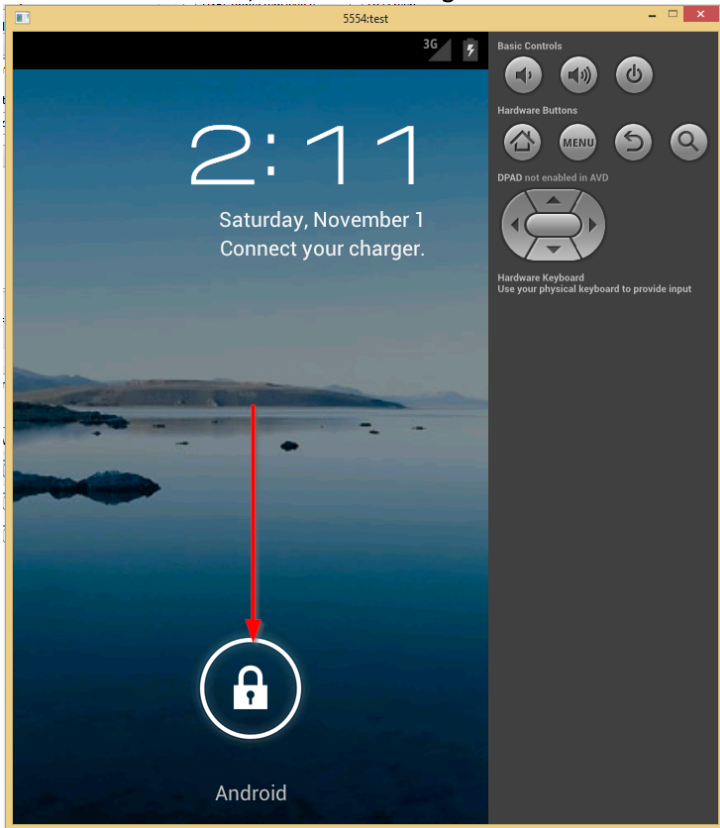
You can move the lock to the right of the screen.
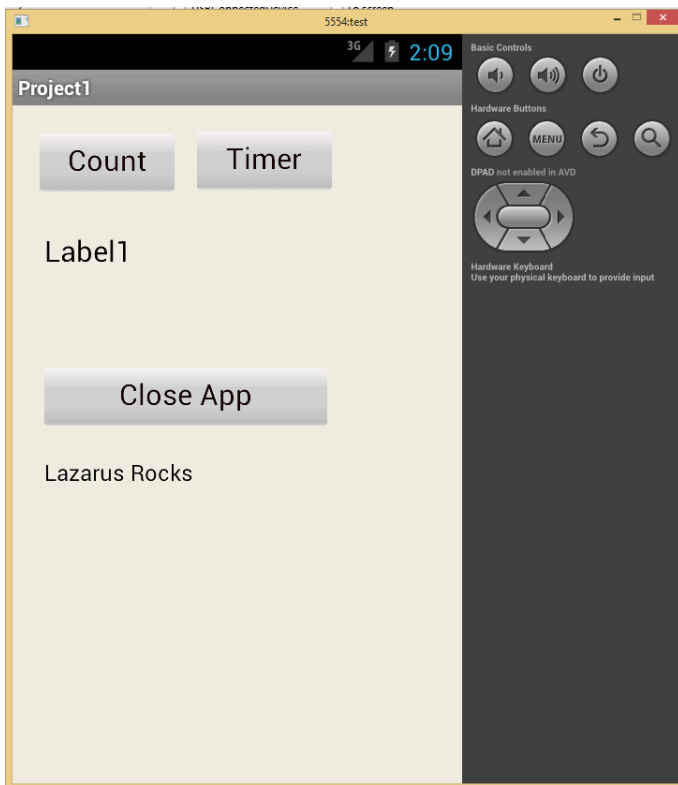
Now this is what we should see.
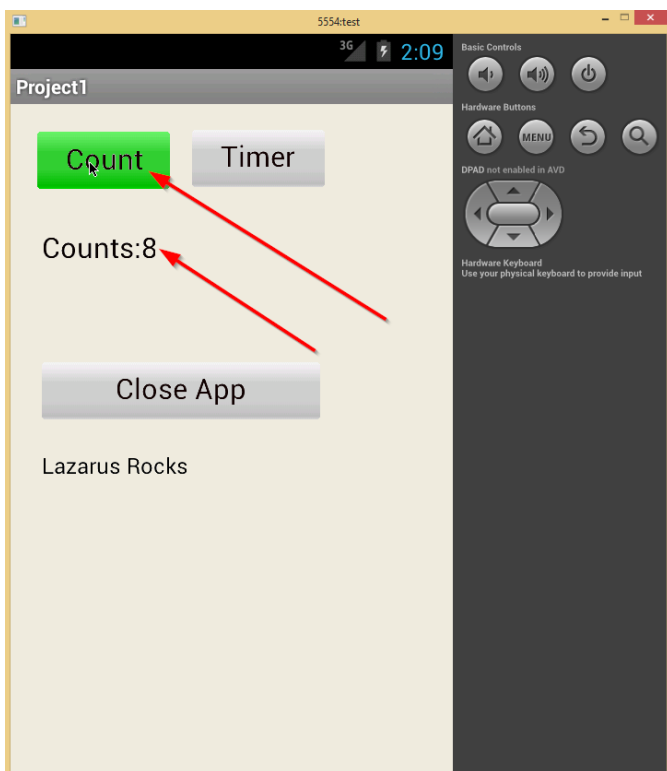Press the apps icon on the bottom of the screen: (icon in the middle)

There is our demo app!!! Click on it.

The app is running

Test the app.

Congratulations!!!!!!!!!!!!!!!!!!!

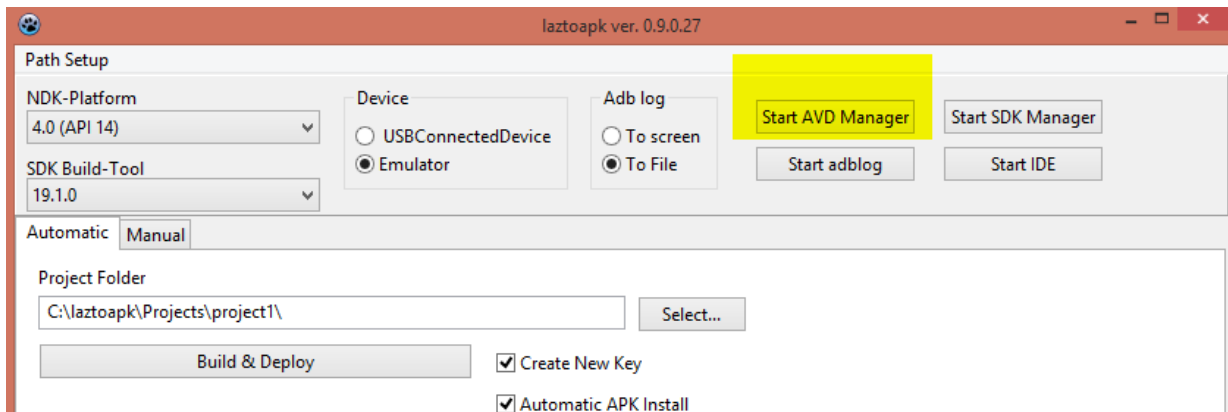## 10 Troubleshooting:

10.1 Where / how to start LazToApk again.

After installation of LazToApk it creates an icon on your desktop. You can restart it from there. When you are going to use it often, put it on the taskbar (right-click and choose "Add to taskbar", or drag it to the taskbar)
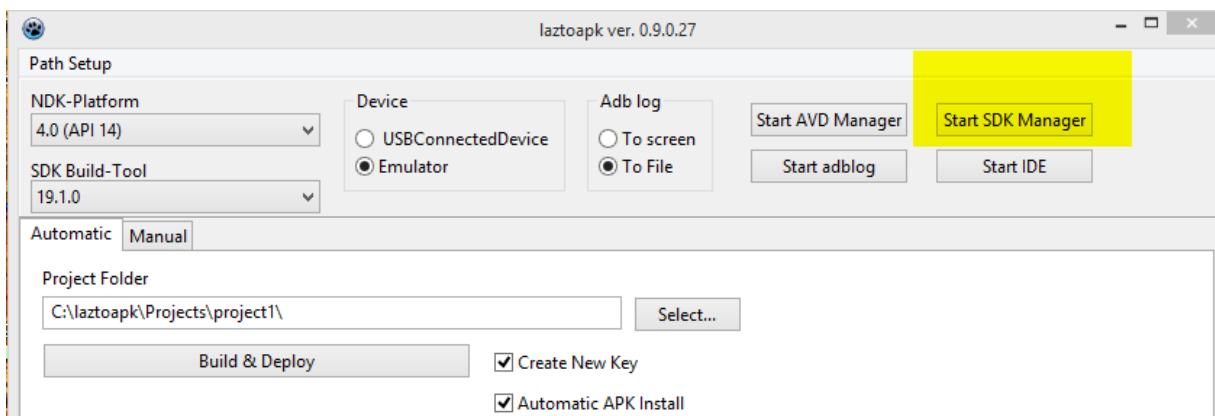
10.2 Create a new Android Virtual Device (AVD):

Start laztoapk and click on the button "Start AVD Manager".

10.2.1 List of possible AVD settings:

You can find a list of possible AVD settings at:
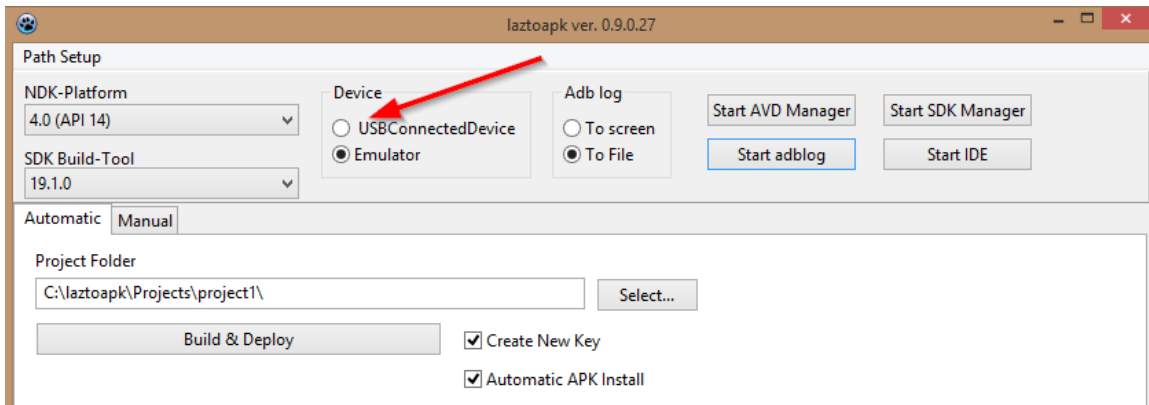
http://www.avd-settings.de/

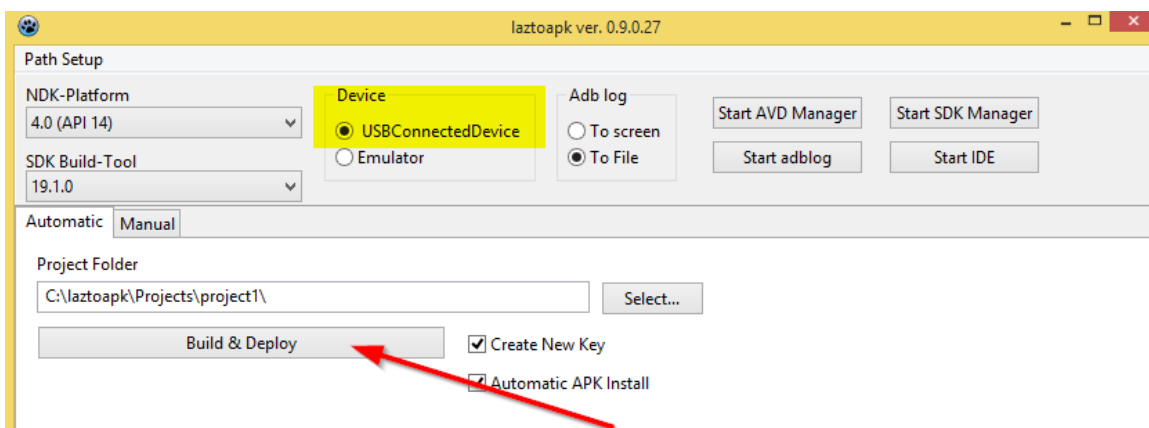## 10.3 Update the Android SDK (add new Android API's)

Start lazToApk and click on button "Start SDK Manager".

11 Running the demo on your own (real) device:

Make sure your physical device has USB debugging on!! (search google to find out how to do that)

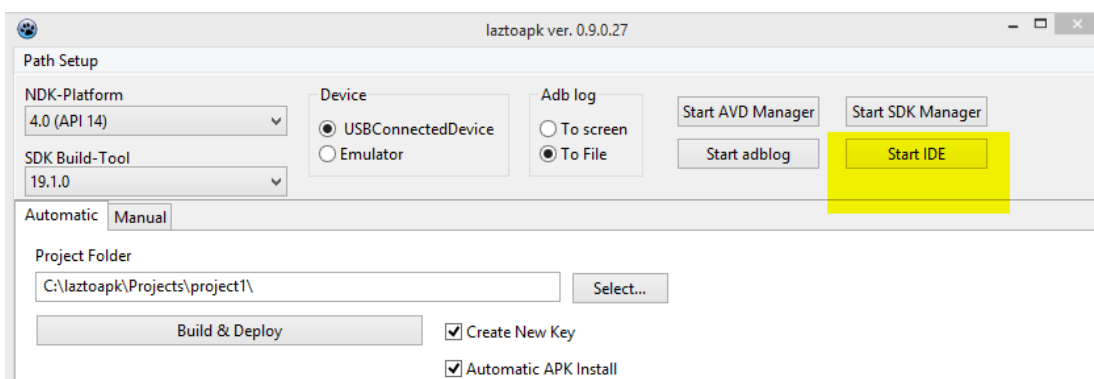Start LazToApk and place the check at "USBConnectedDevice" like so:

Then press "Build & Deploy".

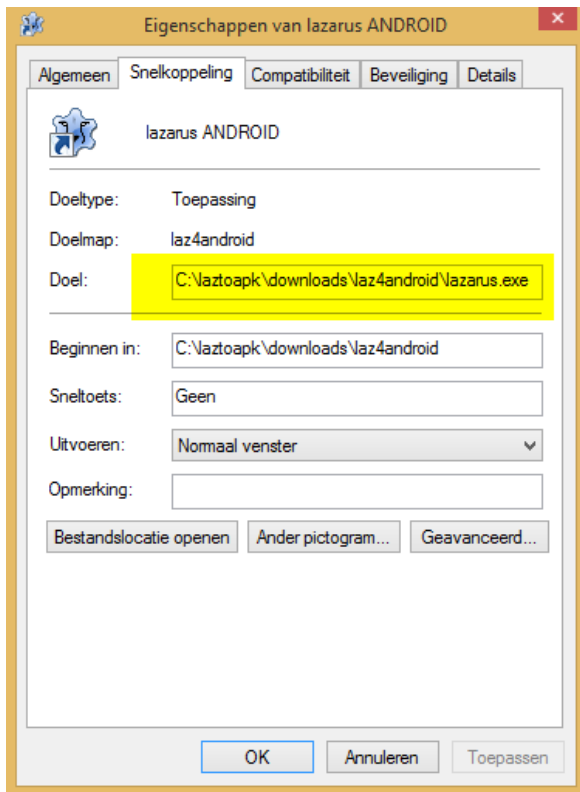# 12 Run Lazarus for Android to create your own app for Android:

For this you cannot use the "Normal" Lazarus that might also be present on your system. That one does not have the correct components and stuff added.

12.1 Use LazToApk:

Use button "Start IDE" on the LazToApk screen.

12.2 Create another icon and use that next to the "Normal" Lazarus.

Find the directory:

    C:\laztoapk\downloads\laz4android

Create an icon for the file lazarus.exe. This is the Lazarus with which you can create Android app's.

You can have both versions of Lazarus on your system. At least for me it works fine.