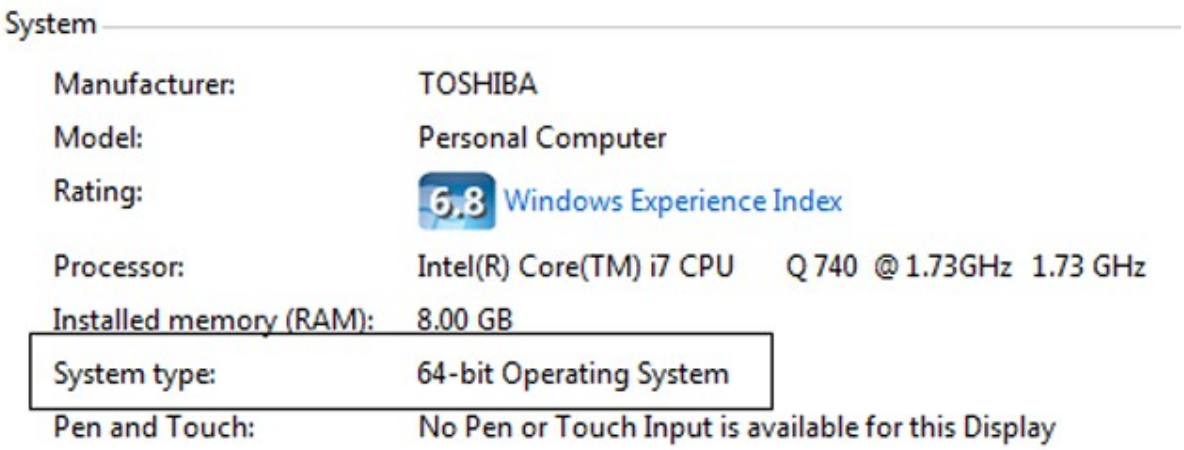
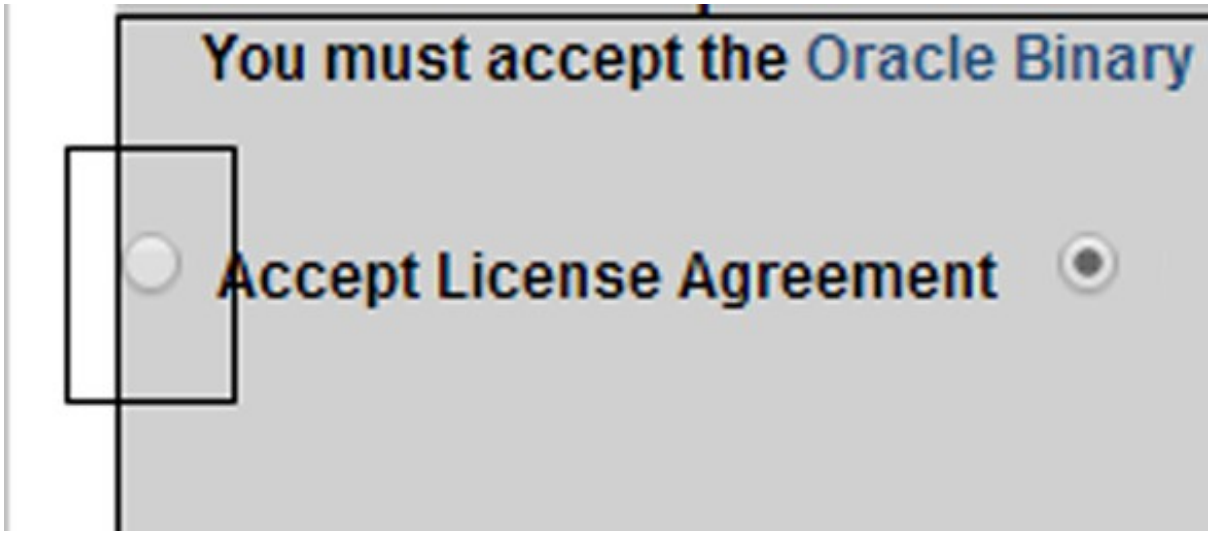
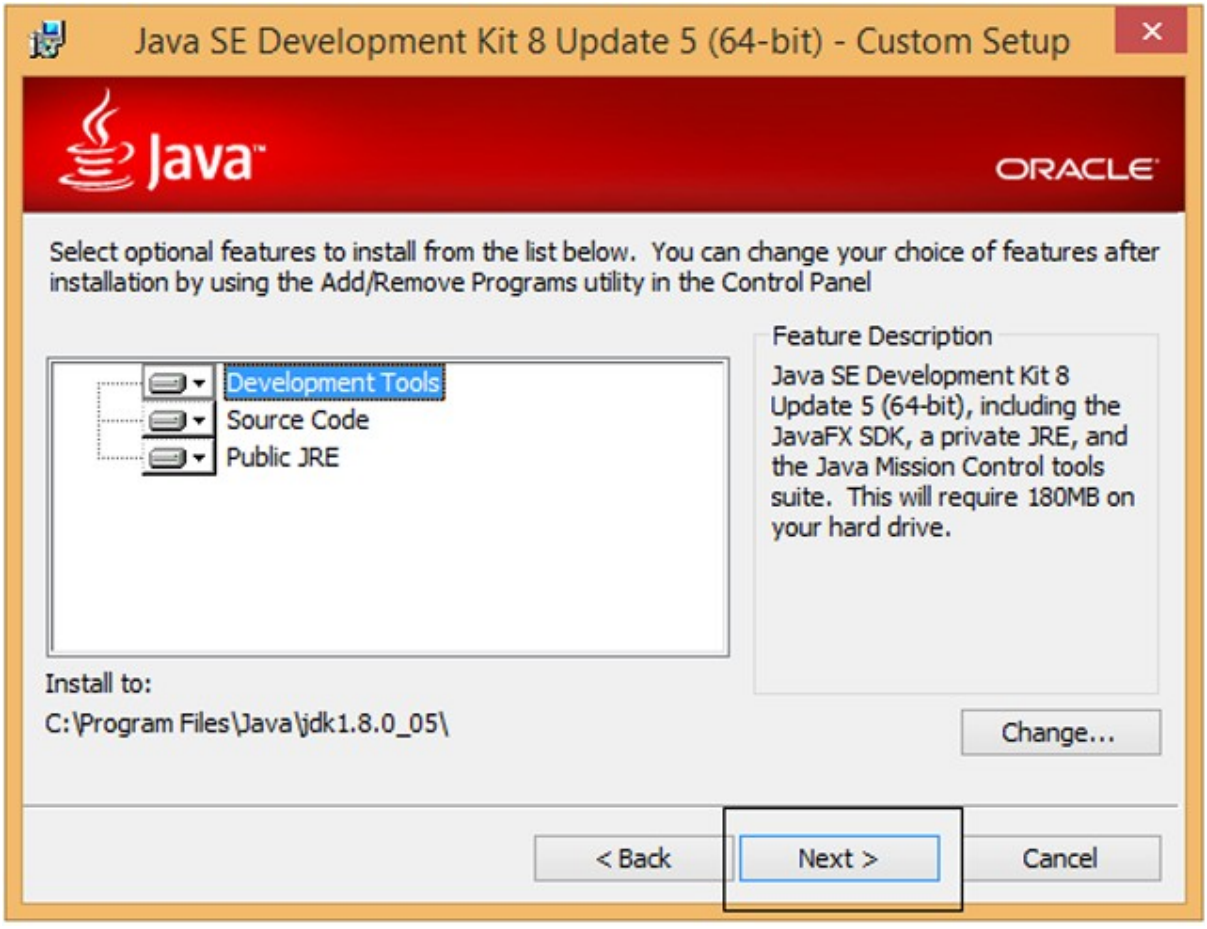
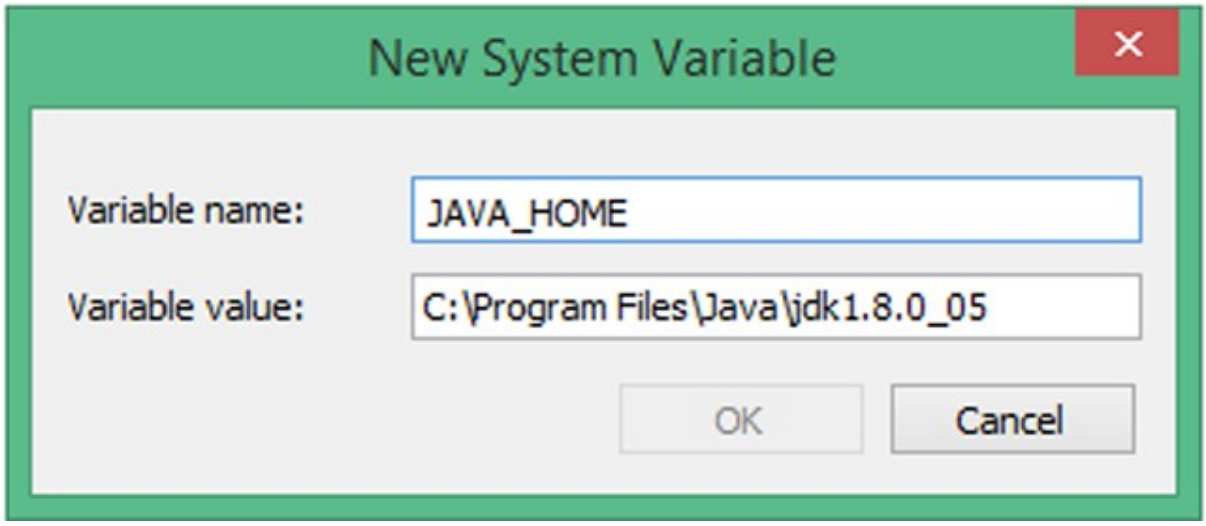
Chapter 1

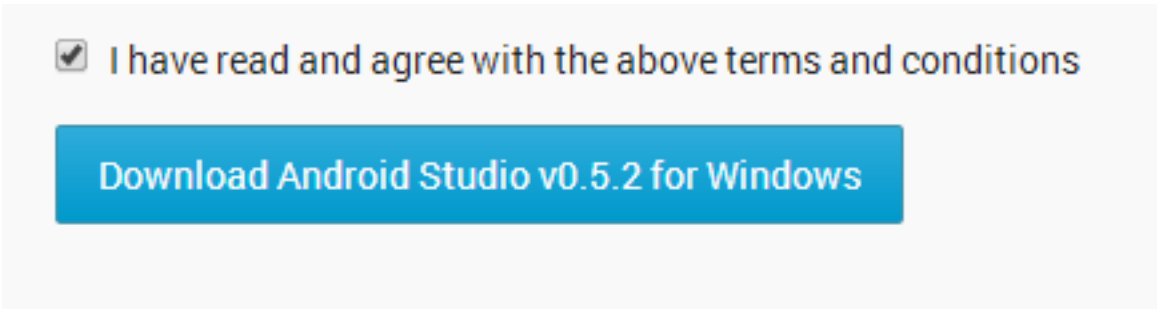
Why Java, Android, and Games?

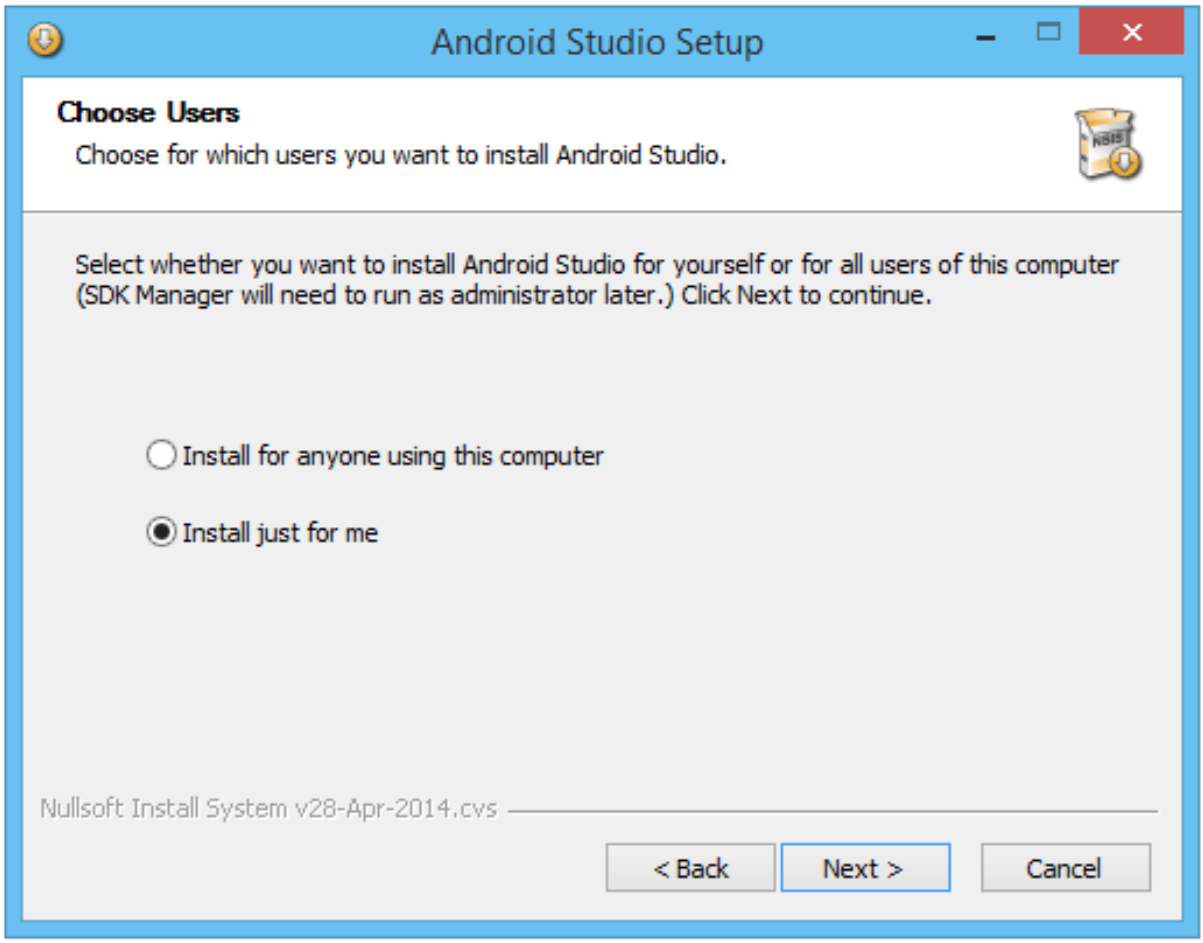


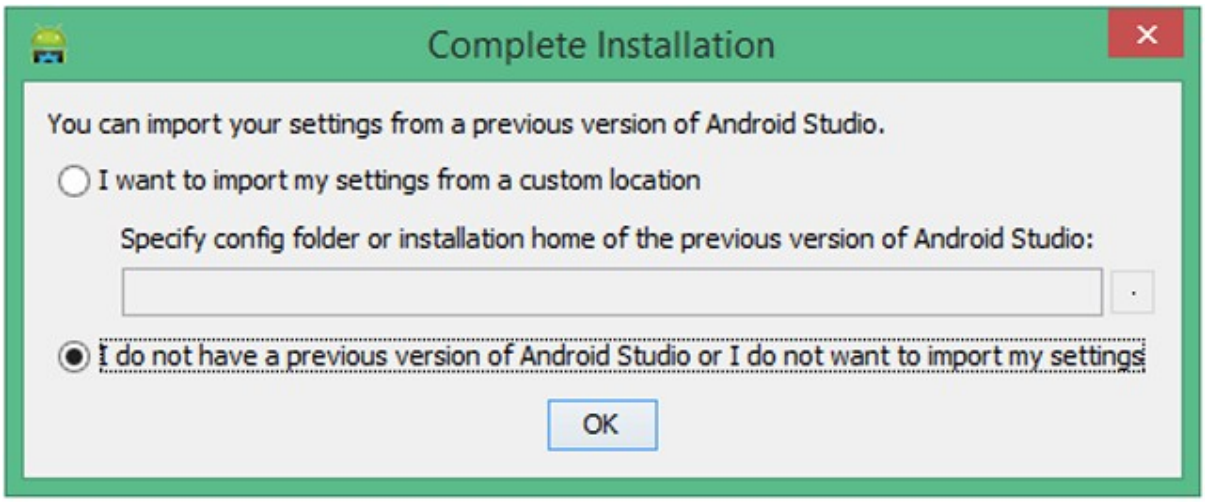

You must accept the Oracle Binary
Accept License Agreement


Java SE Development Kit 8 Update 5 (64-bit) - Custom Setup
Java
ORACLE
Select optional features to install from the list below. You can change your choice of features after installation by using the Add/Remove Programs utility in the Control Panel
Development Tools
Source Code
Public JRE
Feature Description
Java SE Development Kit 8 Update 5 (64-bit), including the JavaFX SDK, a private JRE, and the Java Mission Control tools suite. This will require 180MB on your hard drive.
Install to:
C:\Program Files\Java\jdk1.8.0_05\
Change...
< Back
Next >
Cancel


New System Variable
Variable name:
JAVA_HOME
Variable value:
C:\Program Files\Java\jdk1.8.0_05
OK
Cancel

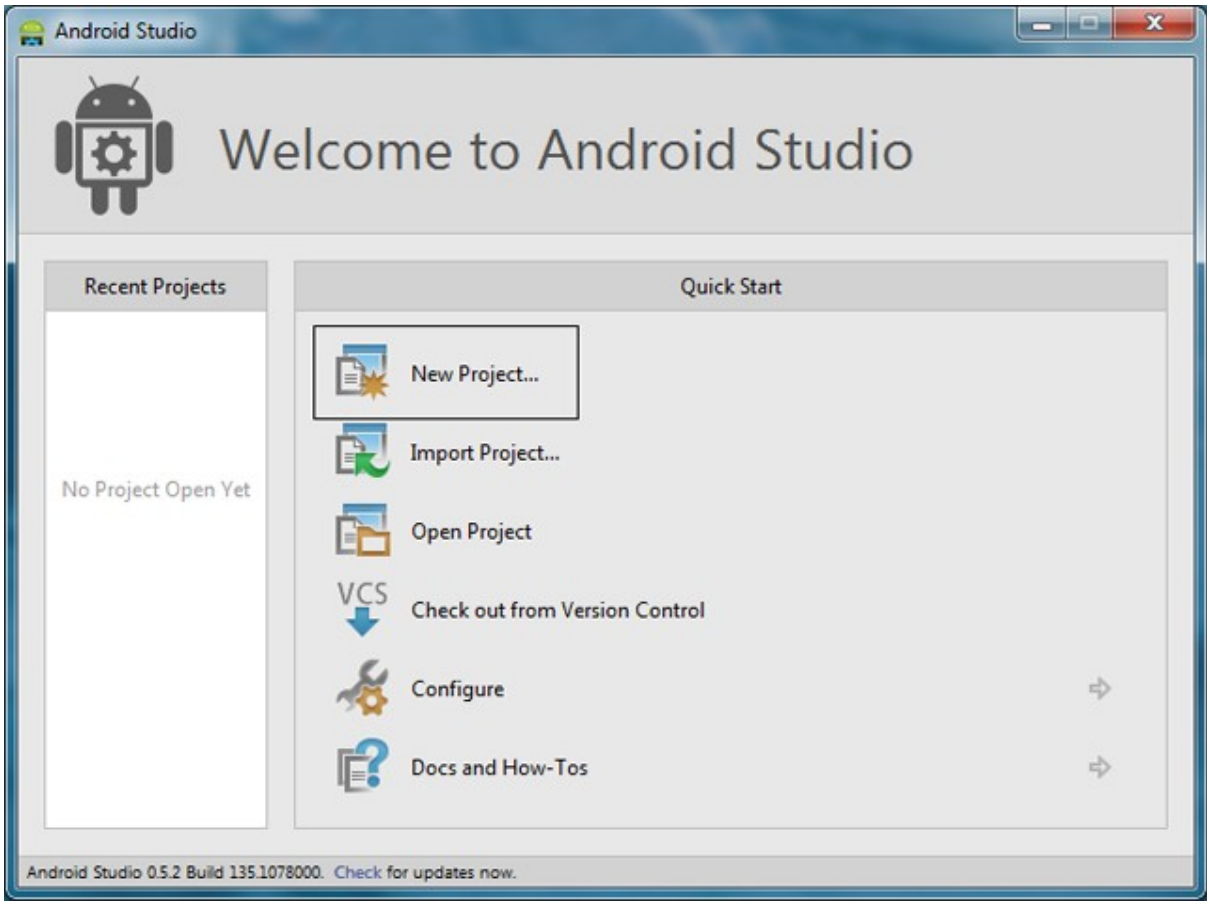

I have read and agree with the above terms and conditions
Download Android Studio v0.5.2 for Windows

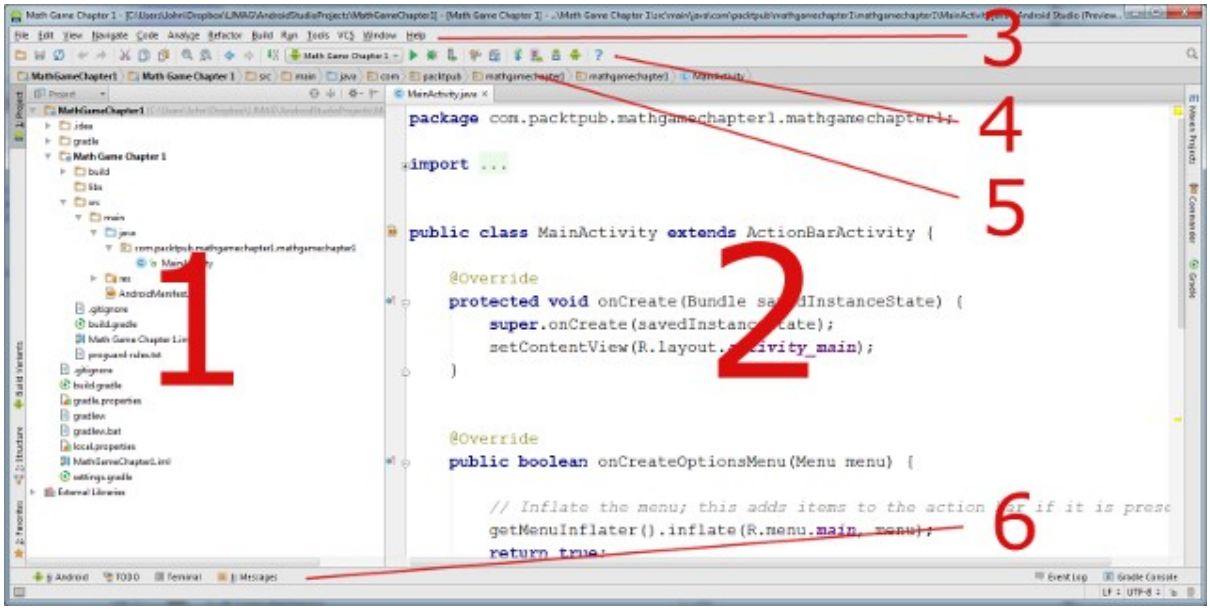

Android Studio Setup
Choose Users
Choose for which users you want to install Android Studio.
Select whether you want to install Android Studio for yourself or for all users of this computer (SDK Manager will need to run as administrator later.) Click Next to continue.
Install for anyone using this computer
Install just for me
Nullsoft Install System v28-Apr-2014.cvs
< Back
Next >
Cancel

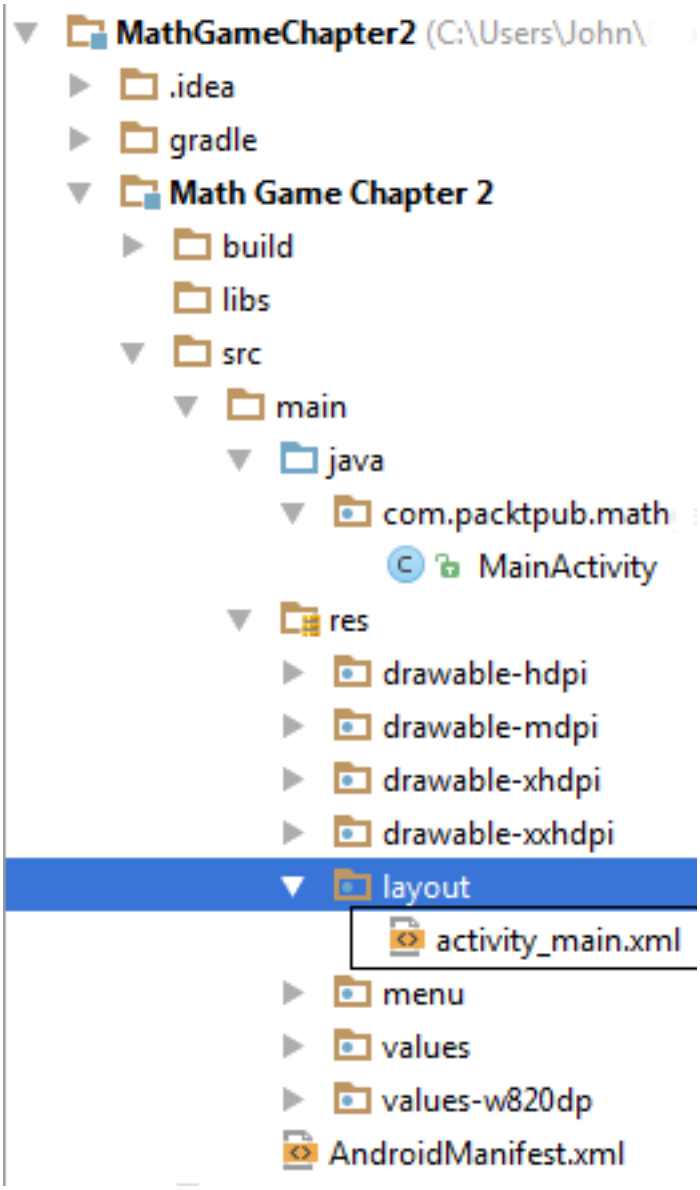


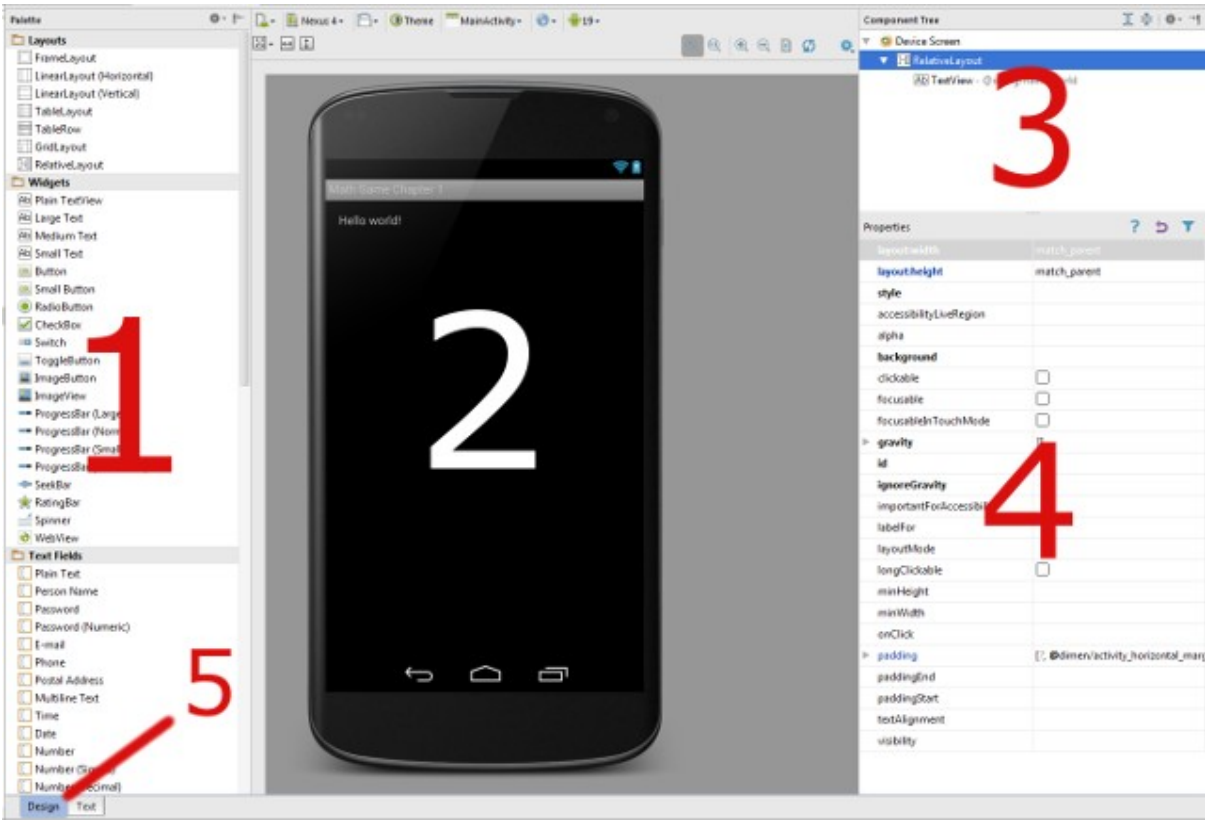
Chapter 2

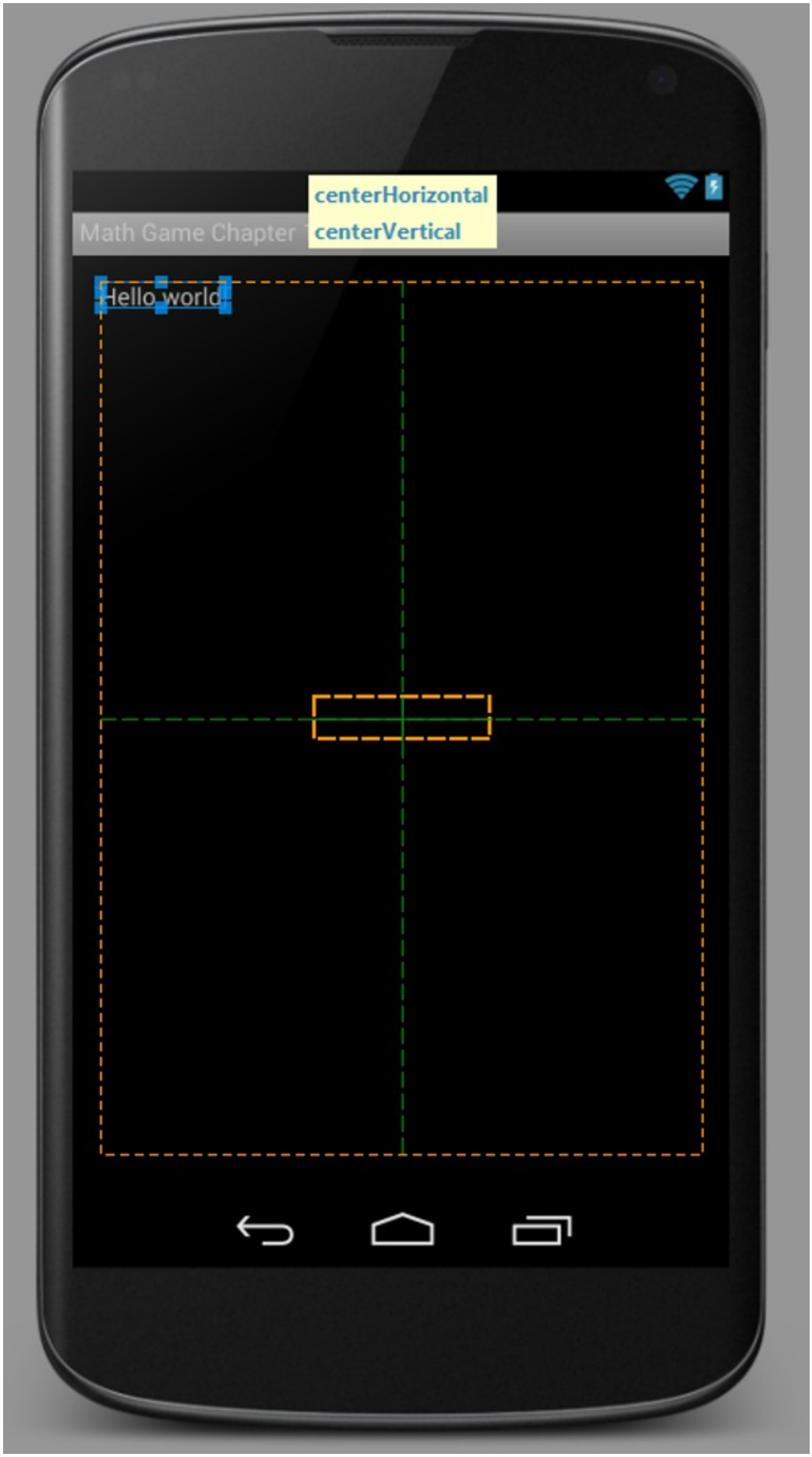
Getting Started with Android




1
2
3
4
5
6
package com.packtpub.mathgamechapter1.mathgamechapter1;
import ...
public class MainActivity extends ActionBarActivity {
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main);
}
@Override
public boolean onCreateOptionsMenu(Menu menu) {
// Inflate the menu; this adds items to the action bar if it is prese
getMenuInflater().inflate(R.menu.main, menu);
return true;

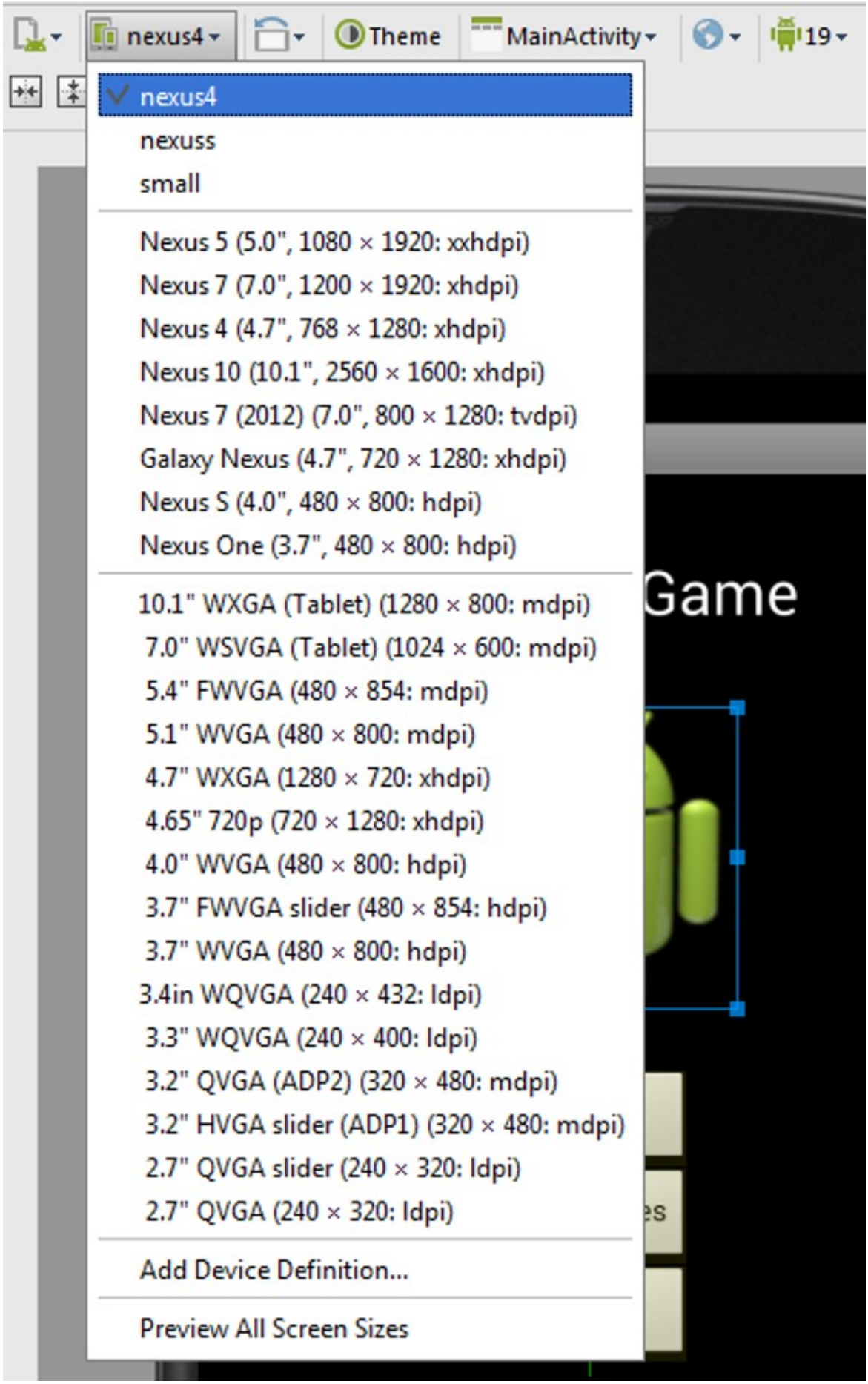

MathGameChapter2 (C:\Users\John\
.idea
gradle
Math Game Chapter 2
build
libs
src
main
java
com.packtpub.math
MainActivity
res
drawable-hdpi
drawable-mdpi
drawable-xhdpi
drawable-xxhdpi
layout
activity_main.xml
menu
values
values-w820dp
AndroidManifest.xml


Palette
Layouts
FrameLayout
LinearLayout (Horizontal)
LinearLayout (Vertical)
TableLayout
TableRow
GridLayout
RelativeLayout
Widgets
Plain TextView
Large Text
Medium Text
Small Text
Button
Small Button
RadioButton
CheckBox
Switch
ToggleButton
ImageButton
ImageView
SeekBar
RatingBar
Spinner
WebView
Text Fields
Plain Text
Person Name
Password
Password (Numeric)
E-mail
Phone
Postal Address
Multiline Text
Time
Date
Number
Design
Text
Component Tree
Device Screen
RelativeLayout
Properties
layout:width
match_parent
layout:height
style
accessibilityLiveRegion
alpha
background
clickable
focusable
focusableInTouchMode
gravity
id
ignoreGravity
labelFor
layoutMode
longClickable
minHeight
minWidth
onClick
padding
paddingEnd
paddingStart
textAlignment
visibility
Hello world!
1
2
3
4
5

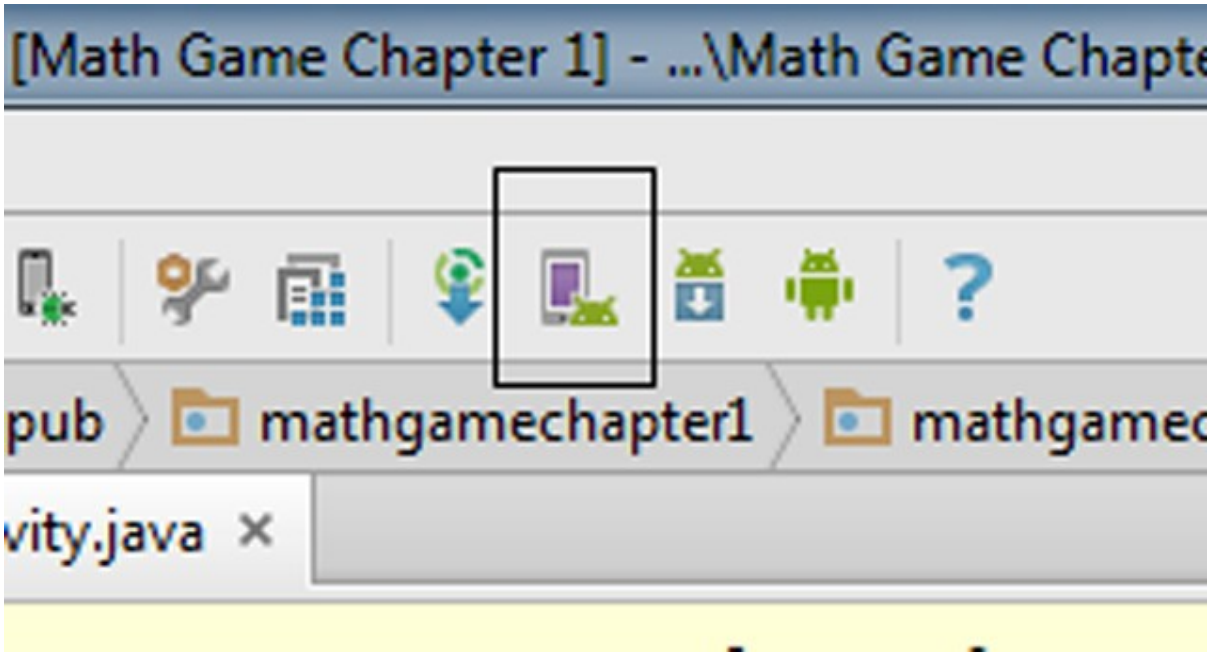

centerHorizontal
centerVertical
Math Game Chapter
Hello world

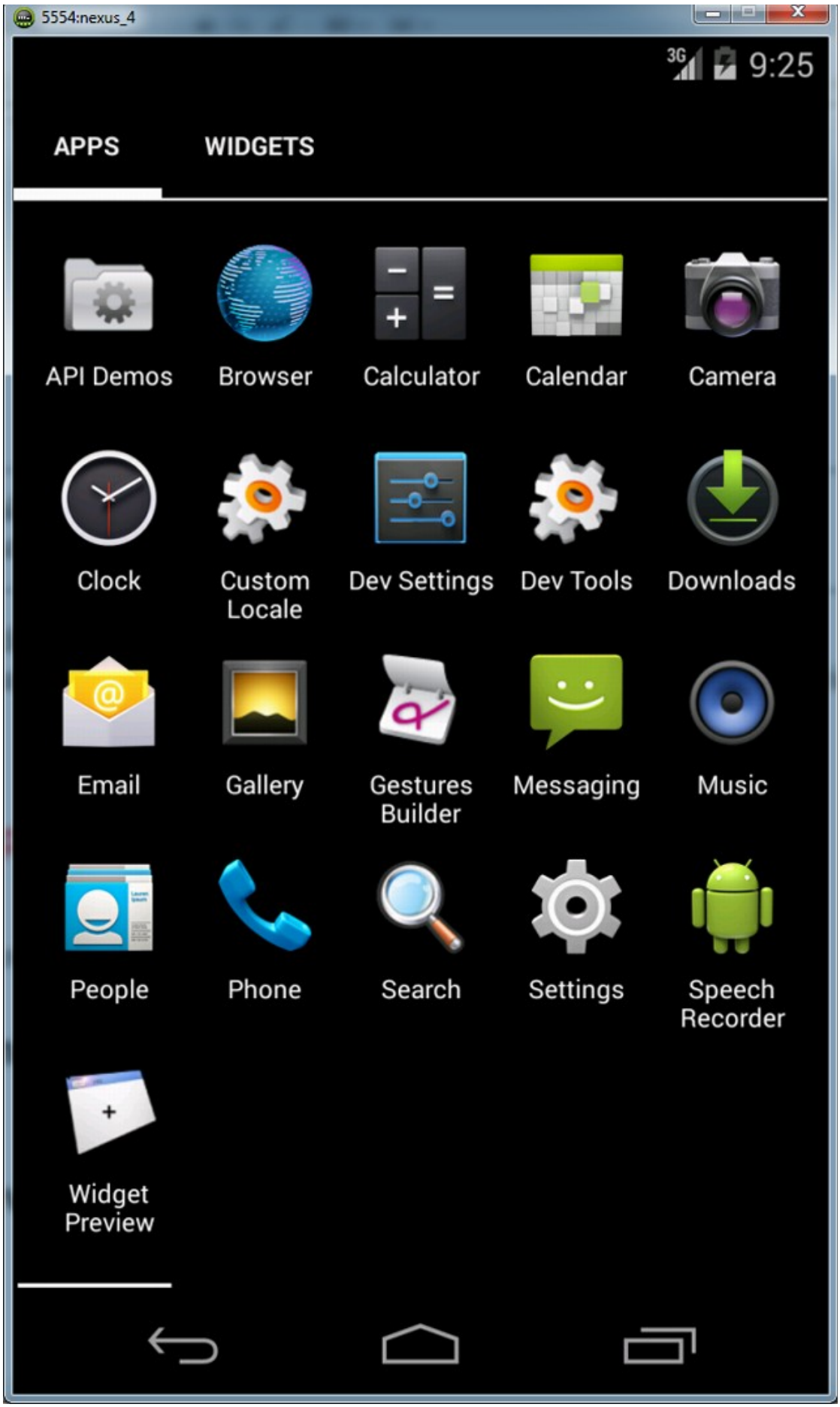
textSize
100sp
...

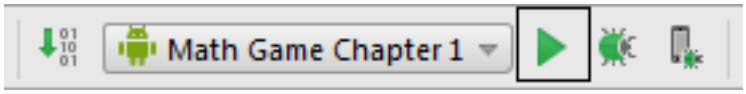
Math Game Chapter 1
My Math Game
Play
High Scores
Quit

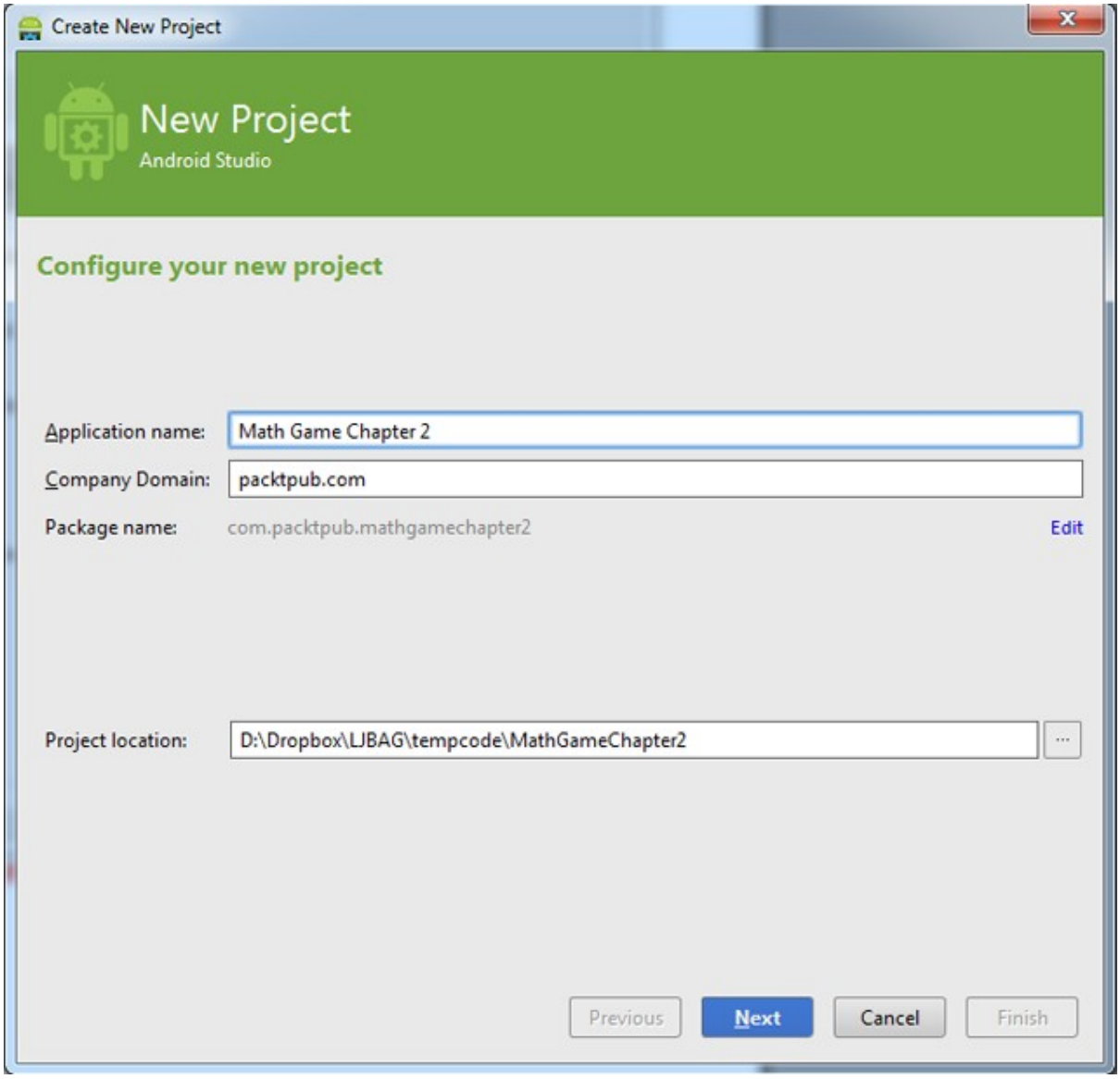

nexus4
Theme
MainActivity
19
nexus4
nexuss
small
Nexus 5 (5.0", 1080 × 1920: xxhdpi)
Nexus 7 (7.0", 1200 × 1920: xhdpi)
Nexus 4 (4.7", 768 × 1280: xhdpi)
Nexus 10 (10.1", 2560 × 1600: xhdpi)
Nexus 7 (2012) (7.0", 800 × 1280: tvdpi)
Galaxy Nexus (4.7", 720 × 1280: xhdpi)
Nexus S (4.0", 480 × 800: hdpi)
Nexus One (3.7", 480 × 800: hdpi)
10.1" WXGA (Tablet) (1280 × 800: mdpi)
7.0" WSVGA (Tablet) (1024 × 600: mdpi)
5.4" FWVGA (480 × 854: mdpi)
5.1" WVGA (480 × 800: mdpi)
4.7" WXGA (1280 × 720: xhdpi)
4.65" 720p (720 × 1280: xhdpi)
4.0" WVGA (480 × 800: hdpi)
3.7" FWVGA slider (480 × 854: hdpi)
3.7" WVGA (480 × 800: hdpi)
3.4in WQVGA (240 × 432: ldpi)
3.3" WQVGA (240 × 400: ldpi)
3.2" QVGA (ADP2) (320 × 480: mdpi)
3.2" HVGA slider (ADP1) (320 × 480: mdpi)
2.7" QVGA slider (240 × 320: ldpi)
2.7" QVGA (240 × 320: ldpi)
Add Device Definition...
Preview All Screen Sizes
Game

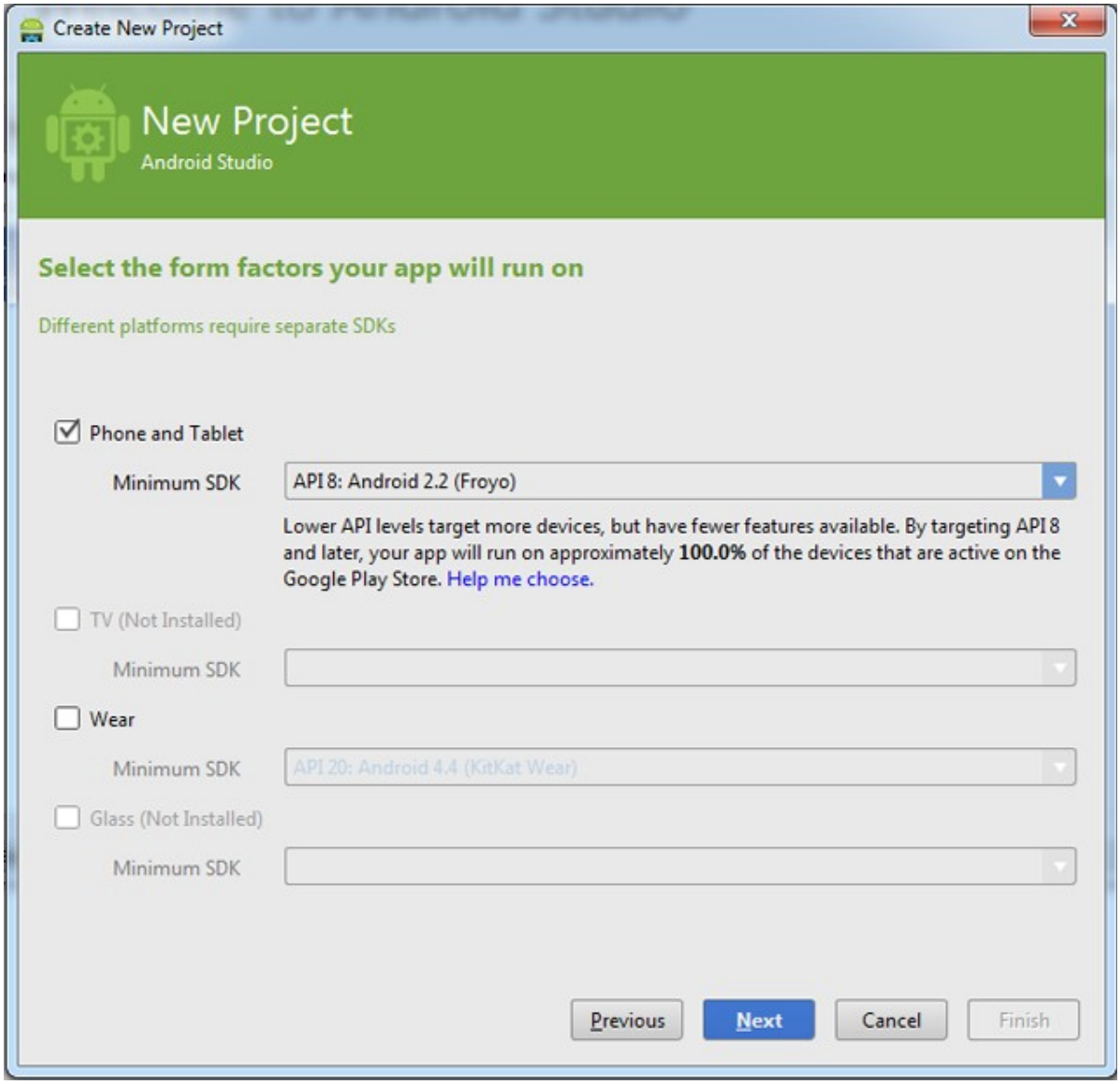
```
package com.packtpub.mathg

import ...

public class MainActivity
```

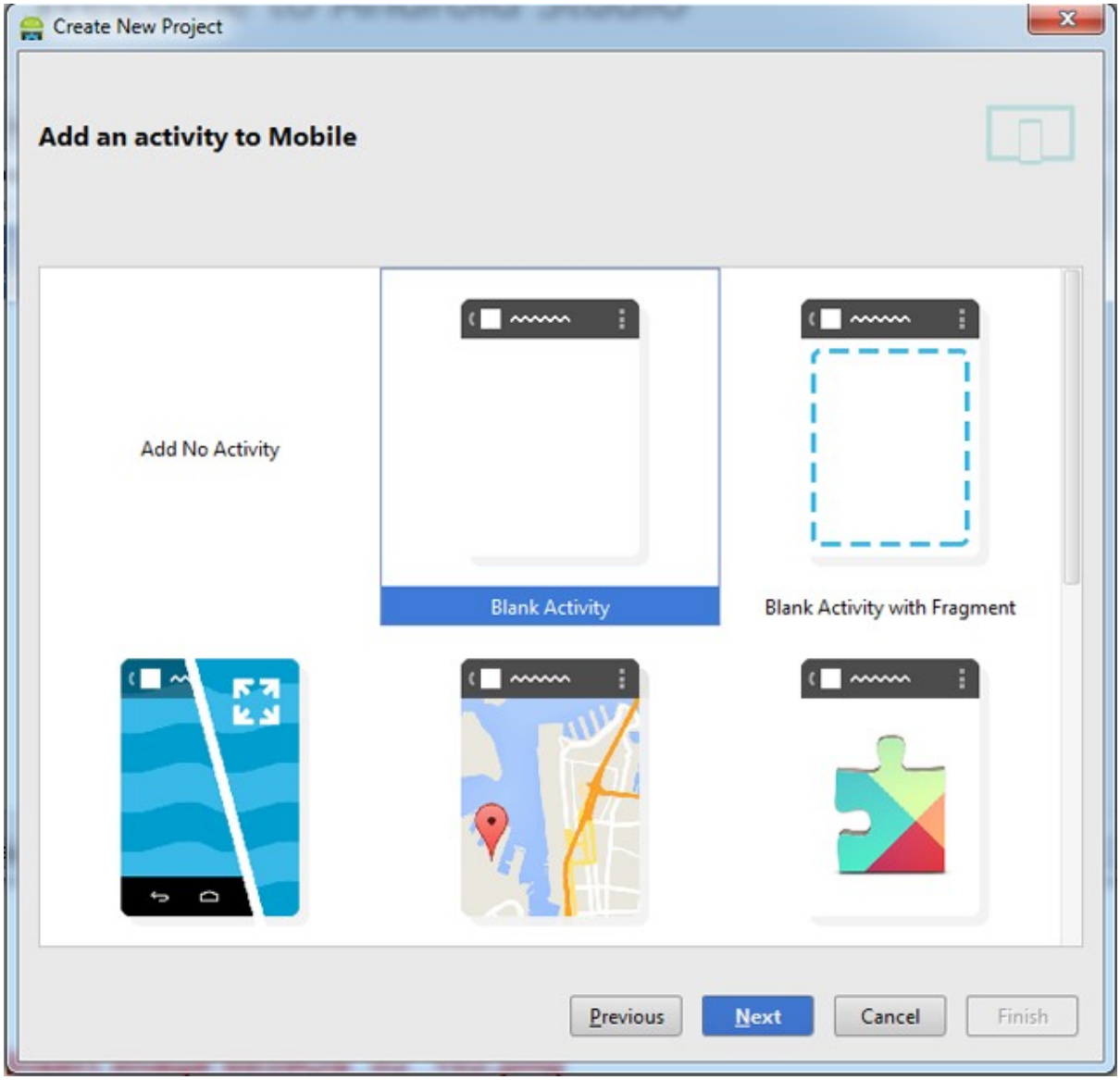


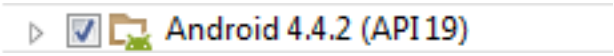

5554:nexus_4
9:25
APPS
WIDGETS
API Demos
Browser
Calculator
Calendar
Camera
Clock
Custom Locale
Dev Settings
Dev Tools
Downloads
Email
Gallery
Gestures Builder
Messaging
Music
People
Phone
Search
Settings
Speech Recorder
Widget Preview


Math Game Chapter 1


Create New Project
New Project
Android Studio
Configure your new project
Application name:
Math Game Chapter 2
Company Domain:
packtpub.com
Package name:
com.packtpub.mathgamechapter2
Edit
Project location:
D:\Dropbox\LJBAG\tempcode\MathGameChapter2
Previous
Next
Cancel
Finish

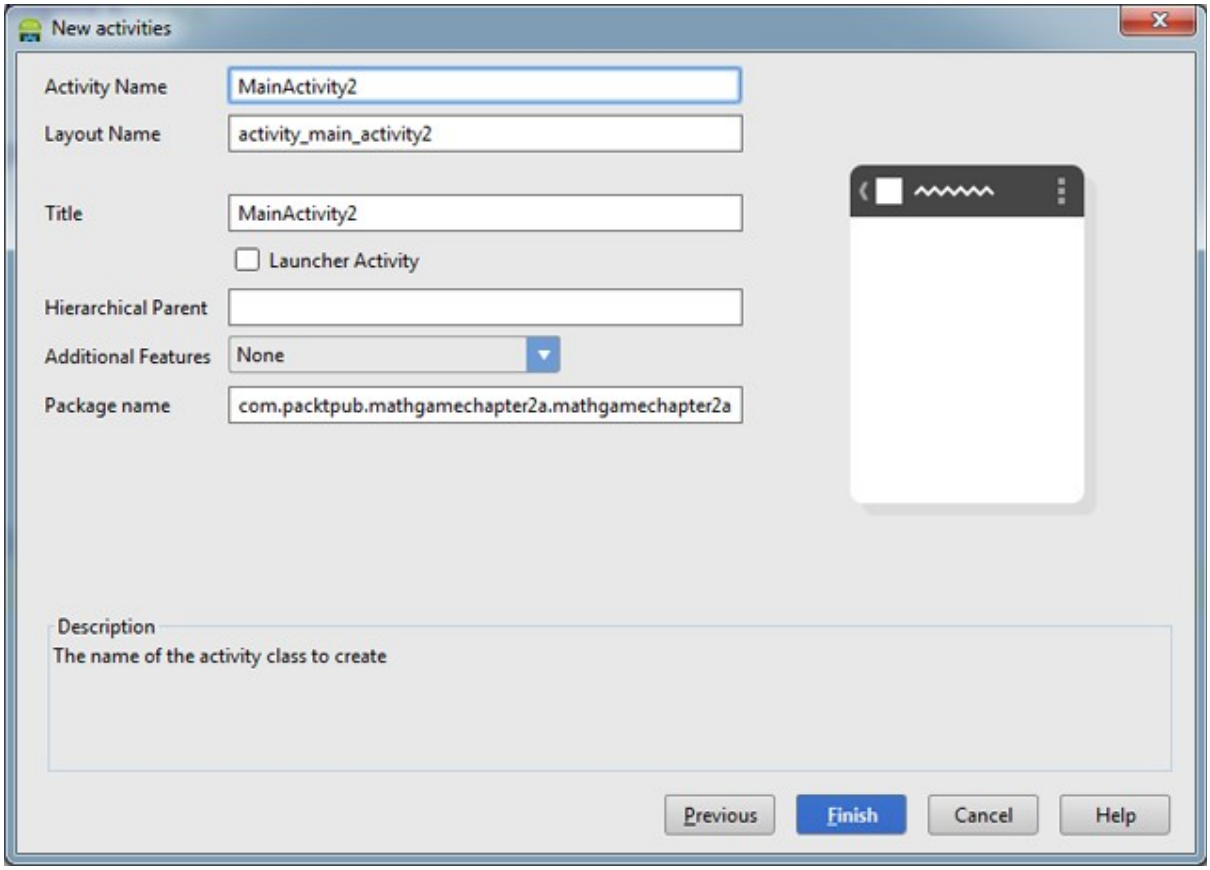

Create New Project
New Project
Android Studio
Select the form factors your app will run on
Different platforms require separate SDKs
Phone and Tablet
Minimum SDK
API 8: Android 2.2 (Froyo)
Lower API levels target more devices, but have fewer features available. By targeting API 8 and later, your app will run on approximately 100.0% of the devices that are active on the Google Play Store. Help me choose.
TV (Not Installed)
Minimum SDK
Wear
Minimum SDK
API 20: Android 4.4 (KitKat Wear)
Glass (Not Installed)
Minimum SDK
Previous
Next
Cancel
Finish

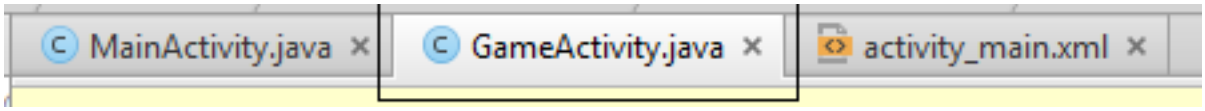


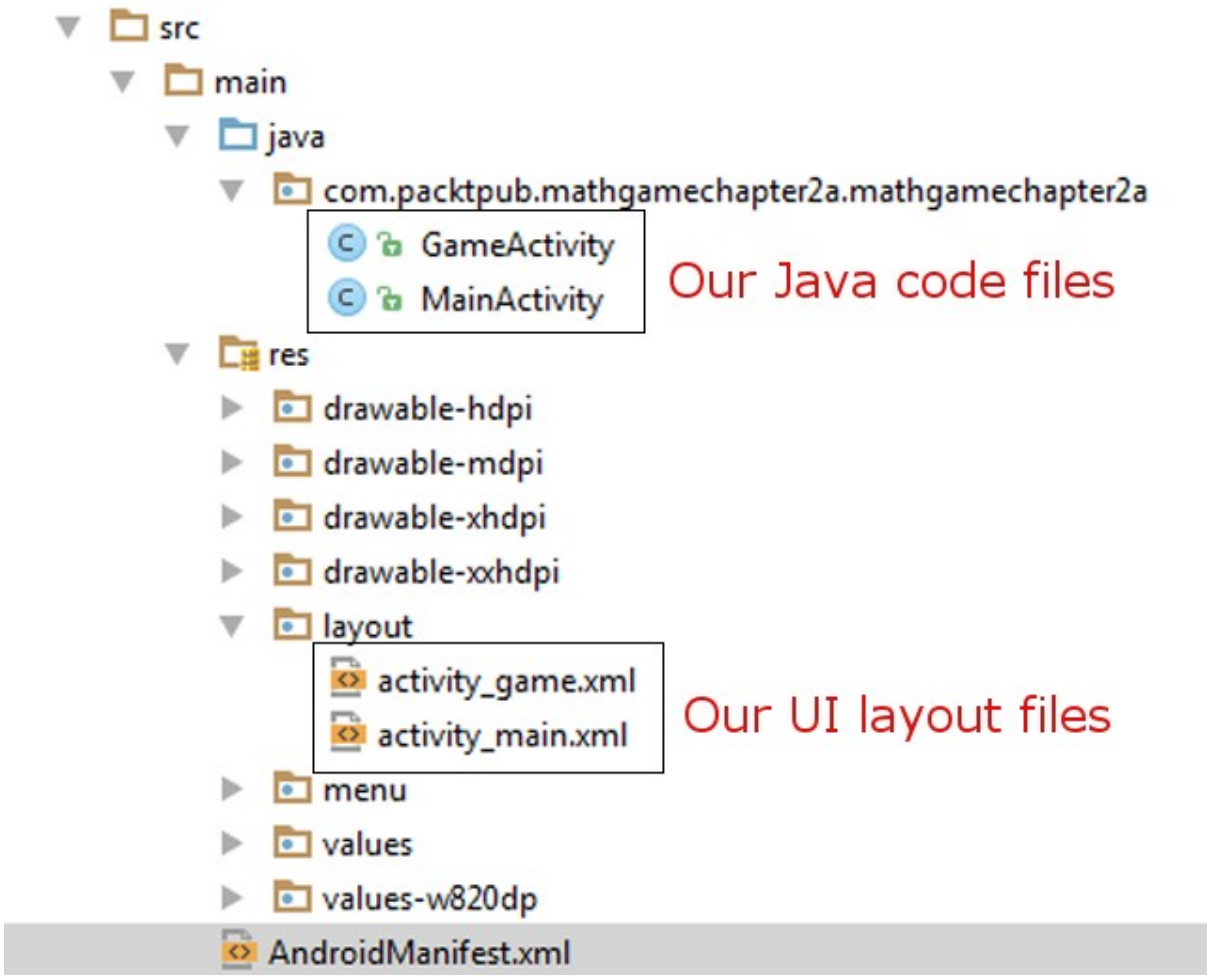


Chapter 3

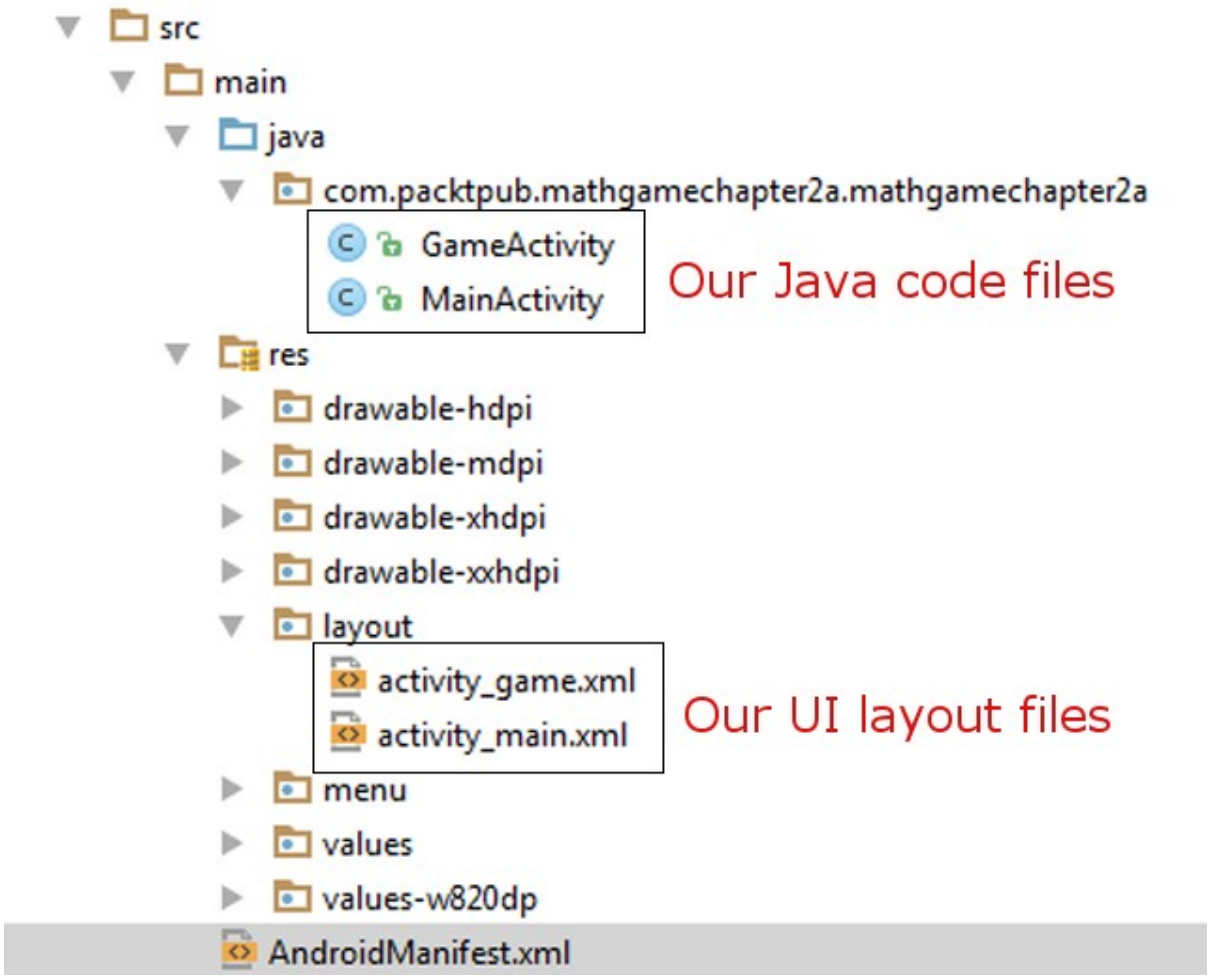
Speaking Java – Your First Game


New activities
Activity Name
MainActivity2
Layout Name
activity_main_activity2
Title
MainActivity2
Launcher Activity
Hierarchical Parent
Additional Features
None
Package name
com.packtpub.mathgamechapter2a.mathgamechapter2a
Description
The name of the activity class to create
Previous
Finish
Cancel
Help


MainActivity.java
GameActivity.java
activity_main.xml



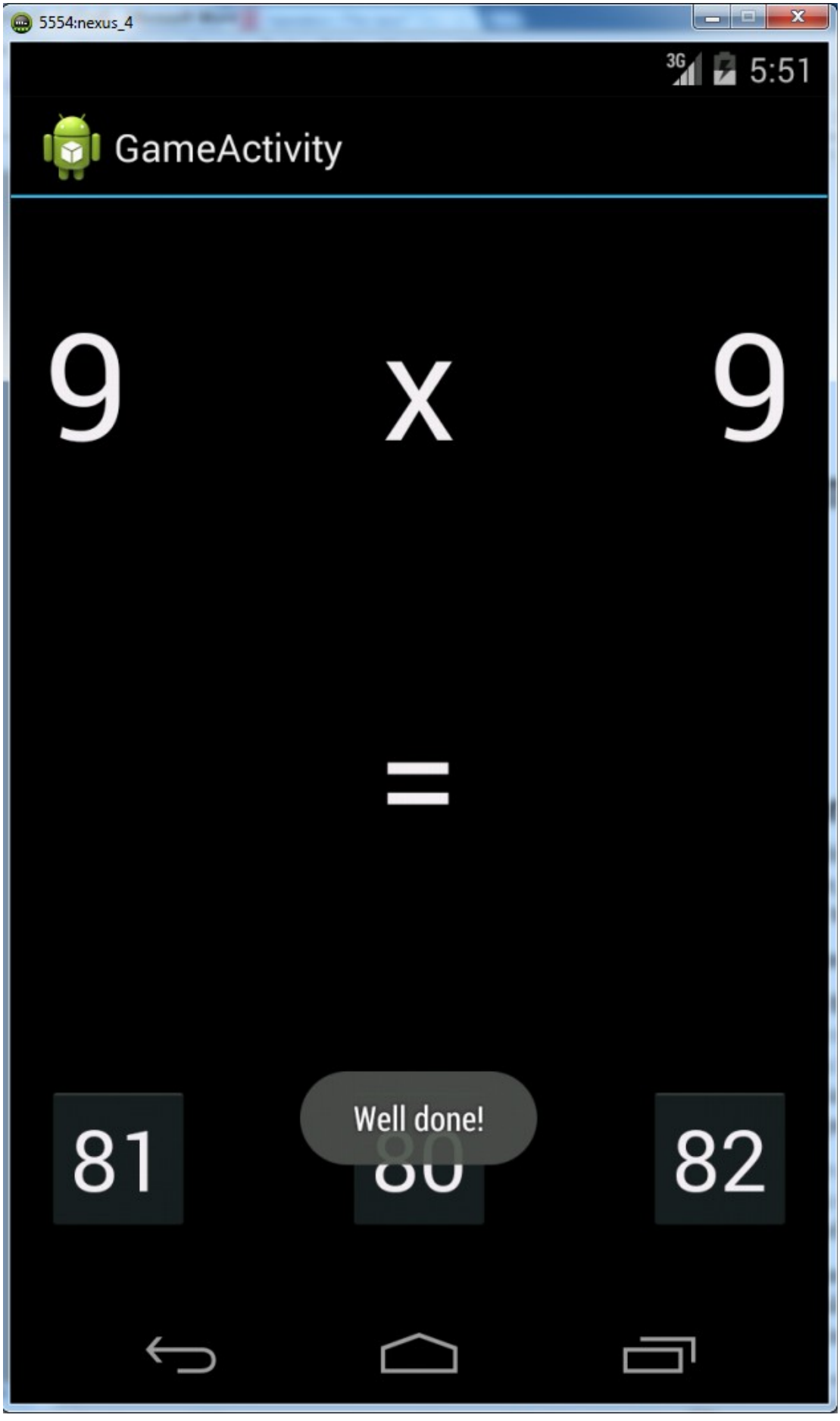

```
package com.packtpub.mathgamechapter2a.mathgamechapter2a;

import ...


public class MainActivity extends Activity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
    }

}
```




```
score = "Ada Lovelace"
```

Incompatible types.
Required: int
Found: java.lang.String

';' expected


5554:nexus_4
3G
5:51
GameActivity
9
x
9
=
Well done!
81
80
82

```
a = a + b;
```

Incompatible types.
Required: int
Found: java.lang.String

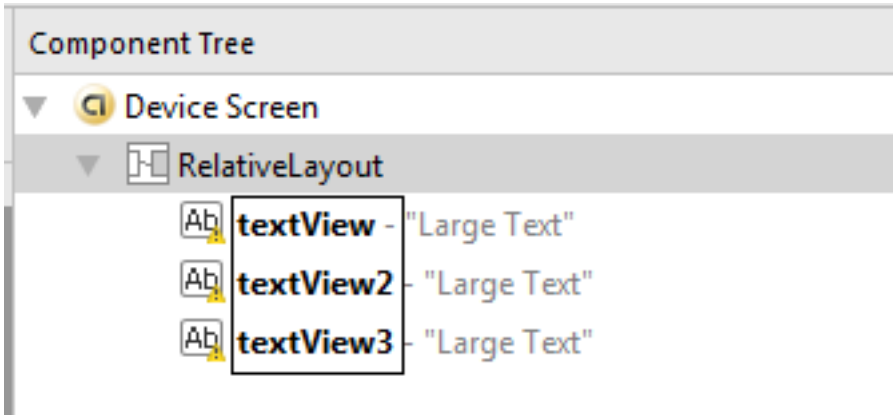
Finish lookup even when non-focused	Code Completion	1,281 times
Basic code completion	Code Completion	1,847 times
Variable name completion	Code Completion	2,131 times

```
    //to show our var
    textObjectPartA.se
    textObjectPartB.se
    //which button re
    buttonObjectChoice
    buttonObjectChoice
    buttonObjectChoice
    buttonObjectChoice1.
}//onCreate ends here
```

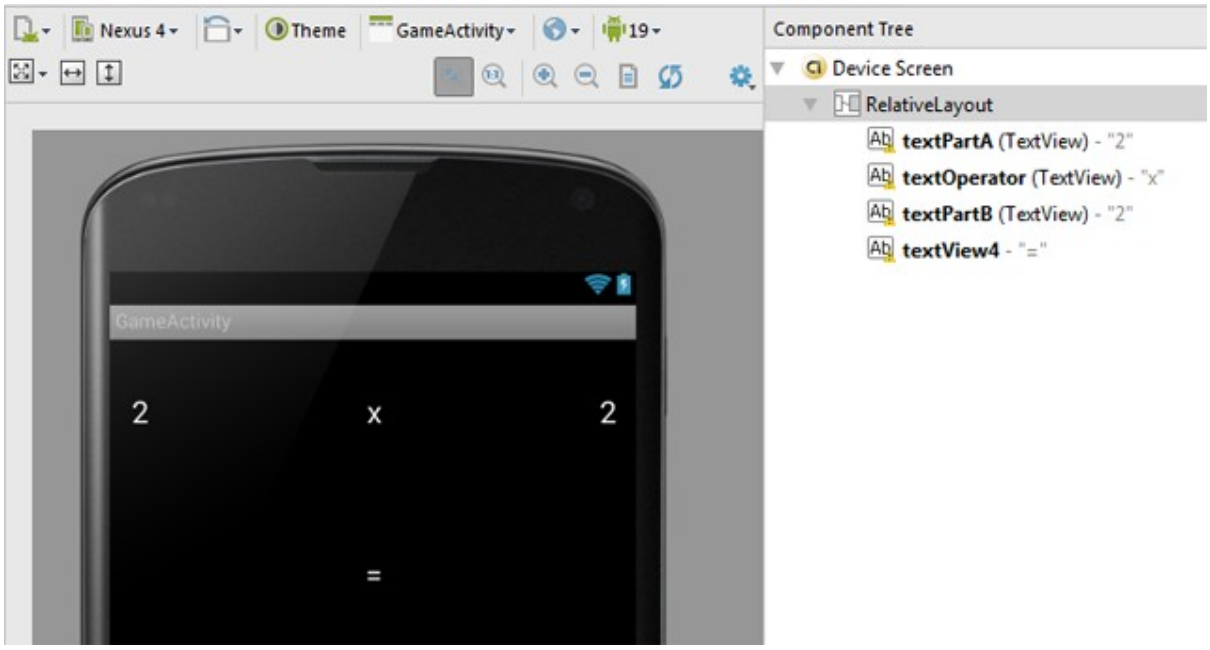
```
setBackgroundResource(int resid)                    void
setBackground(Drawable background)                  void
setText(char[] text, int start, int ...             void
equals(Object o)                                    boolean
setVisibility(int visibility)                       void
onInitializeAccessibilityEvent(Acces...            void
onInitializeAccessibilityNodeInfo(Ac...            void
addChildrenForAccessibility(ArrayLis...            void
addFocusables(ArrayList<View> views,...            void
addFocusables(ArrayList<View> views,...            void
Ctrl+Down and Ctrl+Up will move caret down and up in the editor >>
```

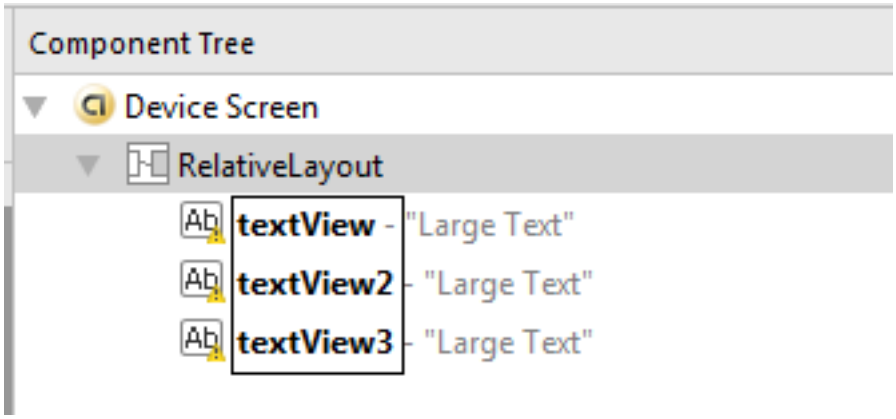
GameActivity
2 x 2
=
2
4
6

GameActivity
Large Text
Large Text
Large Text

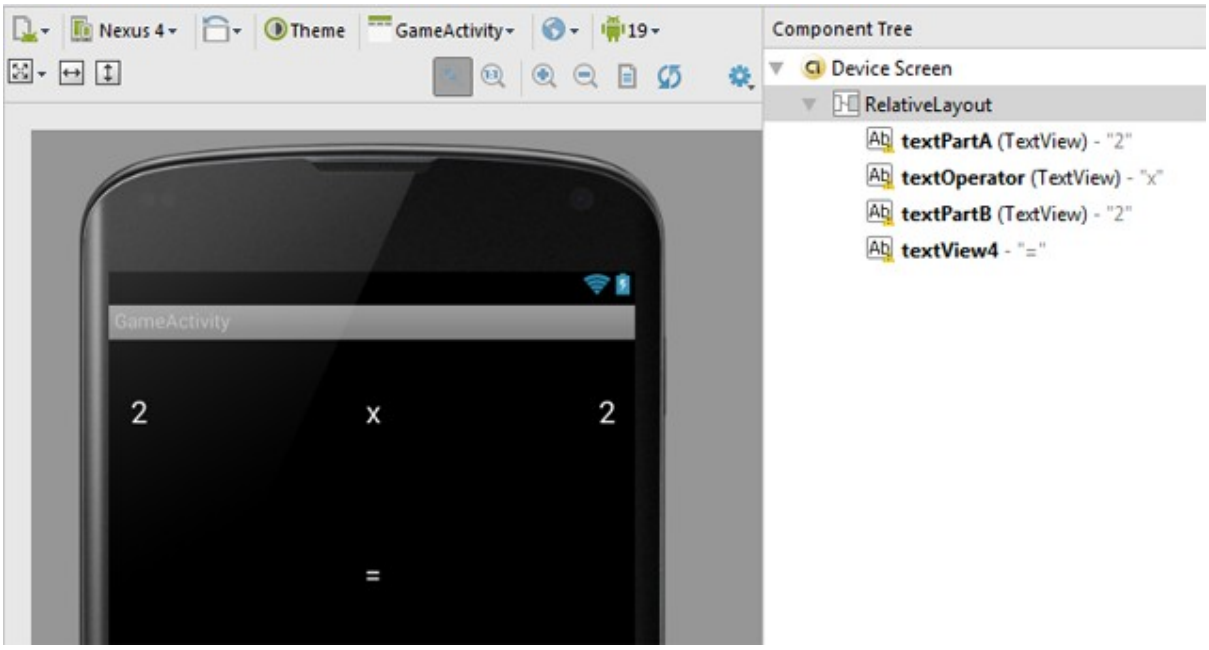

Component Tree
Device Screen
RelativeLayout
textView - "Large Text"
textView2 - "Large Text"
textView3 - "Large Text"

hint
id
@+id/textView
importantForAccessibility


Nexus 4
Theme
GameActivity
19
Component Tree
Device Screen
RelativeLayout
textPartA (TextView) - "2"
textOperator (TextView) - "x"
textPartB (TextView) - "2"
textView4 - "="
GameActivity
2
x
2
=

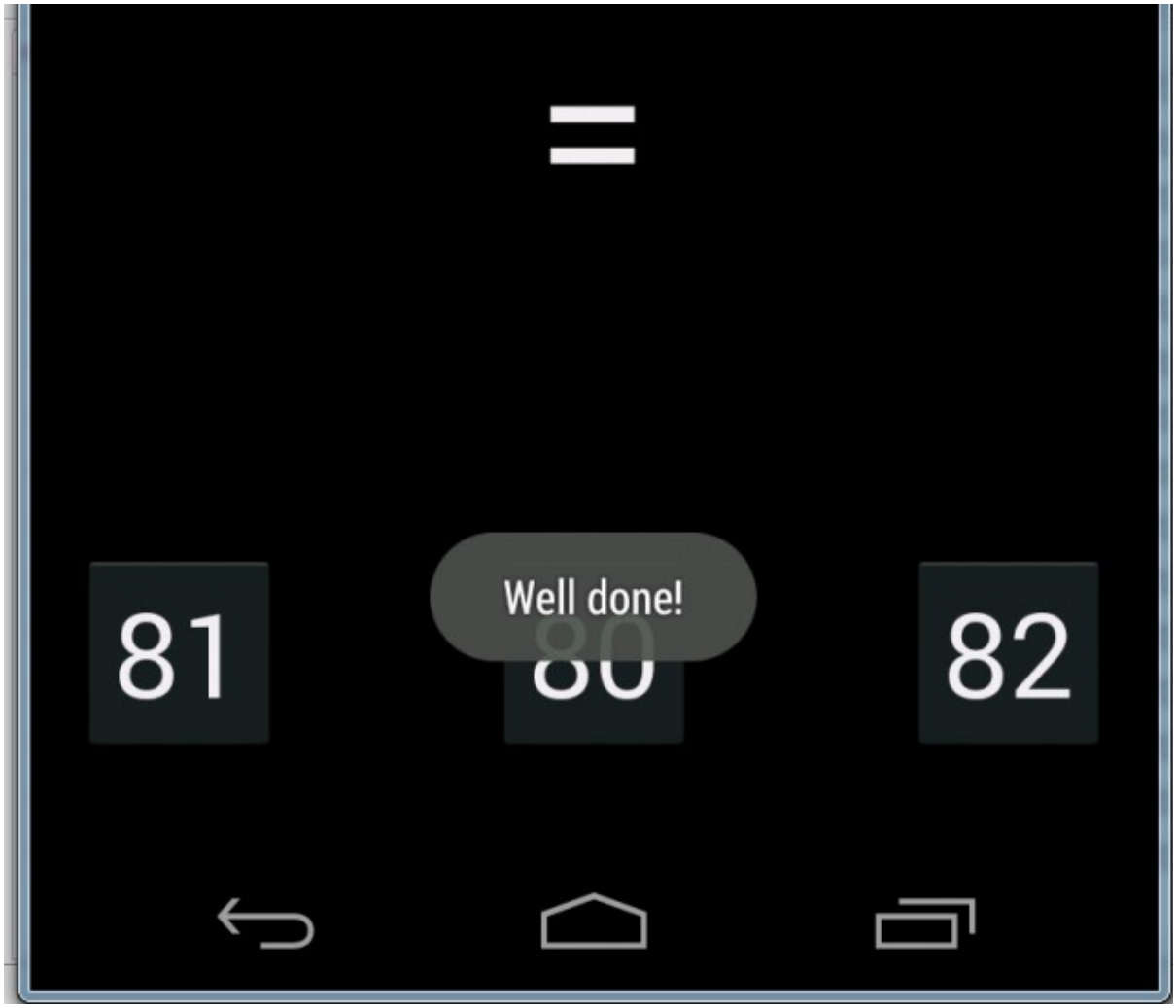

Component Tree
Device Screen
RelativeLayout
textView - "Large Text"
textView2 - "Large Text"
textView3 - "Large Text"

hint
id
@+id/textView
importantForAccessibility


Nexus 4
Theme
GameActivity
19
Component Tree
Device Screen
RelativeLayout
textPartA (TextView) - "2"
textOperator (TextView) - "x"
textPartB (TextView) - "2"
textView4 - "="
GameActivity
2
x
2
=

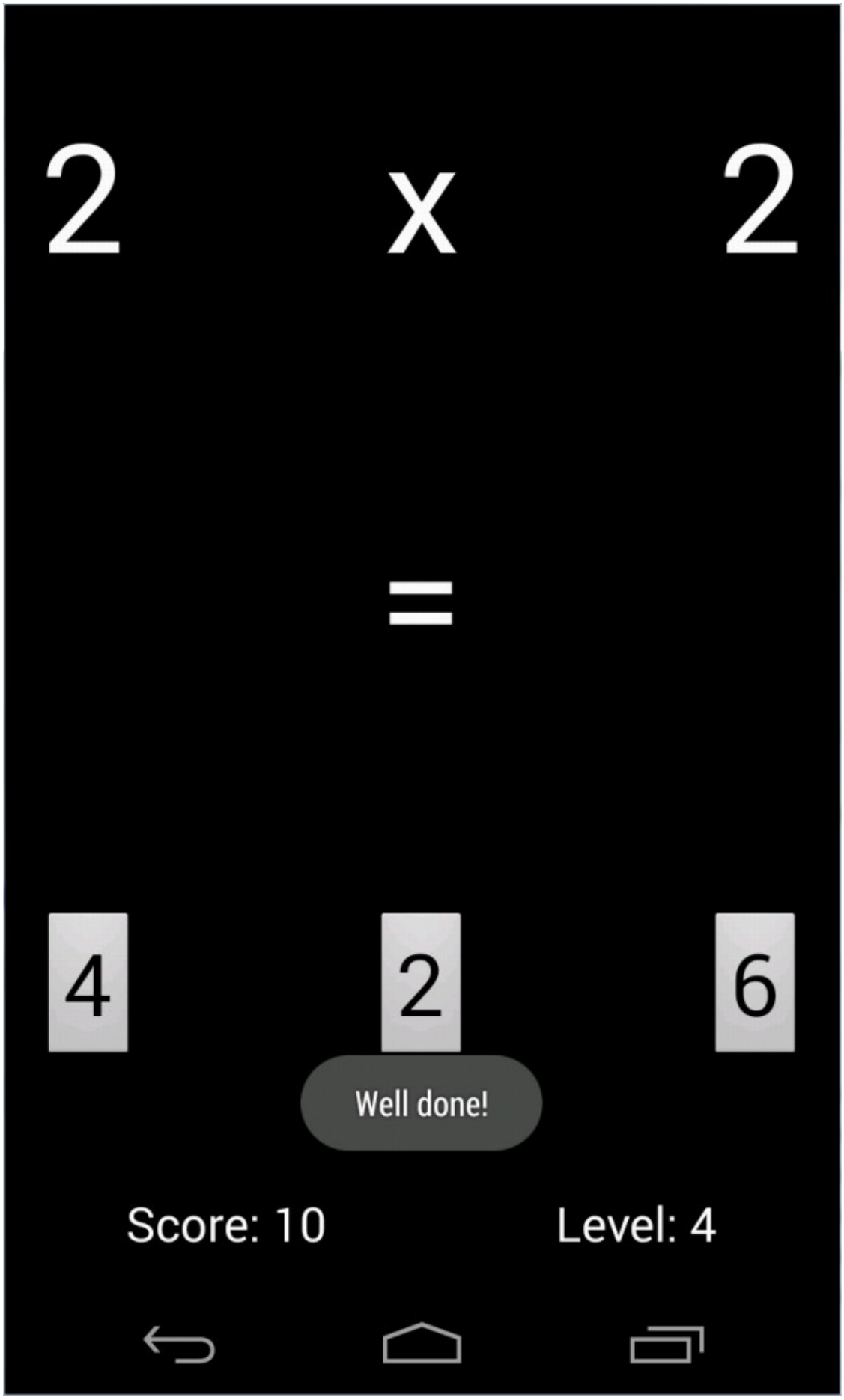
id	textView

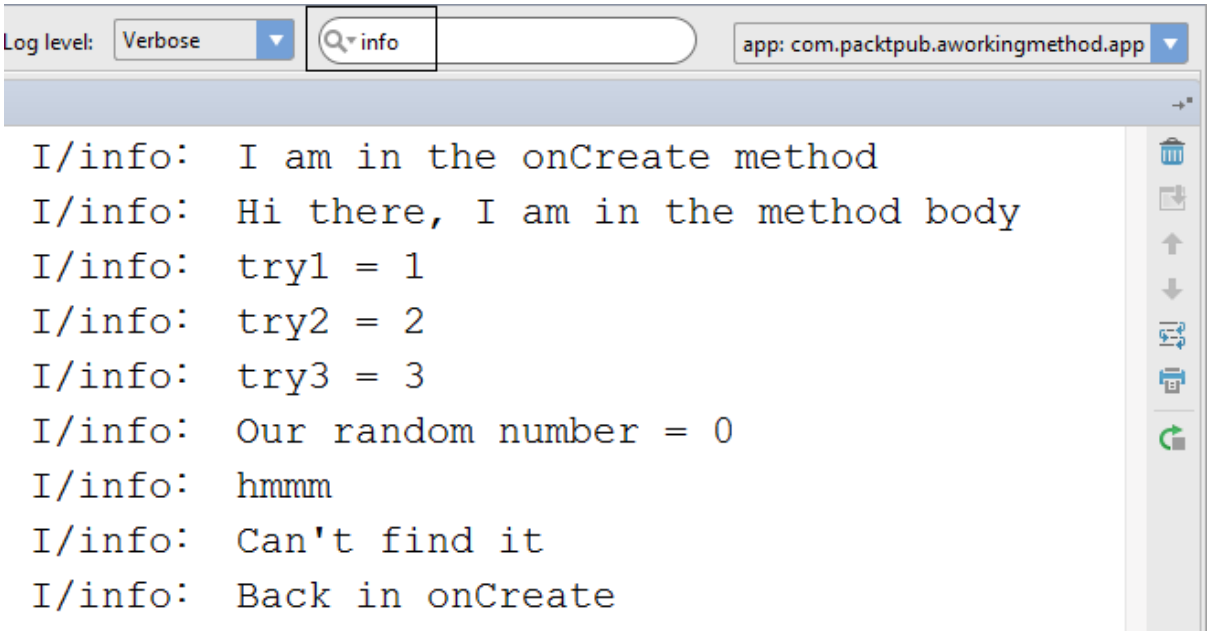
5554:nexus_4
3G
8:38
GameActivity
9
x
9
=
81
80
82



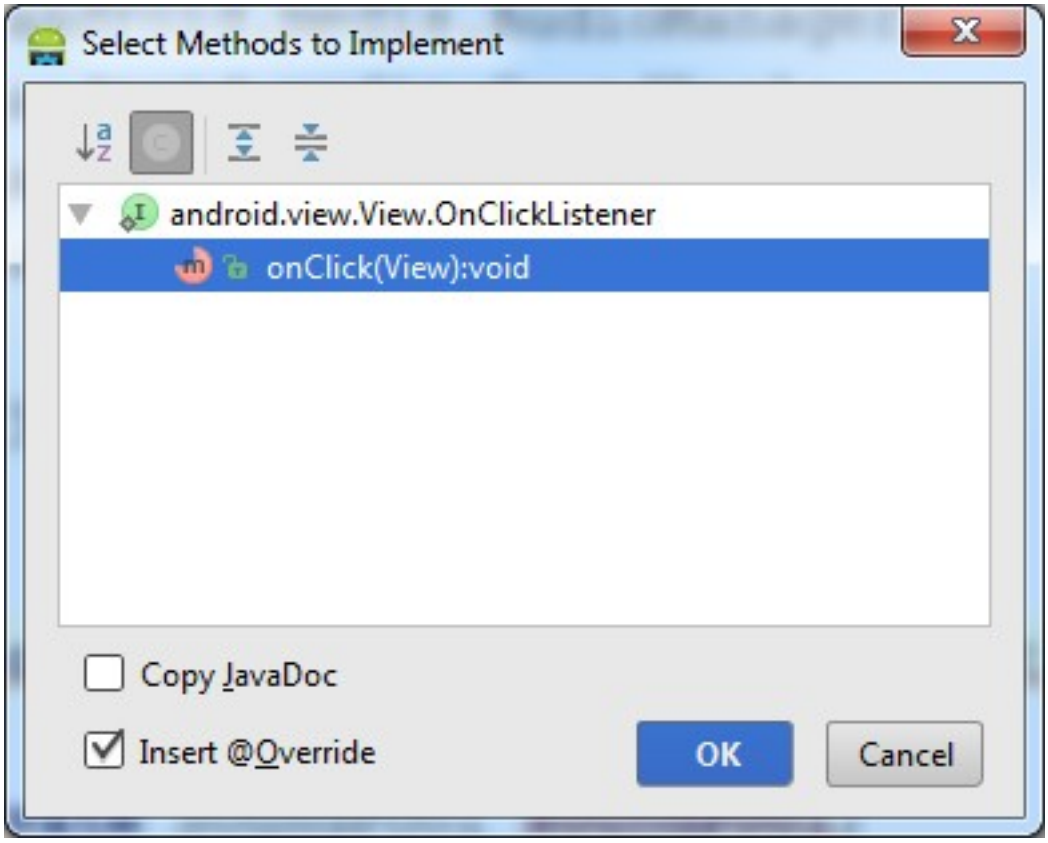
Chapter 4

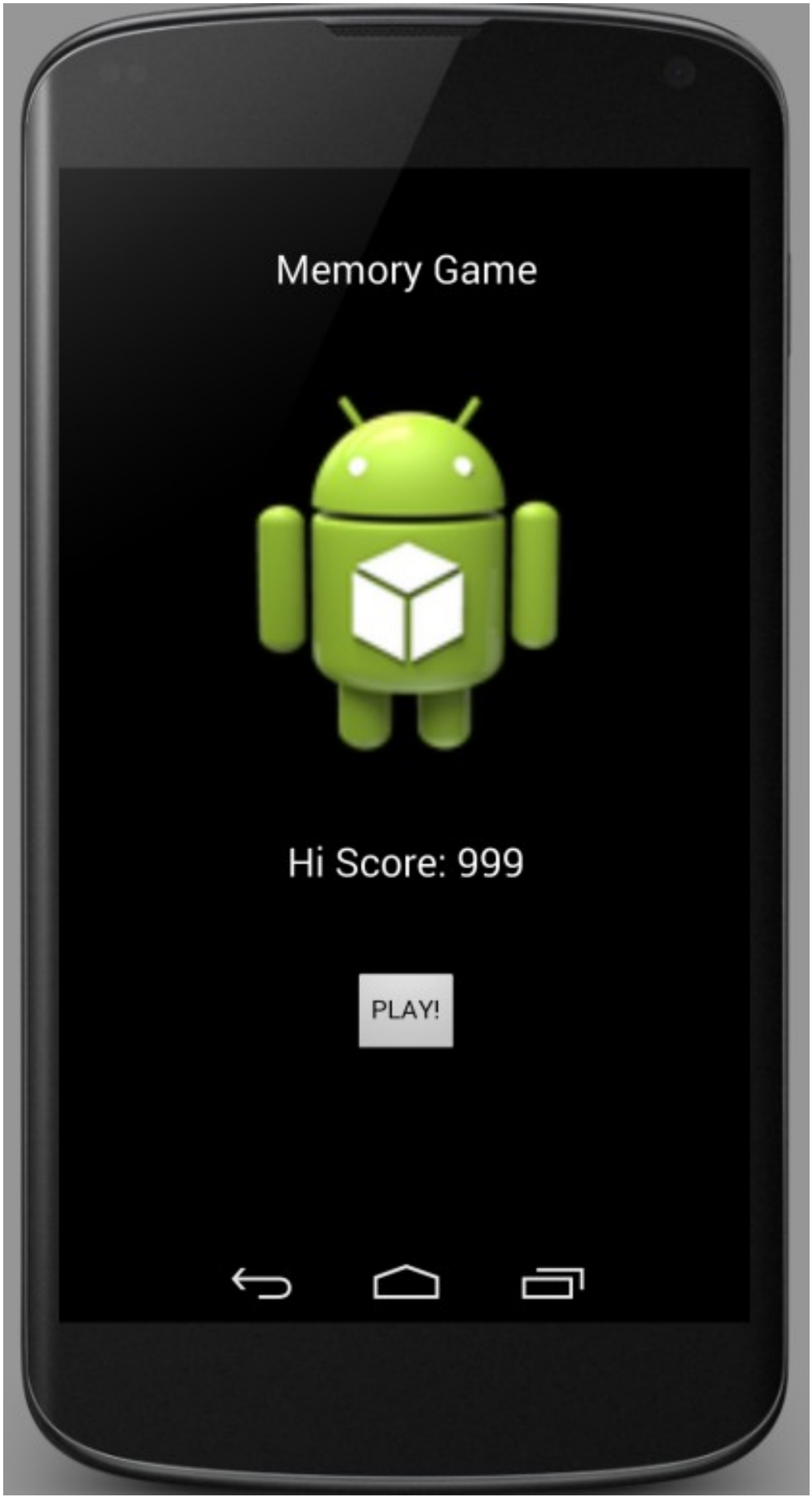
Discovering Loops and Methods


2 x 2
=
4
2
6
Well done!
Score: 10
Level: 4

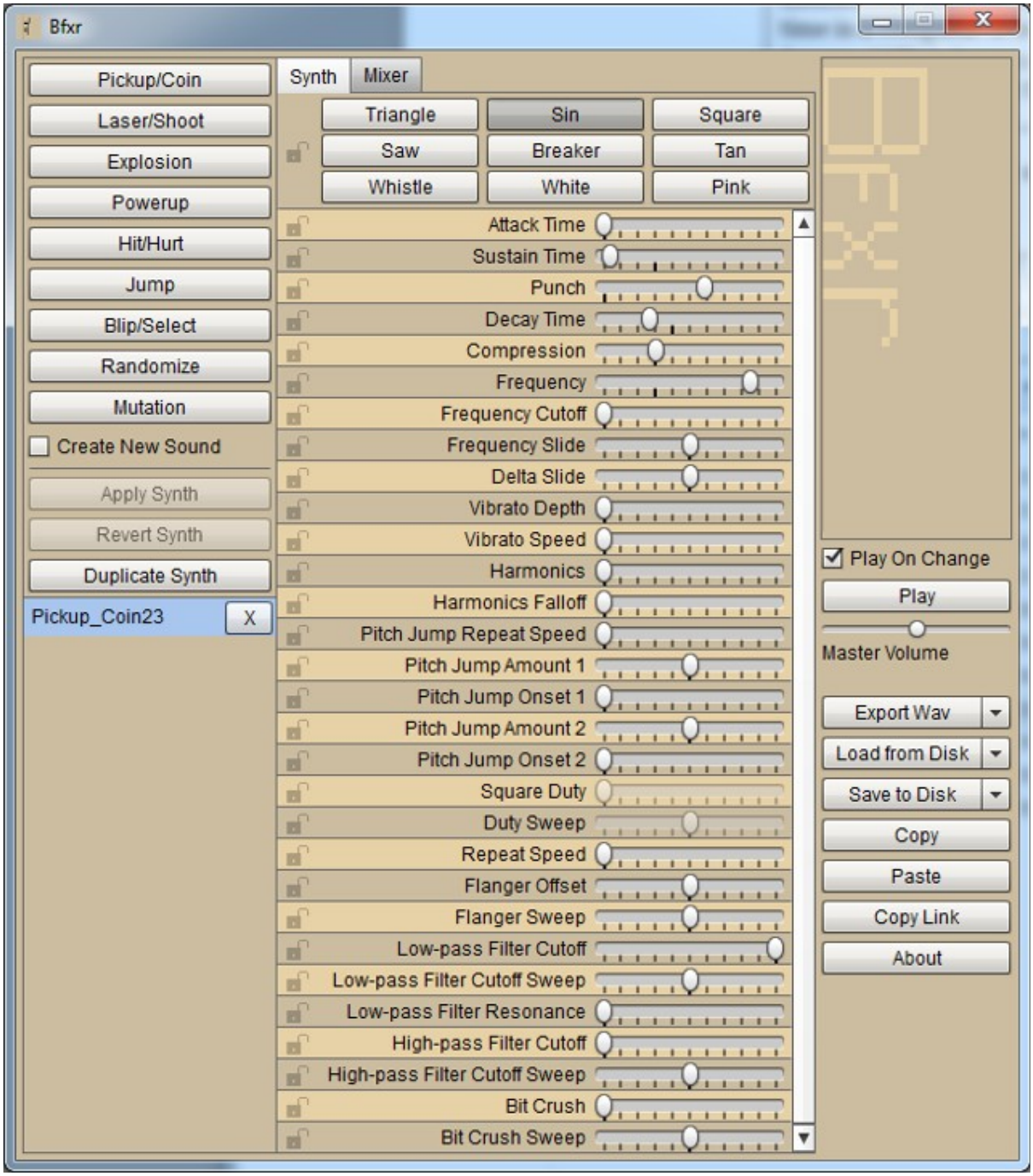

Log level:
Verbose
info
app: com.packtpub.aworkingmethod.app
I/info: I am in the onCreate method
I/info: Hi there, I am in the method body
I/info: try1 = 1
I/info: try2 = 2
I/info: try3 = 3
I/info: Our random number = 0
I/info: hmmm
I/info: Can't find it
I/info: Back in onCreate

```
I am in the onCreate method
Hi there, I am in the method body
try1 = 1
try2 = 2
try3 = 3
Our random number = 3
aha!
Found It!
Back in onCreate
```

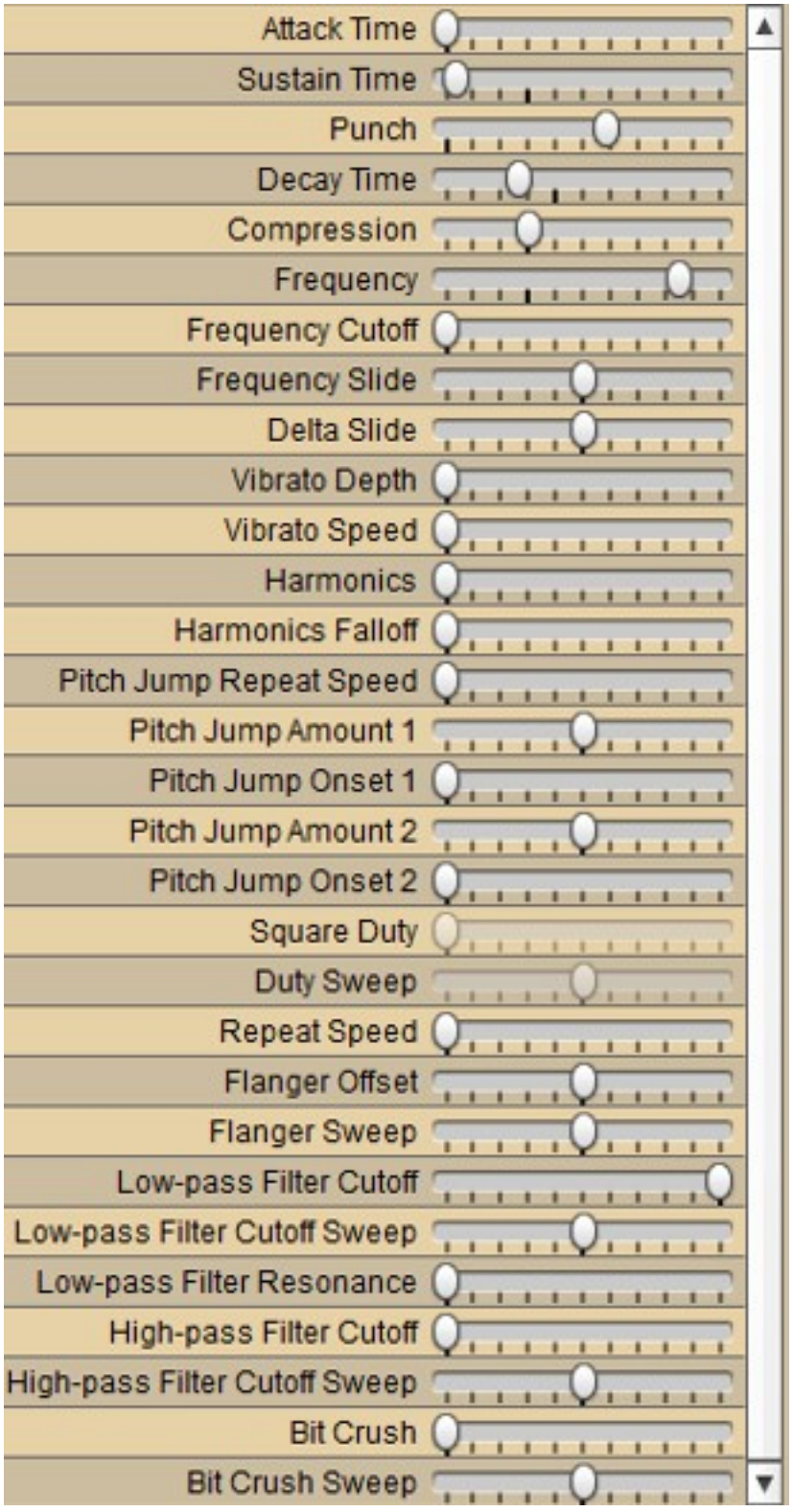

Select Methods to Implement
android.view.View.OnClickListener
onClick(View):void
Copy JavaDoc
Insert @Override
OK
Cancel


Memory Game
Hi Score: 999
PLAY!

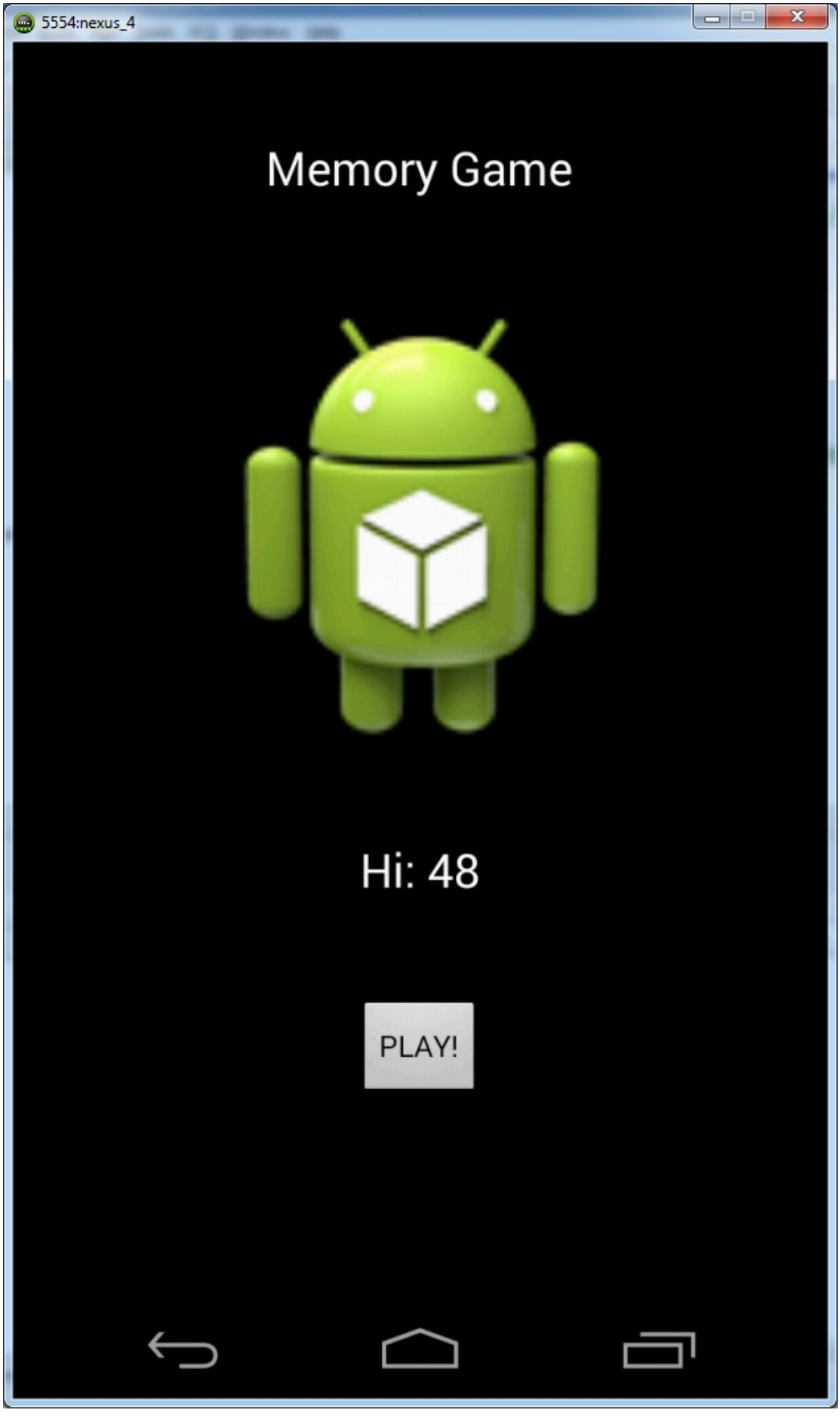
Score: 999
Difficulty: 4
Watch/Go
1
2
3
4
Replay

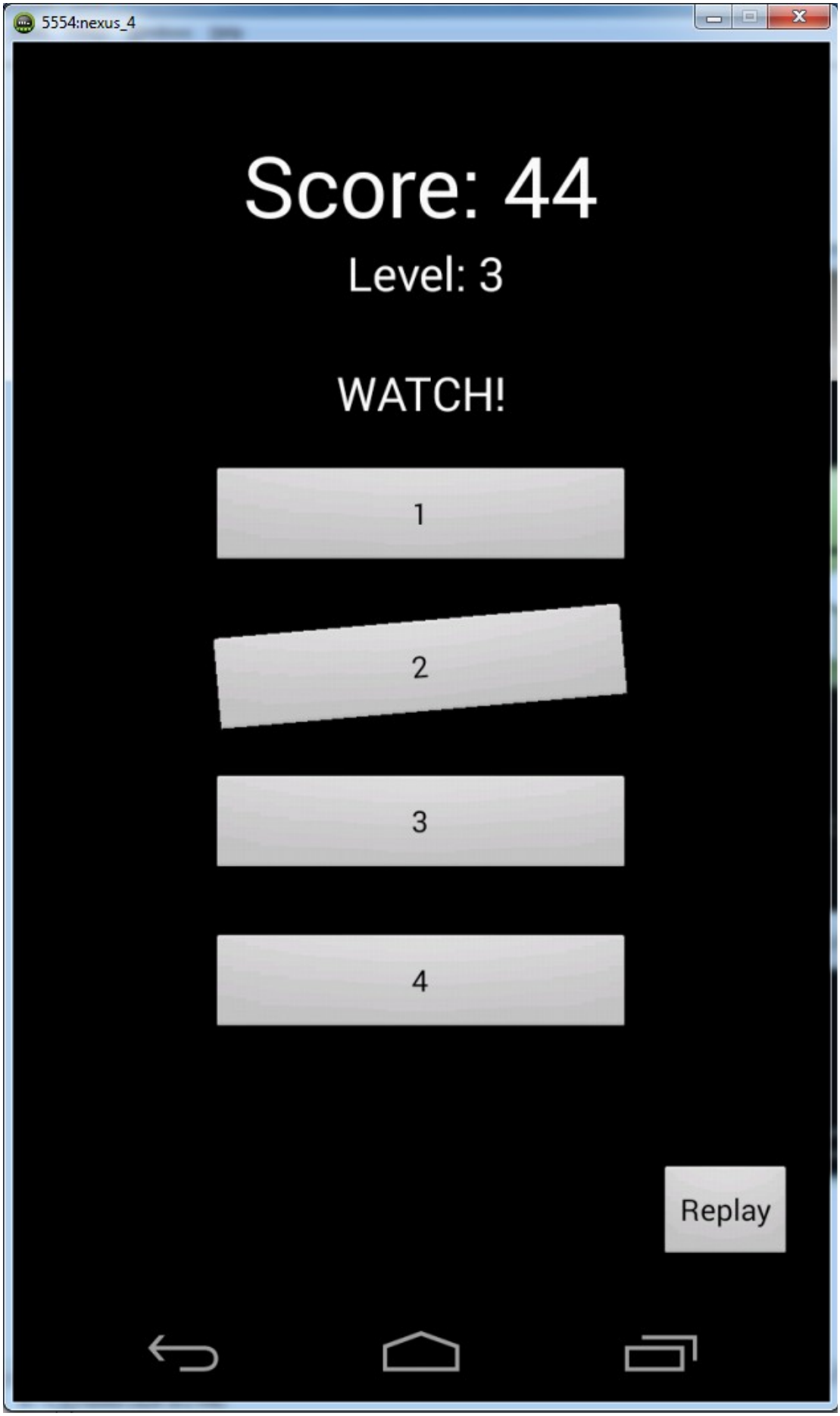

Bfxr
Pickup/Coin
Laser/Shoot
Explosion
Powerup
Hit/Hurt
Jump
Blip/Select
Randomize
Mutation
Create New Sound
Apply Synth
Revert Synth
Duplicate Synth
Pickup_Coin23
X
Synth
Mixer
Triangle
Sin
Square
Saw
Breaker
Tan
Whistle
White
Pink
Attack Time
Sustain Time
Punch
Decay Time
Compression
Frequency
Frequency Cutoff
Frequency Slide
Delta Slide
Vibrato Depth
Vibrato Speed
Harmonics
Harmonics Falloff
Pitch Jump Repeat Speed
Pitch Jump Amount 1
Pitch Jump Onset 1
Pitch Jump Amount 2
Pitch Jump Onset 2
Square Duty
Duty Sweep
Repeat Speed
Flanger Offset
Flanger Sweep
Low-pass Filter Cutoff
Low-pass Filter Cutoff Sweep
Low-pass Filter Resonance
High-pass Filter Cutoff
High-pass Filter Cutoff Sweep
Bit Crush
Bit Crush Sweep
Play On Change
Play
Master Volume
Export Wav
Load from Disk
Save to Disk
Copy
Paste
Copy Link
About

Pickup/Coin
Laser/Shoot
Explosion
Powerup
Hit/Hurt
Jump
Blip/Select
Randomize
Mutation


Attack Time
Sustain Time
Punch
Decay Time
Compression
Frequency
Frequency Cutoff
Frequency Slide
Delta Slide
Vibrato Depth
Vibrato Speed
Harmonics
Harmonics Falloff
Pitch Jump Repeat Speed
Pitch Jump Amount 1
Pitch Jump Onset 1
Pitch Jump Amount 2
Pitch Jump Onset 2
Square Duty
Duty Sweep
Repeat Speed
Flanger Offset
Flanger Sweep
Low-pass Filter Cutoff
Low-pass Filter Cutoff Sweep
Low-pass Filter Resonance
High-pass Filter Cutoff
High-pass Filter Cutoff Sweep
Bit Crush
Bit Crush Sweep

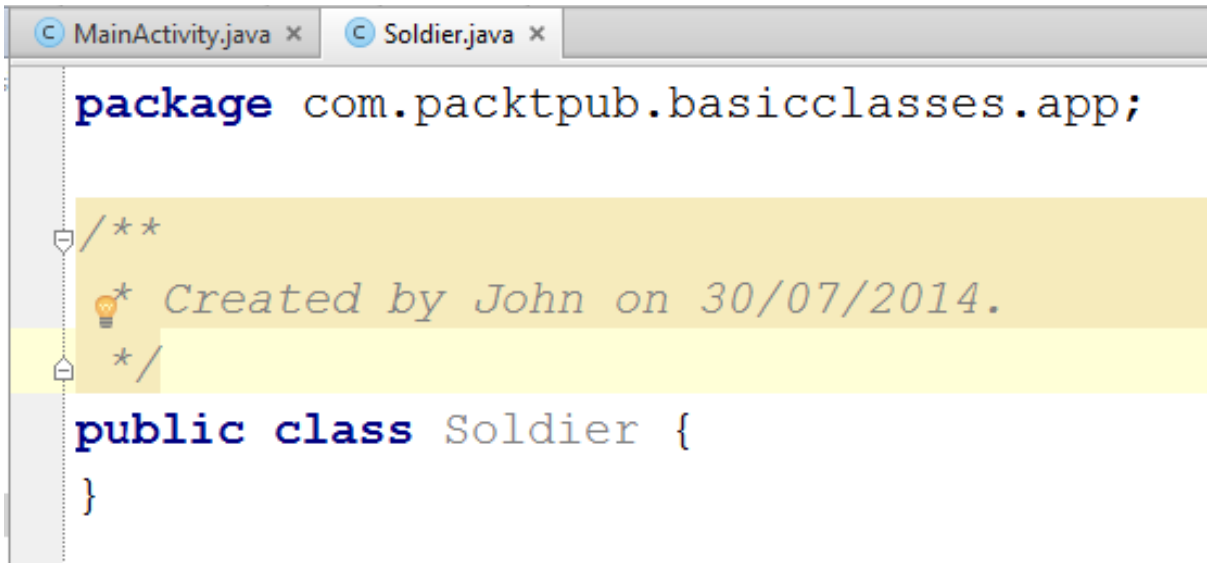
Export Wav


5554:nexus_4
Memory Game
Hi: 48
PLAY!


5554:nexus_4
Score: 44
Level: 3
WATCH!
1
2
3
4
Replay

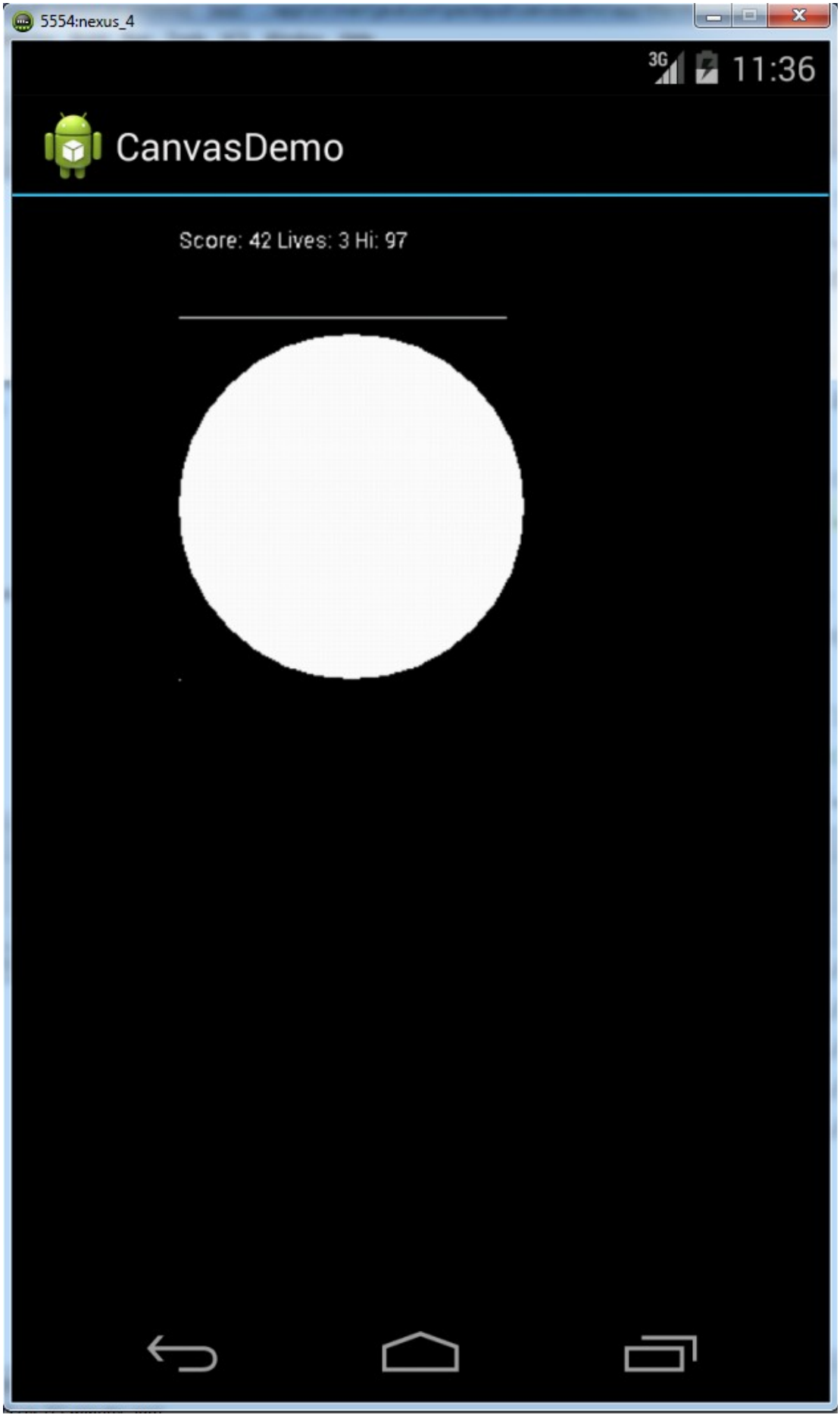
Chapter 6

OOP – Using Other People's Hard Work

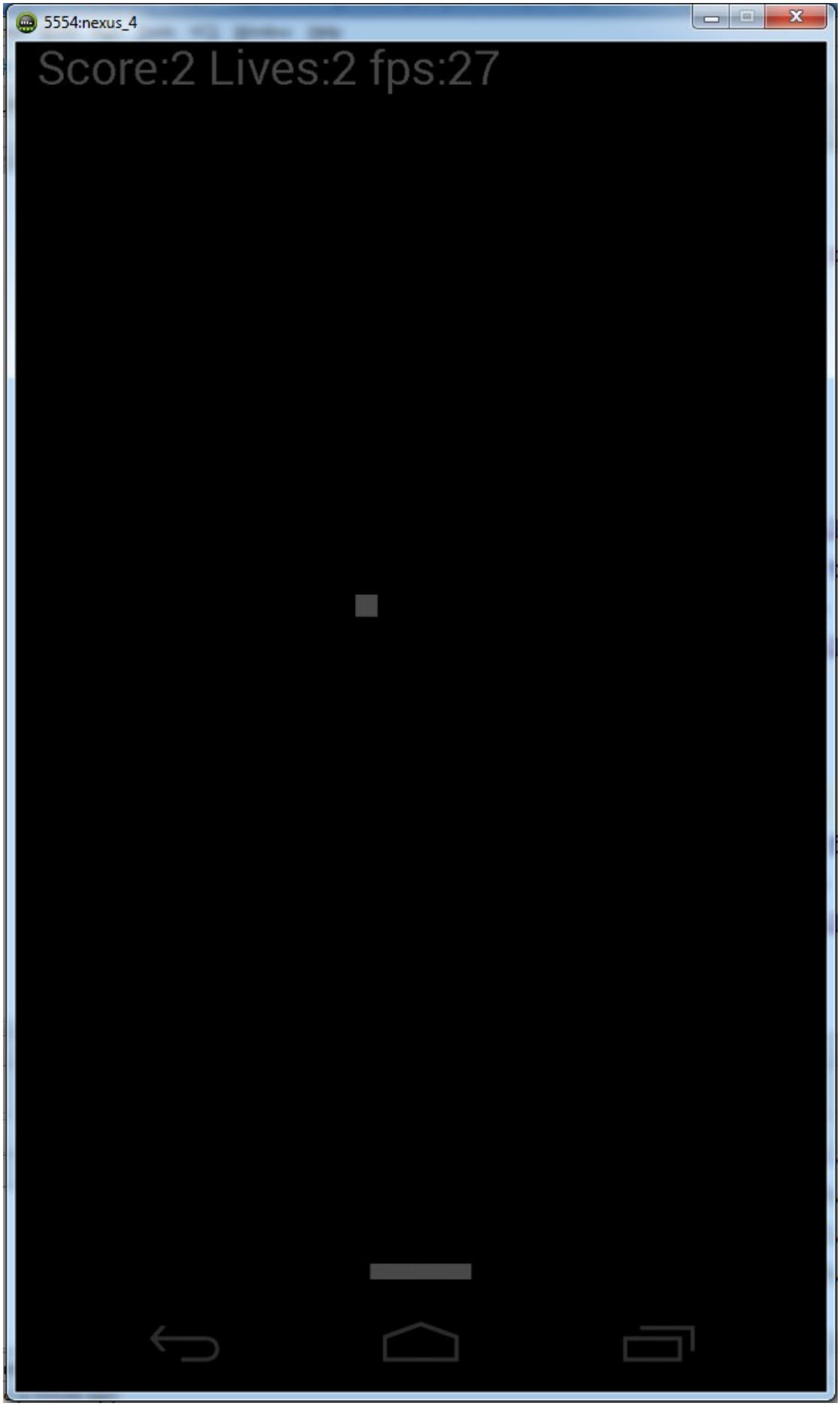


Chapter 7

Retro Squash Game

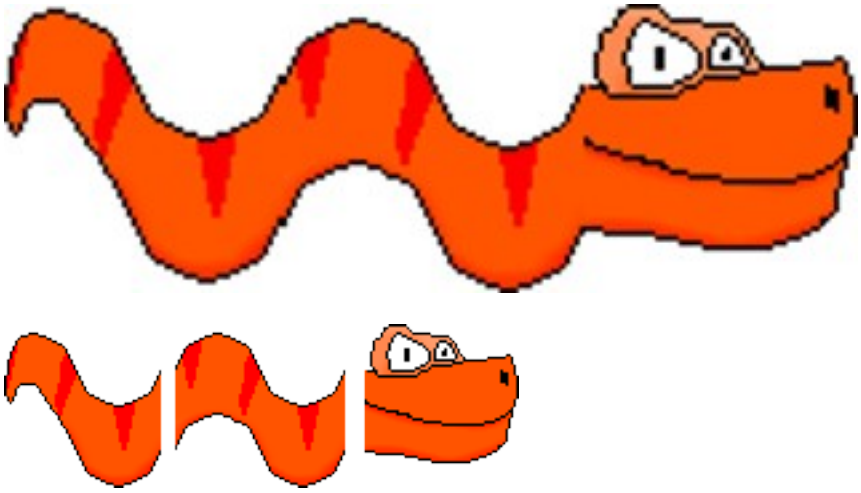

5554:nexus_4
11:36
CanvasDemo
Score: 42 Lives: 3 Hi: 97

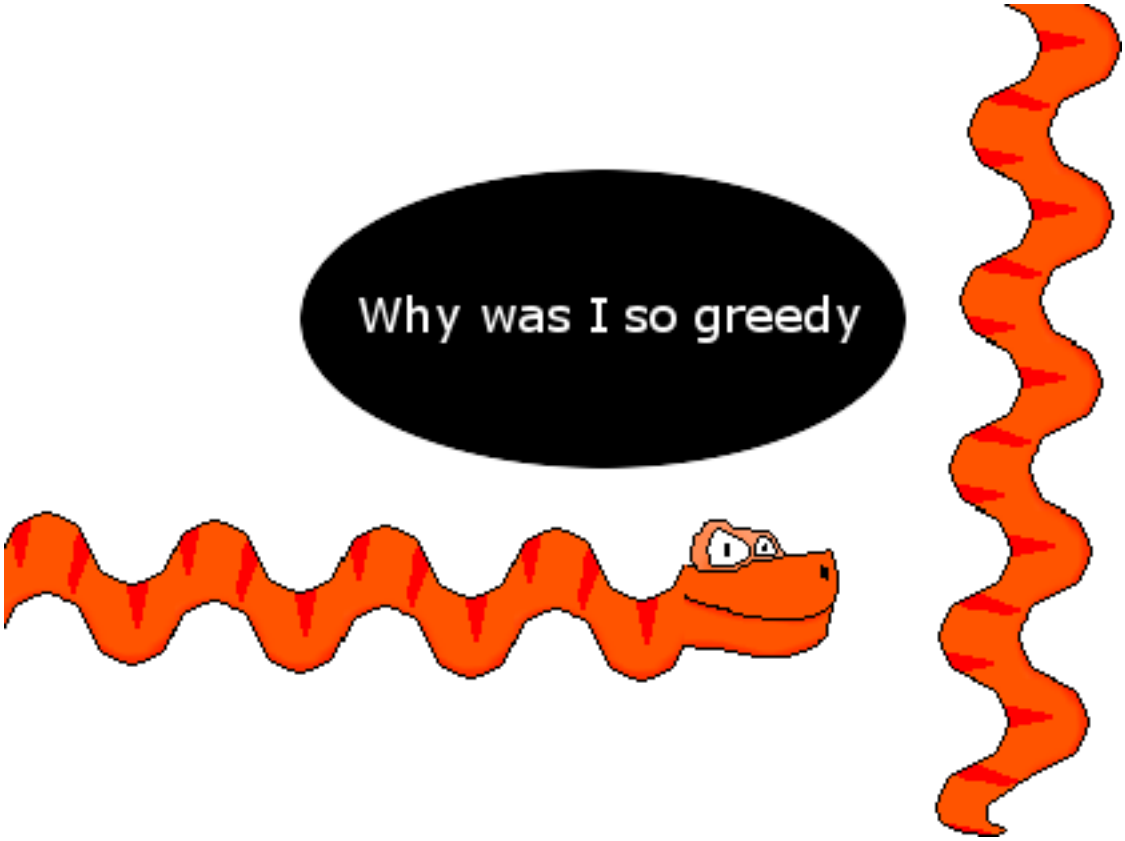
Blip/Select

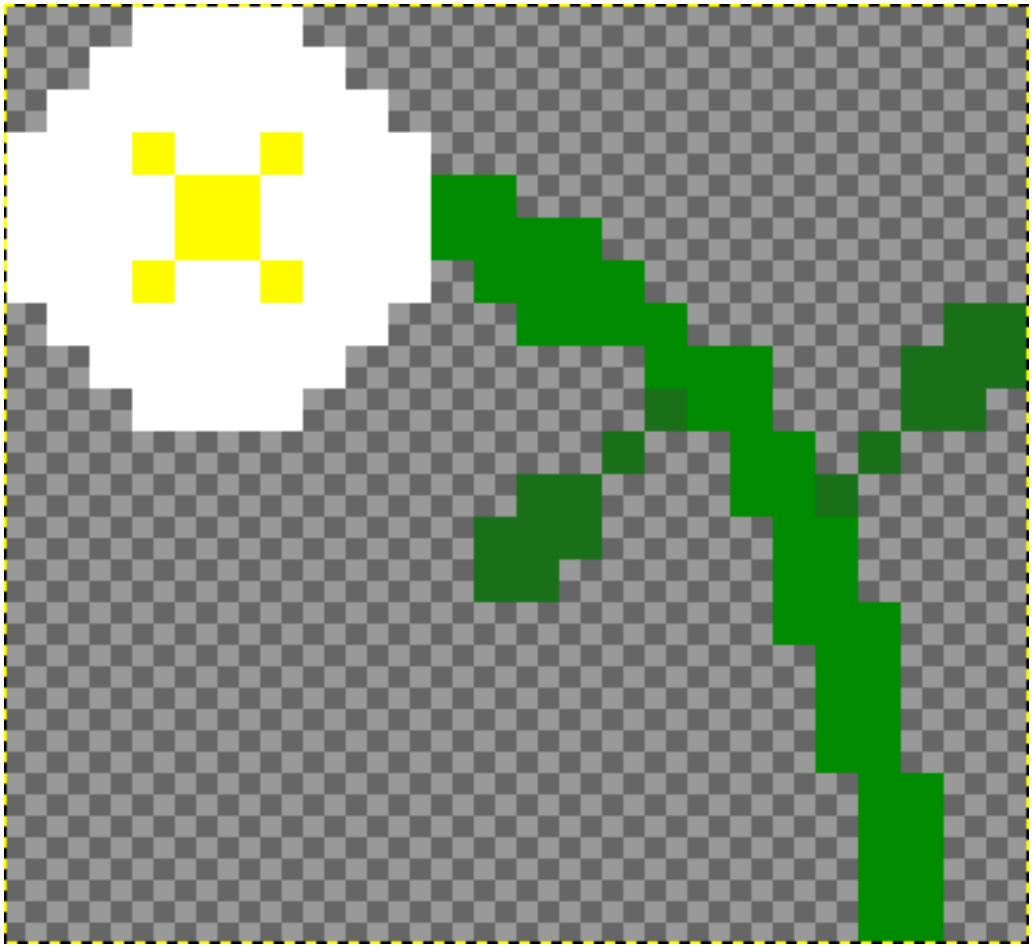

5554:nexus_4
Score:2 Lives:2 fps:27

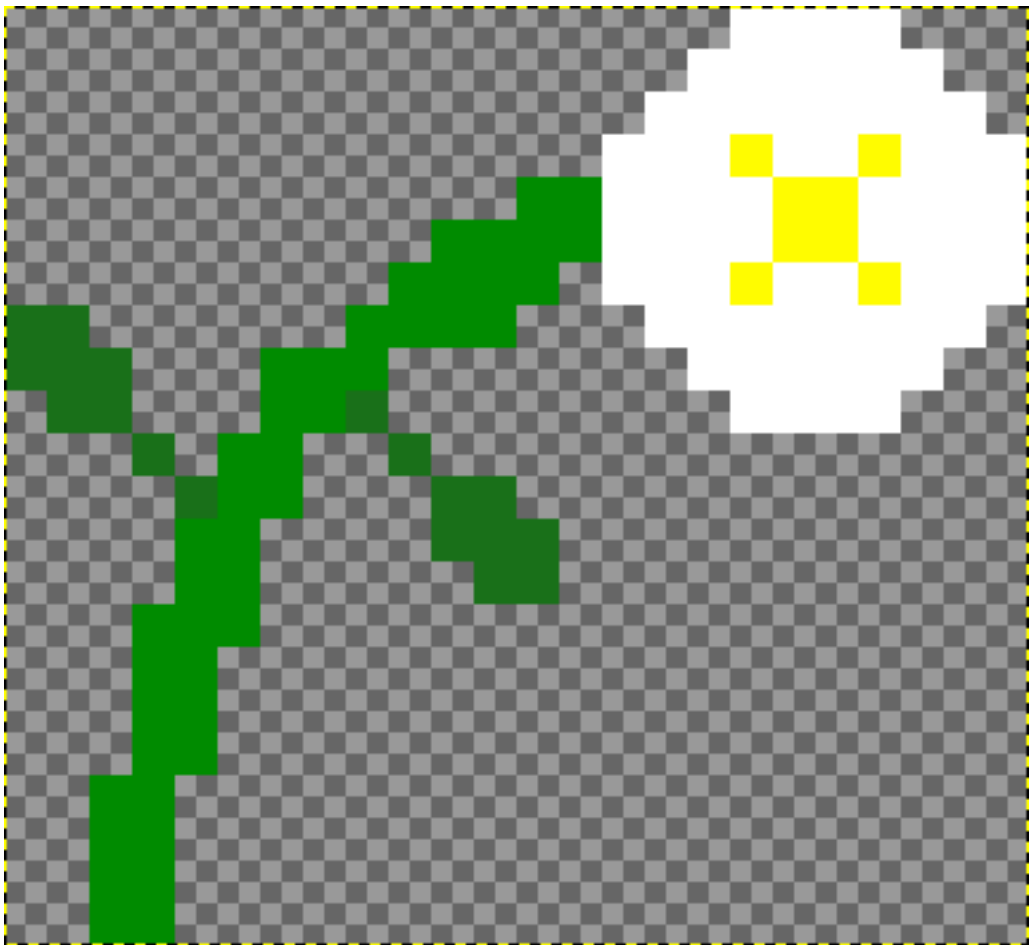
Chapter 8

The Snake Game

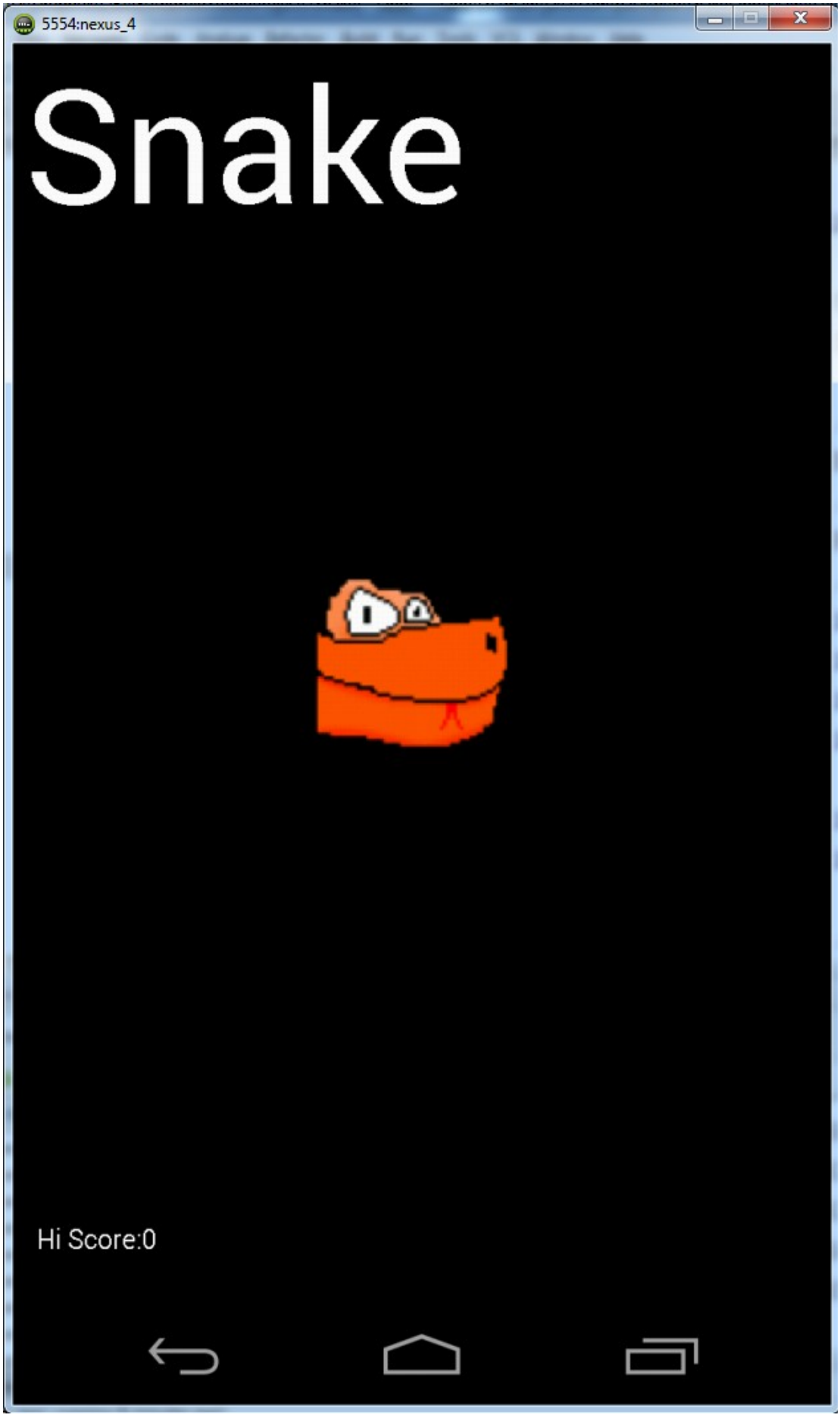


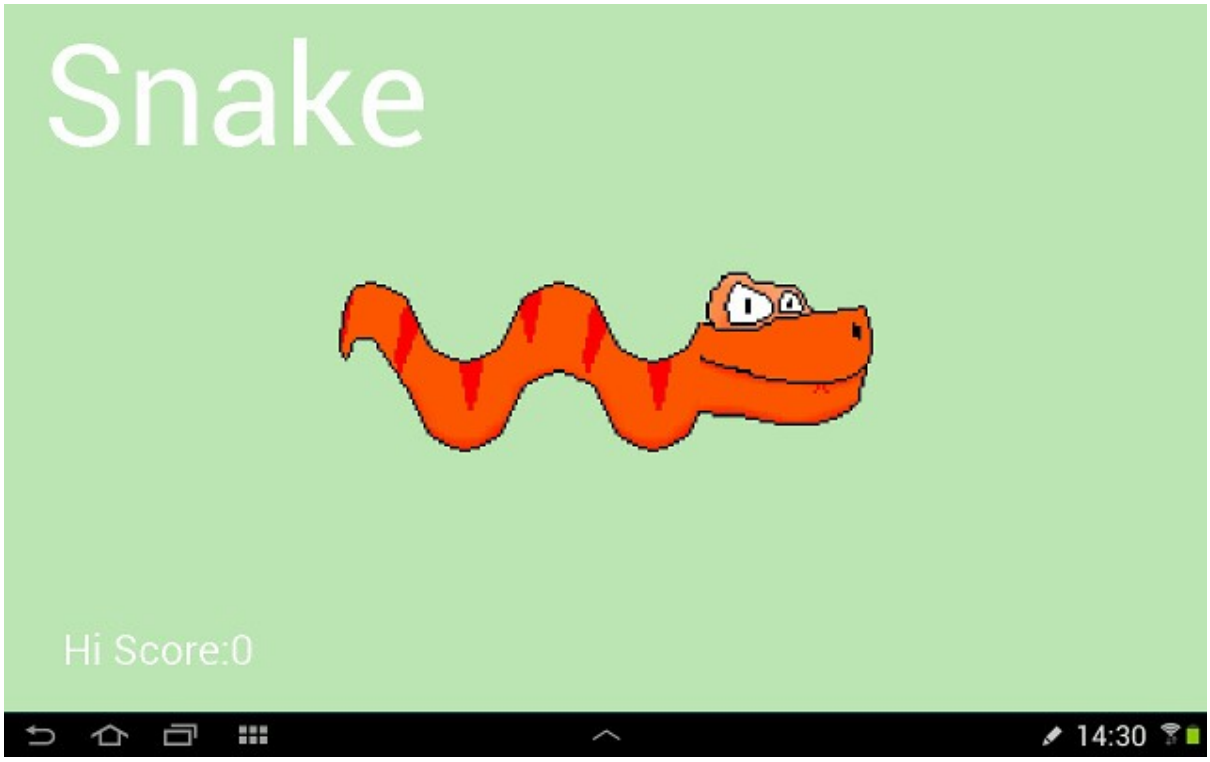

Why was I so greedy

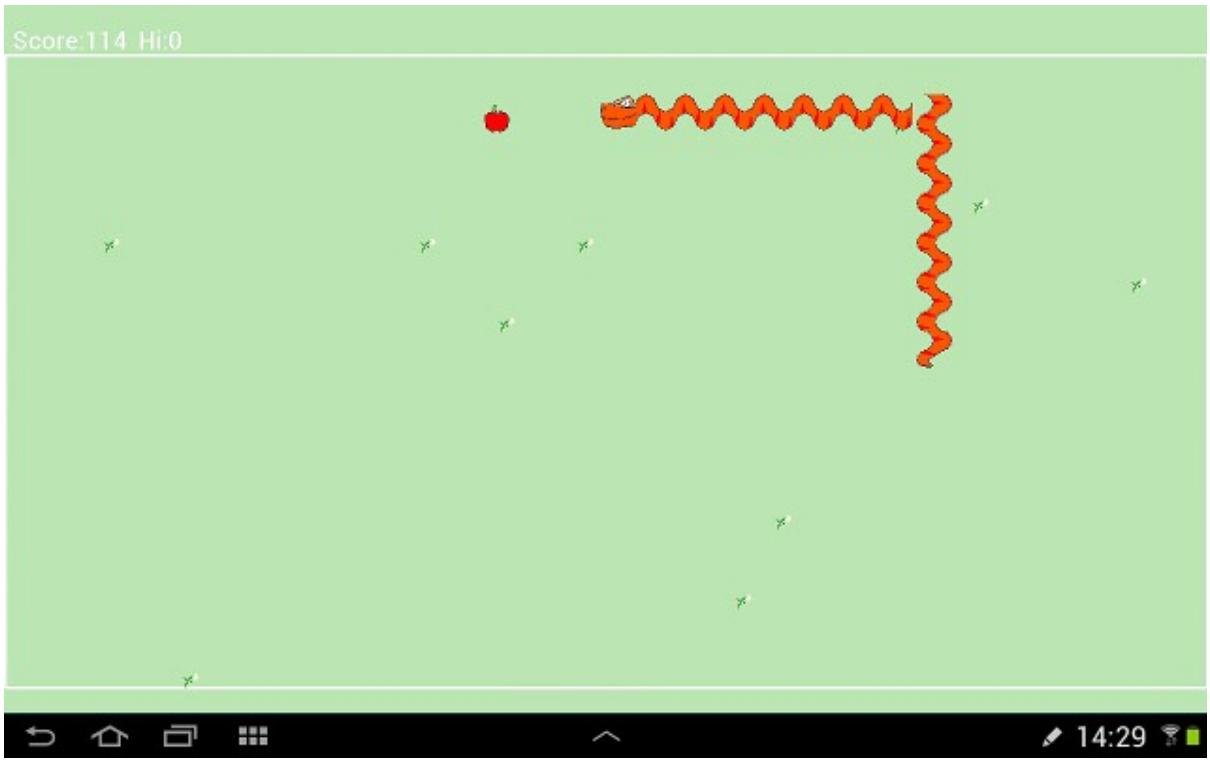




Score:0 Hi:0


5554:nexus_4
Snake
Hi Score:0

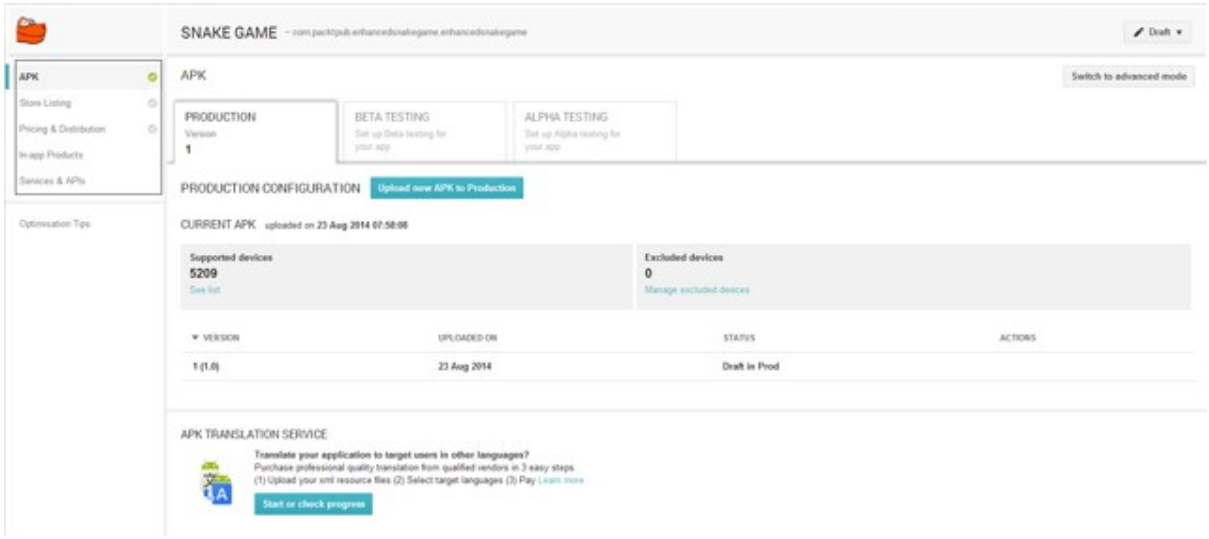


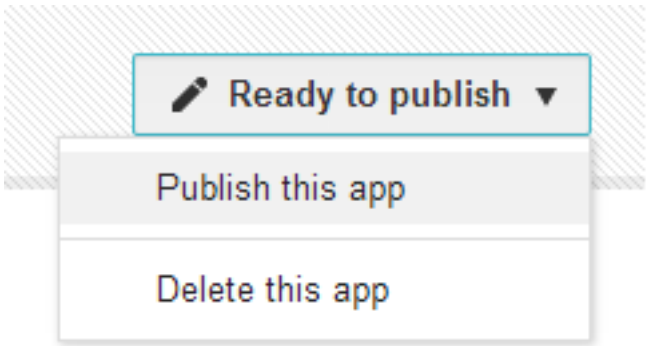


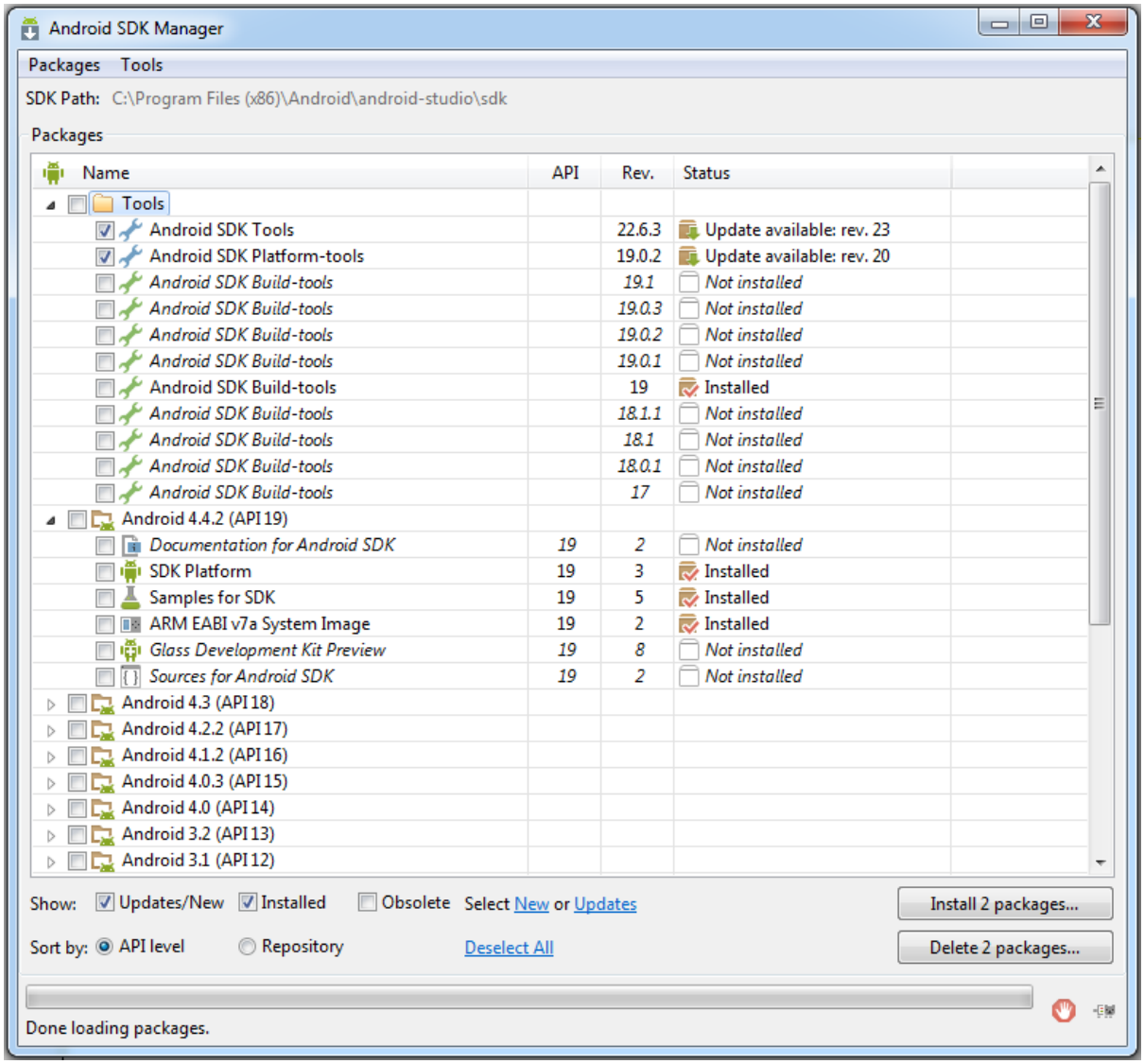
Chapter 9

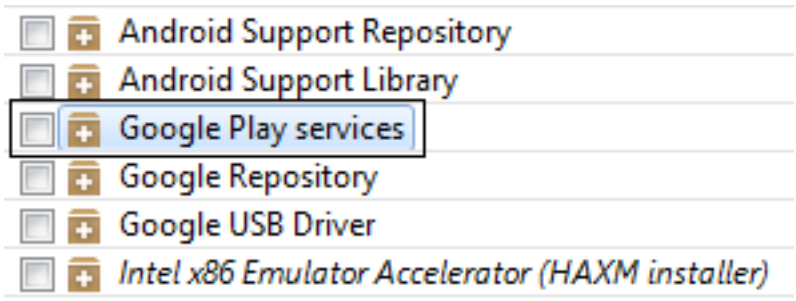
Making Your Game the Next Big Thing

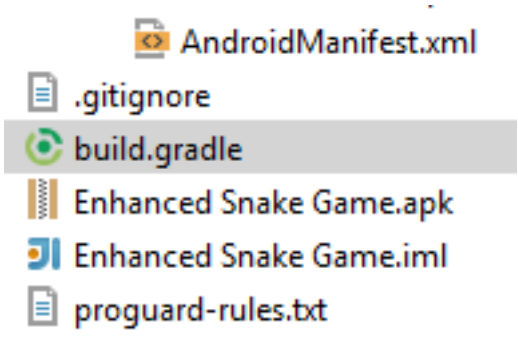
ALL APPLICATIONS
+ Add new application

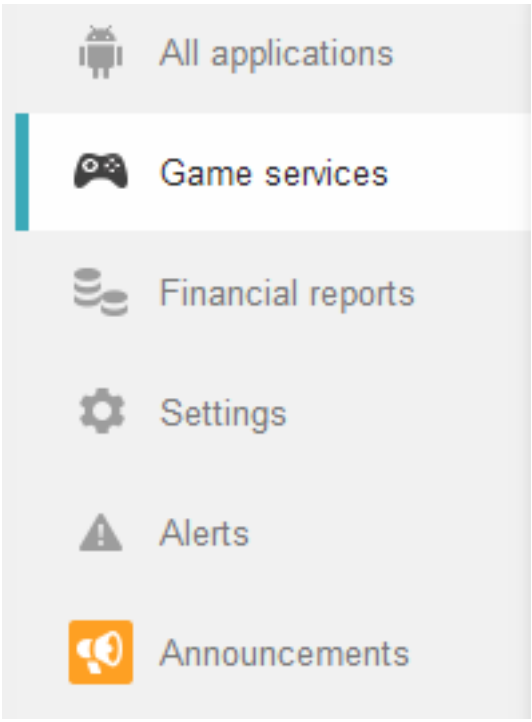

SNAKE GAME
APK
Store Listing
Pricing & Distribution
In-app Products
Services & APIs
Optimisation Tips
Draft
APK
Switch to advanced mode
PRODUCTION
Version
1
BETA TESTING
ALPHA TESTING
PRODUCTION CONFIGURATION
Upload new APK to Production
CURRENT APK uploaded on 23 Aug 2014 07:58:08
Supported devices
5209
See list
Excluded devices
0
Manage excluded devices
VERSION
UPLOADED ON
STATUS
ACTIONS
1 (1.0)
23 Aug 2014
Draft in Prod
APK TRANSLATION SERVICE
Translate your application to target users in other languages?
Purchase professional quality translation from qualified vendors in 3 easy steps
(1) Upload your xml resource files (2) Select target languages (3) Pay Learn more
Start or check progress


Ready to publish
Publish this app
Delete this app


Android SDK Manager
Packages Tools
SDK Path: C:\Program Files (x86)\Android\android-studio\sdk
Packages
Name API Rev. Status
Tools
Android SDK Tools 22.6.3 Update available: rev. 23
Android SDK Platform-tools 19.0.2 Update available: rev. 20
Android SDK Build-tools 19.1 Not installed
Android SDK Build-tools 19.0.3 Not installed
Android SDK Build-tools 19.0.2 Not installed
Android SDK Build-tools 19.0.1 Not installed
Android SDK Build-tools 19 Installed
Android SDK Build-tools 18.1.1 Not installed
Android SDK Build-tools 18.1 Not installed
Android SDK Build-tools 18.0.1 Not installed
Android SDK Build-tools 17 Not installed
Android 4.4.2 (API 19)
Documentation for Android SDK 19 2 Not installed
SDK Platform 19 3 Installed
Samples for SDK 19 5 Installed
ARM EABI v7a System Image 19 2 Installed
Glass Development Kit Preview 19 8 Not installed
Sources for Android SDK 19 2 Not installed
Android 4.3 (API 18)
Android 4.2.2 (API 17)
Android 4.1.2 (API 16)
Android 4.0.3 (API 15)
Android 4.0 (API 14)
Android 3.2 (API 13)
Android 3.1 (API 12)
Show: Updates/New Installed Obsolete Select New or Updates
Install 2 packages...
Sort by: API level Repository Deselect All
Delete 2 packages...
Done loading packages.


Android Support Repository
Android Support Library
Google Play services
Google Repository
Google USB Driver
Intel x86 Emulator Accelerator (HAXM installer)


AndroidManifest.xml
.gitignore
build.gradle
Enhanced Snake Game.apk
Enhanced Snake Game.iml
proguard-rules.txt


All applications
Game services
Financial reports
Settings
Alerts
Announcements

SET UP GOOGLE PLAY GAME SERVICES FOR AN APP

Do you already use Google APIs in your app?

I don't use any Google APIs in my game yet | I already use Google APIs in my game

What is the name of your game?

Snake

5 of 30 characters

This is the name that will be displayed to users in Google Play game services.

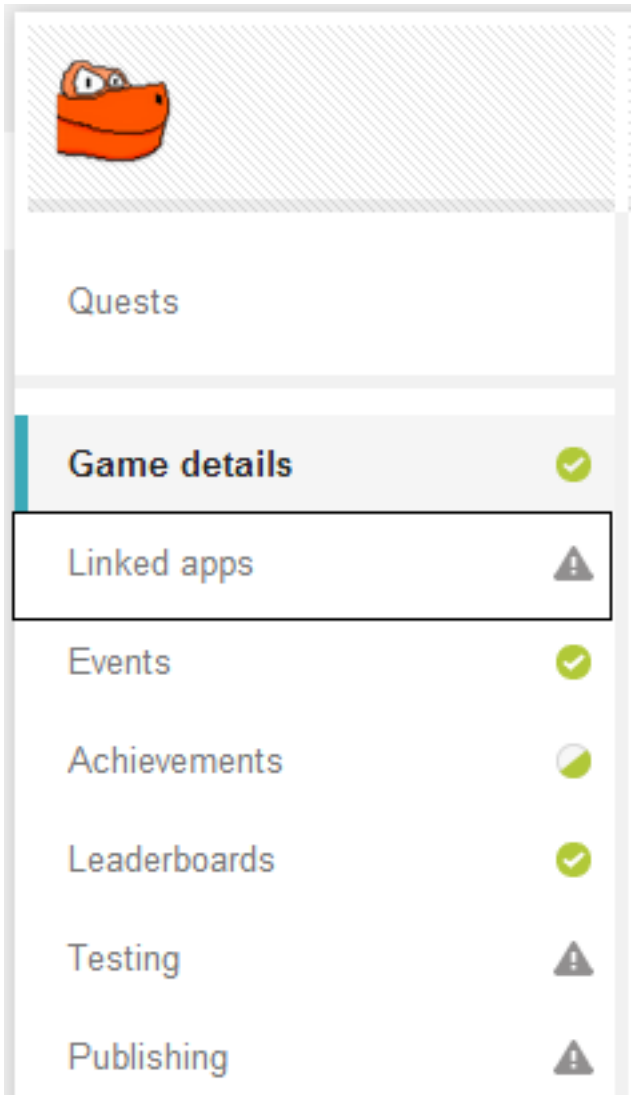
What kind of game is it?

Arcade ▼

The category helps users browse interesting games.

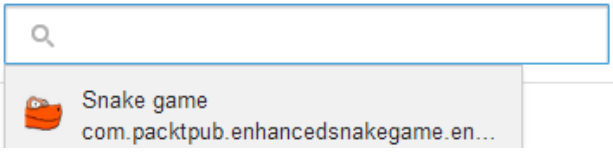
Google Play game services use the following APIs: Google Play App State, Google+ API, Google Play Game Services and Google Play Game Management
We will automatically create a project for your game on the Google Developers Console and enable the necessary APIs for you.

Continue Cancel



Android

Package name



Branding Information

The following information will be shown to users whenever you request access to their private data using your new client ID.

Product name: Snake

Google account: [redacted].com - **you**

Link your project to this account's profile and reputation.

Product logo: https://lh6.ggpht.com/G1KFr1QHwDs2ZTptd2AABga7bU

Update

Max size: 120x60 pixels

Home Page URL:

Continue Cancel

Client ID Settings

Application type

(•) Installed application

Runs on a desktop computer or handheld device (like Android or iPhone).

Installed application type

(•) Android Learn more

API requests are sent directly to Google from your clients' Android devices. Google verifies that each request originates from an Android application that matches the package name and SHA1 signing certificate fingerprint name listed below.

Package name:

(Example: `com.example`)

com.packtpub.enhancedsnakegame.enhance

Signing certificate fingerprint (SHA1):

(Example: `21:45:BD:F6:98:B8:71:50:39:BD:0E:83:F2:06:9B:ED:43:5A:C2:1C`)

[redacted]

Create client Cancel

NEW LEADERBOARD Save Save and add another leaderboard

English (United States) – en-US

Name
English (United States) – en-US
0 of 100 characters

Score formatting
Numeric
Number of decimal places:
0
Add customised unit

What it will look like:
123,450,000

Icon
512 × 512
png or jpg
(optional)

+
Add icon
Drop image here

If no icon is provided, a standard leaderboard icon will be shown to the users.

Ordering
Larger is better | Smaller is better

Limits
(optional)
Do not allow scores below this value:
Do not allow scores above this value:
Leave fields blank for no limit.

List order
1 of 1

NEW ACHIEVEMENT Save Save and add another achievement

English (United States) – en-US

Name
English (United States) – en-US
0 of 100 characters

Description
English (United States) – en-US
(optional for testing)
0 of 500 characters

Icon
512 × 512
png or jpg
(optional for testing)

+
Add icon
Drop image here

Incremental achievements
Are there several steps the user needs to achieve before this achievement is unlocked?

Initial state
Revealed | Hidden

Points
5 of 1,000 achievement points distributed
The point value needs to be between 5 and 200 and needs to be a multiple of 5.

List order
1 of 1

Incremental achievements

Are there several steps the user needs to achieve before this achievement is unlocked?

How many steps are needed?

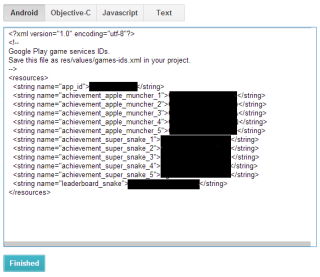
5 Enter a value between 2 and 10,000

5	**Apple Muncher 5**	CgkIrJ3indUHEAIQBg

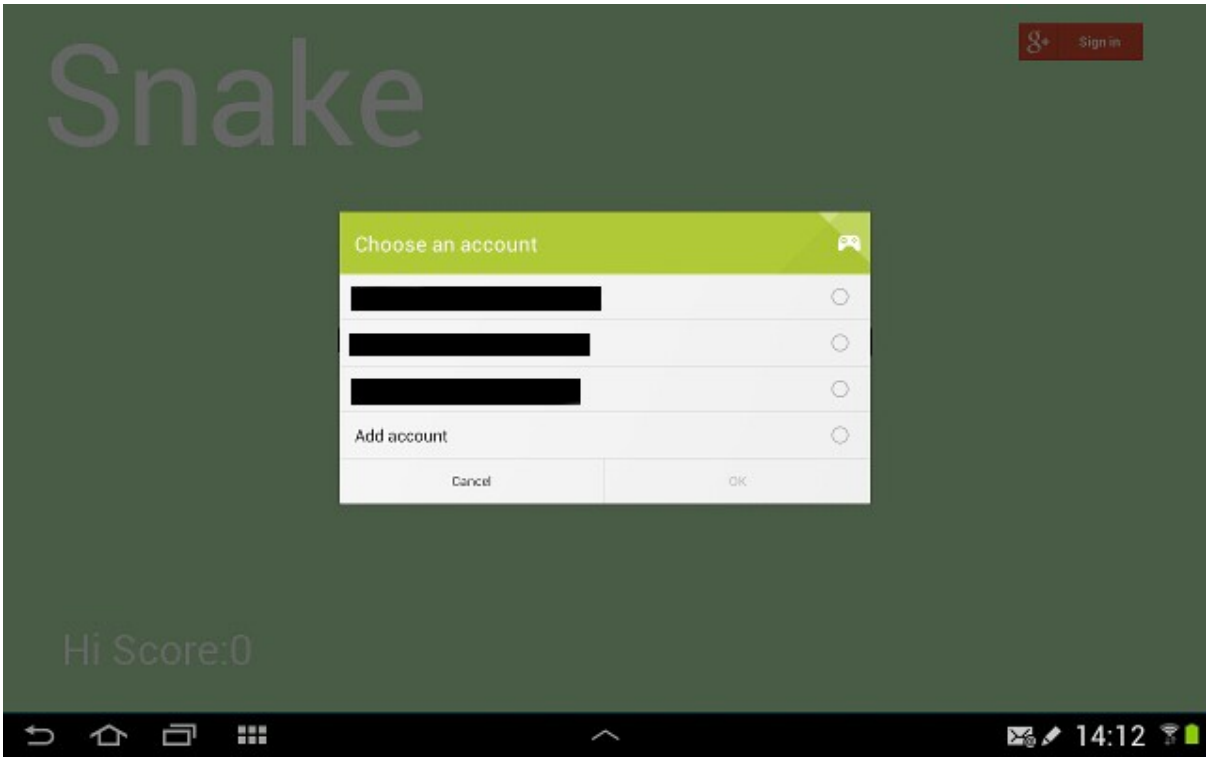
Get resources

Learn all about implementing achievements in the developer documentation.

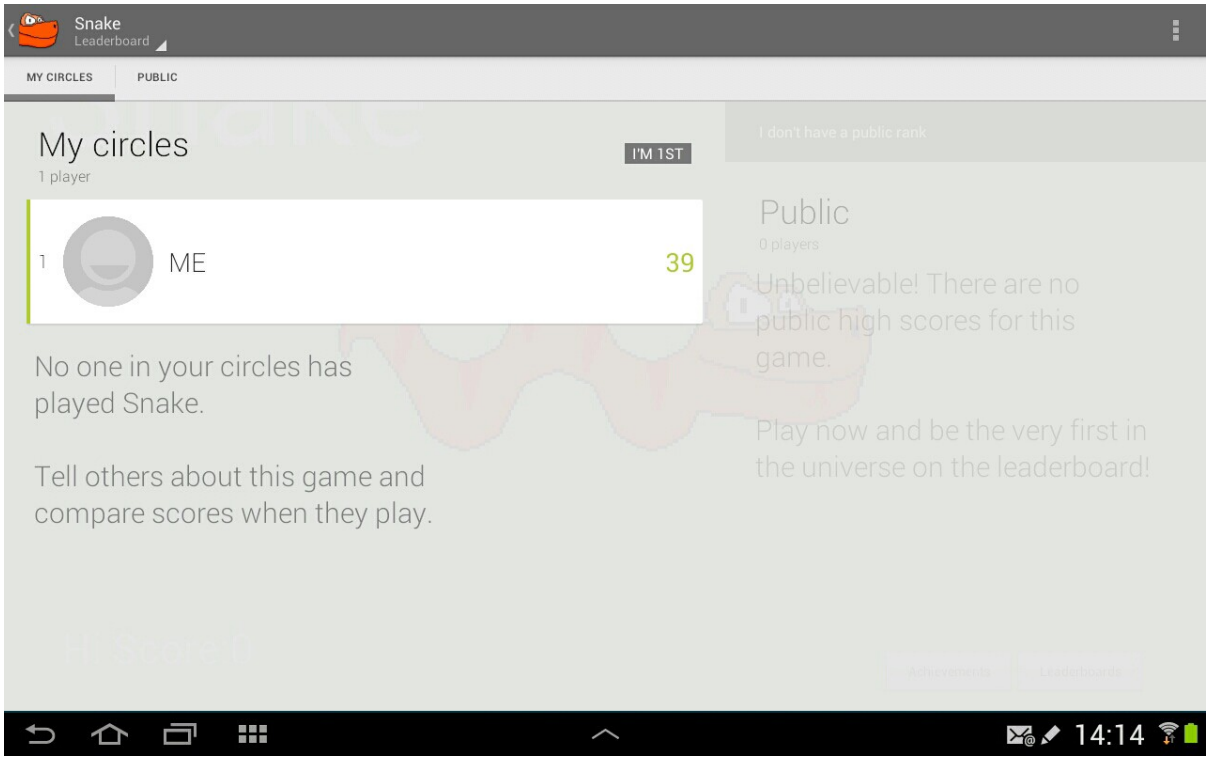
EXPORT RESOURCES

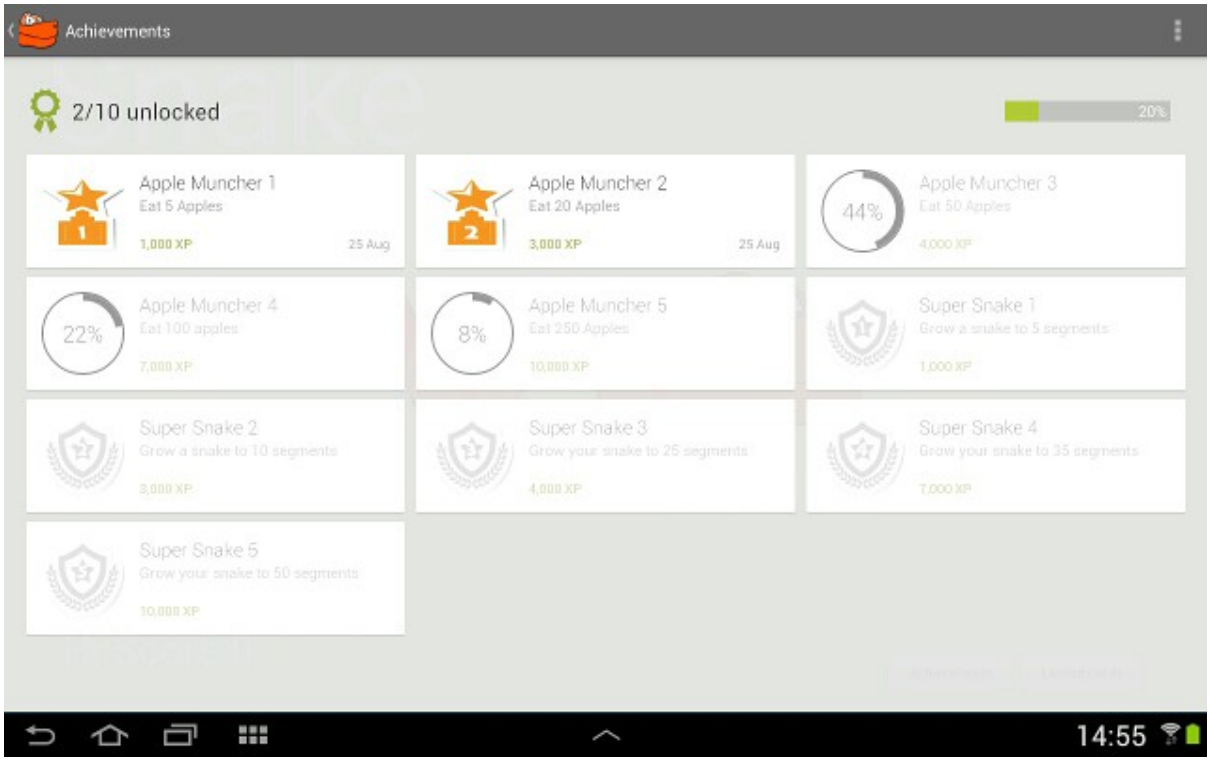


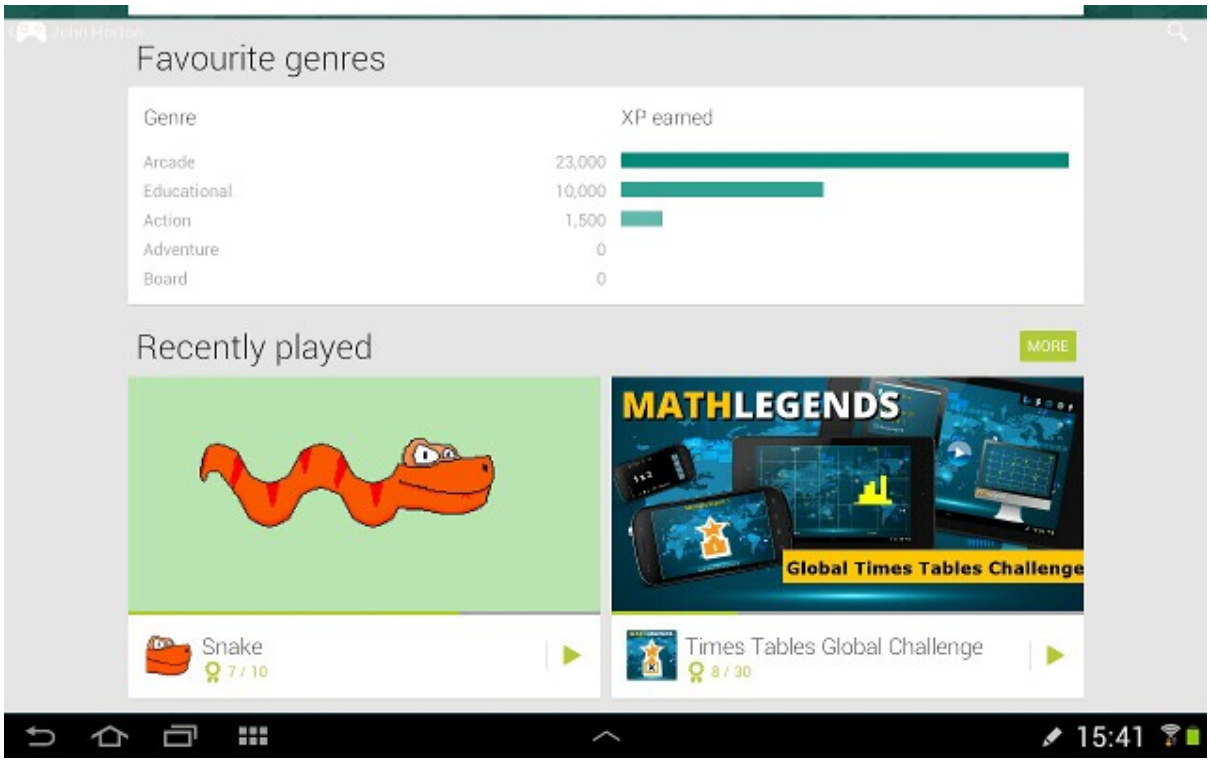
Sign Out
Achievements
Leaderboards


Snake
Sign in
Choose an account
Add account
Cancel
OK
Hi Score:0
14:12

Snake
WELCOME
John Horton
Sign Out
Hi Score:0
Achievements
Leaderboards
14:13

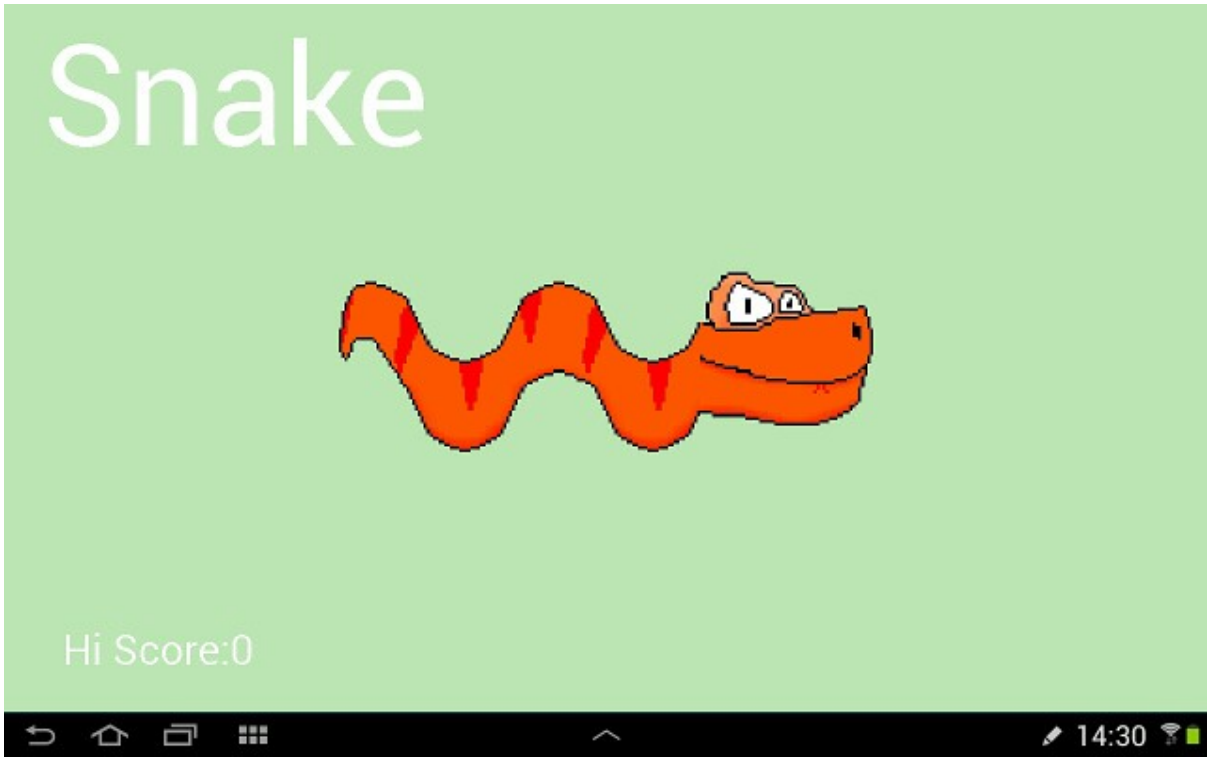

Snake
Leaderboard
MY CIRCLES
PUBLIC
My circles
1 player
I'M 1ST
1
ME
39
No one in your circles has played Snake.
Tell others about this game and compare scores when they play.
I don't have a public rank
Public
0 players
Unbelievable! There are no public high scores for this game.
Play now and be the very first in the universe on the leaderboard!
14:14

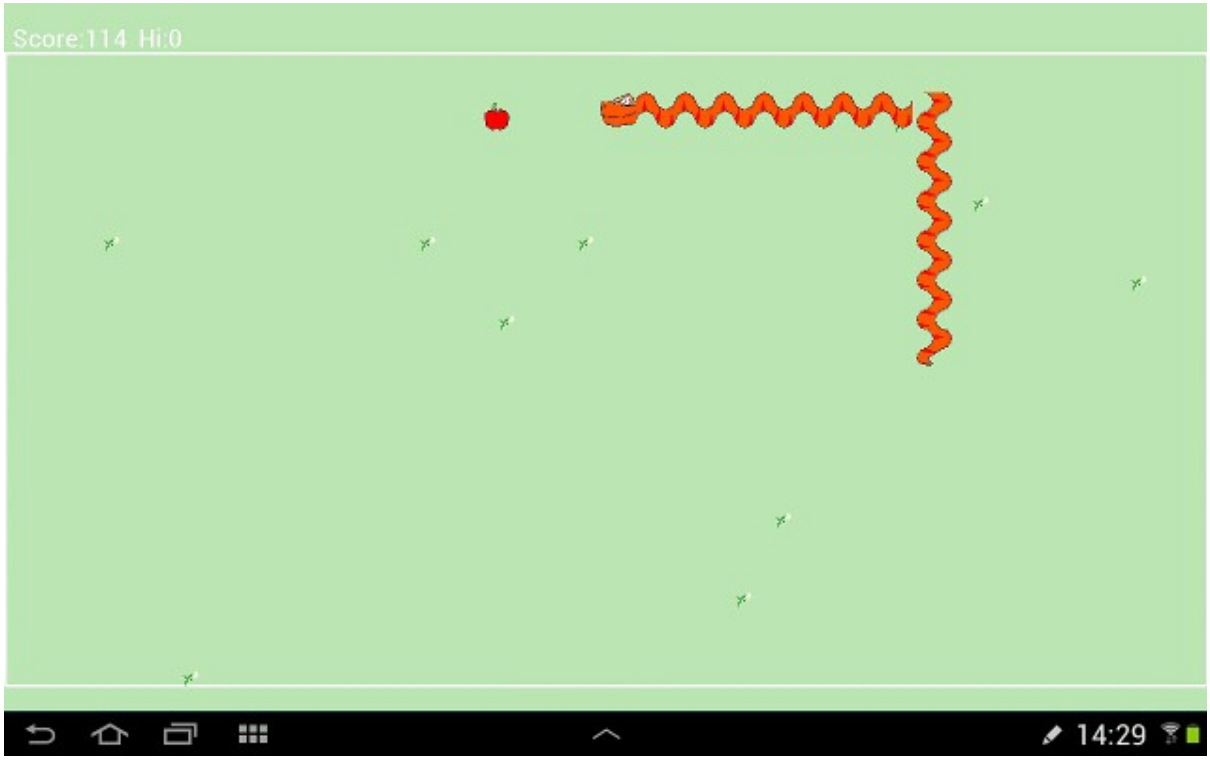




Appendix

Self-test Questions and Answers


Snake
Hi Score:0
14:30


Score:114 Hi:0
14:29