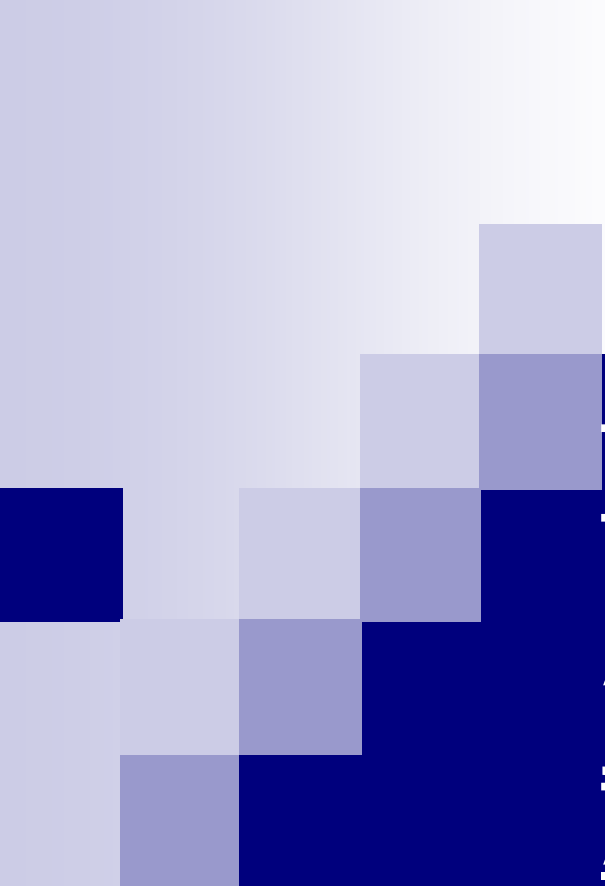




Мови програмування мобільних пристроїв

Модуль 1: Основи програмування Android

Лекція 1. Операційна система Android

Кудін Олексій Володимирович
avk256@gmail.com



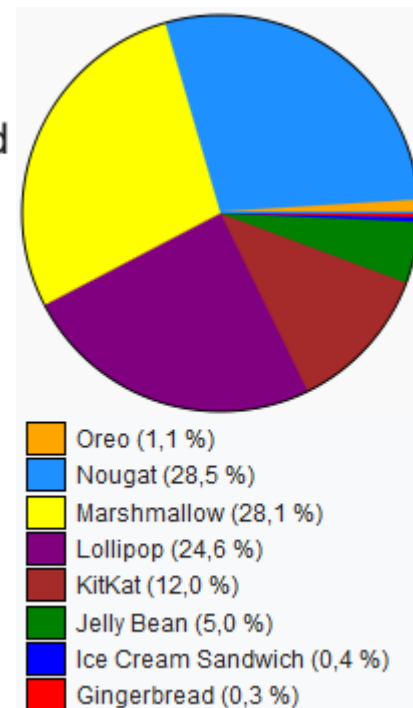
План

1. Архітектура Android.
2. Розвиток версій.
3. Засоби програмування.
4. Компоненти Android додатку.

Архитектура Android



2003	Android Inc., founded by Andy Rubin and backed by Google, was born
2005	Google bought Android Inc.
2007	Android was officially open sourced. Google turned over its ownership to the Open Handset Alliance (OHA)
2008	version 1.0 was released
2009	versions 1.1, 1.5 (Cupcake), 1.6 (Donut), and 2.0 (Eclair) were released
2010	versions 2.2 (Froyo) and 2.3 (Gingerbread) were released
2011	3.0 (Honeycomb) and 4.0 (Ice Cream Sandwich) were released
2012	version 4.1 (Jellybean)
2013	version 4.4 (KitKat)
2014	versions 5.0–5.1 (Lollipop); Android became 64-bit
2015	version 6.0 (Marshmallow)
2016	version 7.0-7.1.2 (Nougat)
2017	version 8 (Oreo)



- Java + Android Software Development Kit (SDK)
- C++ + Native Development Kit (NDK)
- Kotlin
- Xamarin (C#)
- React Native (JS)
- Ionic (JS)

Overview

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Java SE Runtime Environment 8 Downloads

Do you want to run Java™ programs, or do you want to develop Java programs? If you want to run Java programs, but not develop them, download the Java Runtime Environment, or JRE™.

If you want to develop applications for Java, download the Java Development Kit, or JDK™. The JDK includes the JRE, so you do not have to download both separately.

JRE 8u111 Checksum

JRE 8u112 Checksum

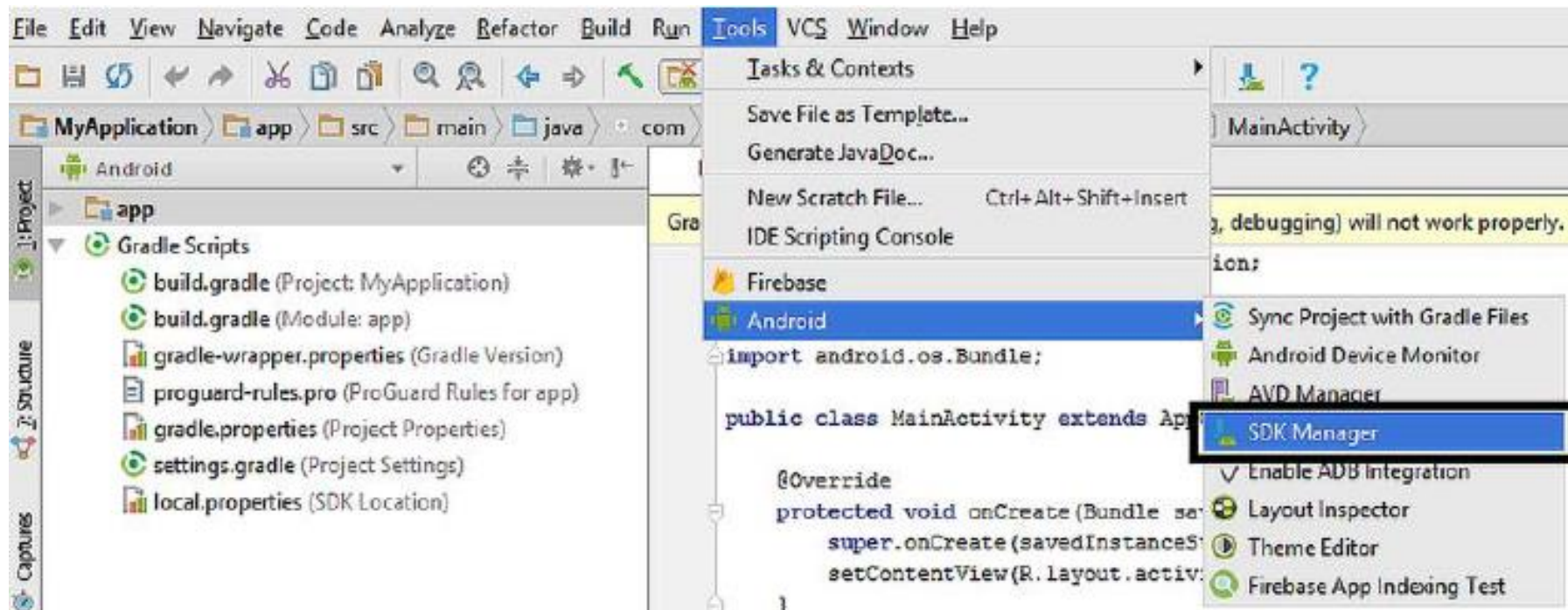
Java SE Runtime Environment 8u111

You must accept the Oracle Binary Code License Agreement for Java SE to download this software.

☐ Accept License Agreement ☒ Decline License Agreement

Product / File Description	File Size	Download
Linux x86	54.86 MB	 jre-8u111-linux-i586.rpm
Linux x86	70.65 MB	 jre-8u111-linux-i586.tar.gz
Linux x64	52.75 MB	 jre-8u111-linux-x64.rpm
Linux x64	68.57 MB	 jre-8u111-linux-x64.tar.gz
Mac OS X	64.33 MB	 jre-8u111-macosx-x64.dmg
Mac OS X	56 MB	 jre-8u111-macosx-x64.tar.gz
Solaris SPARC 64-bit	46.04 MB	 jre-8u111-solaris-sparcv9.tar.gz
Solaris x64	49.88 MB	 jre-8u111-solaris-x64.tar.gz
Windows x86 Online	0.7 MB	 jre-8u111-windows-i586-iftw.exe
Windows x86 Offline	53.53 MB	 jre-8u111-windows-i586.exe
Windows x86	59.43 MB	 jre-8u111-windows-i586.tar.gz
Windows x64 Offline	60.31 MB	 jre-8u111-windows-x64.exe
Windows x64	62.78 MB	 jre-8u111-windows-x64.tar.gz

Інсталяція



Default Settings

✕

🔍

▼ Appearance & Behavior

Appearance

Menus and Toolbars

▼ System Settings

Passwords

HTTP Proxy

Updates

Usage Statistics

Android SDK

Notifications

Quick Lists

Path Variables

Keymap

▶ Editor

Plugins

▶ Build, Execution, Deployment

▶ Tools

Appearance & Behavior > System Settings > Android SDK

Reset

Manager for the Android SDK and Tools used by Android Studio

Android SDK Location: [Edit](#)

SDK Platforms

SDK Tools

SDK Update Sites

Each Android SDK Platform package includes the Android platform and sources pertaining to an API level by default. Once installed, Android Studio will automatically check for updates. Check "show package details" to display individual SDK components.

	Name	API Level	Revision	Status
☒	Android API 27	27	1	Installed
☐	Android 8.0 (Oreo)	26	2	Not installed
☐	Android 7.1.1 (Nougat)	25	3	Not installed
☒	Android 7.0 (Nougat)	24	2	Not installed
☐	Android 6.0 (Marshmallow)	23	3	Not installed
☐	Android 5.1 (Lollipop)	22	2	Not installed
☐	Android 5.0 (Lollipop)	21	2	Not installed
☐	Android 4.4W (KitKat Wear)	20	2	Not installed
☐	Android 4.4 (KitKat)	19	4	Not installed
☐	Android 4.3 (Jelly Bean)	18	3	Not installed
☐	Android 4.2 (Jelly Bean)	17	3	Not installed
☐	Android 4.1 (Jelly Bean)	16	5	Not installed
☐	Android 4.0.3 (IceCreamSandwich)	15	5	Not installed
☐	Android 4.0 (IceCreamSandwich)	14	4	Not installed
☐	Android 3.2 (Honeycomb)	13	1	Not installed
☐	Android 3.1 (Honeycomb)	12	3	Not installed
☐	Android 3.0 (Honeycomb)	11	2	Not installed
☐	Android 2.3.3 (Gingerbread)	10	2	Not installed
☐	Android 2.3 (Gingerbread)	9	2	Not installed
☐	Android 2.2 (Froyo)	8	3	Not installed
☐	Android 2.1 (Eclair)	7	3	Not installed


Default Settings
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Appearance & Behavior > System Settings > Android SDK

Reset

Manager for the Android SDK and Tools used by Android Studio

Android SDK Location: [Edit](#)

SDK Platforms

SDK Tools

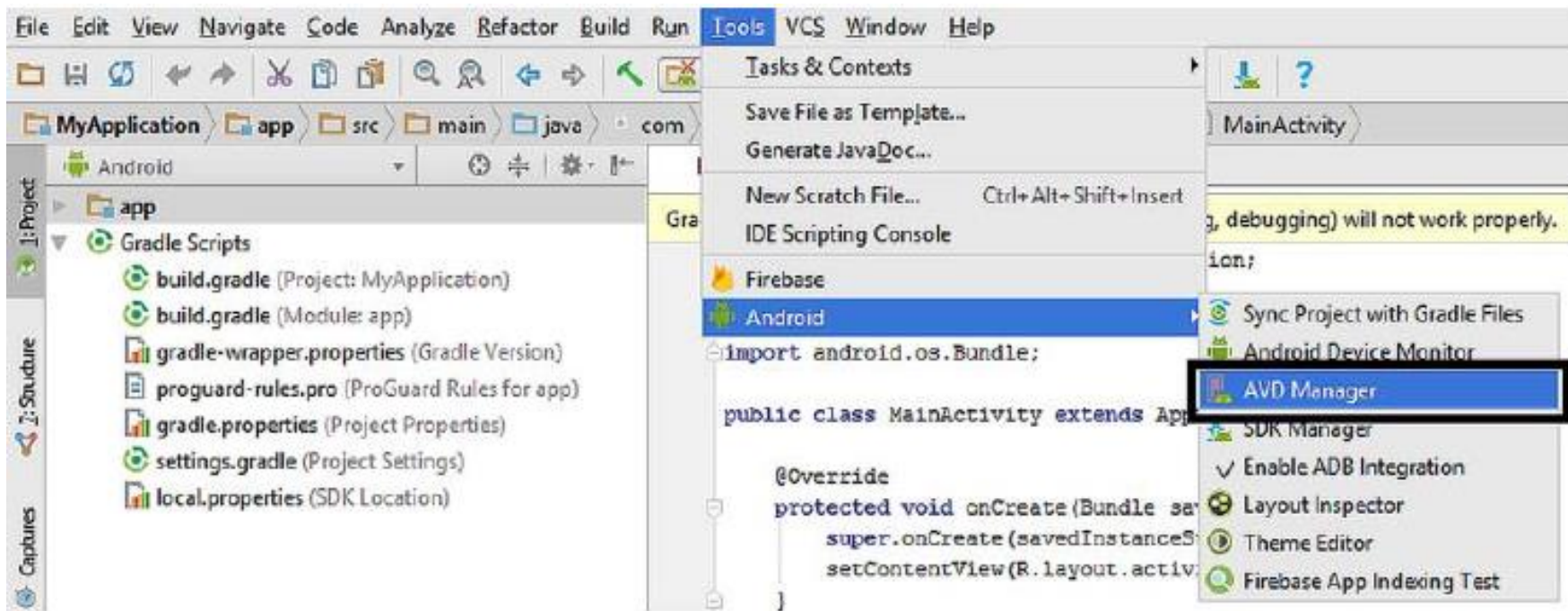
SDK Update Sites

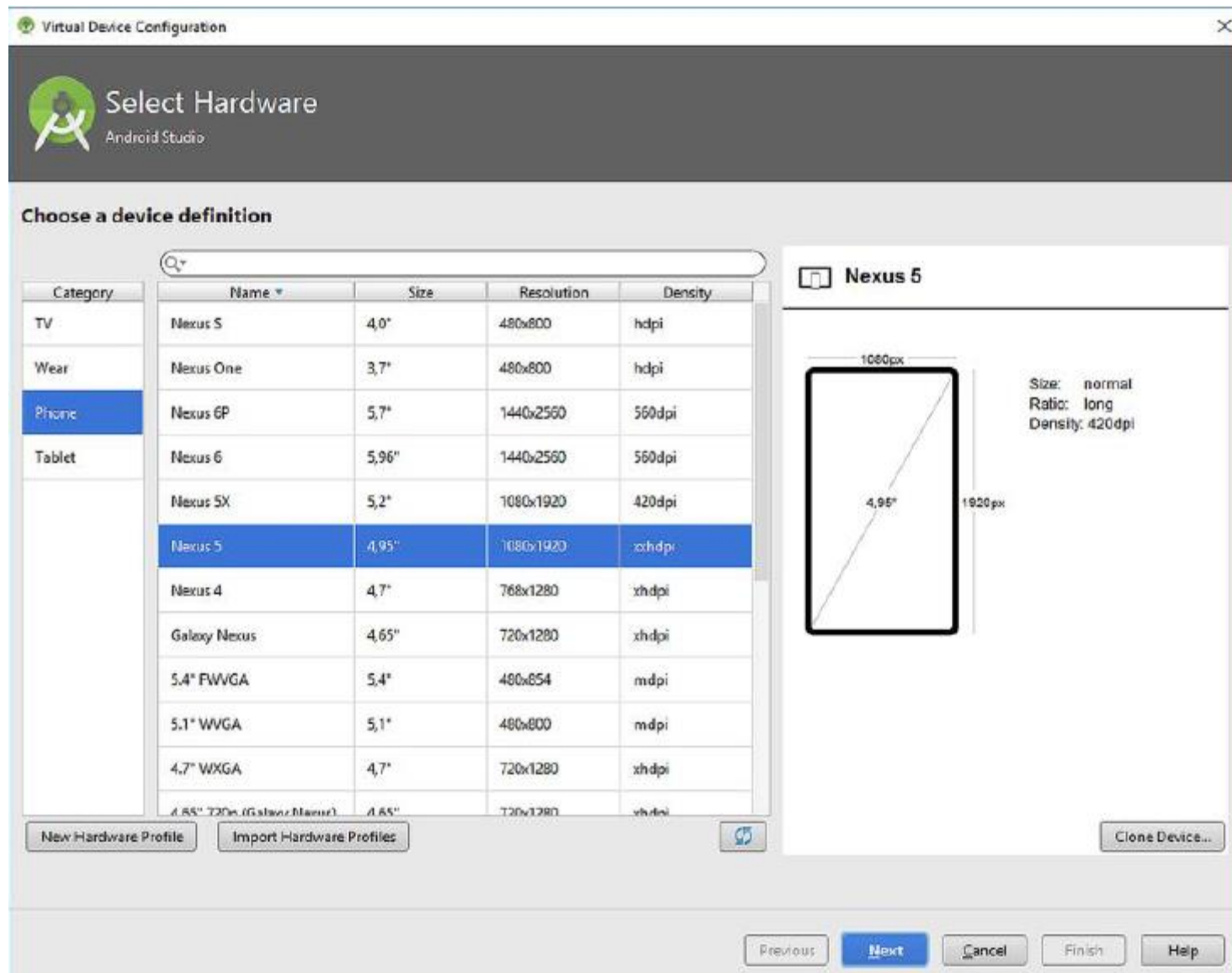
Below are the available SDK developer tools. Once installed, Android Studio will automatically check for updates.

Check "show package details" to display available versions of an SDK Tool.

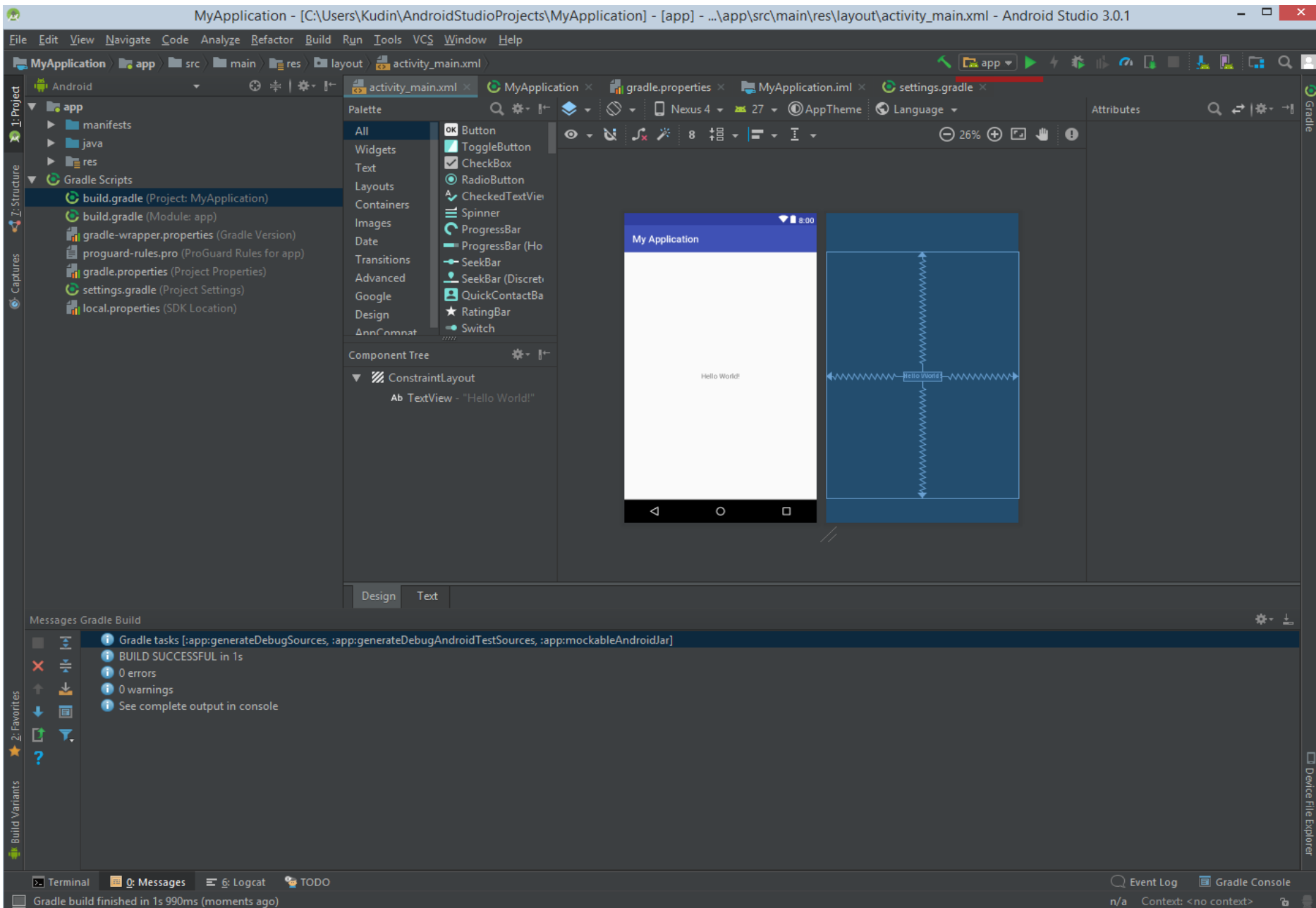
	Name	Version	Status
☒	Android SDK Build-Tools		Installed
☐	GPU Debugging tools		Not Installed
☐	CMake		Not Installed
☐	LLDB		Not Installed
☐	Android Auto API Simulators	1	Not installed
☐	Android Auto Desktop Head Unit emulator	1.1	Not installed
☒	Android Emulator	27.1.7	Installed
☒	Android SDK Platform-Tools	27.0.1	Installed
☒	Android SDK Tools	26.1.1	Installed
☐	Documentation for Android SDK	1	Not installed
☐	Google Play APK Expansion library	1	Not installed
☐	Google Play Licensing Library	1	Not installed
☐	Google Play services	46	Not installed
☒	Google USB Driver	11	Not installed
☐	Google Web Driver	2	Not installed
☐	Instant Apps Development SDK	1.1.0	Not installed
☒	Intel x86 Emulator Accelerator (HAXM installer)	6.2.1	Installed
☐	NDK	16.1.4479499	Not installed
▼ ☒	Support Repository		
☒	ConstraintLayout for Android		Installed
☒	Solver for ConstraintLayout		Installed
☒	Android Support Repository	47.0.0	Installed
☒	Google Repository	58	Installed

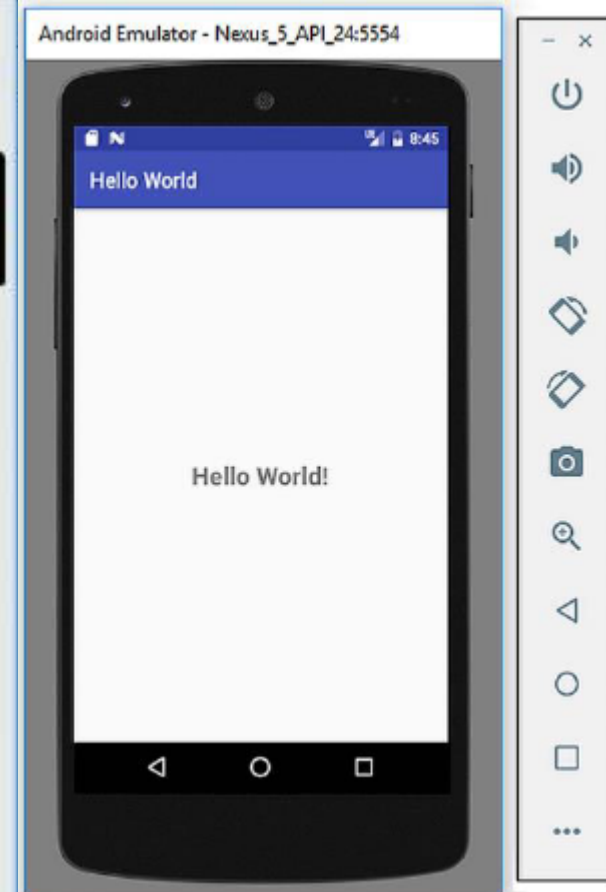
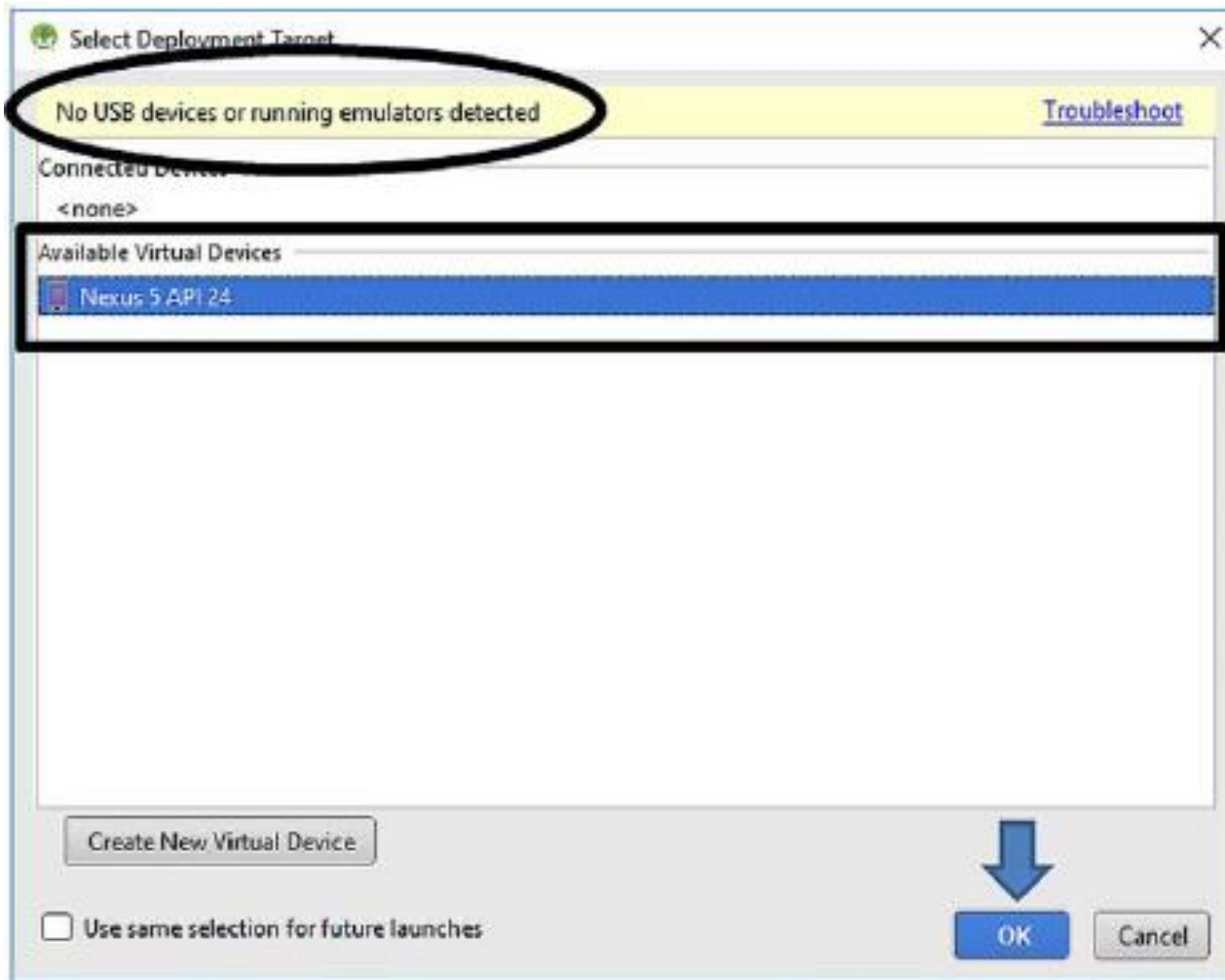
Інсталяція

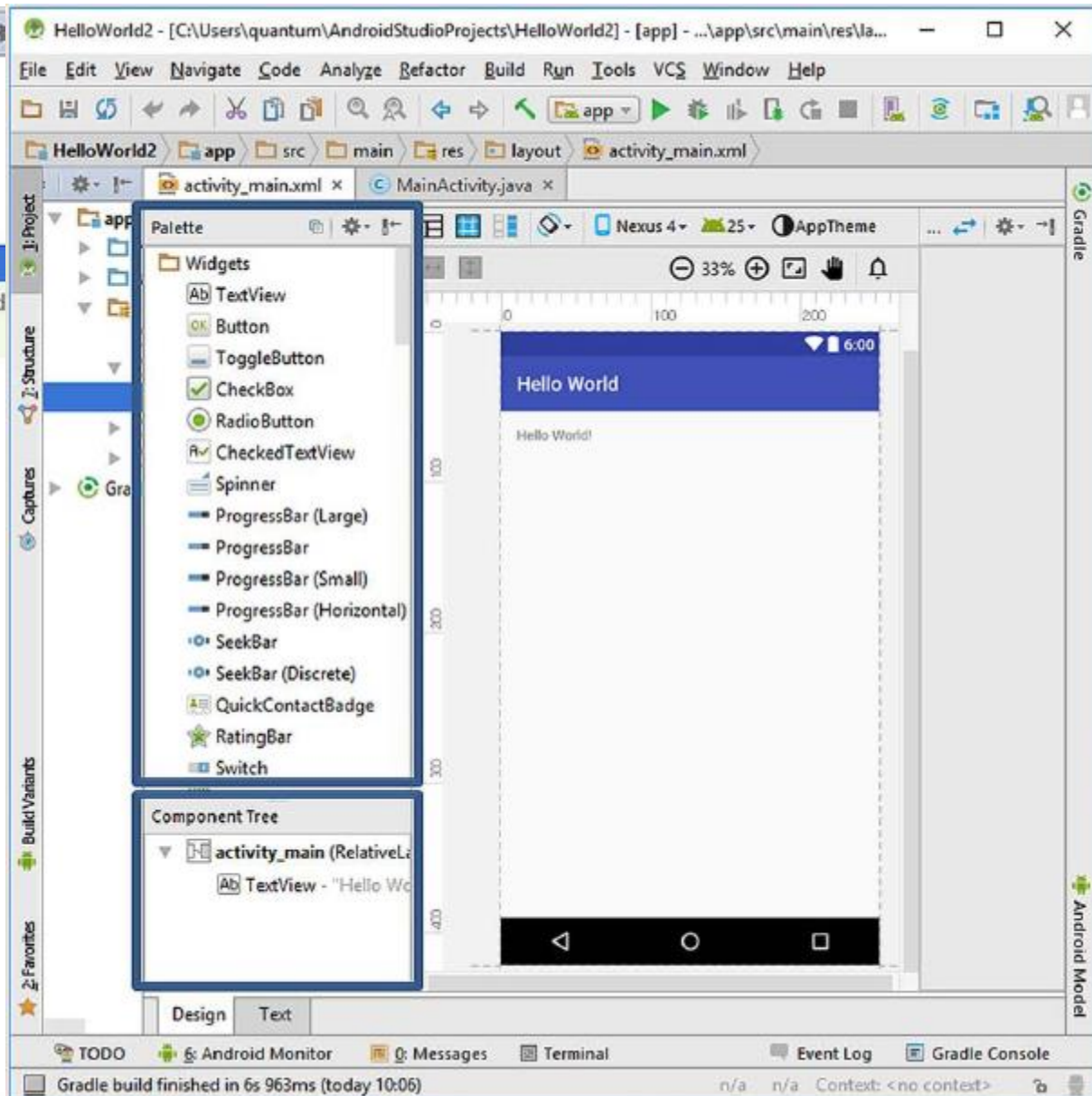
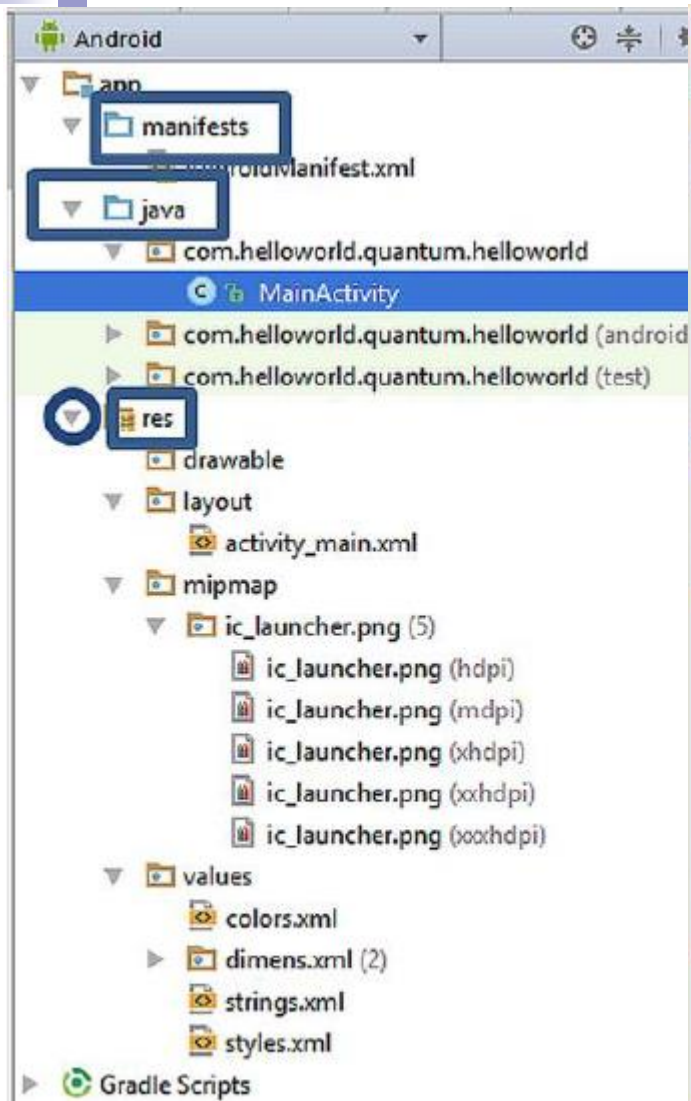




Інсталяція



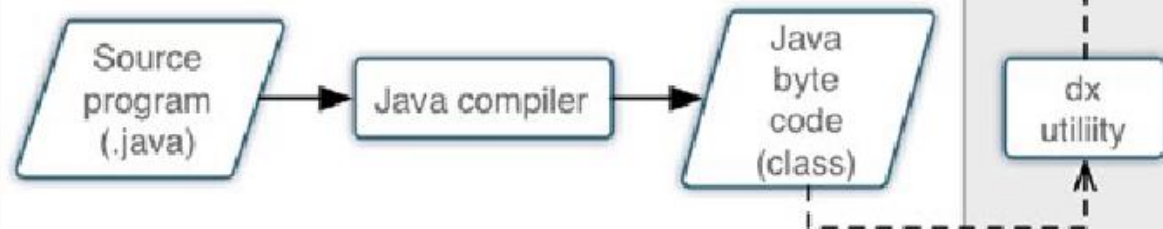




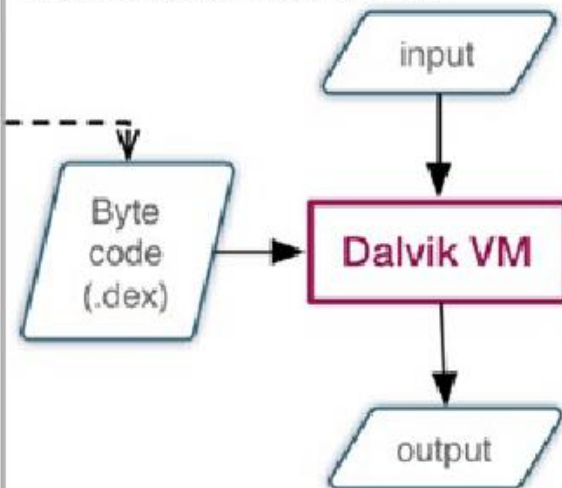
```
1 |<?xml version="1.0" encoding="utf-8"?>
2 |<android.support.constraint.ConstraintLayout
3 |    xmlns:android="http://schemas.android.com/apk/res/android"
4 |    xmlns:app="http://schemas.android.com/apk/res-auto"
5 |    xmlns:tools="http://schemas.android.com/tools"
6 |    android:layout_width="match_parent"
7 |    android:layout_height="match_parent"
8 |    tools:context="com.example.ted.myapplication.MainActivity">
9 |
10 |    <TextView
11 |        android:layout_width="wrap_content"
12 |        android:layout_height="wrap_content"
13 |        android:text="Hello World!"
14 |        app:layout_constraintBottom_toBottomOf="parent"
15 |        app:layout_constraintLeft_toLeftOf="parent"
16 |        app:layout_constraintRight_toRightOf="parent"
17 |        app:layout_constraintTop_toTopOf="parent"/>
18 |
19 |</android.support.constraint.ConstraintLayout>
```

Android SDK

JDK



Android runtime



APK file



Component	What It Does	Example
Activity base class: <code>android.app.Activity</code>	Holds, displays the user interface elements (View and ViewGroups). It's a focused thing a user can do with your application	View a single e-mail message, take notes
Service base class: <code>android.app.Service</code>	Run a process in the background	Download a large file from the Internet, play background music
BroadcastReceiver base class: <code>android.content.BroadcastReceiver</code>	Receive messages either from the Android system or from applications	Display a warning message when the device battery dips to below 10%
ContentProvider base class: <code>android.content.ContentProvider</code>	Store and retrieve data, like a database	Contacts or address book on your phone. Any application can look up and add data to the phonebook

