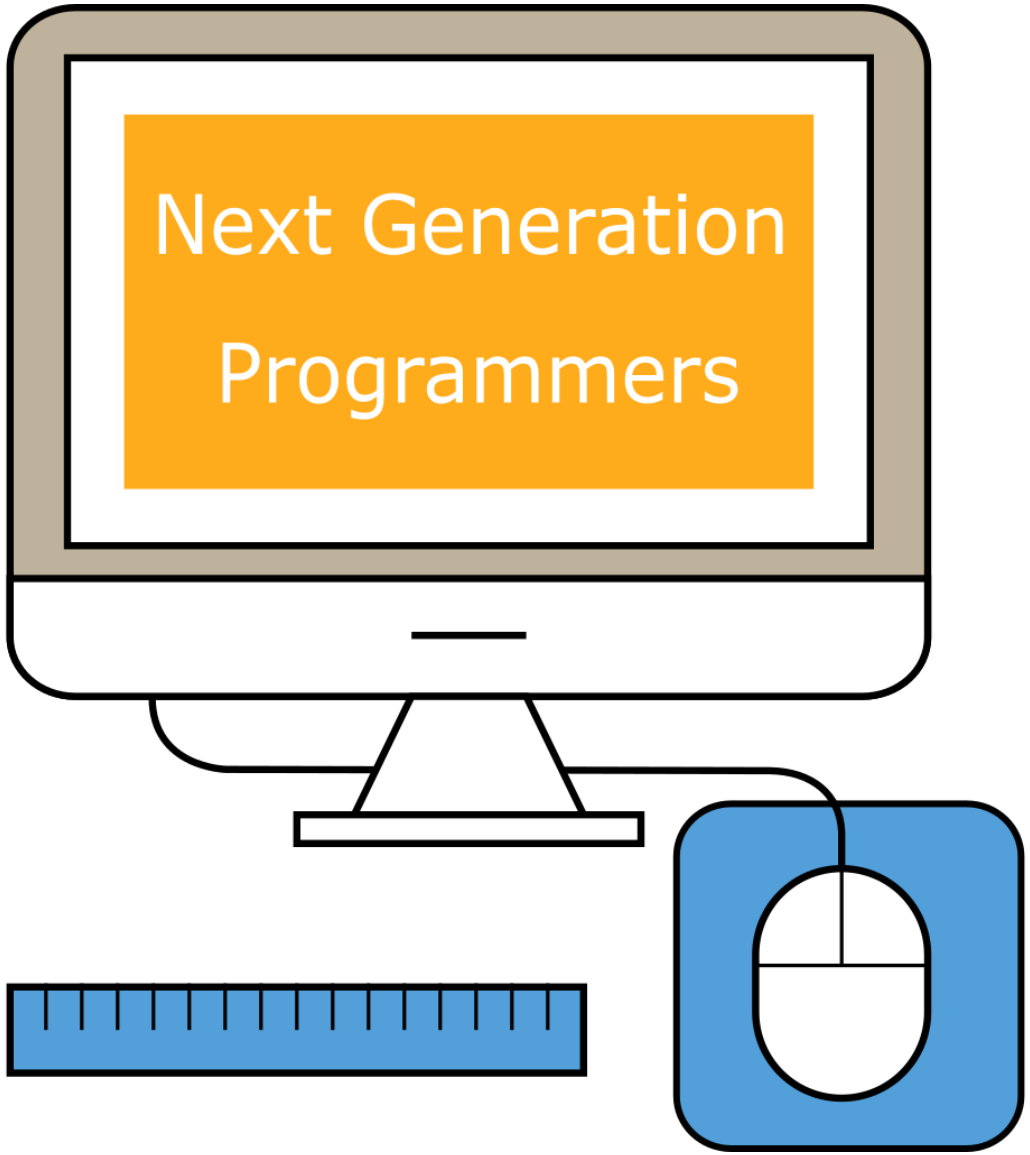
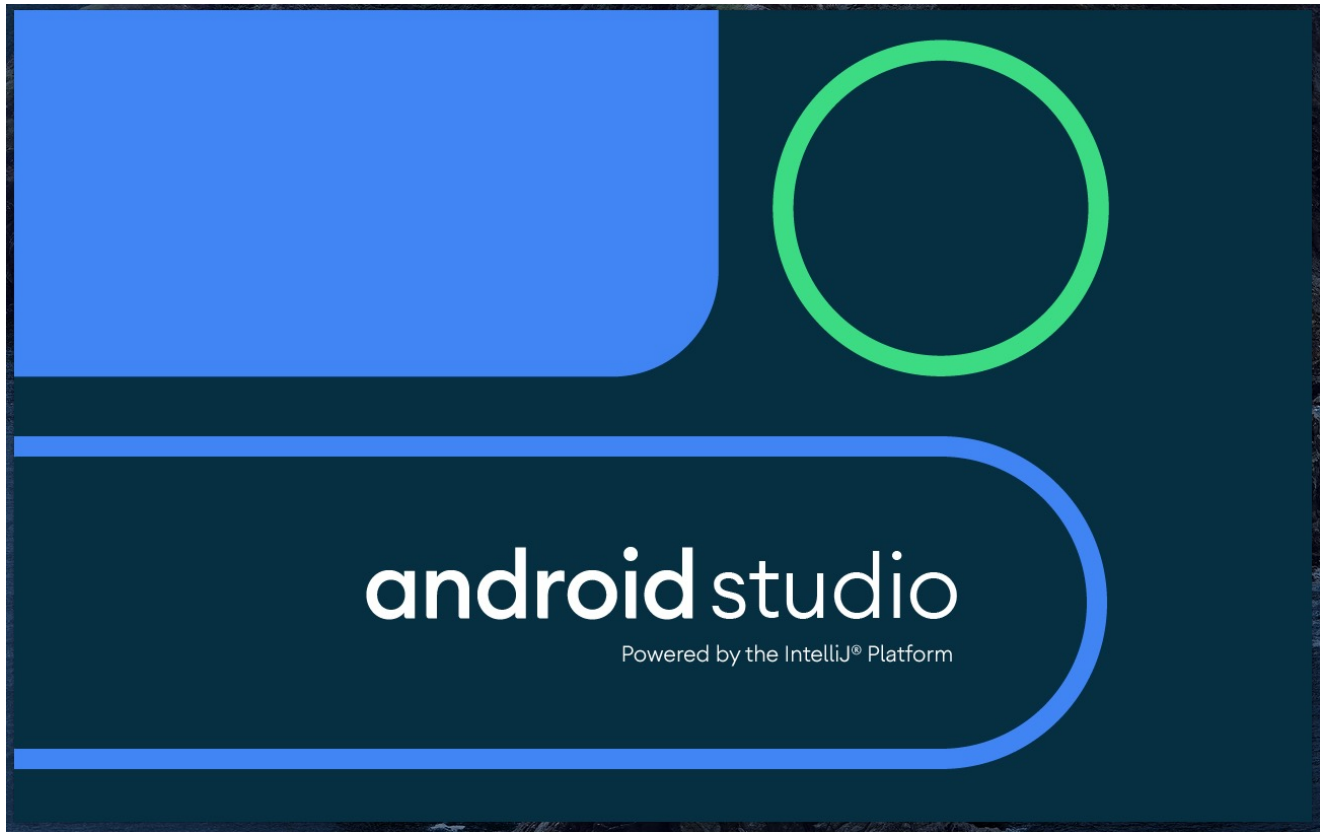
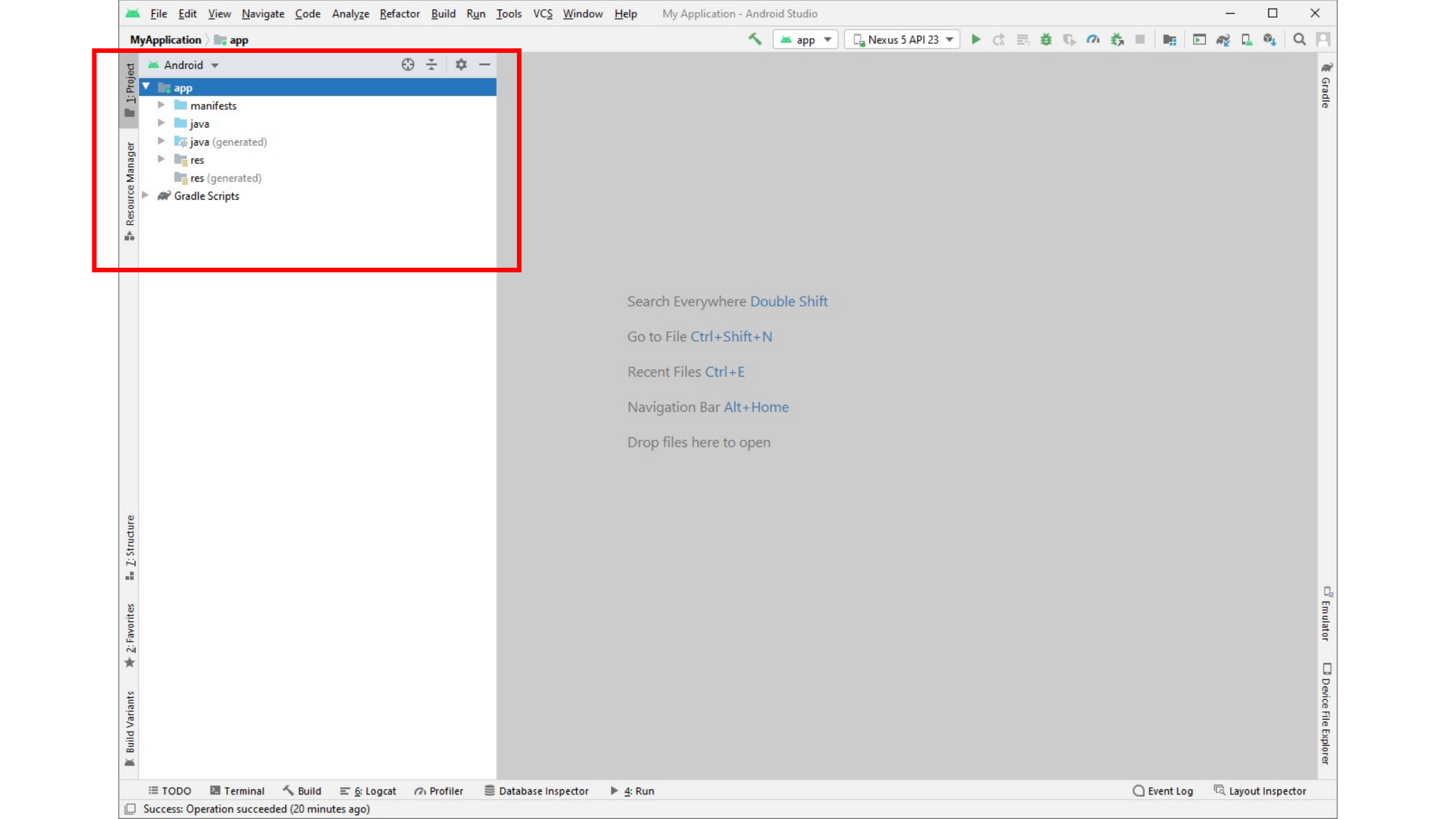
Introduction to Android Studio

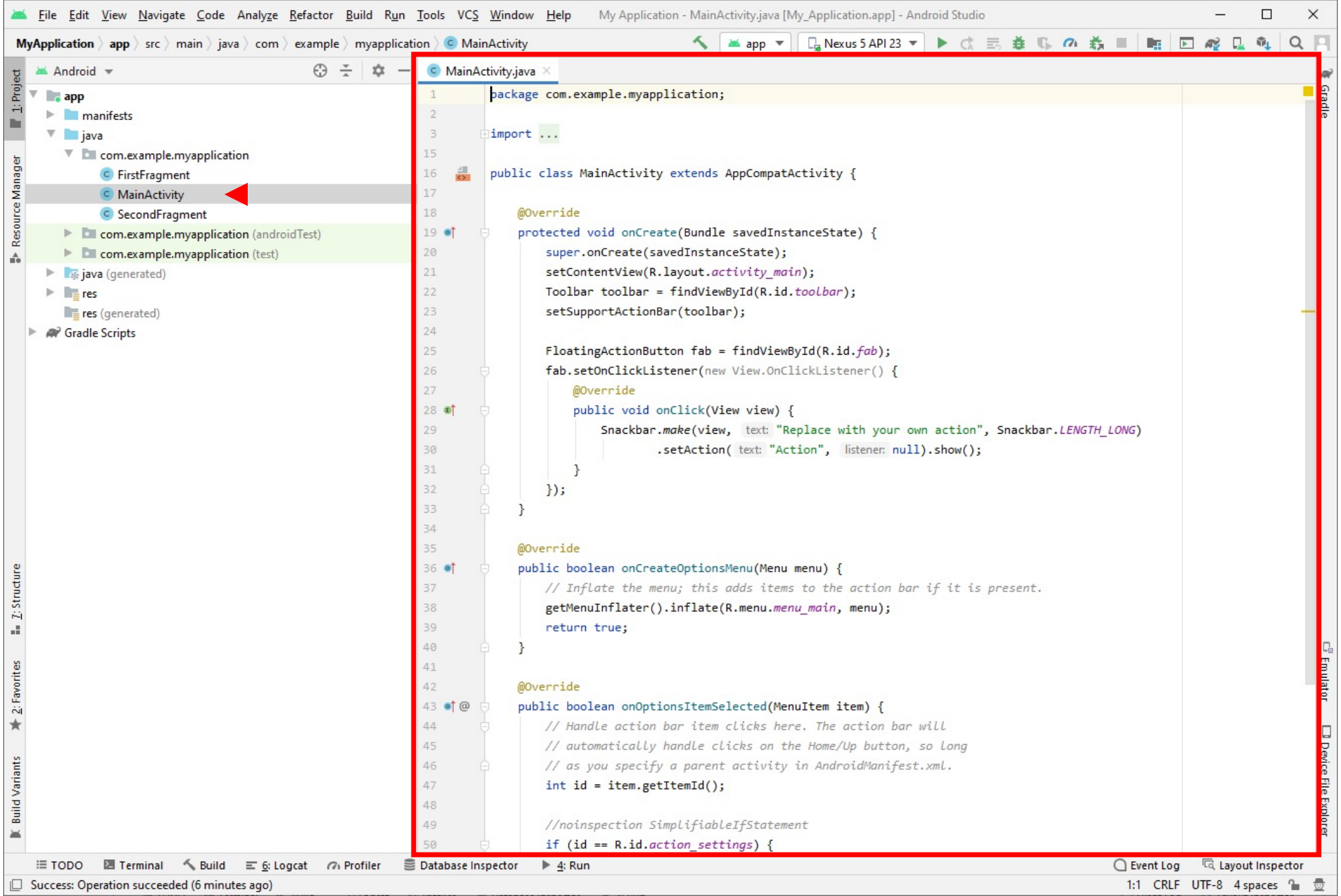


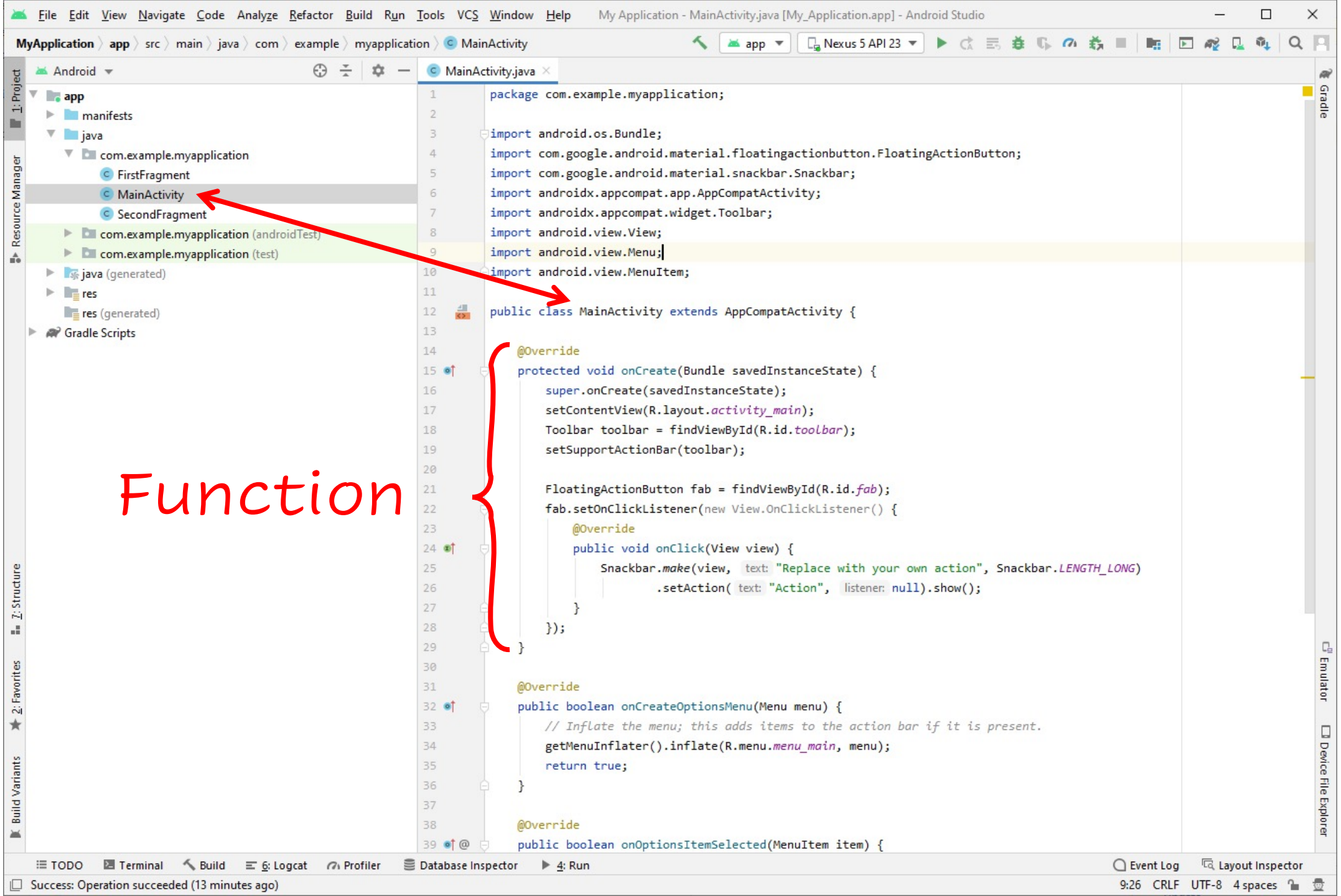
- Android Studio is an **IDE** (= integrated development environment) **for writing code** for Android OS (=Operating System)
  - IDE is like a “Word” processor but for code
  - It simplifies **writing**, **structuring**, **debugging** code (=find errors/mistakes)
- We will learn how to create Android apps in **Java** language
  - 80% of mobile apps for Android are written in Java

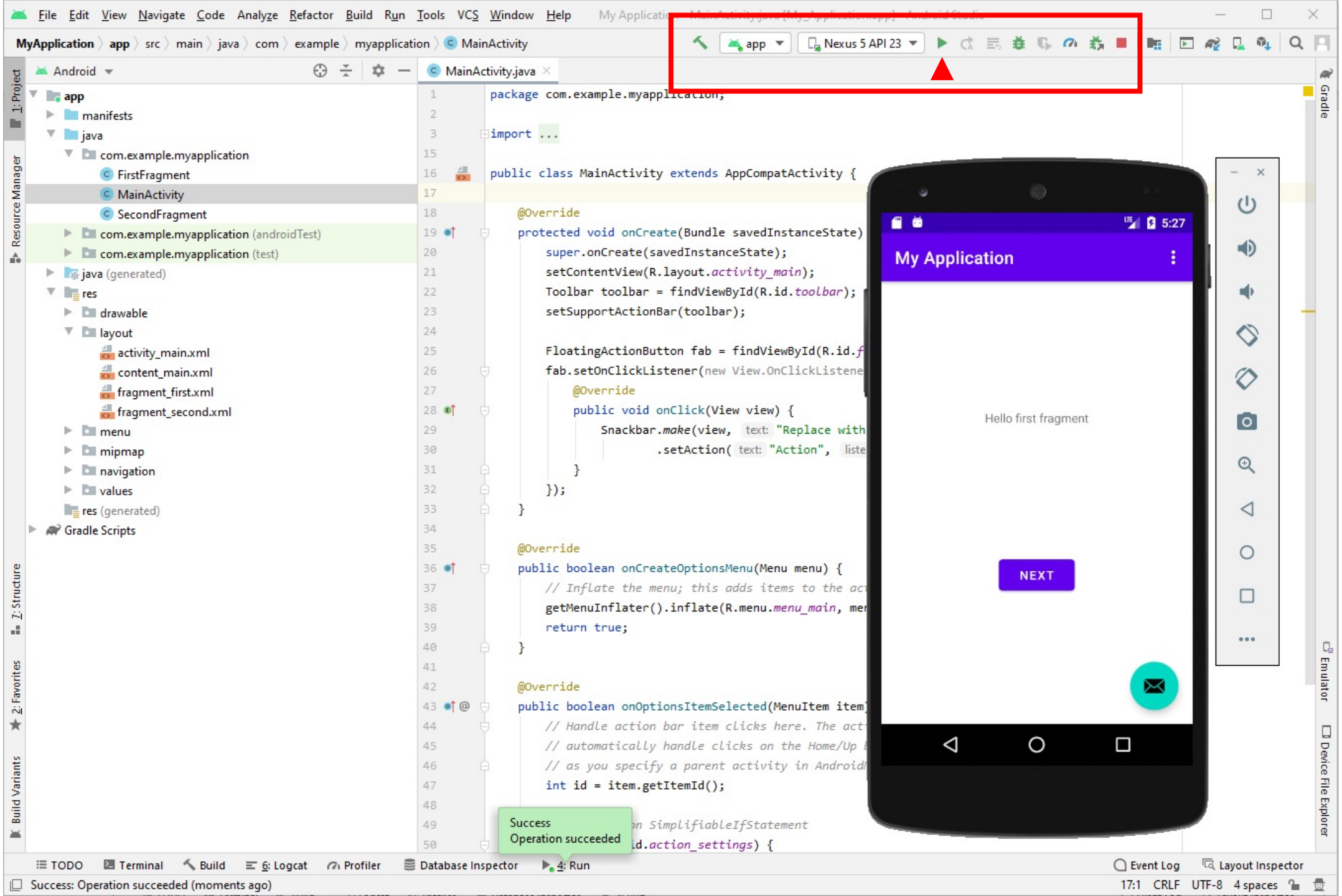


Task 1: Let’s open & run a ready-made app


File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help
My Application - Android Studio
MyApplication app
app
Nexus 5 API 23
Android
app
manifests
java
java (generated)
res
res (generated)
Gradle Scripts
1: Project
Resource Manager
Search Everywhere Double Shift
Go to File Ctrl+Shift+N
Recent Files Ctrl+E
Navigation Bar Alt+Home
Drop files here to open
Gradle
Emulator
Device File Explorer
7: Structure
2: Favorites
Build Variants
TODO
Terminal
Build
6: Logcat
Profiler
Database Inspector
4: Run
Event Log
Layout Inspector
Success: Operation succeeded (20 minutes ago)

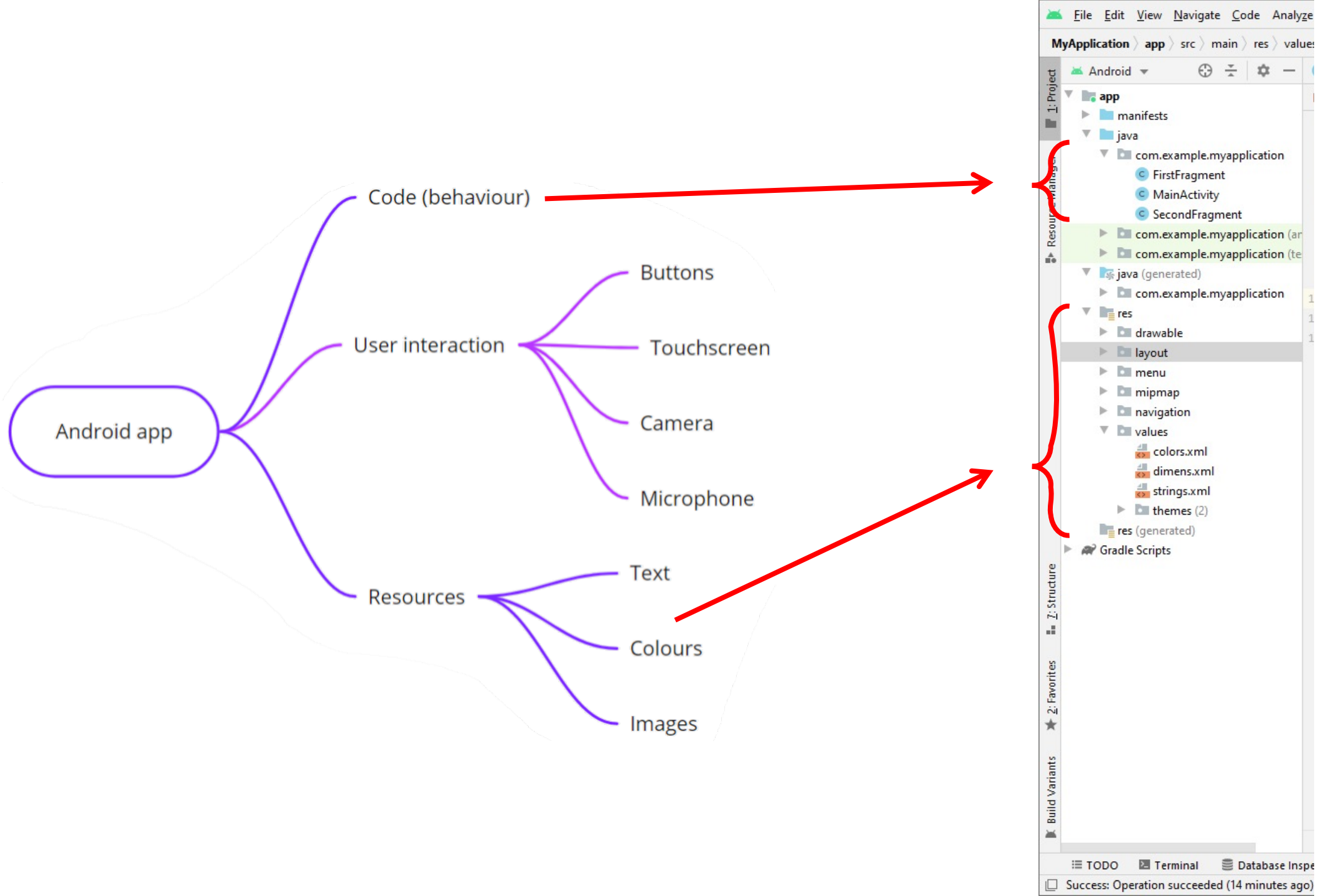

File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help
My Application - MainActivity.java [My_Application.app] - Android Studio
MyApplication app src main java com example myapplication MainActivity
app
Nexus 5 API 23
Android
app
manifests
java
com.example.myapplication
FirstFragment
MainActivity
SecondFragment
com.example.myapplication (androidTest)
com.example.myapplication (test)
java (generated)
res
res (generated)
Gradle Scripts
MainActivity.java
package com.example.myapplication;
import ...
public class MainActivity extends AppCompatActivity {
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main);
Toolbar toolbar = findViewById(R.id.toolbar);
setSupportActionBar(toolbar);
FloatingActionButton fab = findViewById(R.id.fab);
fab.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View view) {
Snackbar.make(view, text: "Replace with your own action", Snackbar.LENGTH_LONG)
.setAction(text: "Action", listener: null).show();
}
});
}
@Override
public boolean onCreateOptionsMenu(Menu menu) {
// Inflate the menu; this adds items to the action bar if it is present.
getMenuInflater().inflate(R.menu.menu_main, menu);
return true;
}
@Override
public boolean onOptionsItemSelected(MenuItem item) {
// Handle action bar item clicks here. The action bar will
// automatically handle clicks on the Home/Up button, so long
// as you specify a parent activity in AndroidManifest.xml.
int id = item.getItemId();
//noinspection SimplifiableIfStatement
if (id == R.id.action_settings) {
1: Project
Resource Manager
7: Structure
2: Favorites
Build Variants
Gradle
Emulator
Device File Explorer
TODO
Terminal
Build
6: Logcat
Profiler
Database Inspector
4: Run
Event Log
Layout Inspector
Success: Operation succeeded (6 minutes ago)
1:1 CRLF UTF-8 4 spaces

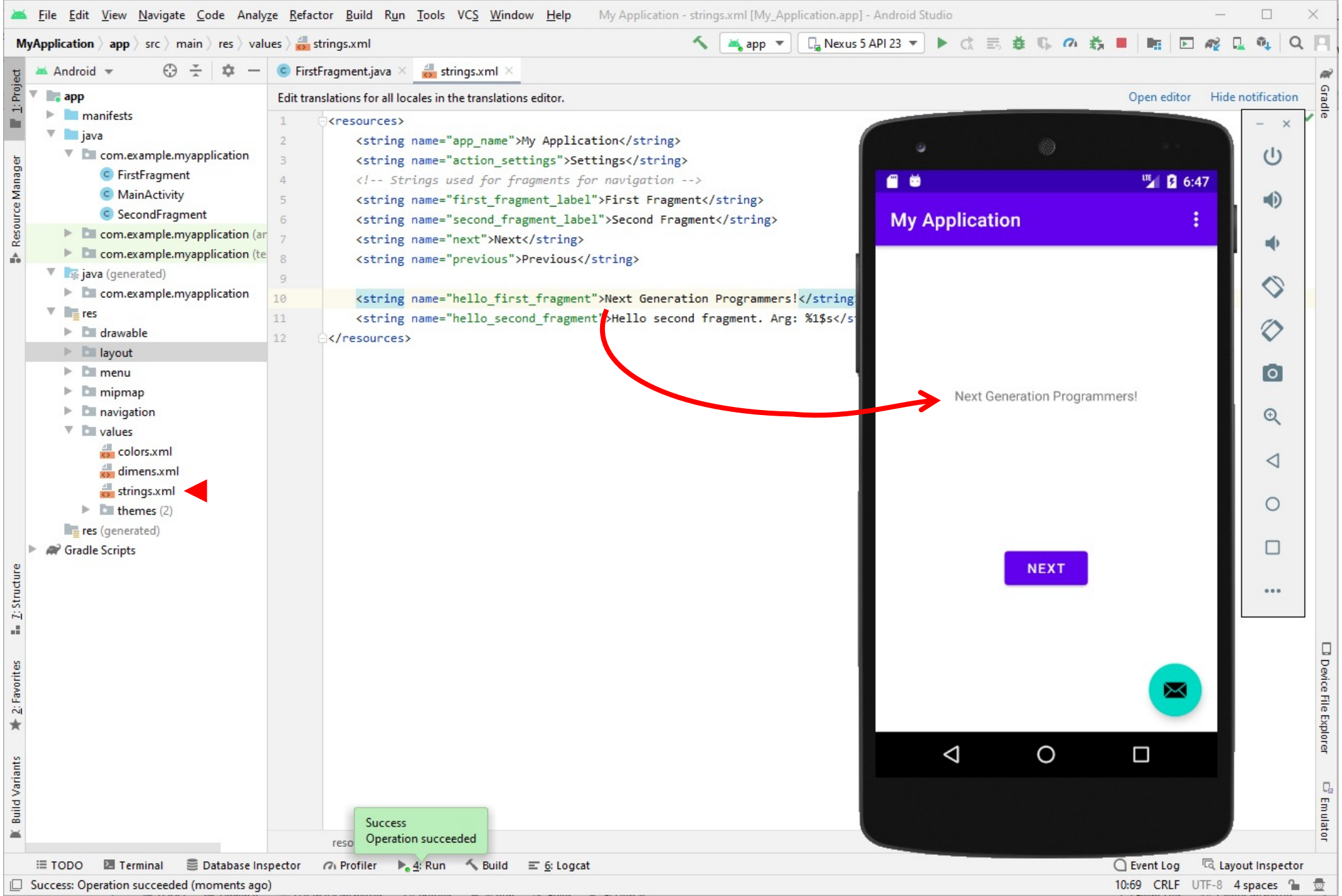

File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help
My Application - MainActivity.java [My_Application.app] - Android Studio
MyApplication app src main java com example myapplication MainActivity
app
Nexus 5 API 23
Android
app
manifests
java
com.example.myapplication
FirstFragment
MainActivity
SecondFragment
com.example.myapplication (androidTest)
com.example.myapplication (test)
java (generated)
res
res (generated)
Gradle Scripts
MainActivity.java
package com.example.myapplication;
import android.os.Bundle;
import com.google.android.material.floatingactionbutton.FloatingActionButton;
import com.google.android.material.snackbar.Snackbar;
import androidx.appcompat.app.AppCompatActivity;
import androidx.appcompat.widget.Toolbar;
import android.view.View;
import android.view.Menu;
import android.view.MenuItem;
public class MainActivity extends AppCompatActivity {
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main);
Toolbar toolbar = findViewById(R.id.toolbar);
setSupportActionBar(toolbar);
FloatingActionButton fab = findViewById(R.id.fab);
fab.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View view) {
Snackbar.make(view, text: "Replace with your own action", Snackbar.LENGTH_LONG)
.setAction(text: "Action", listener: null).show();
}
});
}
@Override
public boolean onCreateOptionsMenu(Menu menu) {
// Inflate the menu; this adds items to the action bar if it is present.
getMenuInflater().inflate(R.menu.menu_main, menu);
return true;
}
@Override
public boolean onOptionsItemSelected(MenuItem item) {
Function
1: Project
Resource Manager
7: Structure
2: Favorites
Build Variants
Gradle
Emulator
Device File Explorer
TODO Terminal Build 6: Logcat Profiler Database Inspector 4: Run
Event Log Layout Inspector
Success: Operation succeeded (13 minutes ago)
9:26 CRLF UTF-8 4 spaces


File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help
MyApplication app src main java com example myapplication MainActivity
app
Nexus 5 API 23
Android
MainActivity.java
app
manifests
java
com.example.myapplication
FirstFragment
MainActivity
SecondFragment
com.example.myapplication (androidTest)
com.example.myapplication (test)
java (generated)
res
drawable
layout
activity_main.xml
content_main.xml
fragment_first.xml
fragment_second.xml
menu
mipmap
navigation
values
res (generated)
Gradle Scripts
package com.example.myapplication;
import ...
public class MainActivity extends AppCompatActivity {
@Override
protected void onCreate(Bundle savedInstanceState)
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main);
Toolbar toolbar = findViewById(R.id.toolbar);
setSupportActionBar(toolbar);
FloatingActionButton fab = findViewById(R.id.f
fab.setOnClickListener(new View.OnClickListene
@Override
public void onClick(View view) {
Snackbar.make(view, text: "Replace with
.setAction(text: "Action", liste
}
});
}
@Override
public boolean onCreateOptionsMenu(Menu menu) {
// Inflate the menu; this adds items to the act
getMenuInflater().inflate(R.menu.menu_main, mer
return true;
}
@Override
public boolean onOptionsItemSelected(MenuItem item)
// Handle action bar item clicks here. The act
// automatically handle clicks on the Home/Up
// as you specify a parent activity in Android
int id = item.getItemId();
on SimplifiableIfStatement
id.action_settings) {
Success
Operation succeeded
5:27
My Application
Hello first fragment
NEXT
TODO Terminal Build 6: Logcat Profiler Database Inspector 4: Run
Event Log Layout Inspector
Success: Operation succeeded (moments ago)
17:1 CRLF UTF-8 4 spaces
Gradle
Emulator
Device File Explorer
1: Project
Resource Manager
7: Structure
2: Favorites
Build Variants

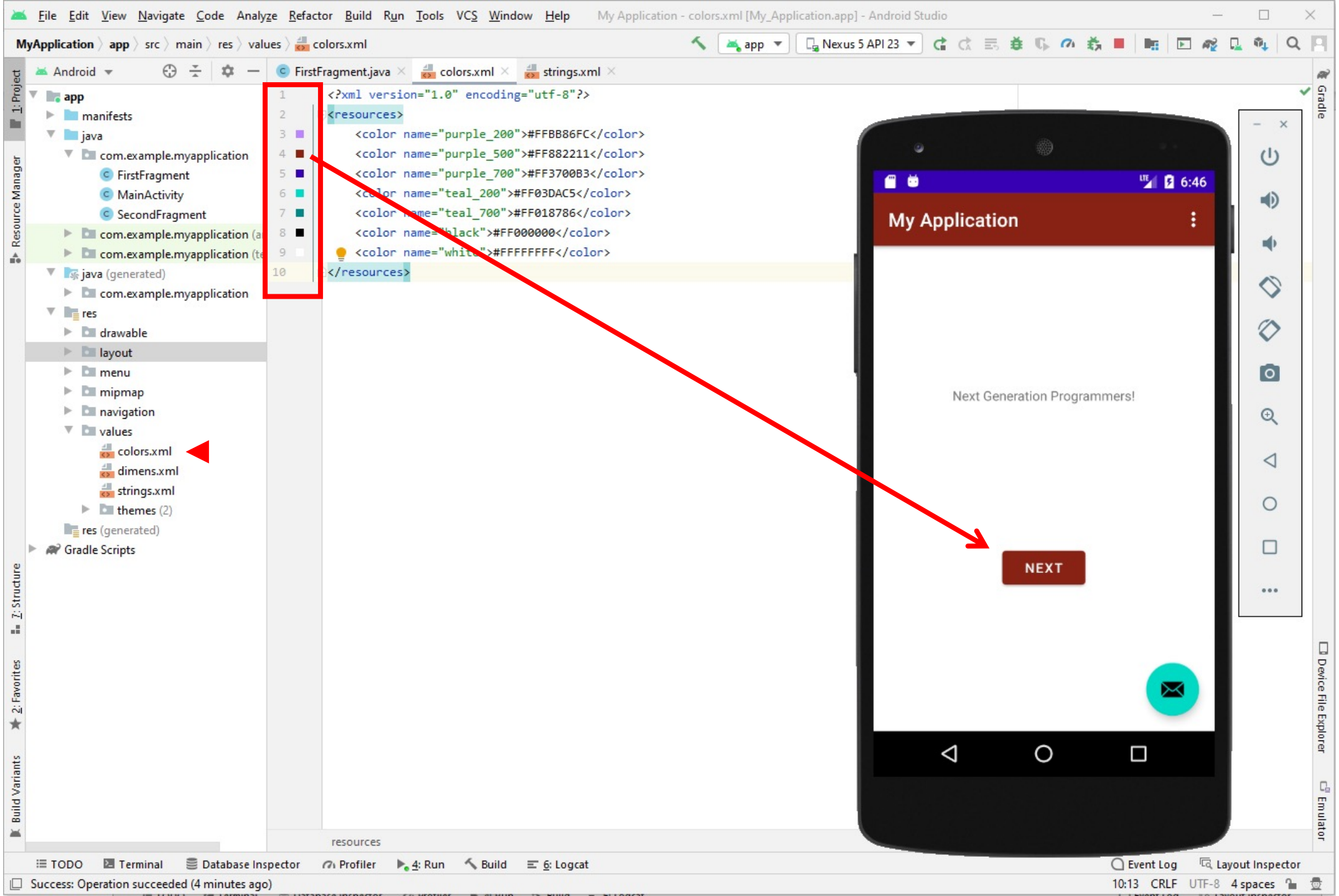
Task 2: Let’s edit the text!

Change the text to anything you want, for example: “My name is X and I am a Next Generation Programmer.”


Android app
Code (behaviour)
User interaction
Buttons
Touchscreen
Camera
Microphone
Resources
Text
Colours
Images
File Edit View Navigate Code Analyze
MyApplication app src main res values
Android
1: Project
app
manifests
java
com.example.myapplication
FirstFragment
MainActivity
SecondFragment
com.example.myapplication (ar
com.example.myapplication (te
java (generated)
com.example.myapplication
res
drawable
layout
menu
mipmap
navigation
values
colors.xml
dimens.xml
strings.xml
themes (2)
res (generated)
Gradle Scripts
7: Structure
2: Favorites
Build Variants
TODO
Terminal
Database Inspe
Success: Operation succeeded (14 minutes ago)

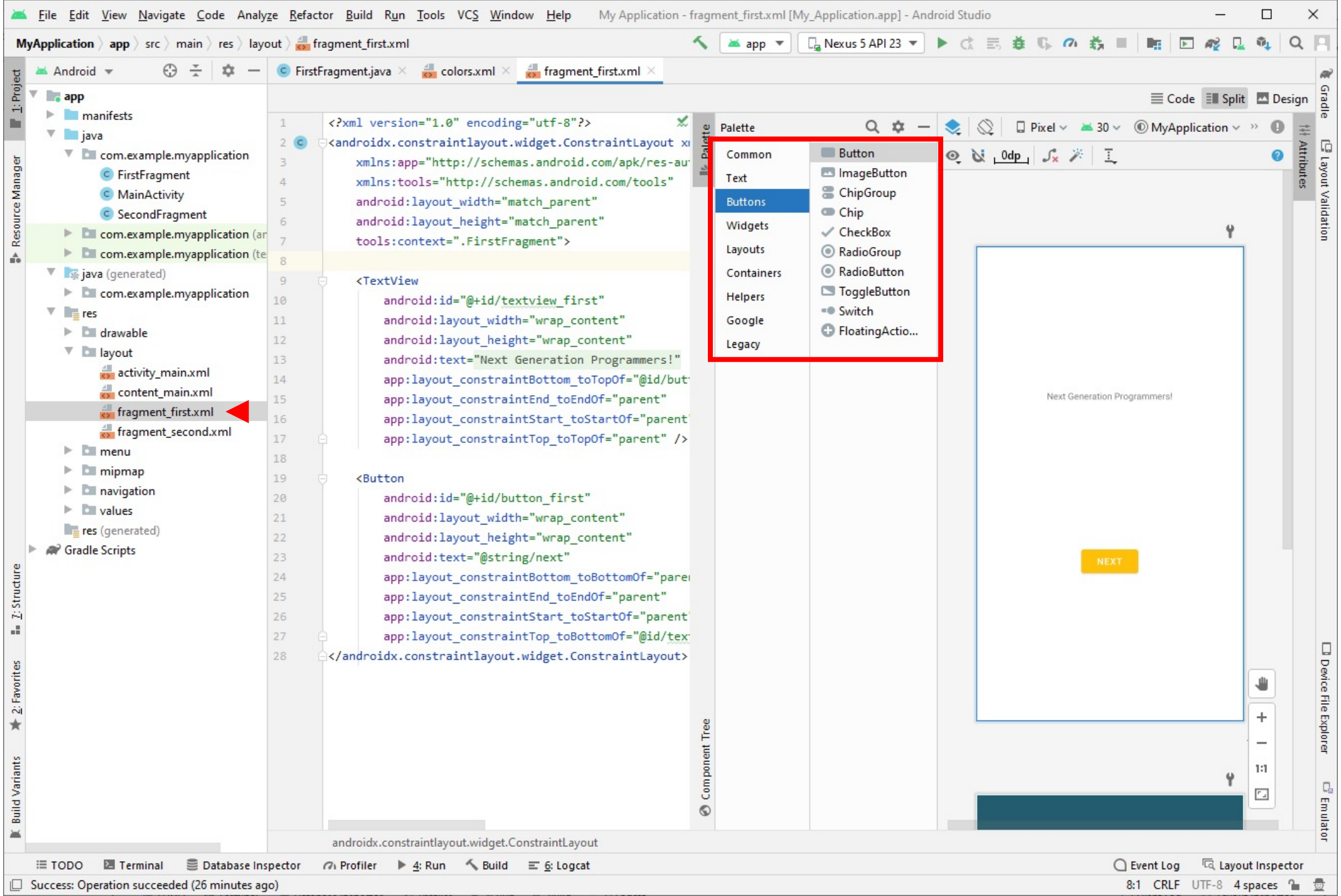

File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help
My Application - strings.xml [My_Application.app] - Android Studio
MyApplication app src main res values strings.xml
app
Nexus 5 API 23
Android
FirstFragment.java
strings.xml
Edit translations for all locales in the translations editor.
Open editor
Hide notification
app
manifests
java
com.example.myapplication
FirstFragment
MainActivity
SecondFragment
com.example.myapplication (ar
com.example.myapplication (te
java (generated)
com.example.myapplication
res
drawable
layout
menu
mipmap
navigation
values
colors.xml
dimens.xml
strings.xml
themes (2)
res (generated)
Gradle Scripts
1 <resources>
2 <string name="app_name">My Application</string>
3 <string name="action_settings">Settings</string>
4 <!-- Strings used for fragments for navigation -->
5 <string name="first_fragment_label">First Fragment</string>
6 <string name="second_fragment_label">Second Fragment</string>
7 <string name="next">Next</string>
8 <string name="previous">Previous</string>
9
10 <string name="hello_first_fragment">Next Generation Programmers!</string
11 <string name="hello_second_fragment">Hello second fragment. Arg: %1$s</s
12 </resources>
6:47
My Application
Next Generation Programmers!
NEXT
Success
Operation succeeded
TODO
Terminal
Database Inspector
Profiler
4: Run
Build
6: Logcat
Event Log
Layout Inspector
Success: Operation succeeded (moments ago)
10:69
CRLF
UTF-8
4 spaces

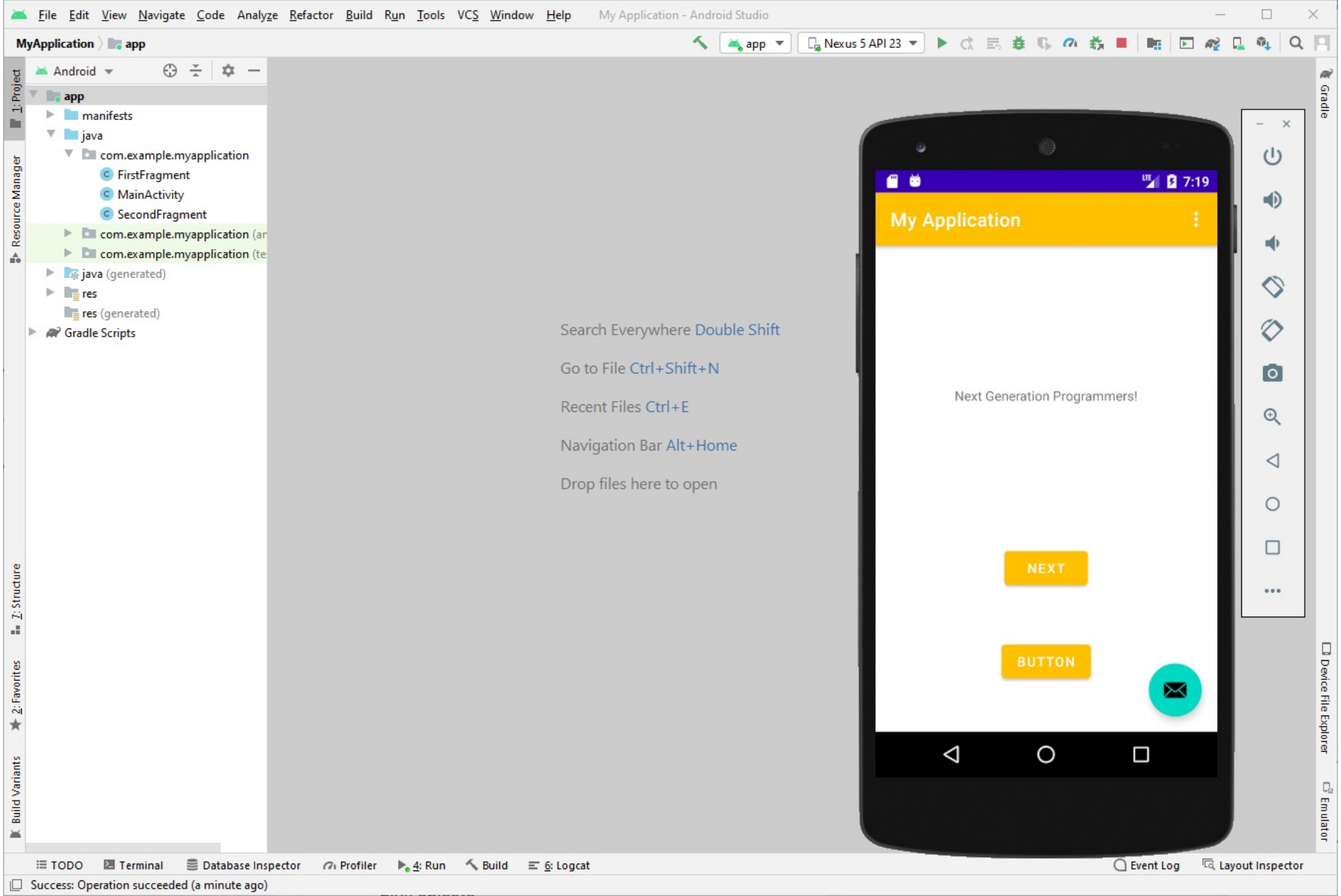
Task 3: Let’s edit the colour!


File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help
My Application - colors.xml [My_Application.app] - Android Studio
MyApplication app src main res values colors.xml
app
Nexus 5 API 23
Android
FirstFragment.java
colors.xml
strings.xml
app
manifests
java
com.example.myapplication
FirstFragment
MainActivity
SecondFragment
java (generated)
res
drawable
layout
menu
mipmap
navigation
values
colors.xml
dimens.xml
strings.xml
themes (2)
Gradle Scripts
<?xml version="1.0" encoding="utf-8"?>
<resources>
<color name="purple_200">#FFBB86FC</color>
<color name="purple_500">#FF882211</color>
<color name="purple_700">#FF3700B3</color>
<color name="teal_200">#FF03DAC5</color>
<color name="teal_700">#FF018786</color>
<color name="black">#FF000000</color>
<color name="white">#FFFFFFFF</color>
</resources>
resources
6:46
My Application
Next Generation Programmers!
NEXT
TODO Terminal Database Inspector Profiler 4: Run Build 6: Logcat
Event Log Layout Inspector
Success: Operation succeeded (4 minutes ago)
10:13 CRLF UTF-8 4 spaces

Bonus task: Let’s add another button

Add a button


File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help
My Application - fragment_first.xml [My_Application.app] - Android Studio
MyApplication app src main res layout fragment_first.xml
app
Nexus 5 API 23
Android
app
manifests
java
com.example.myapplication
FirstFragment
MainActivity
SecondFragment
com.example.myapplication (ar
com.example.myapplication (te
java (generated)
com.example.myapplication
res
drawable
layout
activity_main.xml
content_main.xml
fragment_first.xml
fragment_second.xml
menu
mipmap
navigation
values
res (generated)
Gradle Scripts
FirstFragment.java
colors.xml
fragment_first.xml
Code
Split
Design
1 <?xml version="1.0" encoding="utf-8"?>
2 <androidx.constraintlayout.widget.ConstraintLayout x
3 xmlns:app="http://schemas.android.com/apk/res-au
4 xmlns:tools="http://schemas.android.com/tools"
5 android:layout_width="match_parent"
6 android:layout_height="match_parent"
7 tools:context=".FirstFragment">
8
9 <TextView
10 android:id="@+id/textview_first"
11 android:layout_width="wrap_content"
12 android:layout_height="wrap_content"
13 android:text="Next Generation Programmers!"
14 app:layout_constraintBottom_toTopOf="@id/but
15 app:layout_constraintEnd_toEndOf="parent"
16 app:layout_constraintStart_toStartOf="parent
17 app:layout_constraintTop_toTopOf="parent" />
18
19 <Button
20 android:id="@+id/button_first"
21 android:layout_width="wrap_content"
22 android:layout_height="wrap_content"
23 android:text="@string/next"
24 app:layout_constraintBottom_toBottomOf="pare
25 app:layout_constraintEnd_toEndOf="parent"
26 app:layout_constraintStart_toStartOf="parent
27 app:layout_constraintTop_toBottomOf="@id/tex
28 </androidx.constraintlayout.widget.ConstraintLayout>
Palette
Common
Text
Buttons
Widgets
Layouts
Containers
Helpers
Google
Legacy
Button
ImageButton
ChipGroup
Chip
CheckBox
RadioGroup
RadioButton
ToggleButton
Switch
FloatingActio...
Pixel
30
MyApplication
0dp
Next Generation Programmers!
NEXT
androidx.constraintlayout.widget.ConstraintLayout
TODO
Terminal
Database Inspector
Profiler
4: Run
Build
6: Logcat
Event Log
Layout Inspector
Success: Operation succeeded (26 minutes ago)
8:1 CRLF UTF-8 4 spaces

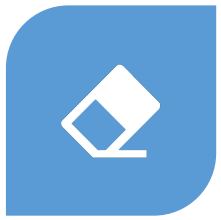

File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help
My Application - Android Studio
MyApplication app
app
Nexus 5 API 23
Android
app
manifests
java
com.example.myapplication
FirstFragment
MainActivity
SecondFragment
com.example.myapplication (ar
com.example.myapplication (te
java (generated)
res
res (generated)
Gradle Scripts
Search Everywhere Double Shift
Go to File Ctrl+Shift+N
Recent Files Ctrl+E
Navigation Bar Alt+Home
Drop files here to open
7:19
My Application
Next Generation Programmers!
NEXT
BUTTON
1: Project
Resource Manager
7: Structure
2: Favorites
Build Variants
Gradle
Device File Explorer
Emulator
TODO
Terminal
Database Inspector
Profiler
4: Run
Build
6: Logcat
Event Log
Layout Inspector
Success: Operation succeeded (a minute ago)

Common glossary

UI / GUI / HMI

DEVELOPMENT

IMPLEMENT



EDIT

TEST

RUN

DEBUG