

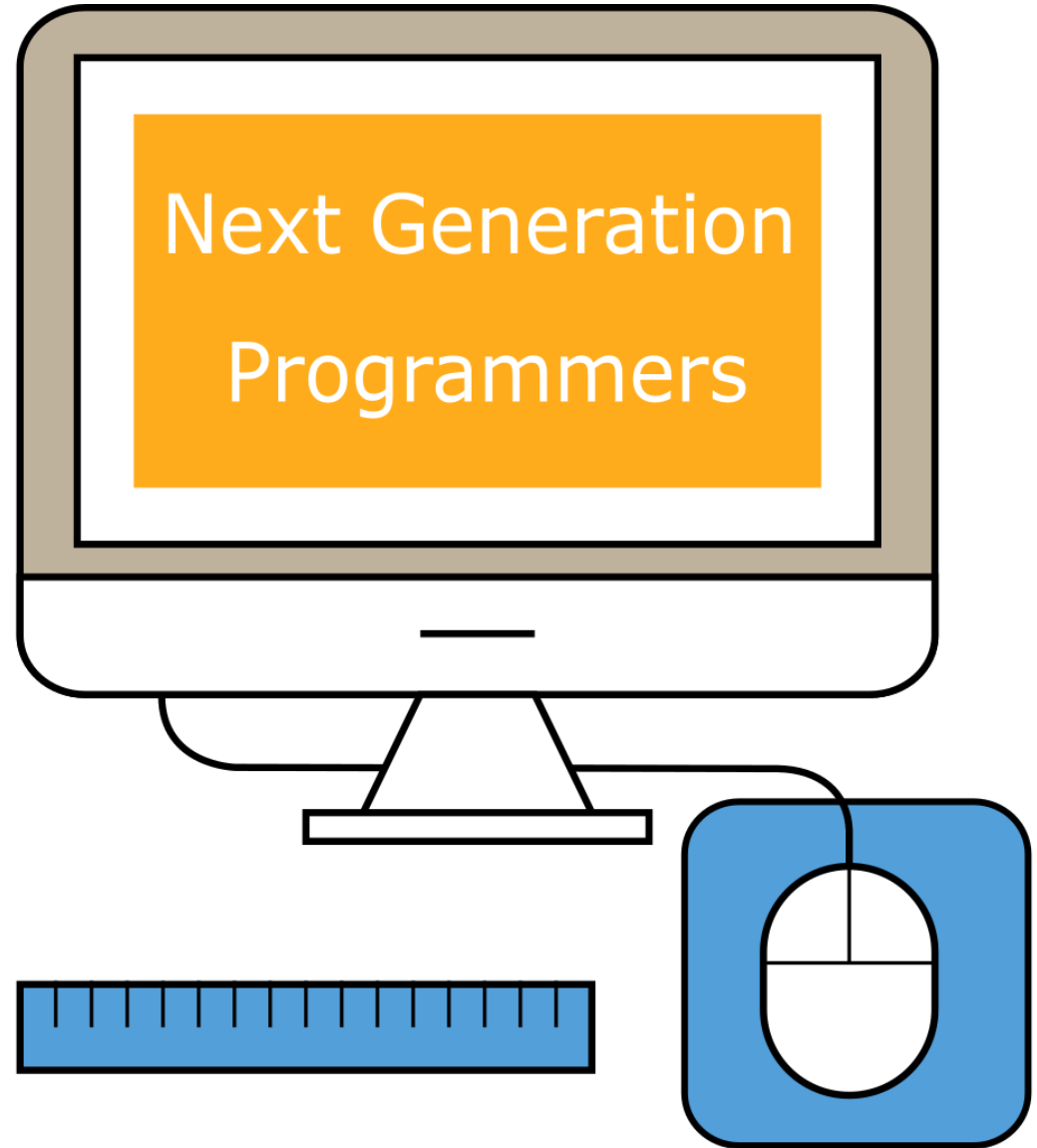
App development in Android Studio

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June 2021



Android
Studio



MyApplication > app > src > main > java > com > example >.myapplication > FirstF

Android > FirstFragment.java

1 package com.example.myapplication;

2

3 import ...

13

14 public class FirstFragment extends Fragment {

15

16 private FragmentFirstBinding binding;

17

18 @Override

19 public View onCreateView(
20 LayoutInflater inflater, ViewGroup container,
21 Bundle savedInstanceState
22) {

23

24 binding = FragmentFirstBinding.inflate(inflater, container, attachToParent: false);

25 return binding.getRoot();

26

27 }

28

29 public void onViewCreated(@NonNull View view, Bundle savedInstanceState) {

30 super.onViewCreated(view, savedInstanceState);

31

32 binding.buttonFirst.setOnClickListener(new View.OnClickListener() {

33 @Override

34 public void onClick(View view) {

35 NavHostFragment.findNavController(fragment: FirstFragment.this)
36 .navigate(R.id.action_FirstFragment_to_SecondFragment);

37 }

38 }
39 };

40

Button!

Function

Gradle build failed in 4 s 50 ms (8 minutes ago)

27:6 CRLF UTF-8 4 spaces

File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help My Application - FirstFragment.java [My_Application.app]

main > java > com > example > myapplication > FirstFragment > onCreateView

Android FirstFragment.java

Project

- app
 - manifests
 - java
 - com.example.myapplication
 - FirstFragment
 - MainActivity
 - SecondFragment
 - com.example.myapplication (android)
 - com.example.myapplication (test)
 - java (generated)
 - res
 - res (generated)
 - Gradle Scripts

Resource Manager

Structure

Build Variants

Device File Explorer

Emulator

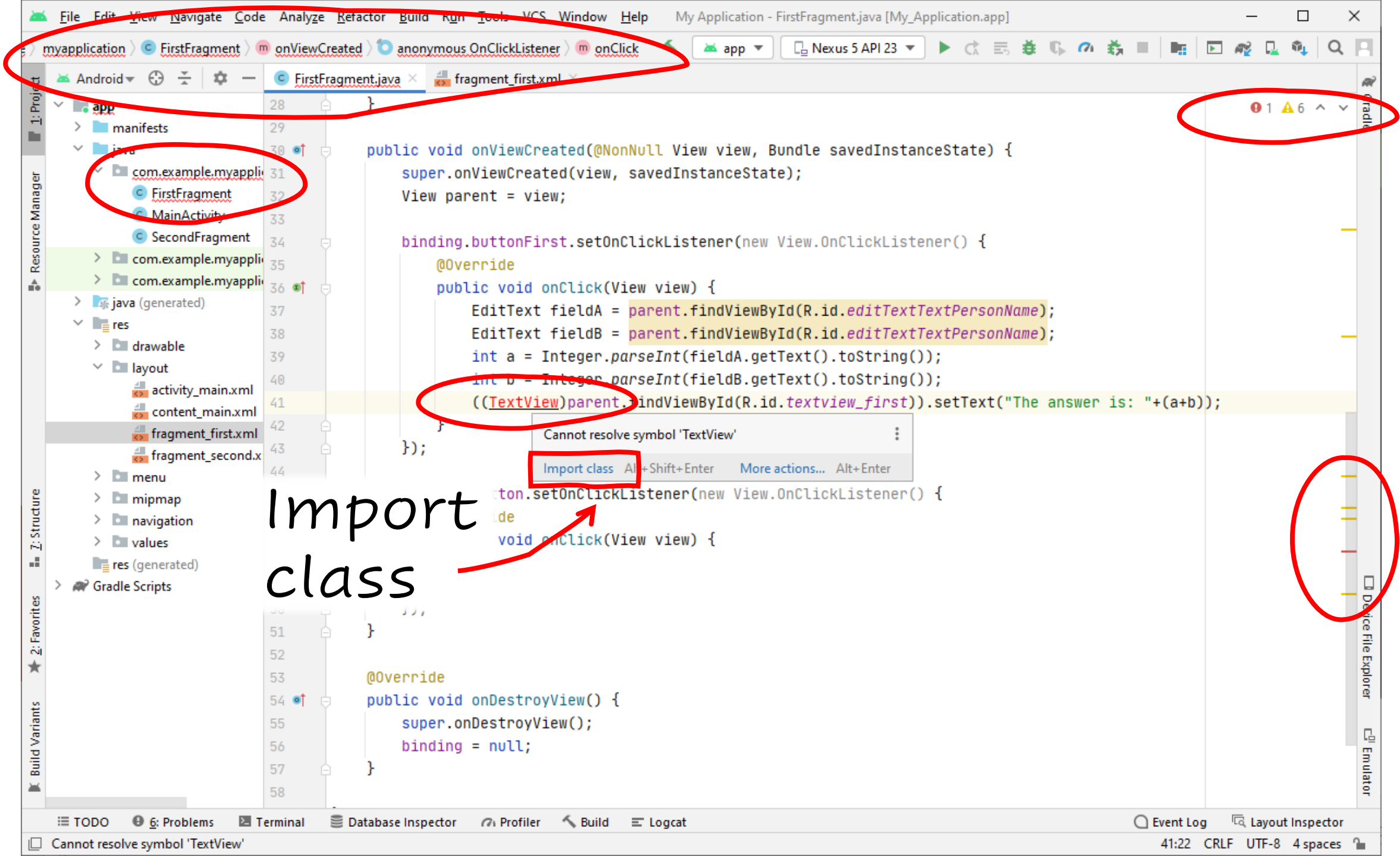
```
22     } {
23
24         binding = FragmentFirstBinding.inflate(inflater, container, attachToParent: false);
25         return binding.getRoot();
26     }
27
28
29     public void onViewCreated(@NonNull View view, Bundle savedInstanceState) {
30         super.onViewCreated(view, savedInstanceState);
31
32         binding.buttonFirst.setOnClickListener(new View.OnClickListener() {
33             @Override
34             public void onClick(View view) {
35                 NavHostFragment.findNavController( fragment: FirstFragment.this)
36                     .navigate(R.id.action_FirstFragment_to_SecondFragment);
37             }
38         });
39
40         binding.buttonFirst.setOnClickListener(new View.OnClickListener() {
41             @Override
42             public void onClick(View view) {
43                 NavHostFragment.findNavController( fragment: FirstFragment.this)
44                     .navigate(R.id.action_FirstFragment_to_SecondFragment);
45             }
46         });
47     }
48
49     @Override
50     public void onDestroyView() {
51         super.onDestroyView();
52         binding = null;
```

Copy

Gradle build failed in 4 s 50 ms (9 minutes ago)

Event Log Layout Inspector

38:12 CRLF UTF-8 4 spaces



Where we are at after Lesson 2...

The screenshot displays the Android Studio IDE with the `FirstFragment.java` file open. The code is as follows:

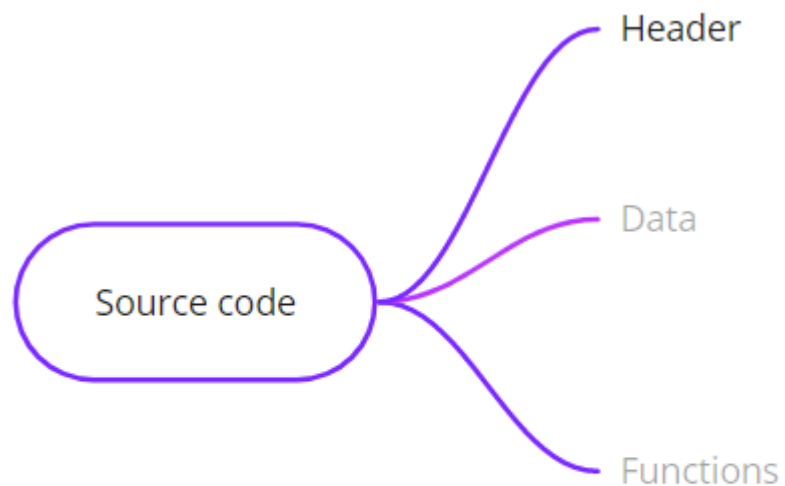
```
30
31
32 public void onViewCreated(@NonNull View view, Bundle savedInstanceState) {
33     super.onViewCreated(view, savedInstanceState);
34     View parent = view;
35
36     binding.buttonFirst.setOnClickListener(new View.OnClickListener() {
37         @Override
38         public void onClick(View view) {
39             EditText fieldA = parent.findViewById(R.id.editTextTextP
40             EditText fieldB = parent.findViewById(R.id.editTextTextP
41             int a = Integer.parseInt(fieldA.getText().toString());
42             int b = Integer.parseInt(fieldB.getText().toString());
43             ((TextView)parent.findViewById(R.id.textview_first)).set
44         }
45     });
46
47     binding.button.setOnClickListener(new View.OnClickListener() {
48         @Override
49         public void onClick(View view) {
50
51         }
52     });
53
54     @Override
55     public void onDestroyView() {
56         super.onDestroyView();
57         binding = null;
58     }
59 }
```

The IDE interface includes a Project Manager on the left showing the project structure, a Run button at the bottom, and a status bar at the bottom indicating "Launch succeeded (2 minutes ago)".

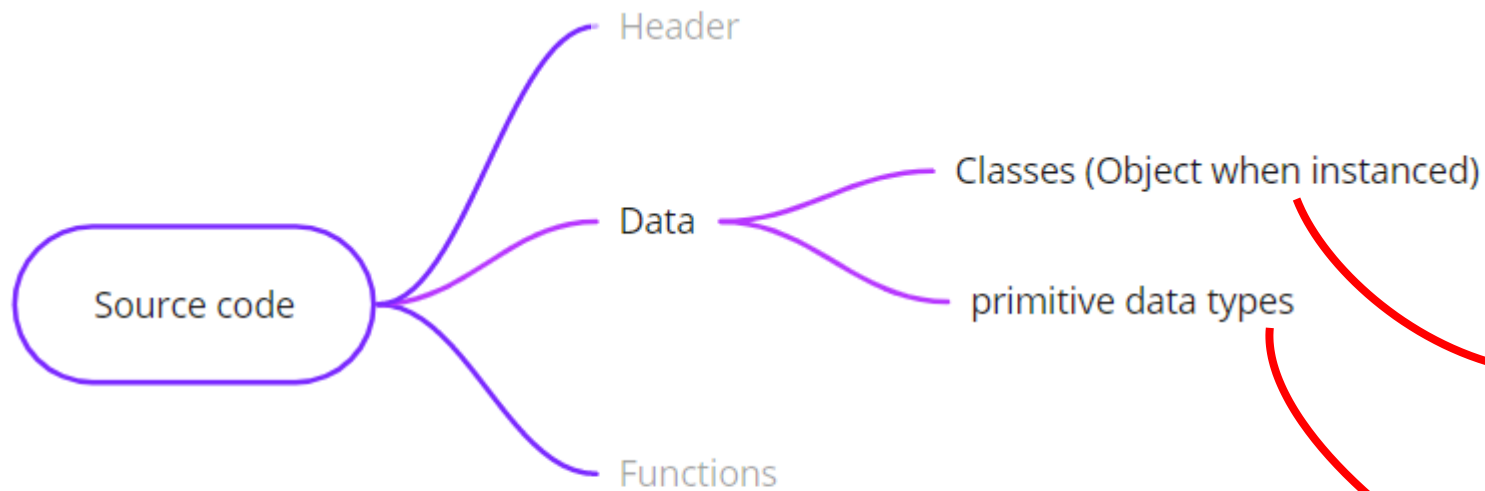
On the right, a smartphone preview shows the app's UI. The app has a yellow header bar with the title "First Fragment". The main content area displays "The answer is: 2021". Below this, there are two input fields: the first contains "2000" and the second contains "21". A yellow "NEXT" button is positioned between the two fields. At the bottom, there is a yellow "BUTTON" and a green circular button with a white envelope icon.

Function

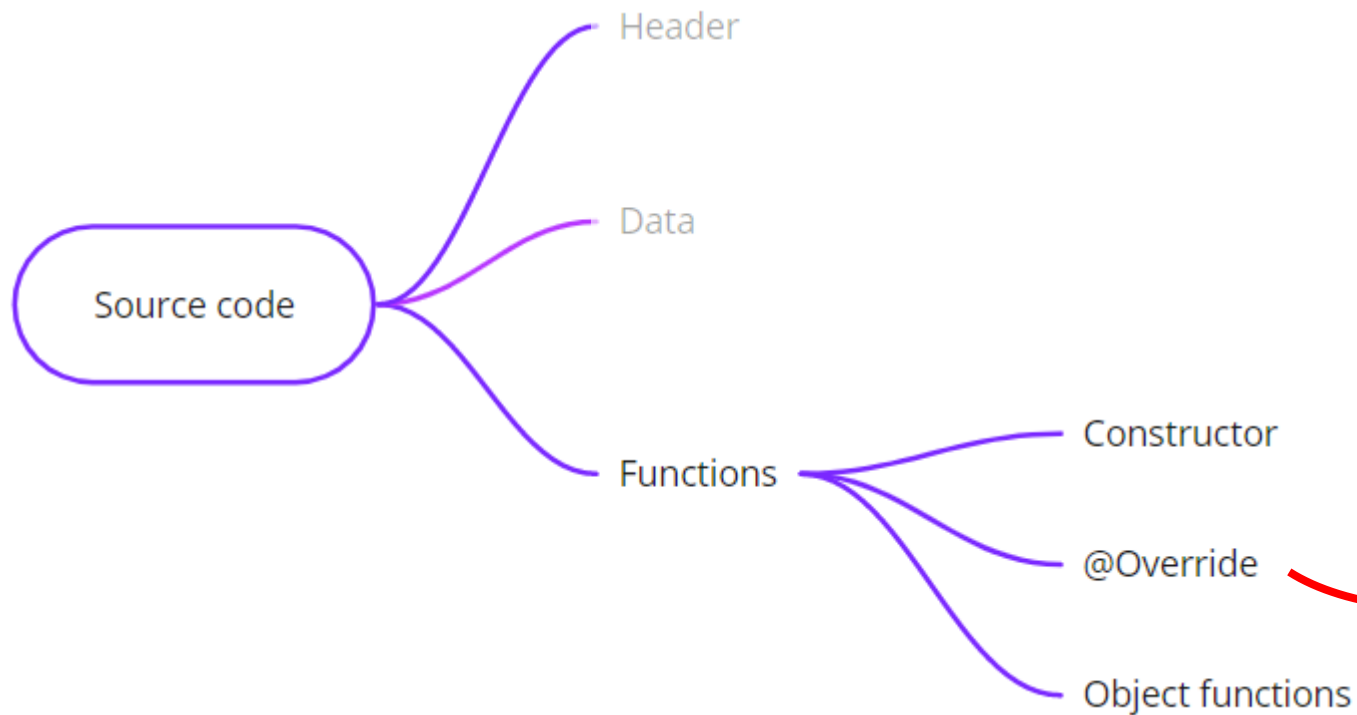
```
1 package com.example.myapplication;
2
3 import android.os.Bundle;
4 import com.google.android.material.floatingactionbutton.FloatingActionButton;
5 import com.google.android.material.snackbar.Snackbar;
6 import androidx.appcompat.app.AppCompatActivity;
7 import androidx.appcompat.widget.Toolbar;
8 import android.view.View;
9 import android.view.Menu;
10 import android.view.MenuItem;
11
12 public class MainActivity extends AppCompatActivity {
13
14     @Override
15     protected void onCreate(Bundle savedInstanceState) {
16         super.onCreate(savedInstanceState);
17         setContentView(R.layout.activity_main);
18         Toolbar toolbar = findViewById(R.id.toolbar);
19         setSupportActionBar(toolbar);
20
21         FloatingActionButton fab = findViewById(R.id.fab);
22         fab.setOnClickListener(new View.OnClickListener() {
23             @Override
24             public void onClick(View view) {
25                 Snackbar.make(view, text: "Replace with your own action", Snackbar.LENGTH_LONG)
26                     .setAction(text: "Action", listener: null).show();
27             }
28         });
29     }
30
31     @Override
32     public boolean onCreateOptionsMenu(Menu menu) {
33         // Inflate the menu; this adds items to the action bar if it is present.
34         getMenuInflater().inflate(R.menu.menu_main, menu);
35         return true;
36     }
37
38     @Override
39     public boolean onOptionsItemSelected(MenuItem item) {
```

```
1 package com.example.myapplication;
2
3 import android.os.Bundle;
4 import android.view.LayoutInflater;
5 import android.view.View;
6 import android.view.ViewGroup;
7 import android.widget.EditText;
8 import android.widget.TextView;
9
10 import androidx.annotation.NonNull;
11 import androidx.fragment.app.Fragment;
12 import androidx.navigation.fragment.NavHostFragment;
13
14 import com.example.myapplication.databinding.FragmentFirstBind
15
16 public class FirstFragment extends Fragment {
17
18     private FragmentFirstBinding binding;
19
20     @Override
21     public View onCreateView(
22         LayoutInflater inflater, ViewGroup container,
23         Bundle savedInstanceState) {
24         super.onCreateView(inflater, container, savedInstanceState);
25         View parent = view;
26
27         binding.buttonFirst.setOnClickListener(new View.OnClickListener() {
28             @Override
29             public void onClick(View view) {
30                 EditText fieldA = parent.findViewById(R.id.edit7);
31                 EditText fieldB = parent.findViewById(R.id.edit7);
32                 int a = Integer.parseInt(fieldA.getText().toString());
33                 int b = Integer.parseInt(fieldB.getText().toString());
34                 ((TextView)parent.findViewById(R.id.textview_fir
35             });
36
37         binding.button.setOnClickListener(new View.OnClickListener() {
38             @Override
39             public void onClick(View view) {
40
41             }
42         });
43     }
44 }
```



```
1 package com.example.myapplication;
2
3 import android.os.Bundle;
4 import android.view.LayoutInflater;
5 import android.view.View;
6 import android.view.ViewGroup;
7 import android.widget.EditText;
8 import android.widget.TextView;
9
10 import androidx.annotation.NonNull;
11 import androidx.fragment.app.Fragment;
12 import androidx.navigation.fragment.NavHostFragment;
13
14 import com.example.myapplication.databinding.FragmentFirstBind
15
16 public class FirstFragment extends Fragment {
17
18     private FragmentFirstBinding binding;
19
20     @Override
21     public View onCreateView(
22         LayoutInflater inflater, ViewGroup container,
23         Bundle savedInstanceState) {
24         super.onCreateView(inflater, container, savedInstanceState);
25         View parent = view;
26
27         binding.buttonFirst.setOnClickListener(new View.OnClickListener() {
28             @Override
29             public void onClick(View view) {
30                 EditText fieldA = parent.findViewById(R.id.edit7);
31                 EditText fieldB = parent.findViewById(R.id.edit7);
32                 int a = Integer.parseInt(fieldA.getText().toString());
33                 int b = Integer.parseInt(fieldB.getText().toString());
34                 ((TextView)parent.findViewById(R.id.textview_fir
35             )).setText(a + b);
36         });
37
38         binding.button.setOnClickListener(new View.OnClickListener() {
39             @Override
40             public void onClick(View view) {
41
42             }
43         });
44     }
45 }
46
47 binding.button.setOnClickListener(new View.OnClickListener() {
48     @Override
49     public void onClick(View view) {
50
51     }
52 });
53 }
```

```
1 package com.example.myapplication;
2
3 import android.os.Bundle;
4 import android.view.LayoutInflater;
5 import android.view.View;
6 import android.view.ViewGroup;
7 import android.widget.EditText;
8 import android.widget.TextView;
9
10 import androidx.annotation.NonNull;
11 import androidx.fragment.app.Fragment;
12 import androidx.navigation.fragment.NavHostFragment;
13
14 import com.example.myapplication.databinding.FragmentFirstBind
15
16 public class FirstFragment extends Fragment {
17
18     private FragmentFirstBinding binding;
19
20     @Override
21     public View onCreateView(
22         LayoutInflater inflater, ViewGroup container,
23         Bundle savedInstanceState) {
24         super.onCreateView(inflater, container, savedInstanceState);
25         binding = FragmentFirstBinding.inflate(inflater, container, false);
26         return binding.getRoot();
27     }
28
29     @Override
30     public void onViewCreated(@NonNull View view, Bundle savedInstanceState) {
31         super.onViewCreated(view, savedInstanceState);
32         View parent = view;
33
34         binding.buttonFirst.setOnClickListener(new View.OnClickListener() {
35             @Override
36             public void onClick(View view) {
37                 EditText fieldA = parent.findViewById(R.id.edit7);
38                 EditText fieldB = parent.findViewById(R.id.edit7);
39                 int a = Integer.parseInt(fieldA.getText().toString());
40                 int b = Integer.parseInt(fieldB.getText().toString());
41                 ((TextView)parent.findViewById(R.id.textview_fir
42             ));
43         });
44
45         binding.button.setOnClickListener(new View.OnClickListener() {
46             @Override
47             public void onClick(View view) {
48             }
49         });
50     }
51 }
```



Task 1: Let's look at the code
we wrote in the last lesson

File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help My Application - FirstFragment.java [My_Application.app]

myapplication > FirstFragment > onCreateView > anonymous OnClickListener > onClick

app Nexus 5 API 23

1: Project

- app
 - manifests
 - java
 - com.example.myapplication
 - FirstFragment
 - MainActivity
 - SecondFragment
 - com.example.myapplication
 - com.example.myapplication
 - 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

2: Structure

3: Favorites

Build Variants

Resource Manager

Gradle

```
25
26     binding = FragmentFirstBinding.inflate(inflater, container, attachToParent: false);
27     return binding.getRoot();
28
29 }
30
31 public void onCreateView(@NonNull View view, Bundle savedInstanceState) {
32     super.onCreateView(view, savedInstanceState);
33     View parent = view;
34
35     binding.buttonFirst.setOnClickListener(new View.OnClickListener() {
36         @Override
37         public void onClick(View view) {
38             EditText fieldA = parent.findViewById(R.id.editTextTextPersonName);
39             EditText fieldB = parent.findViewById(R.id.editTextTextPersonName2);
40             int a = Integer.parseInt(fieldA.getText().toString());
41             int b = Integer.parseInt(fieldB.getText().toString());
42             ((TextView)parent.findViewById(R.id.textView_first)).setText("The answer is: " + (a+b));
43         }
44     });
45
46     binding.button.setOnClickListener(new View.OnClickListener() {
47         @Override
48         public void onClick(View view) {
49
50         }
51     });
52 }
53
54 @Override
55 public void onDestroyView() {
```

Launch succeeded (2 minutes ago)

38:84 CRLF UTF-8 4 spaces

TODO Problems Terminal Database Inspector Profiler Run Build Logcat Event Log Layout Inspector

File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help My Application - FirstFragment.java [My_Application.app]

ation > app > src > main > java > com > example > myapplication > FirstFragment > readInteger app Nexus 5 API 23

1: Project 2: Favorites 3: Structure 4: Run 5: Build 6: Logcat 7: Event Log 8: Layout Inspector

Android FirstFragment.java fragment_first.xml

Type this code

```
23 Bundle savedInstanceState
24 ) {
25     binding = FragmentFirstBinding.inflate(inflater, container, attachToParent: false);
26     return binding.getRoot();
27 }
28
29 @
30 private int readInteger(EditText field){
31     int result = Integer.parseInt(field.getText().toString());
32     return result;
33 }
34
35 public void onViewCreated(@NonNull View view, Bundle savedInstanceState) {
36     super.onViewCreated(view, savedInstanceState);
37     View parent = view;
38
39     binding.buttonFirst.setOnClickListener(new View.OnClickListener() {
40         @Override
41         public void onClick(View view) {
42             EditText fieldA = parent.findViewById(R.id.editTextTextPersonName);
43             EditText fieldB = parent.findViewById(R.id.editTextTextPersonName2);
44             int a = readInteger(fieldA);
45             int b = readInteger(fieldB);
46             ((TextView)parent.findViewById(R.id.textview_first)).setText("The answer is: " + (a+b));
47         }
48     });
49
50     binding.button.setOnClickListener(new View.OnClickListener() {
51         @Override
52         public void onClick(View view) {
53
54         }
55     });
56 }
```

res

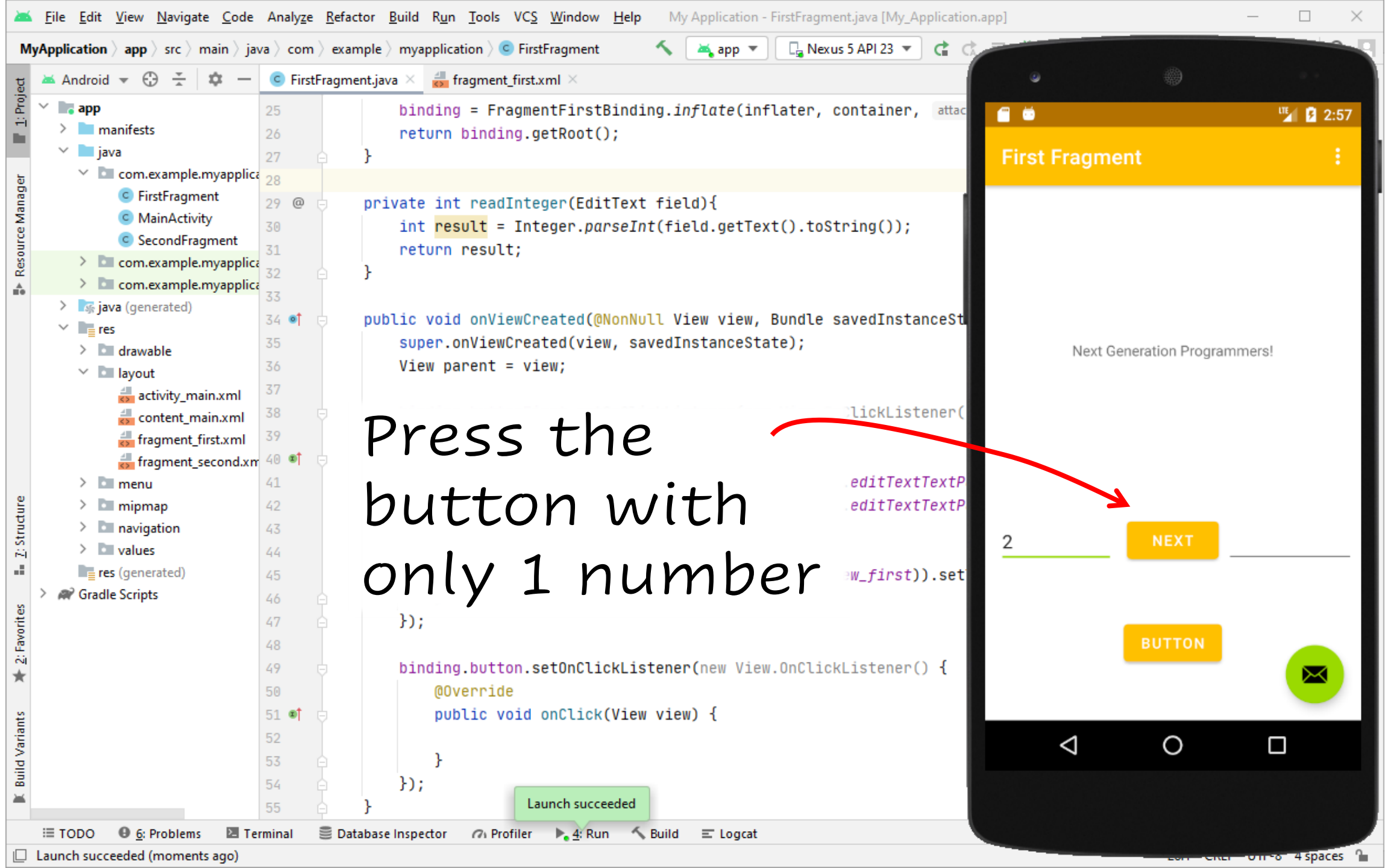
- drawable
- layout
 - activity_main.xml
 - content_main.xml
 - fragment_first.xml
 - fragment_second.xml
- menu
- mipmap
- navigation
- values
- res (generated)

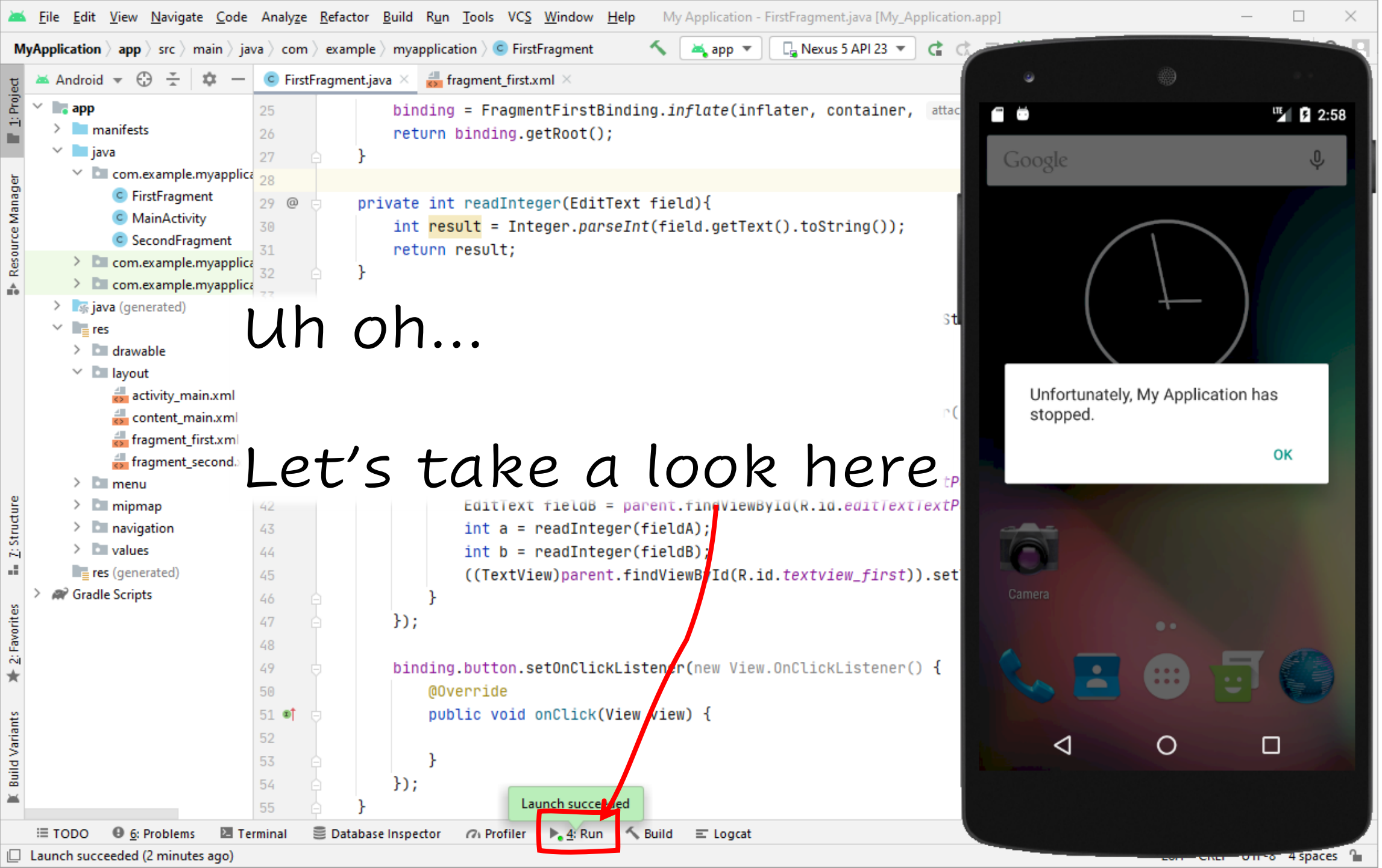
Gradle Scripts

Device File Explorer Emulator

Failed to start monitoring HT76Y1A00095 (31 minutes ago)

31:23 CRLF UTF-8 4 spaces





MyApplication > app > src > main > java > com > example >.myapplication > FirstFragment

Android > FirstFragment.java > fragment_first.xml

```
27 }
28
29 @
30 private int readInteger(EditText field){
31     int result = Integer.parseInt(field.getText().toString());
32     return result;
33 }
```

Run: app

glUtilsParamSize: unknow param 0x00008824
D/EGL_emulation: eglMakeCurrent: 0xae4d4480: ver 3 1
D/AndroidRuntime: Shutting down VM
E/AndroidRuntime: FATAL EXCEPTION: main
Process: com.example.myapplication, PID: 12363
java.lang.NumberFormatException: Invalid int: ""
at java.lang.Integer.invalidInt(Integer.java:138)
at java.lang.Integer.parseInt(Integer.java:358)
at java.lang.Integer.parseInt(Integer.java:334)
at com.example.myapplication.FirstFragment.readInteger(FirstFragment.java:30)
at com.example.myapplication.FirstFragment.access\$000(FirstFragment.java:16)
at com.example.myapplication.FirstFragment\$1.onClick(FirstFragment.java:44)
at android.view.View.performClick(View.java:5198)
at com.google.android.material.button.MaterialButton.performClick(MaterialButton.java:992)
at android.view.View\$PerformClick.run(View.java:21147)
at android.os.Handler.handleCallback(Handler.java:739)
at android.os.Handler.dispatchMessage(Handler.java:95)
at android.os.Looper.loop(Looper.java:148)
at android.app.ActivityThread.main(ActivityThread.java:5417) <1 internal call>
at com.android.internal.os.ZygoteInit\$MethodAndArgsCaller.run(ZygoteInit.java:726)
at com.android.internal.os.ZygoteInit.main(ZygoteInit.java:616)

Our new function!

Launch succeeded (4 minutes ago)

Event Log Layout Inspector 43:1 CRLF UTF-8 4 spaces

FileEditViewNavigateCodeAnalyzeRefactorBuildRunToolsVCSWindowHelpMy Application - FirstFragment.java [My_Application.app]

ation > app > src > main > java > com > example > myapplication > FirstFragment > readInteger

AndroidFirstFragment.javaxfragment_first.xmlx

1: Project

app

manifests

java

com.example.myapplication

FirstFragment

MainActivity

SecondFragment

com.example.myapplication

com.example.myapplication

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

2: Structure

3: Favorites

Build Variants

28

29

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52

53

54

55

56

57

58

@

private int readInteger(EditText field){

int result = Integer.parseInt(field.getText().toString());

return result;

}

public void onView

super.onViewC

View parent =

binding.butto

@Override

public vo

EditT

EditT

int a

int b

((Tex

});

binding.butto

@Override

public void onClick(View view) {

}

});

}

@Override

public void onDestroyView() {

java.lang

public final class Integer

extends Number

implements Comparable<Integer>

The Integer class wraps a value of the primitive type int in an object. An object of type Integer contains a single field whose type is int.

In addition, this class provides several methods for converting an int to a String and a String to an int, as well as other constants and methods useful when dealing with an int.

Implementation note: The implementations of the "bit twiddling" methods (such as highestOneBit and numberOfTrailingZeros) are based on material from Henry S. Warren, Jr.'s *Hacker's Delight*, (Addison Wesley, 2002).

Since: JDK1.0

< Android API 30 Platform >

savedInstanceState) {

ClickListener() {

editTextTextPersonName);

editTextTextPersonName2);

ew_first)).setText("The answer is: "+(a+b));

listener() {

7

^

v

Device File Explorer

Emulator

TODO

Problems

Terminal

Database Inspector

Profiler

Run

Build

Logcat

Event Log

Layout Inspector

Local variable 'result' is redundant

1 char

30:19

CRLF

UTF-8

4 spaces

File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help My Application - FirstFragment.java [My_Application.app]

action > app > src > main > java > com > example > myapplication > FirstFragment > readInteger

Android FirstFragment.java fragment_first.xml

1: Project

- app
 - manifests
 - java
 - com.example.myapplication
 - FirstFragment
 - MainActivity
 - SecondFragment
 - com.example.myapplication
 - com.example.myapplication
 - 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

2: Structure

3: Favorites

Build Variants

```
28
29 @
30 private int readInteger(EditText field){
31     int result = Integer.parseInt(field.getText().toString());
32     return result;
33 }
34
35 public void onViewCreated(
36     super.onViewCreated(
37     View parent = view;
38
39     binding.buttonFirst.S
40     @Override
41     public void onCli
42         EditText fiel
43         EditText fiel
44         int a = readI
45         int b = readI
46         ((TextView)pa
47     });
48
49     binding.button.setOnC
50     @Override
51     public void onCli
52
53
54
55 }
56
57 @Override
58 public void onDestroyView() {
```

java.lang.Integer
public static int parseInt(String s)
throws NumberFormatException

Parses the string argument as a signed decimal integer. The characters in the string must all be decimal digits, except that the first character may be an ASCII minus sign '-' ('\u002D') to indicate a negative value or an ASCII plus sign '+' ('\u002B') to indicate a positive value. The resulting integer value is returned, exactly as if the argument and the radix 10 were given as arguments to the parseInt(String, int) method.

Params: s – a String containing the int representation to be parsed

Returns: the integer value represented by the argument in decimal.

Throws: NumberFormatException – if the string does not contain a parsable integer.

< Android API 30 Platform >

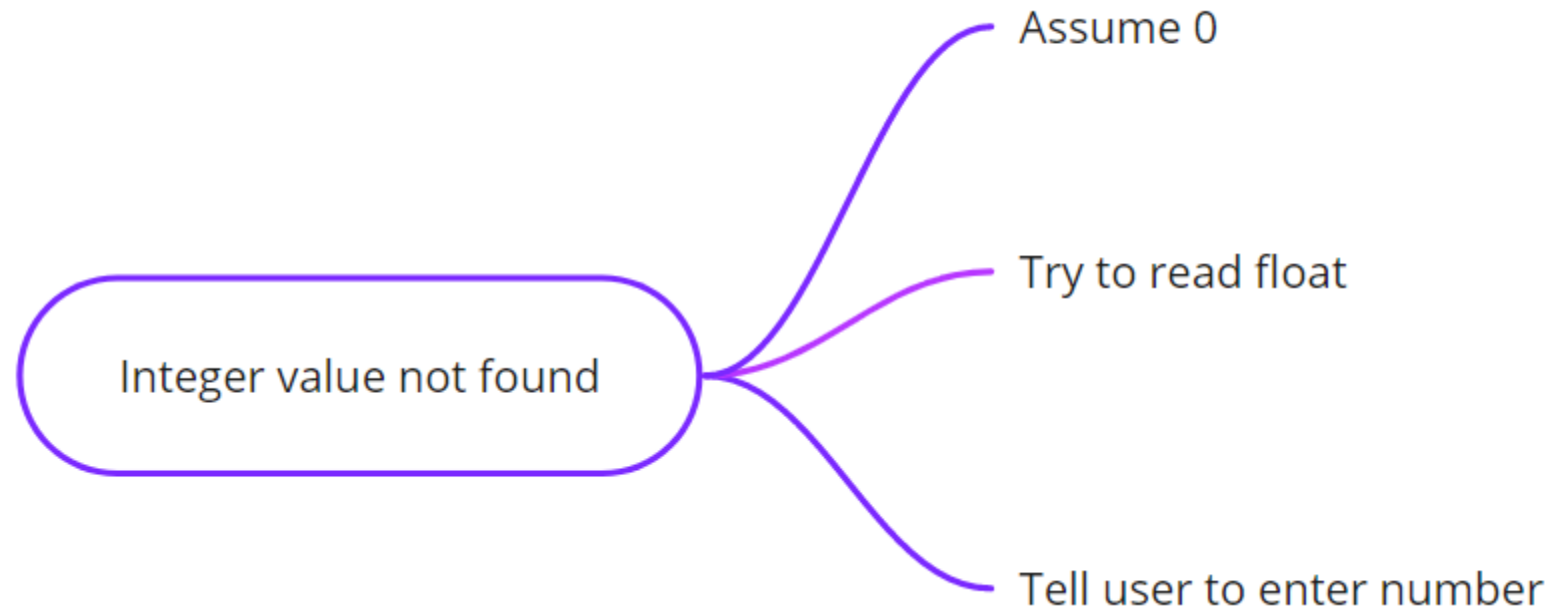
D/AndroidRuntime: Shutting down VM
E/AndroidRuntime: FATAL EXCEPTION: main
Process: com.example.myapplication, PID: 12363
java.lang.NumberFormatException: Invalid int: ""
at java.lang.Integer.invalidInt(Integer.java:138)

Event Log Layout Inspector

Launch succeeded (23 minutes ago) 30:33 CRLF UTF-8 4 spaces



Task 2: Let's fix the problematic function



Integer value not found

Assume 0

Try to read float

Tell user to enter number

```
29 @
30
31
32
33
34
35
36
37
38

private int readInteger(EditText field){
    int result;
    try {
        result = Integer.parseInt(field.getText().toString());
    } catch (NumberFormatException exception) {
        field.setText("0");
        result = 0;
    }
    return result;
}
```


Integer value not found

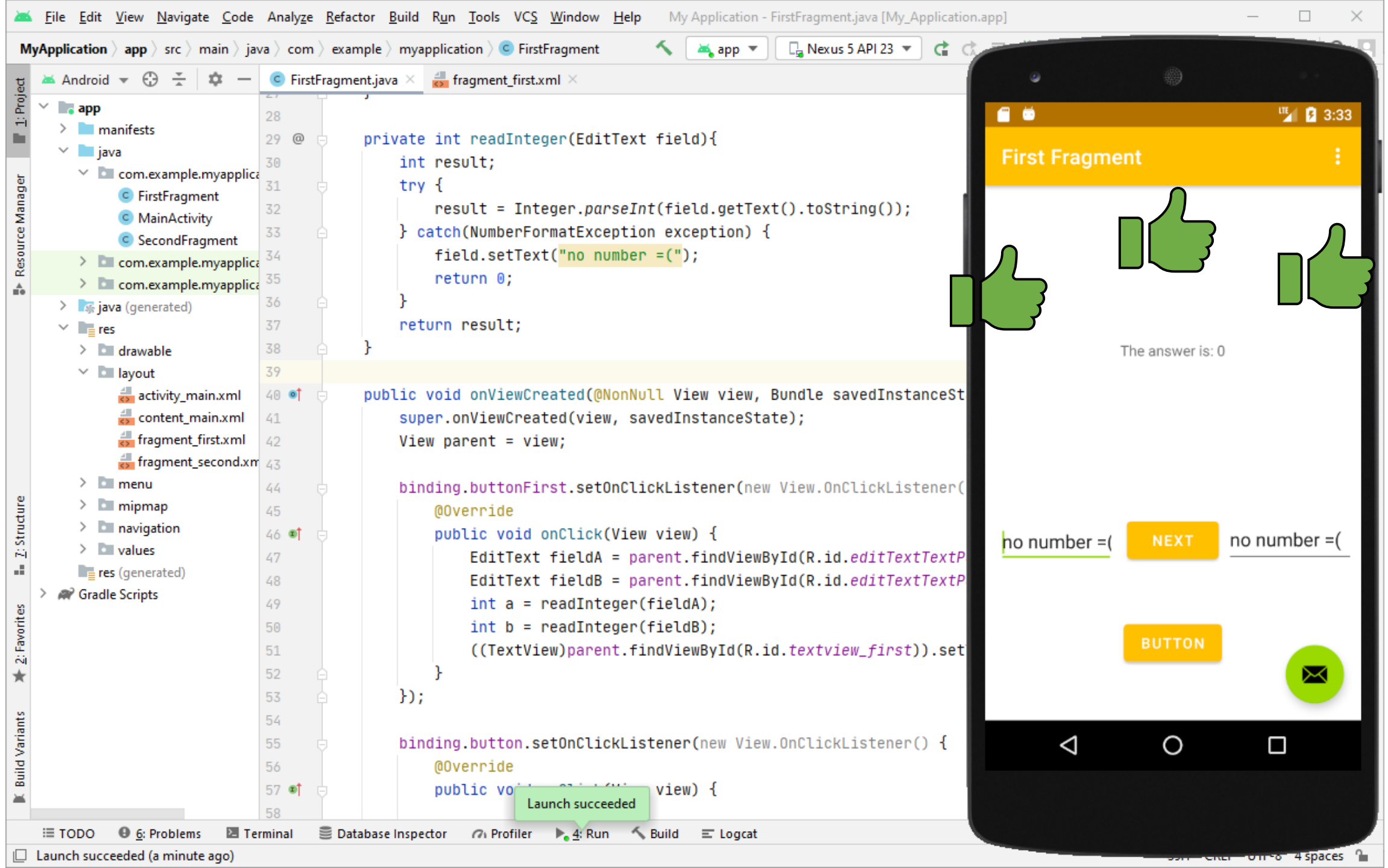
Assume 0

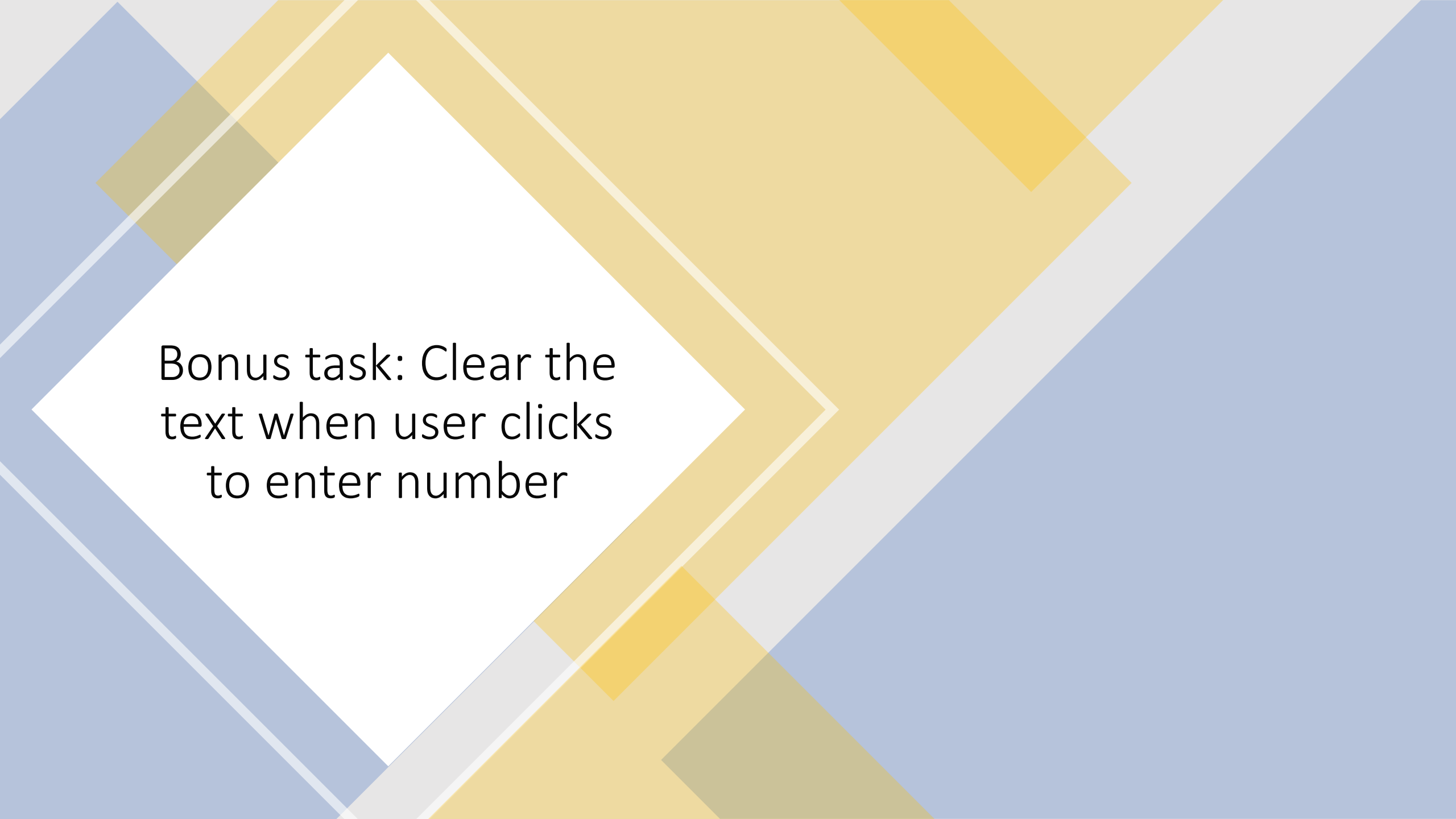
Try to read float

Tell user to enter number

```
29 @
30
31
32
33
34
35
36
37
38

private int readInteger(EditText field){
    int result;
    try {
        result = Integer.parseInt(field.getText().toString());
    } catch(NumberFormatException exception) {
        field.setText("no number =(");
        return 0;
    }
    return result;
}
```





Bonus task: Clear the
text when user clicks
to enter number

MyApplication > app > src > main > java > com > example >.myapplication > FirstFragment

Android > FirstFragment.java > fragment_first.xml

1: Project

- app
 - manifests
 - java
 - com.example.myapplication
 - FirstFragment
 - MainActivity
 - SecondFragment
 - com.example.myapplication
 - com.example.myapplication
 - 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

2: Structure

3: Favorites

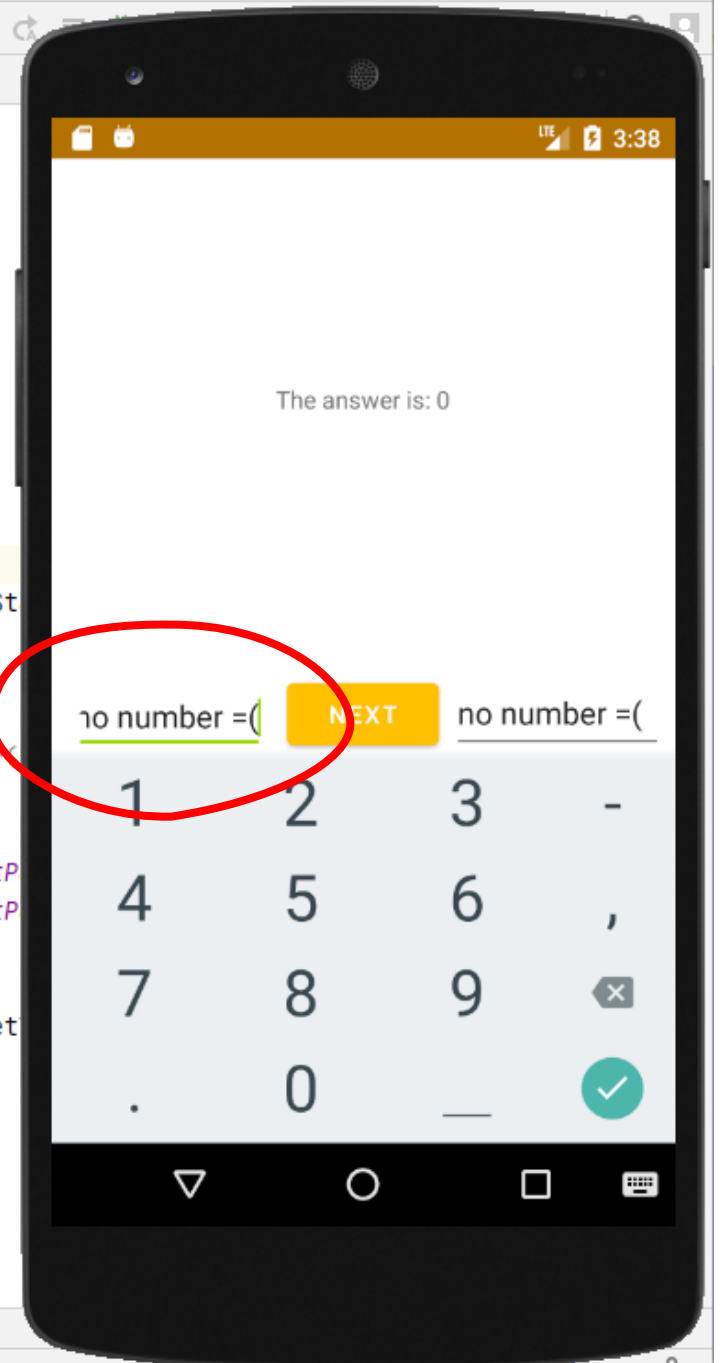
Build Variants

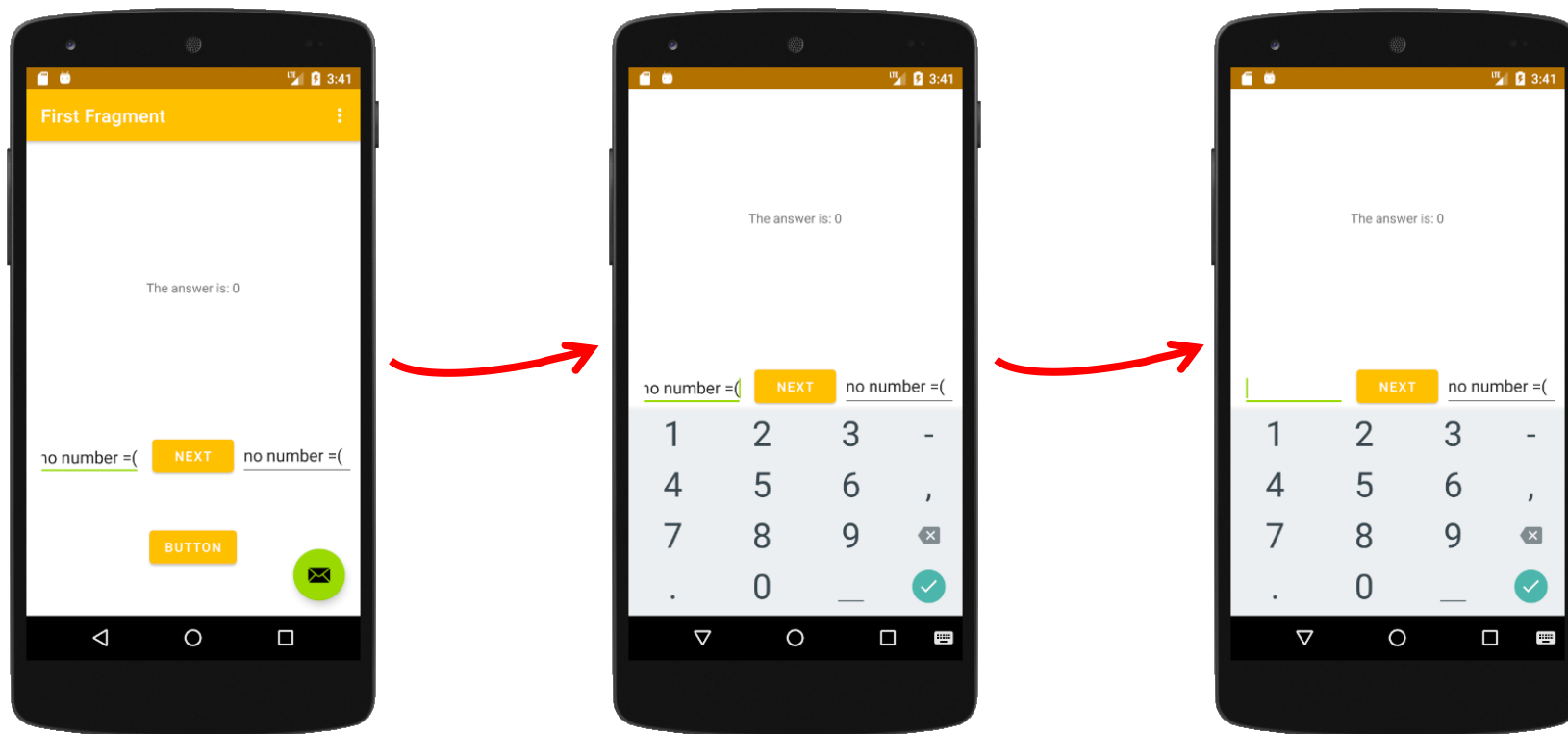
```
28  
29 @ private int readInteger(EditText field){  
30     int result;  
31     try {  
32         result = Integer.parseInt(field.getText().toString());  
33     } catch (NumberFormatException exception) {  
34         field.setText("no number =(");  
35         return 0;  
36     }  
37     return result;  
38 }  
39  
40 public void onViewCreated(@NonNull View view, Bundle savedInstanceState)  
41     super.onViewCreated(view, savedInstanceState);  
42     View parent = view;  
43  
44     binding.buttonFirst.setOnClickListener(new View.OnClickListener() {  
45         @Override  
46         public void onClick(View view) {  
47             EditText fieldA = parent.findViewById(R.id.editTextTextP  
48             EditText fieldB = parent.findViewById(R.id.editTextTextP  
49             int a = readInteger(fieldA);  
50             int b = readInteger(fieldB);  
51             ((TextView)parent.findViewById(R.id.textview_first)).set  
52         }  
53     });  
54  
55     binding.button.setOnClickListener(new View.OnClickListener() {  
56         @Override  
57         public void onClick(View view) {  
58
```

Launch succeeded

Launch succeeded (5 minutes ago)

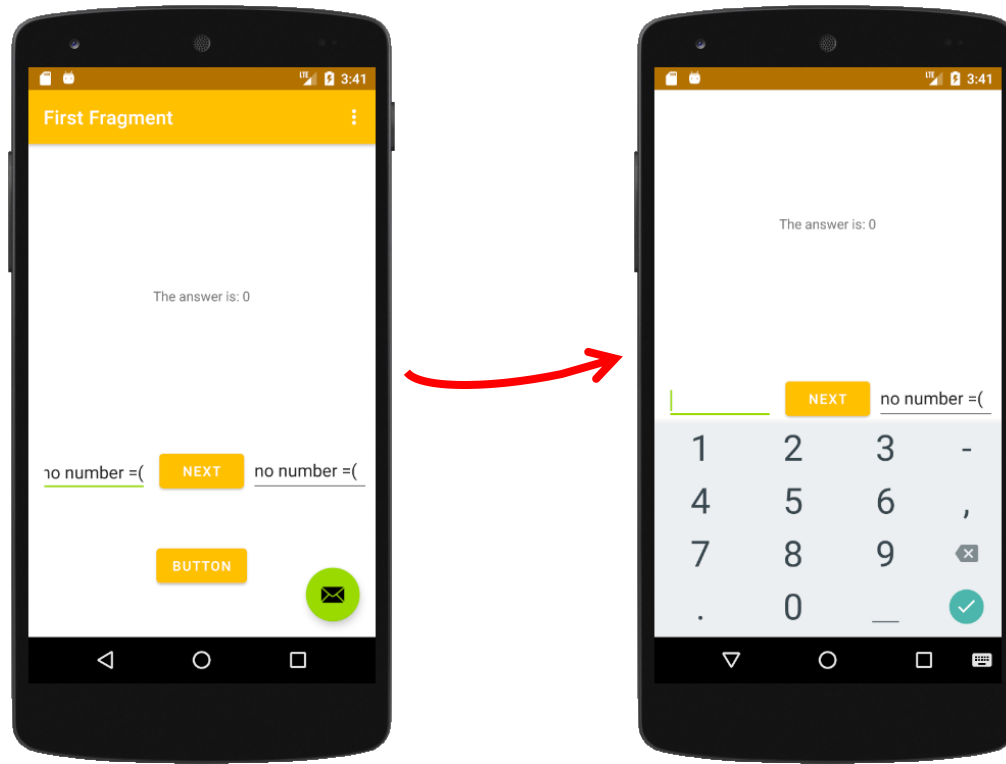
TODO Problems Terminal Database Inspector Profiler Run Build Logcat





Remove annoying text

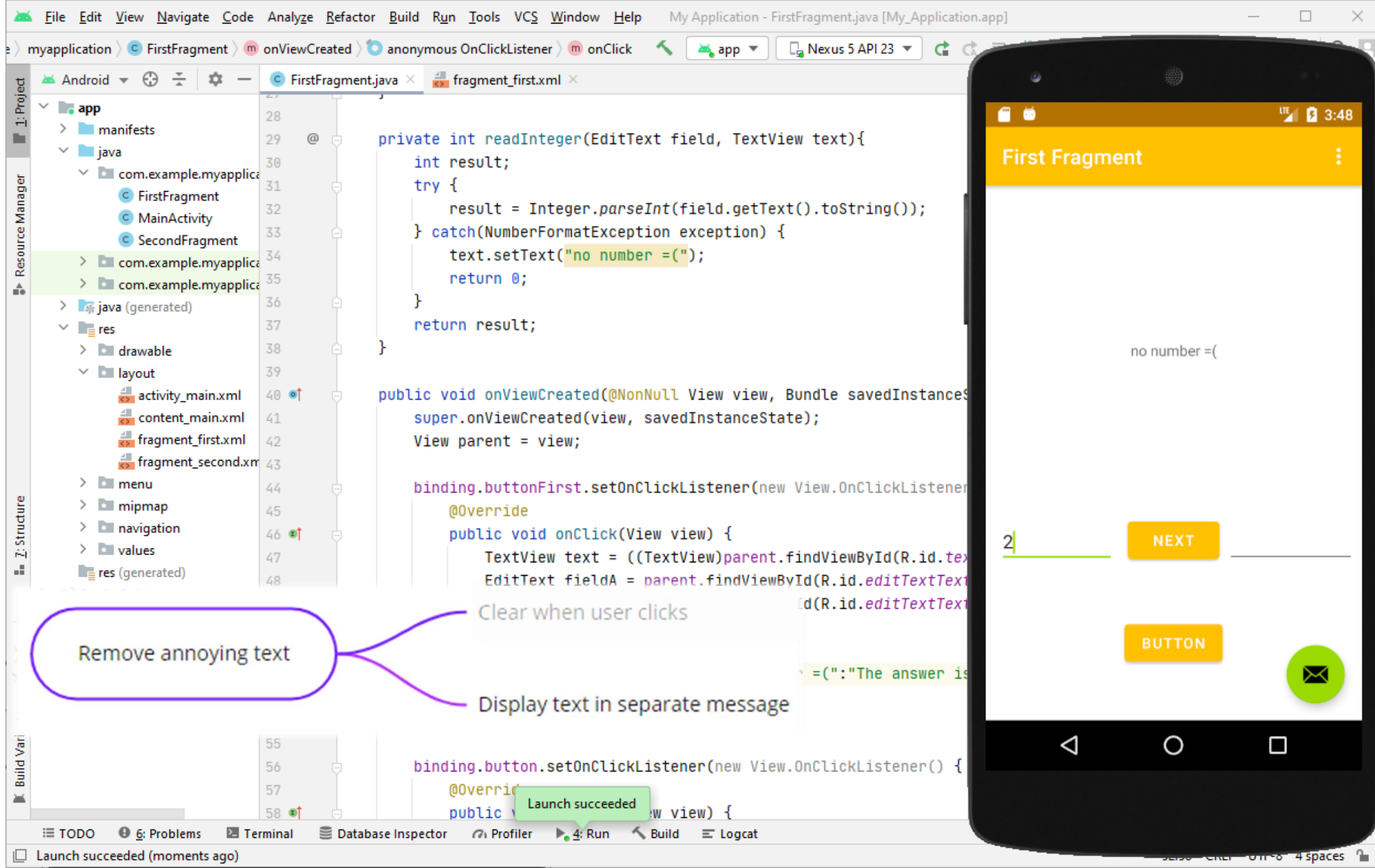
- Clear when user clicks
- Display text in separate message



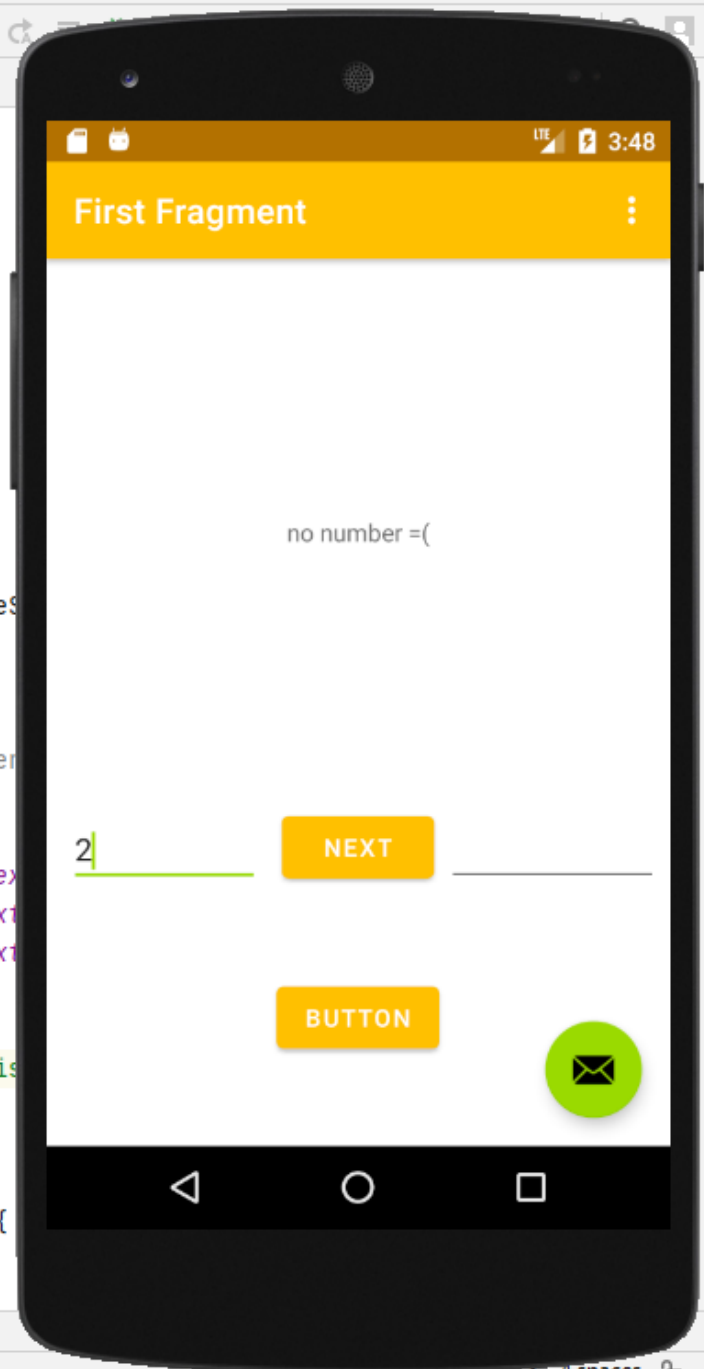
Remove annoying text

Clear when user clicks

Display text in separate message



```
28  
29 @  
30 private int readInteger(EditText field, TextView text){  
31     int result;  
32     try {  
33         result = Integer.parseInt(field.getText().toString());  
34     } catch (NumberFormatException exception) {  
35         text.setText("no number =( ");  
36         return 0;  
37     }  
38     return result;  
39 }  
40  
41 public void onViewCreated(@NonNull View view, Bundle savedInstanceState)  
42     super.onViewCreated(view, savedInstanceState);  
43     View parent = view;  
44  
45     binding.buttonFirst.setOnClickListener(new View.OnClickListener()  
46     @Override  
47     public void onClick(View view) {  
48         TextView text = ((TextView)parent.findViewById(R.id.textView));  
49         EditText fieldA = parent.findViewById(R.id.editTextText);  
50  
51         readInteger(fieldA, text);  
52  
53         text.setText("The answer is " + result);  
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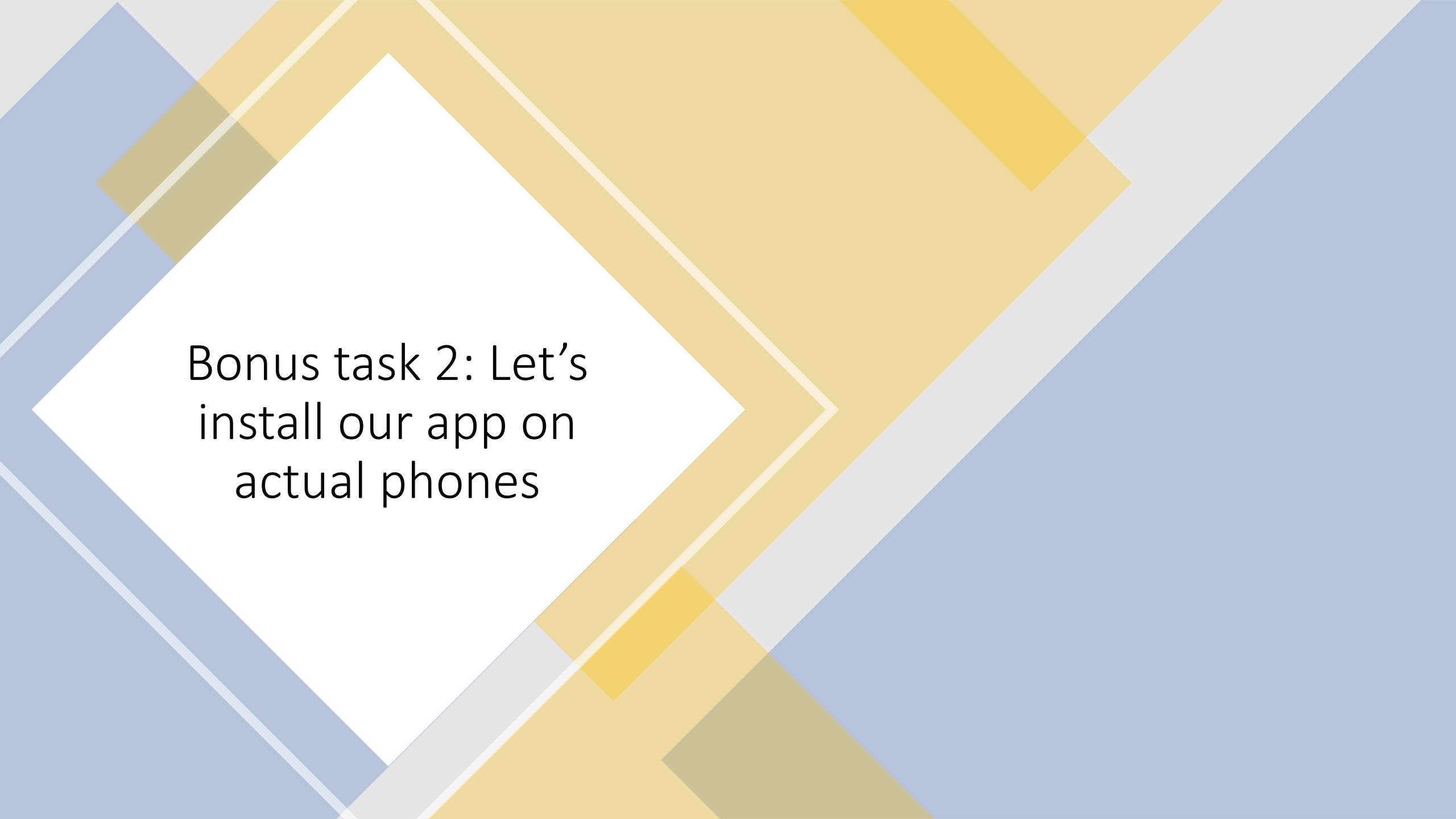


Remove annoying text

Clear when user clicks

Display text in separate message

Launch succeeded



Bonus task 2: Let's
install our app on
actual phones

