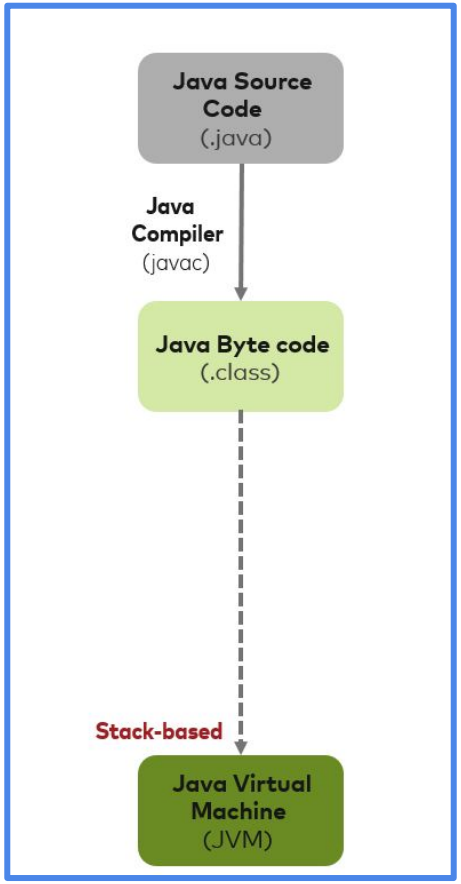
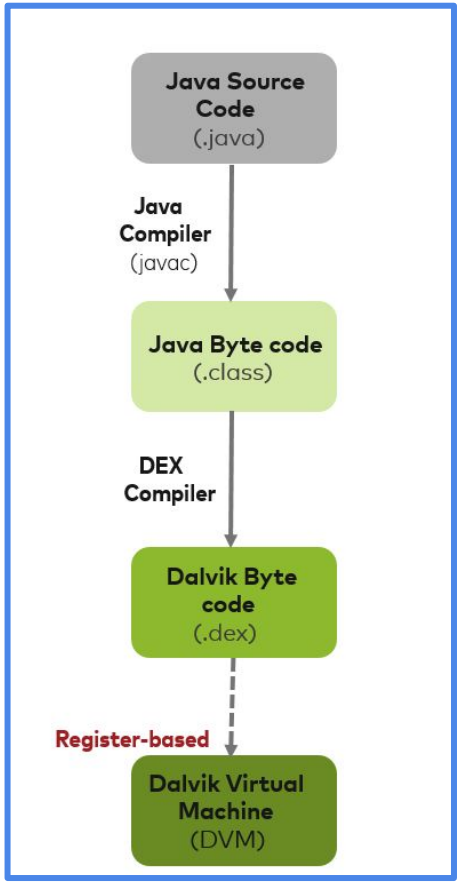
Let’s talk about:

Android

Eclipse does this for us



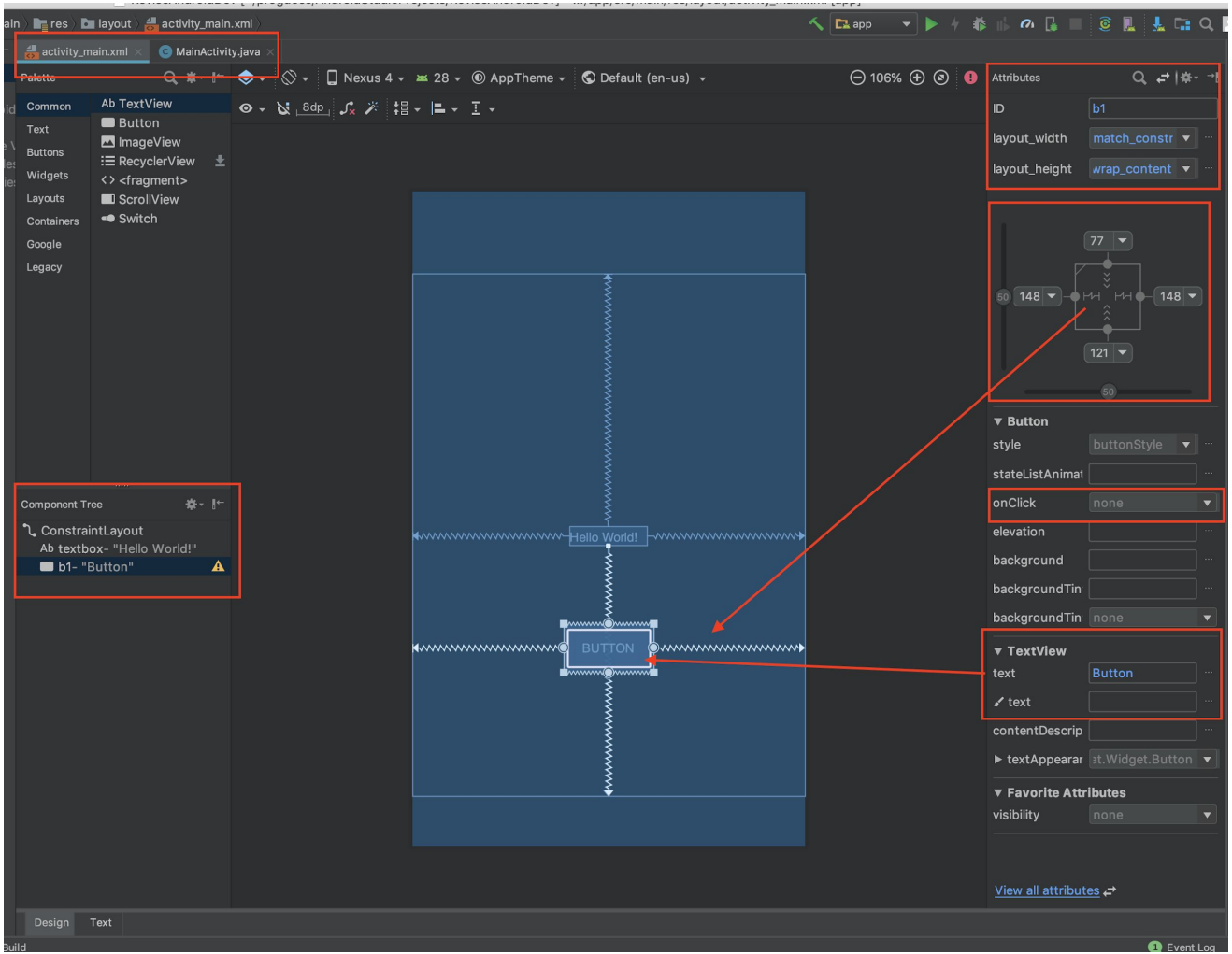


Android does this for us

JVM vs DVM

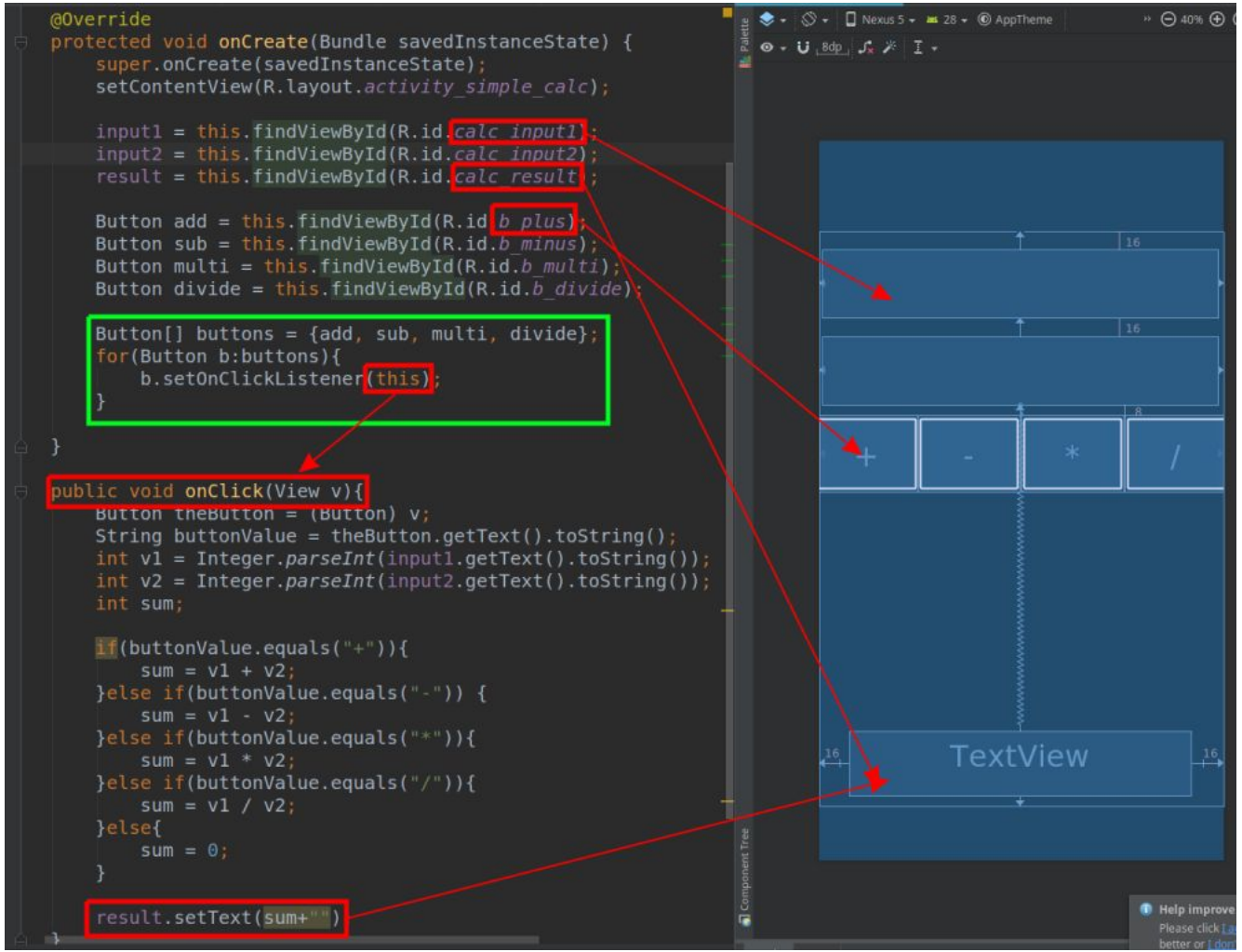
Getting Objects

- **activity_main.xml**
  - Drag & Drop Interface
  - Objects (buttons, text input, etc.) placed here are accessible in the code
- **MainActivity.java**
  - Where most of your development takes place
  - Has two important (and necessary components):
    - **protected void onCreate (…)**
      - This initializes your program (gets and sets values)
    - **public void onClick (View v)**
      - Allows you to program **actions** to **events**
      - For example: **change text when a button is clicked**
      - **View v** means the Object that *calls* this action (when the event occurs)


activity_main.xml
MainActivity.java
Palette
Common
Text
Buttons
Widgets
Layouts
Containers
Google
Legacy
Ab TextView
Button
ImageView
RecyclerView
<fragment>
ScrollView
Switch
Nexus 4
28
AppTheme
Default (en-us)
106%
8dp
Component Tree
ConstraintLayout
Ab textbox- "Hello World!"
b1- "Button"
Hello World!
BUTTON
Attributes
ID
b1
layout_width
match_constr
layout_height
wrap_content
77
148
148
121
50
50
Button
style
buttonStyle
stateListAnimat
onClick
none
elevation
background
backgroundTin
backgroundTin
none
TextView
text
Button
text
contentDescrip
textAppearar
at.Widget.Button
Favorite Attributes
visibility
none
View all attributes
Design
Text
Build
Event Log

How do we get these Objects?

- Button **b1** = **this.findViewById**(**R.id.b1**);
  - **this** means *this specific program (MainActivity.java)*
  - **findViewById** means *get the Object from activity_main.xml*
    - Just like IO.readInt() or Math.random()
  - **R.id.b1** means *with the name "b1" (again, defined in activity_main.xml)*
- **b1.setOnClickListener**(**this**);
  - **b1** is now a Java Object that we can manipulate
  - **setOnClickListener** means *do something when this button is clicked*
- As always, **we need to define what action the button must perform**


@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_simple_calc);
input1 = this.findViewById(R.id.calc_input1);
input2 = this.findViewById(R.id.calc_input2);
result = this.findViewById(R.id.calc_result);
Button add = this.findViewById(R.id.b_plus);
Button sub = this.findViewById(R.id.b_minus);
Button multi = this.findViewById(R.id.b_multi);
Button divide = this.findViewById(R.id.b_divide);
Button[] buttons = {add, sub, multi, divide};
for(Button b:buttons){
b.setOnClickListener(this);
}
}
public void onClick(View v){
Button theButton = (Button) v;
String buttonValue = theButton.getText().toString();
int v1 = Integer.parseInt(input1.getText().toString());
int v2 = Integer.parseInt(input2.getText().toString());
int sum;
if(buttonValue.equals("+")){
sum = v1 + v2;
}else if(buttonValue.equals("-")) {
sum = v1 - v2;
}else if(buttonValue.equals("*")){
sum = v1 * v2;
}else if(buttonValue.equals("/")){
sum = v1 / v2;
}else{
sum = 0;
}
result.setText(sum+"")
}
Nexus 5
28
AppTheme
40%
8dp
16
16
8
+
-
*
/
16
TextView
16
Palette
Component Tree
Help improve
Please click
better or

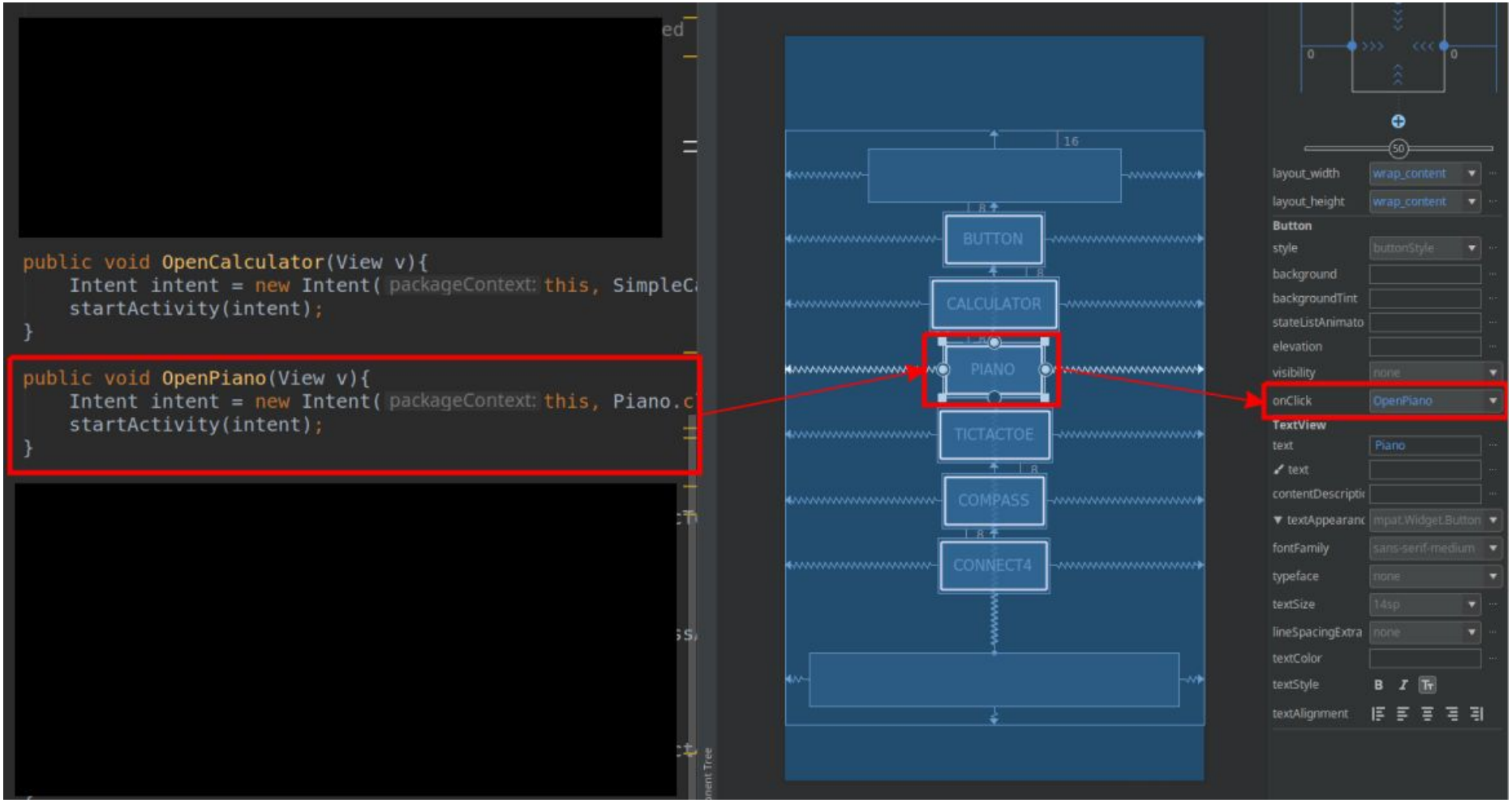
Common Objects

- **Button**
  - Object to define buttons and button properties
- **TextView**
  - Object that **displays text (text output)**

```
TextView output = this.findViewById(R.id.output);
output.setText("This is the new text");
```

- **EditText**
  - Object that **takes in text (text input)** -- remember, all text are **Strings**
  - If dealing with numbers, need to convert **String** to **int** (or **double**)

```
EditText input1 = this.findViewById(R.id.input1);
String input1Value = input1.getText().toString();
```


public void OpenCalculator(View v){
Intent intent = new Intent(packageContext: this, SimpleC
startActivity(intent);
}
public void OpenPiano(View v){
Intent intent = new Intent(packageContext: this, Piano.c
startActivity(intent);
}
16
BUTTON
CALCULATOR
PIANO
TICTACTOE
COMPASS
CONNECT4
layout_width
wrap_content
layout_height
wrap_content
Button
style
buttonStyle
background
backgroundTint
stateListAnimato
elevation
visibility
none
onClick
OpenPiano
TextView
text
Piano
text
contentDescripti
textAppearanc
mpat.Widget.Button
fontFamily
sans-serif-medium
typeface
none
textSize
14sp
lineSpacingExtra
none
textColor
textStyle
textAlignment