My GPA Calculator Application in Kotlin

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Users?

Intro to Android Studio

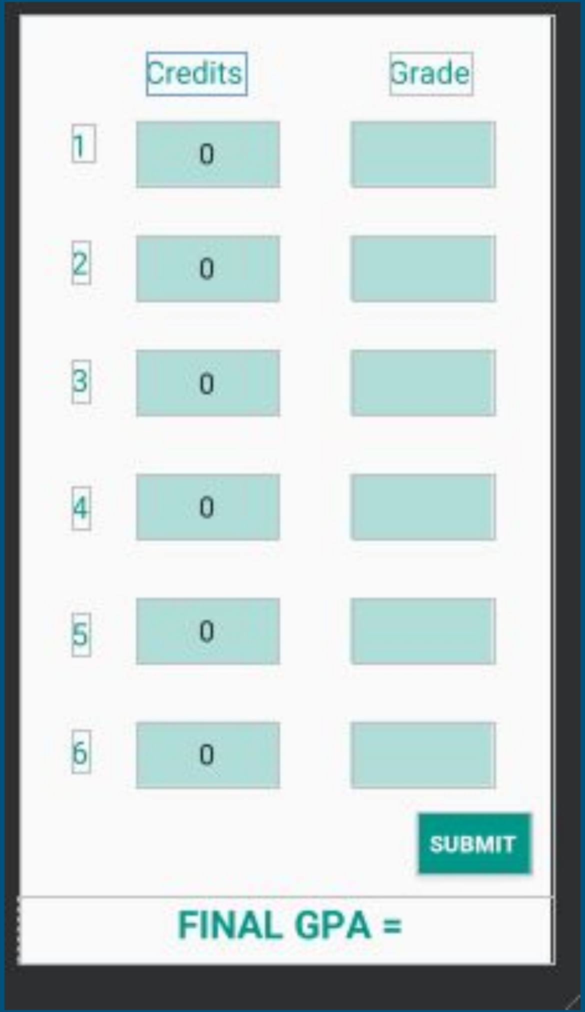
- Open source
- Easy for mobile app development.
- Easily testable if you have an Android (just have to download the APK)
- Free to make and free to get onto mobile device, if it’s an Android.

Intro to Kotlin

- Kotlin is a cross-platform, statically typed (like Haskell), general-purpose programming language with type inference.
- Kotlin is a fairly new language (2011) with a lot of potential.
- Developed by JetBrains
- Kotlin is officially supported by Google for mobile development on Android

XML code

- Layout of the app
- XML TextView Objects
- XML EditText Objects
- XML Spinner Objects
- XML Button Object
- Constraint layout features

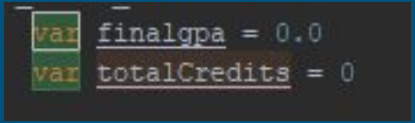


	Credits	Grade
1	0	
2	0	
3	0	
4	0	
5	0	
6	0	

FINAL GPA =

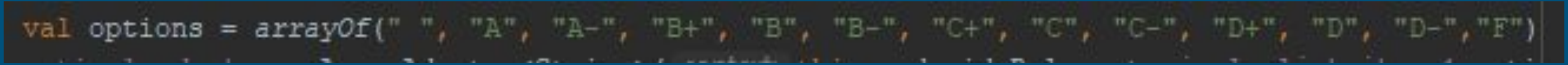
Variable Declaration

- Val and Var (dynamic type checking)
- Var is like general variable and it's known as a mutable variable in Kotlin and can be assigned multiple times.



```
var finalgpa = 0.0
var totalCredits = 0
```

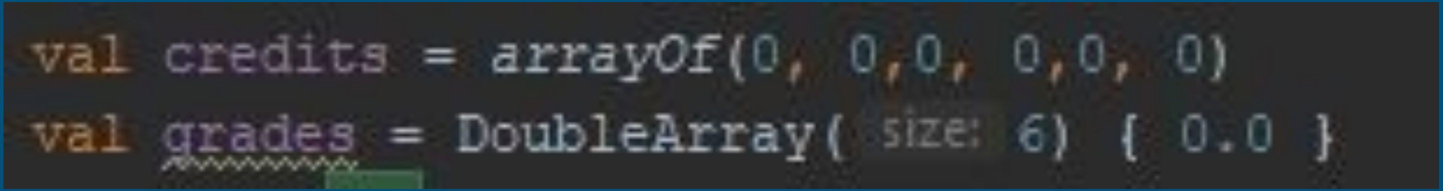
- Val is like Final variable and it's known as immutable in Kotlin and can be initialized only once.



```
val options = arrayOf(" ", "A", "A-", "B+", "B", "B-", "C+", "C", "C-", "D+", "D", "D-","F")
```

Array Declaration

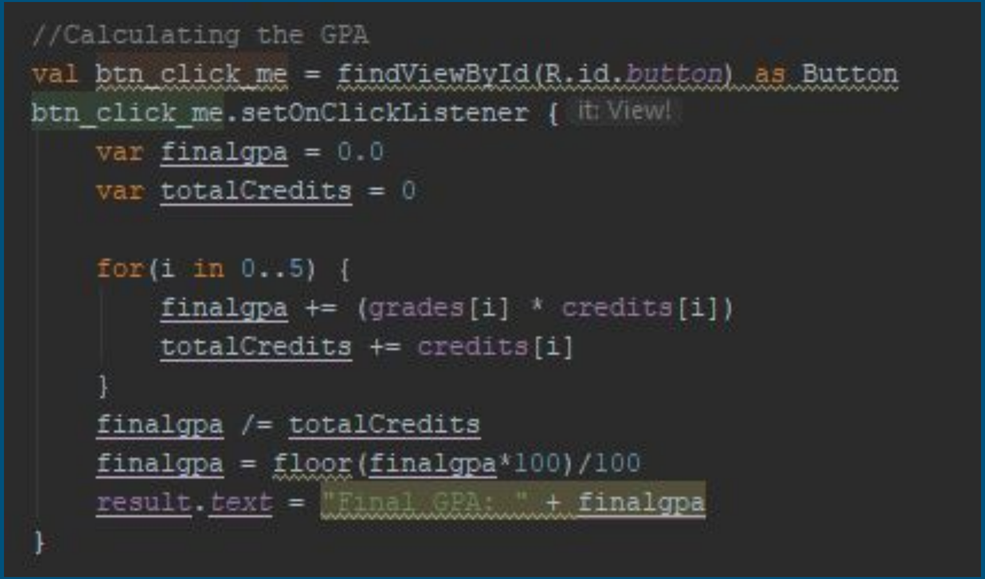
- Arrays
- same readability, but increased writability



```
val credits = arrayOf(0, 0,0, 0,0, 0)
val grades = DoubleArray( size: 6) { 0.0 }
```

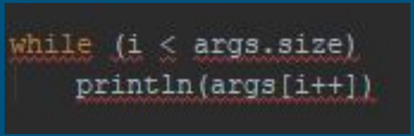
Loops (similar to Python)

- For loop
- While Loop



```
//Calculating the GPA
val btn_click_me = findViewById(R.id.button) as Button
btn_click_me.setOnClickListener {  it: View!
    var finalgpa = 0.0
    var totalCredits = 0

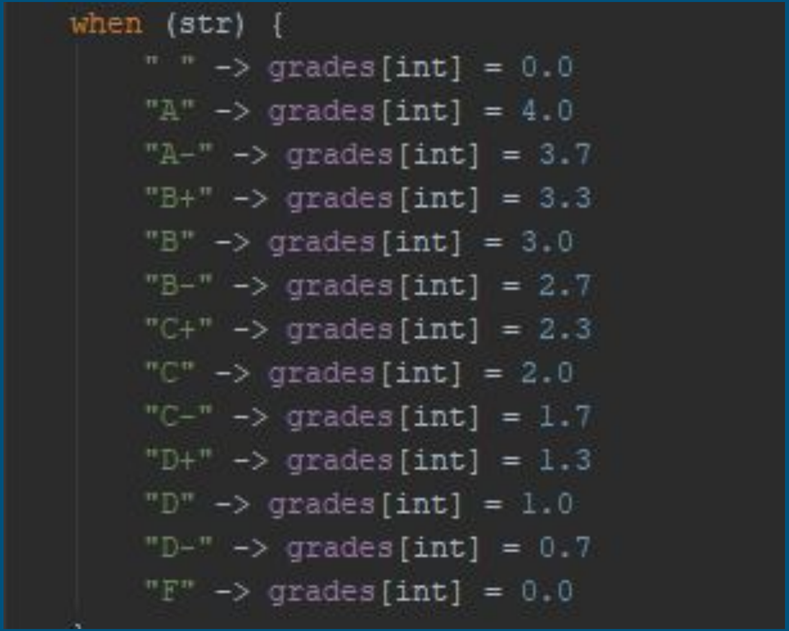
    for(i in 0..5) {
        finalgpa += (grades[i] * credits[i])
        totalCredits += credits[i]
    }
    finalgpa /= totalCredits
    finalgpa = floor(finalgpa*100)/100
    result.text = "Final GPA: " + finalgpa
}
```



```
while (i < args.size)
    println(args[i++])
```

Switch Statements

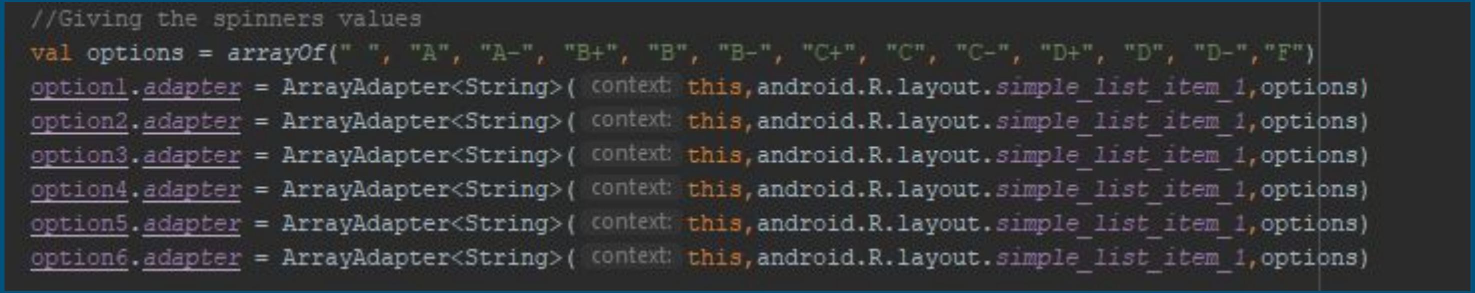
- Switch statements in Kotlin



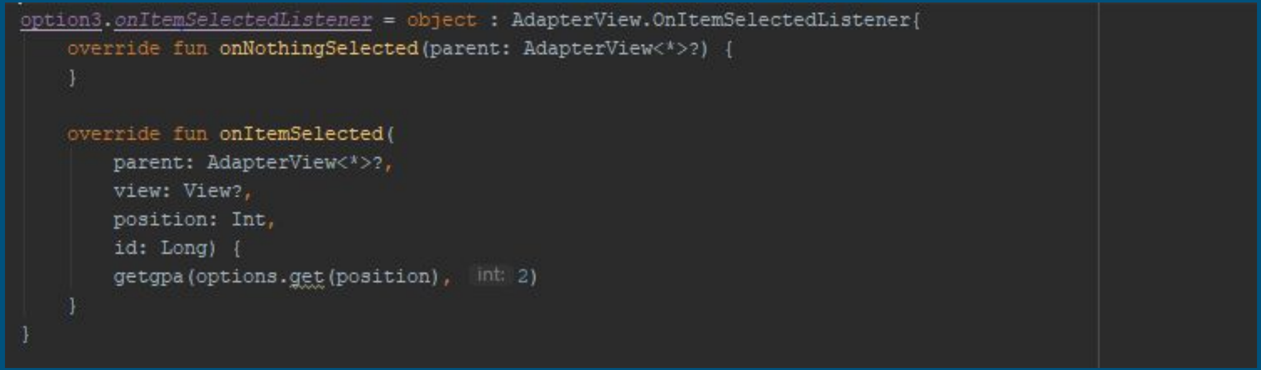
```
    when (str) {
        " " -> grades[int] = 0.0
        "A" -> grades[int] = 4.0
        "A-" -> grades[int] = 3.7
        "B+" -> grades[int] = 3.3
        "B" -> grades[int] = 3.0
        "B-" -> grades[int] = 2.7
        "C+" -> grades[int] = 2.3
        "C" -> grades[int] = 2.0
        "C-" -> grades[int] = 1.7
        "D+" -> grades[int] = 1.3
        "D" -> grades[int] = 1.0
        "D-" -> grades[int] = 0.7
        "F" -> grades[int] = 0.0
    }
```

Backend to Frontend

- ArrayAdapter Class to bind XML spinners to Kotlin arrays



```
//Giving the spinners values
val options = arrayOf(" ", "A", "A-", "B+", "B", "B-", "C+", "C", "C-", "D+", "D", "D-","F")
option1.adapter = ArrayAdapter<String>( context: this,android.R.layout.simple_list_item_1,options)
option2.adapter = ArrayAdapter<String>( context: this,android.R.layout.simple_list_item_1,options)
option3.adapter = ArrayAdapter<String>( context: this,android.R.layout.simple_list_item_1,options)
option4.adapter = ArrayAdapter<String>( context: this,android.R.layout.simple_list_item_1,options)
option5.adapter = ArrayAdapter<String>( context: this,android.R.layout.simple_list_item_1,options)
option6.adapter = ArrayAdapter<String>( context: this,android.R.layout.simple_list_item_1,options)
```

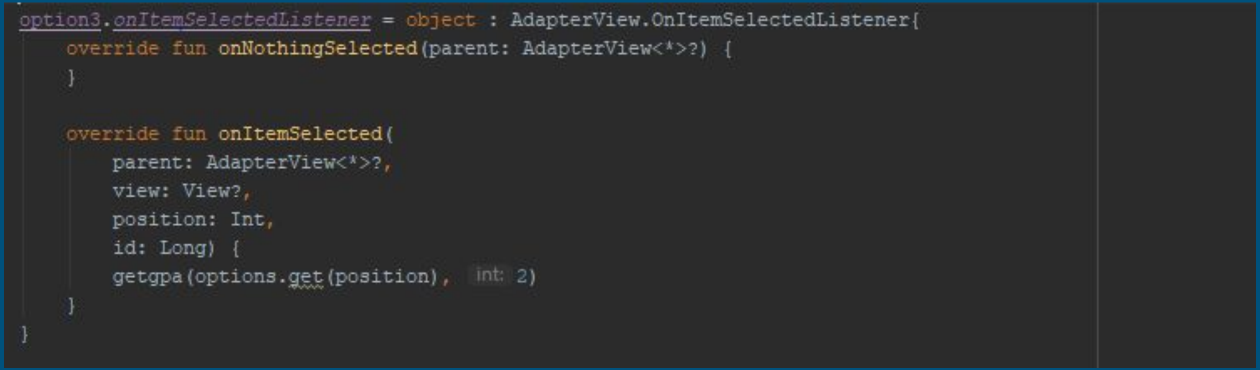


```
option3.onItemSelectedListener = object : AdapterView.OnItemSelectedListener{
    override fun onNothingSelected(parent: AdapterView<*>?) {
    }

    override fun onItemSelected(
        parent: AdapterView<*>?,
        view: View?,
        position: Int,
        id: Long) {
        getgpa(options.get(position),  int: 2)
    }
}
```

Listeners

- onItemSelectedListener and overriding methods
- Each time a user selects a new item from the spinner, the listener will update the array accordingly
- For the purposes of our app, it takes that item, converts its letter grade value into a double GPA score and places it into the correct index of an array.



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    override fun onNothingSelected(parent: AdapterView<*>?) {
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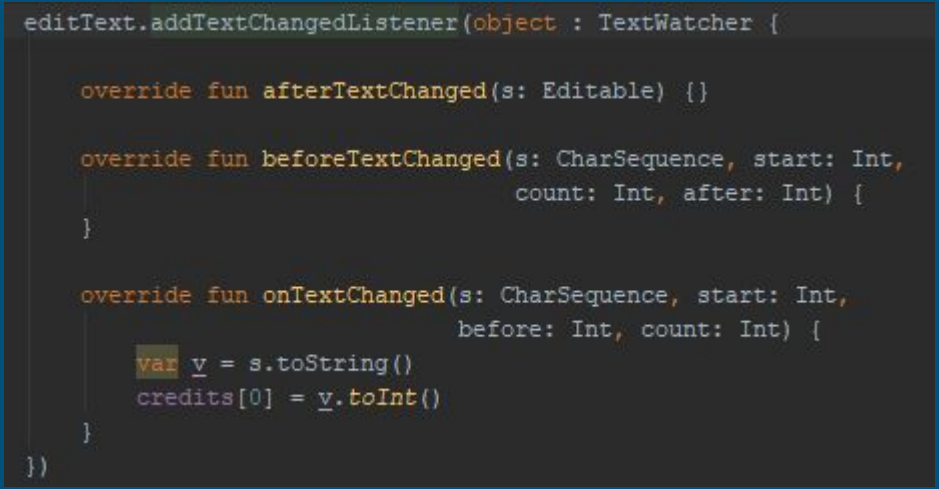
        parent: AdapterView<*>?,
        view: View?,
        position: Int,
        id: Long) {
        getgpa(options.get(position),  int: 2)
    }
}
```

Listeners (cont.)

- TextChangedListener for when user enters credits
  - After TextChanged(), before TextChanged() and onTextChanged()



```
editText.addTextChangedListener(object : TextWatcher {

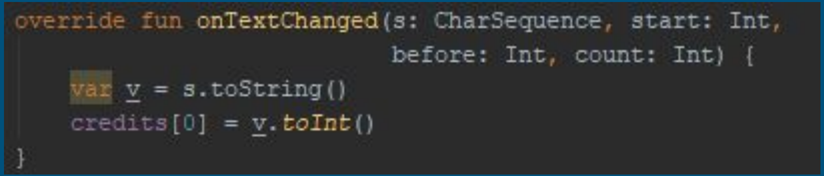
    override fun afterTextChanged(s: Editable) {}

    override fun beforeTextChanged(s: CharSequence, start: Int,
                                   count: Int, after: Int) {
    }

    override fun onTextChanged(s: CharSequence, start: Int,
                               before: Int, count: Int) {
        var v = s.toString()
        credits[0] = v.toInt()
    }
})
```

Parsing Features

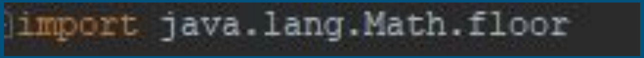
- Parsing the Primitive data types
- User types in their credits as integers but the XML passes them in as Char Sequences
- toString() method, toInt() method



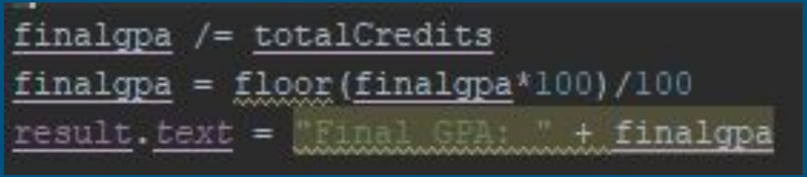
```
override fun onTextChanged(s: CharSequence, start: Int,
                           before: Int, count: Int) {
    var v = s.toString()
    credits[0] = v.toInt()
}
```

Rounding Floating Points

- Rounding float number to desired precision
  - Import java math library
  - Multiply gpa by 100
  - Took the floor of that value
  - Divide that by 100



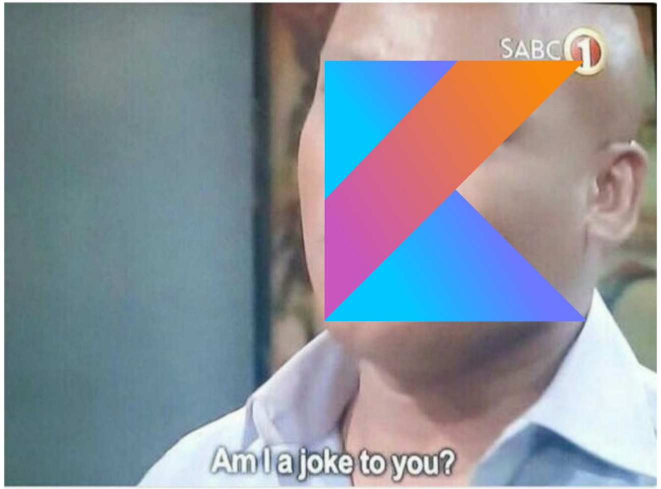
```
import java.lang.Math.floor
```

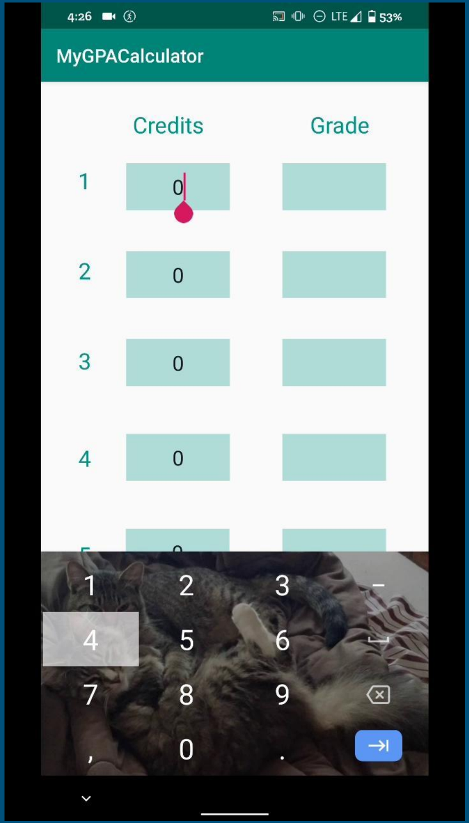


```
finalgpa /= totalCredits
finalgpa = floor(finalgpa*100)/100
result.text = "Final GPA: " + finalgpa
```

App Demo

When you create a new language specifically to develop native android applications and yet you see people using Javascript.





MyGPACalculator

	Credits	Grade
1	0	
2	0	
3	0	
4	0	

Questions?