Mobile Programming

Lec 8. Dice App
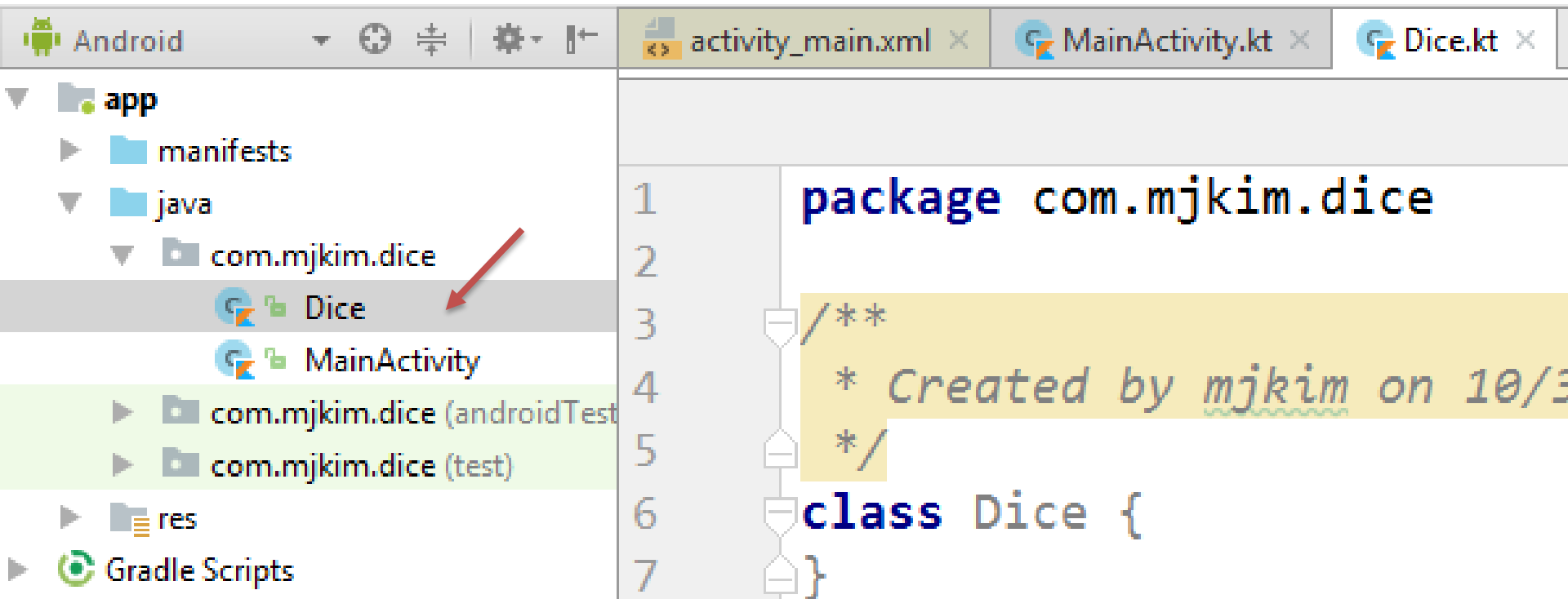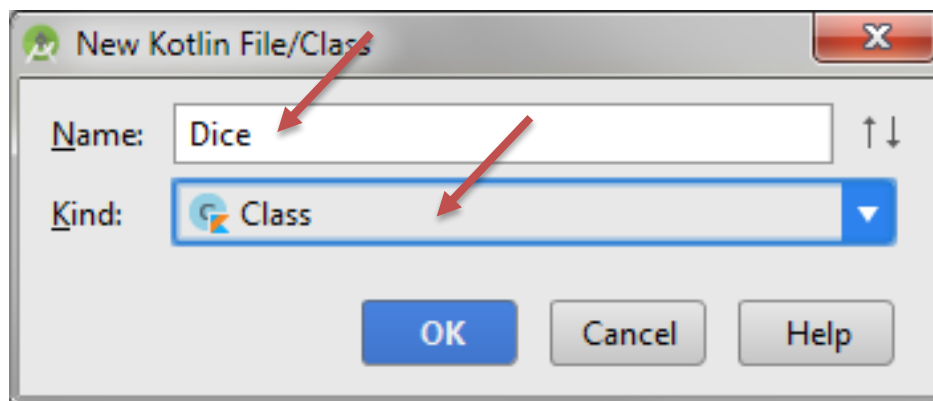
Ewha Womans University

(1) make a custom View class

New Kotlin File/Class

Name: Dice

Kind: Class

OK   Cancel   Help

Android

app
  manifests
  java
    com.mjkim.dice
      Dice
      MainActivity
    com.mjkim.dice (androidTest
    com.mjkim.dice (test)
  res
Gradle Scripts

activity_main.xml   MainActivity.kt   Dice.kt

```
1  package com.mjkim.dice
2
3  /**
4   * Created by mjkim on 10/3
5   */
6  class Dice {
7  }
```
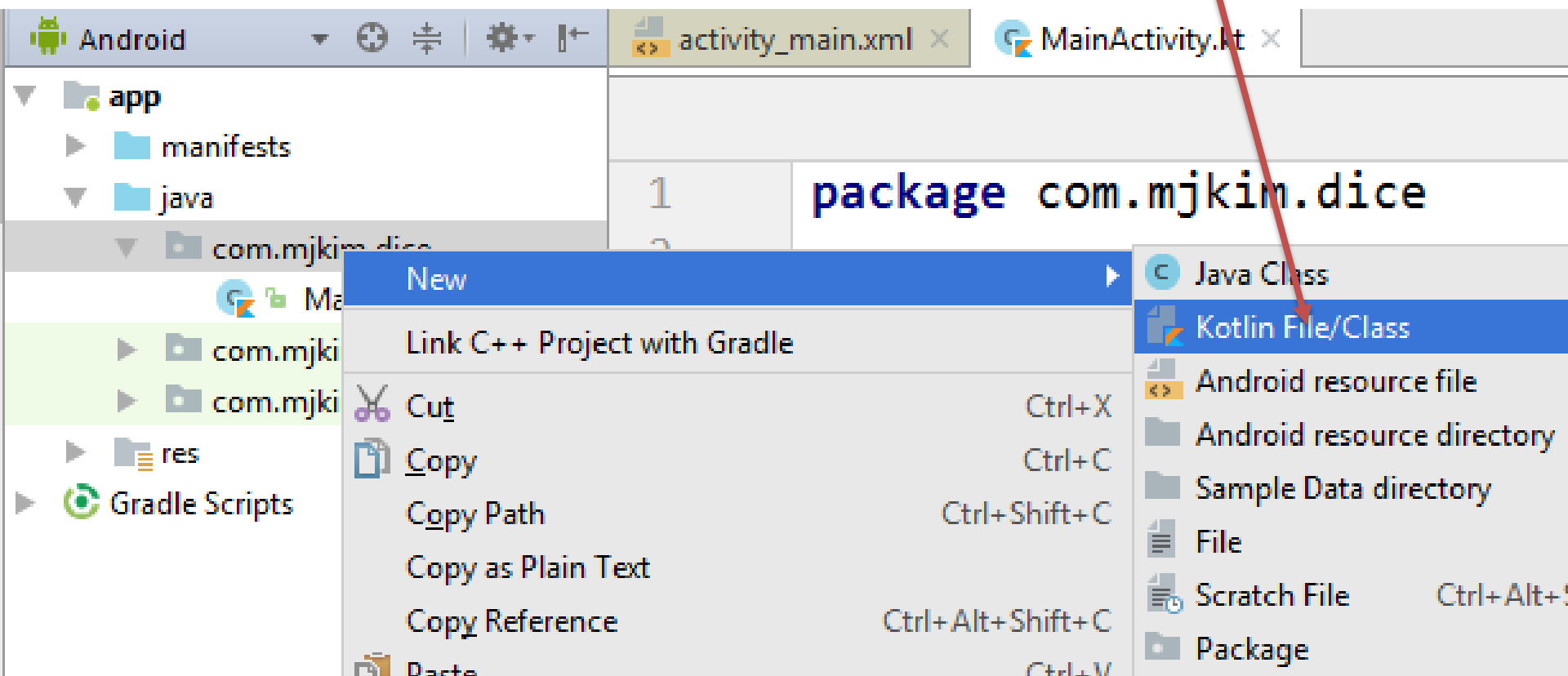
Just one circle

```kotlin
class Dice : View {

    constructor(context: Context) : super(context) {
    }

    constructor(context: Context, attrs: AttributeSet)
            : super(context, attrs) {
    }

    override fun onDraw(canvas: Canvas) {
        super.onDraw(canvas)

        var p = Paint()
        p.setARGB(255, 0, 200, 255)

        canvas.drawCircle(100f, 100f, 50f, p)
    }
}
```

View가 그림을 그리도록
Android가 onDraw( )를 call
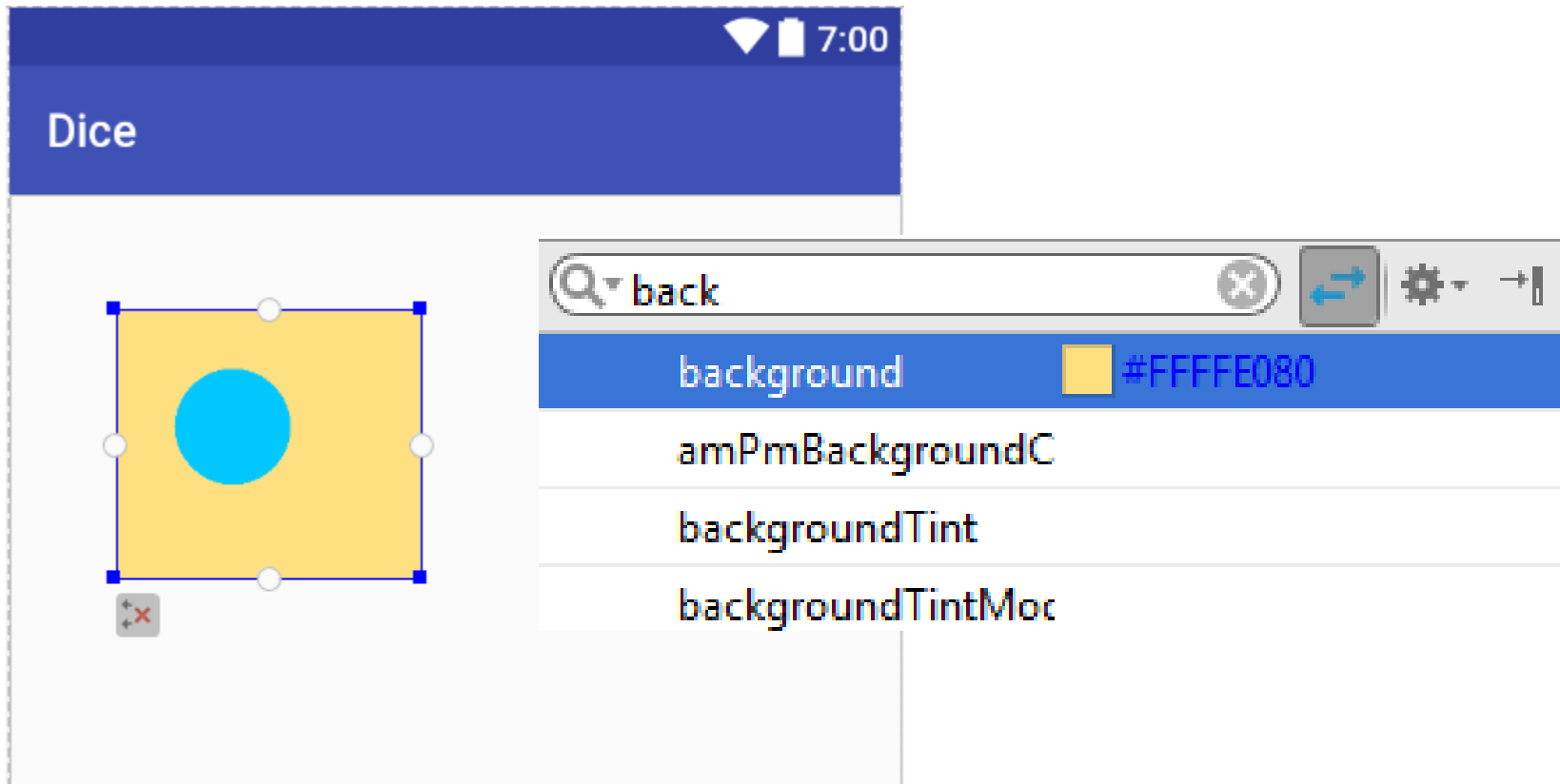
opacity, R, G, B (0~255 range)

x, y, size, paint

Now we have a New UI component
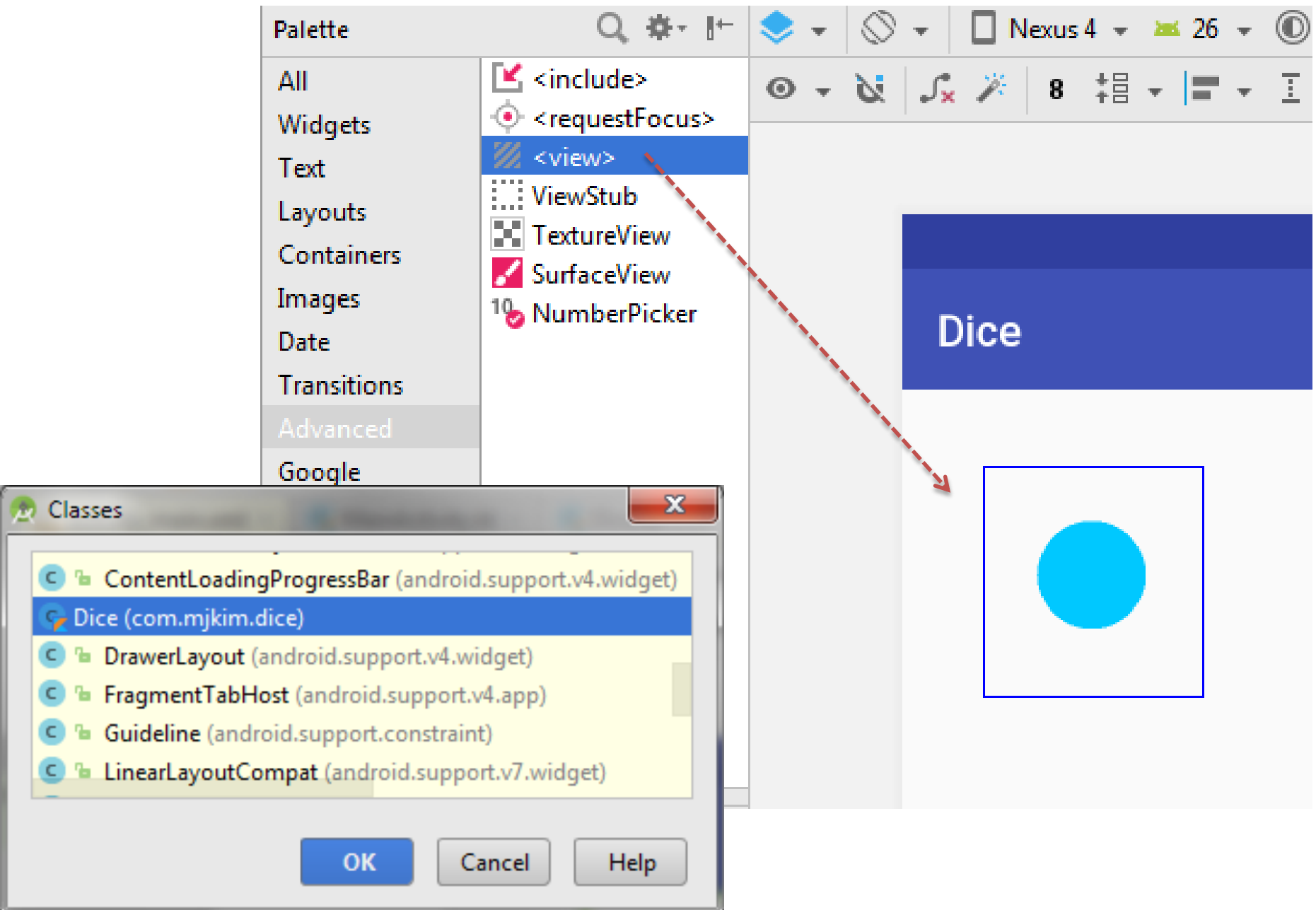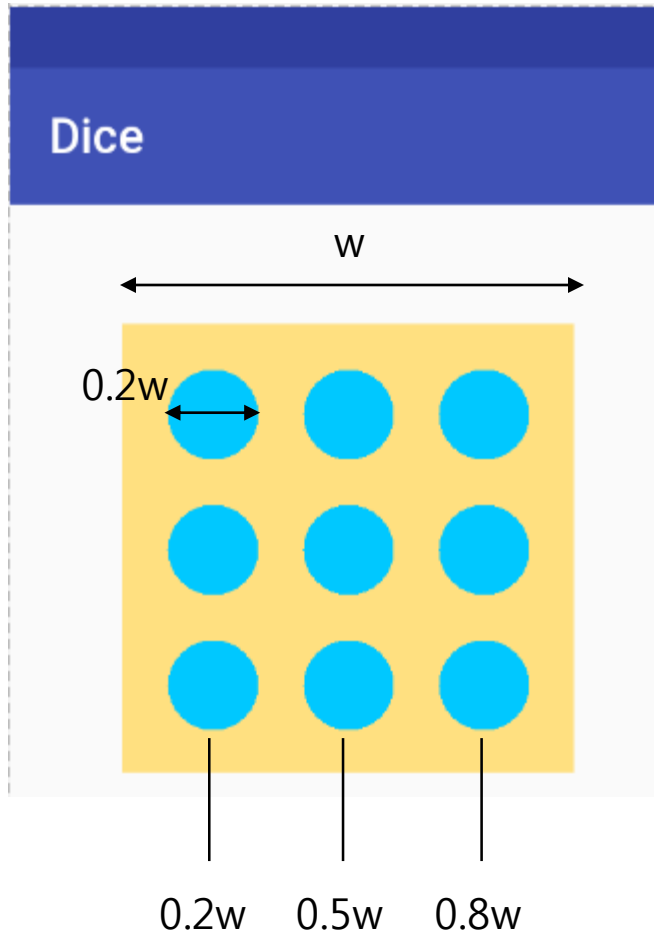
Set background color
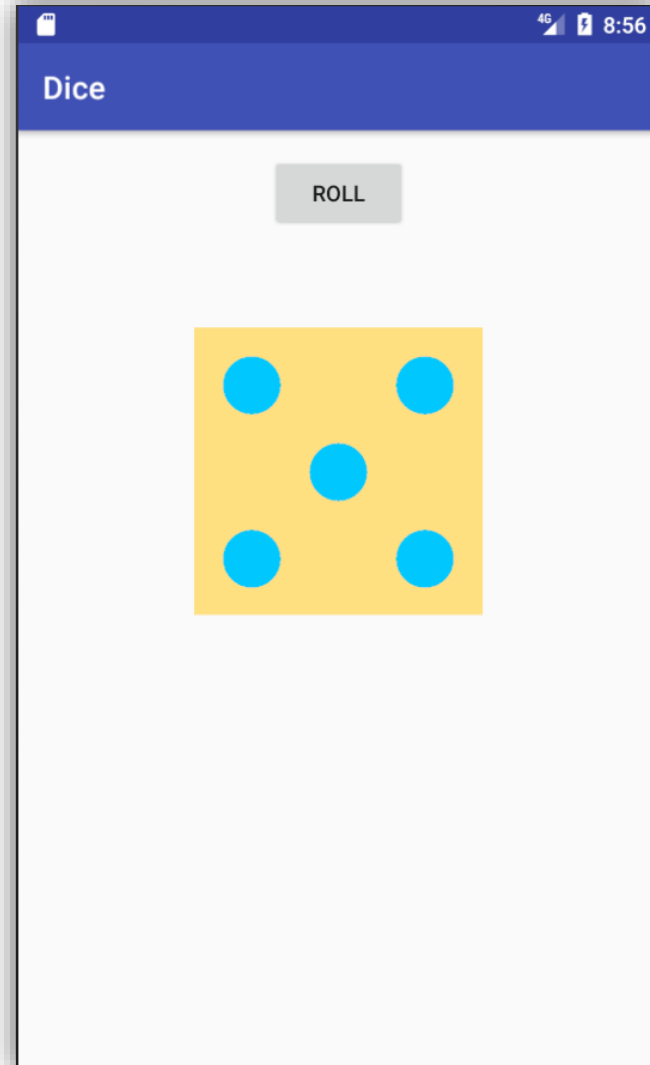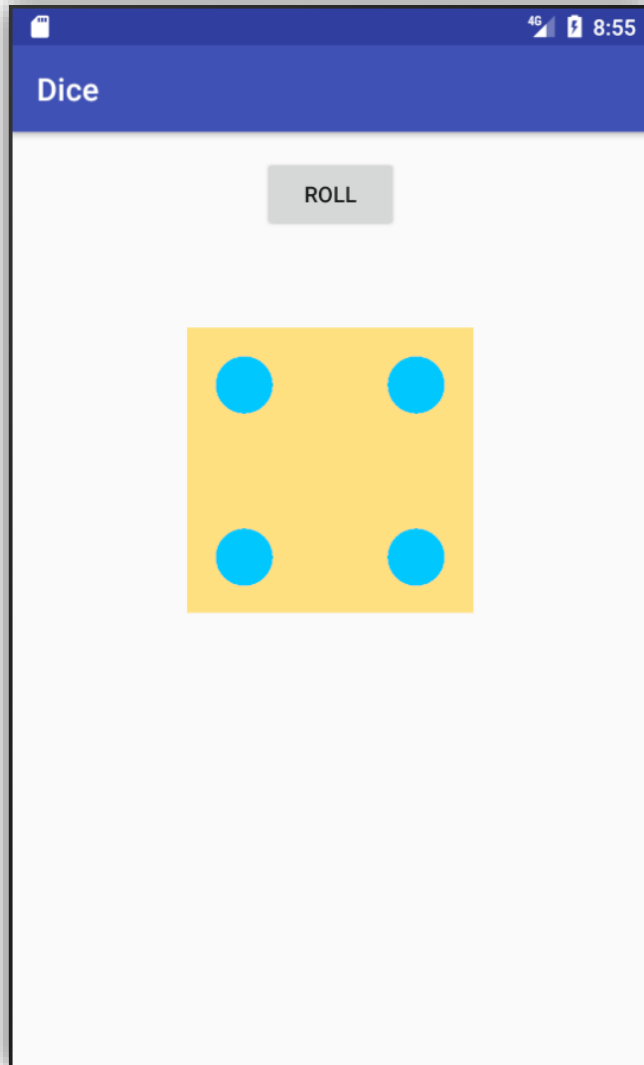
(2) Draw circles


```kotlin
override fun onDraw(canvas: Canvas) {
    super.onDraw(canvas)

    var p = Paint()
    p.setARGB(255, 0, 200, 255)

    var size = 0.1f * width
    var x1 = 0.2f * width
    var x2 = 0.5f * width
    var x3 = 0.8f * width

    canvas.drawCircle(x1, x1, size, p)
    canvas.drawCircle(x1, x2, size, p)
    canvas.drawCircle(x1, x3, size, p)

    canvas.drawCircle(x2, x1, size, p)
    canvas.drawCircle(x2, x2, size, p)
    canvas.drawCircle(x2, x3, size, p)

    canvas.drawCircle(x3, x1, size, p)
    canvas.drawCircle(x3, x2, size, p)
    canvas.drawCircle(x3, x3, size, p)
}
```

(3) Let's Roll

Add data variable, and its setter function

```
class Dice : View {

    var num = 1                          ← # of circles

    fun set_number(n : Int) {
        num = n
        invalidate()                     ← 내용이 바뀌어
    }                                        현재 그림이 틀렸음을
                                             Android에게 알림

                                         →   redraw View !
```

Draw circles according to 'num'

```
if(num == 1) {
    canvas.drawCircle(x2, x2, size, p)
} else if(num == 2) {
    canvas.drawCircle(x1, x1, size, p)
    canvas.drawCircle(x3, x3, size, p)
} else if(num == 3) {                    == 5) {
    canvas.drawCircle(x1, x1, size, p)awCircle(x1, x1, size, p)
    canvas.drawCircle(x2, x2, size, p)awCircle(x3, x1, size, p)
    canvas.drawCircle(x3, x3, size, p)awCircle(x1, x3, size, p)
} else if(num == 4) {                    awCircle(x3, x3, size, p)
    canvas.drawCircle(x1, x1, size, p)awCircle(x2, x2, size, p)
    canvas.drawCircle(x3, x1, size, p)  == 6) {
    canvas.drawCircle(x1, x3, size, p)awCircle(x1, x1, size, p)
    canvas.drawCircle(x3, x3, size, p)awCircle(x1, x2, size, p)
                        canvas.drawCircle(x1, x3, size, p)
                        canvas.drawCircle(x3, x1, size, p)
                        canvas.drawCircle(x3, x2, size, p)
                        canvas.drawCircle(x3, x3, size, p)
}
```

code for "Roll" button (MainActivity.kt)

```kotlin
class MainActivity : AppCompatActivity() {

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)
    }

    fun button_roll(view : View) {
        var n1 = (Math.random() * 6) + 1
        var n2 = n1.toInt()

        dice.set_number(n2)
    }
}
```

0 ~ 0.9999999
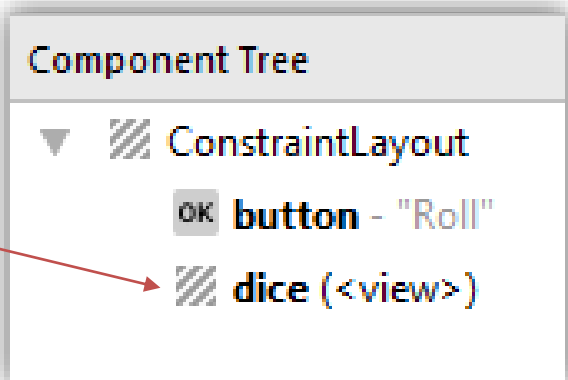
Component Tree

▼ ▨ ConstraintLayout

  ᴼᴷ **button** - "Roll"

  ▨ **dice** (<view>)

```kotlin
class MainActivity : AppCompatActivity() {

    override fun onCreate(savedInstanceState: Bundle?) {...}

    fun button_roll(view : View) {
        var n1 = (Math.random() * 6) + 1
        var n2 = n1.toInt()

        dice.set_number(n2)
    }
}
```
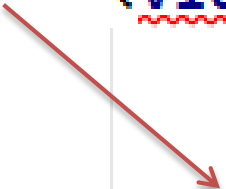
call function

```kotlin
class Dice : View {

    var num = 1

    fun set_number(n : Int) {
        num = n
        invalidate()
    }
}
```

C

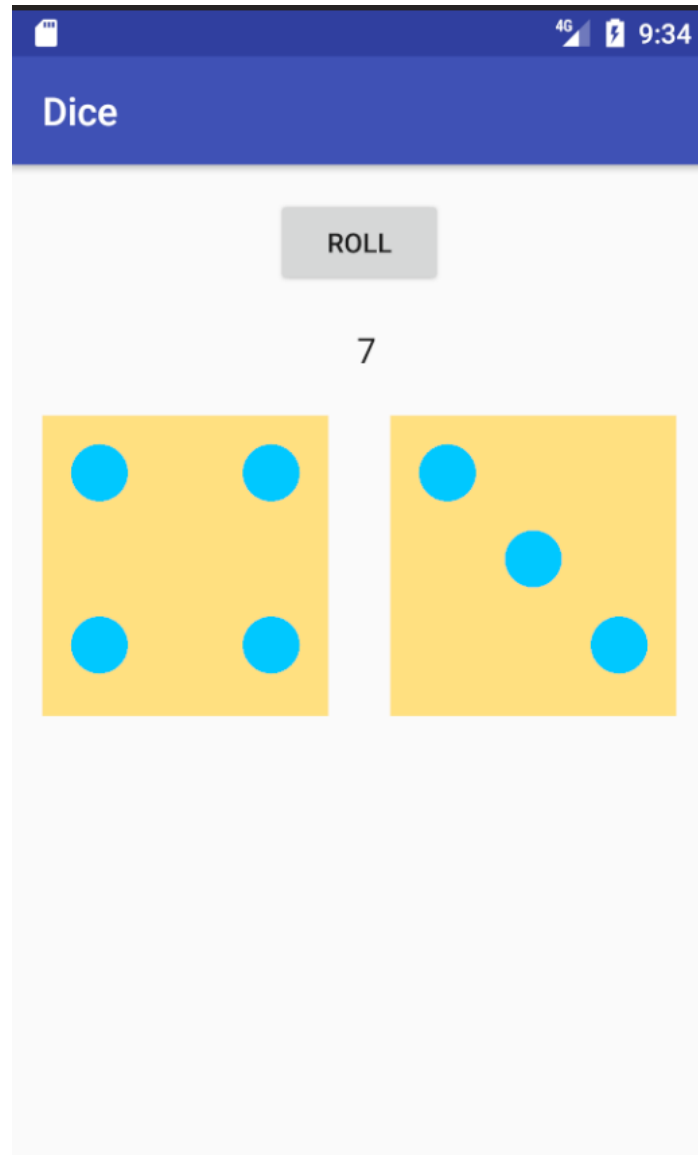update datacc

update display

```xml
<view
    android:id="@+id/dice"
    class="com.mjkim.dice.Dice"
    id="@+id/view"
    android:layout_width="204dp"
    android:layout_height="200dp"
    tools:layout_editor_absoluteX="32dp"
    tools:layout_editor_absoluteY="261dp" />
```

(4) Double Dice, Show the sum (HW)

(5) Shake to Roll ? (HW)