



Lecture 19: Canvas

IN721: Design and Development of Applications for Mobile Devices

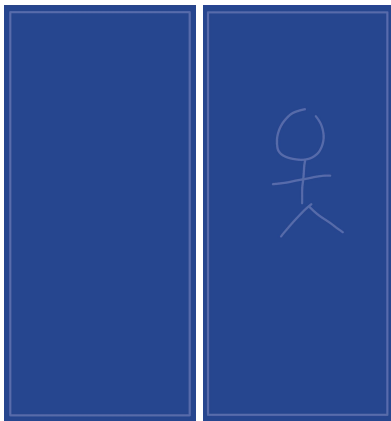
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EXPECTED OUTPUT



CUSTOM VIEW

- ▶ MyCanvasView.kt - custom view class
- ▶ Companion object - STROKE_WIDTH = 12f

```
class MyCanvasView(context: Context) : View(context) {  
  
    private lateinit var extraCanvas: Canvas  
    private lateinit var extraBitmap: Bitmap  
    private lateinit var frame: Rect  
  
    private val drawColor: Int = ResourcesCompat.getColor(resources, R.color.colorPaint, theme: null)  
    private val backgroundColor: Int = ResourcesCompat.getColor(resources, R.color.colorBackground, theme: null)  
    private var path = Path()  
    private val paint: Paint = Paint().apply { this: Paint  
        color = drawColor  
        isAntiAlias = true  
        isDither = true  
        style = Paint.Style.STROKE  
        strokeJoin = Paint.Join.ROUND  
        strokeCap = Paint.Cap.ROUND  
        strokeWidth = Companion.STROKE_WIDTH  
    }  
    private val touchTolerance: Int = ViewConfiguration.get(context).scaledTouchSlop  
  
    private var currentX = 0f  
    private var currentY = 0f  
    private var motionTouchEventX = 0f  
    private var motionTouchEventY = 0f
```

CUSTOM VIEW

- ▶ override function - onDraw
- ▶ override function - onTouchEvent

```
override fun onDraw(canvas: Canvas) {  
    canvas.drawBitmap(extraBitmap, left: 0f, top: 0f, paint: null)  
    extraCanvas.drawRect(frame, paint)  
}
```

```
override fun onTouchEvent(event: MotionEvent): Boolean {  
    motionTouchEventX = event.x  
    motionTouchEventY = event.y  
  
    when (event.action) {  
        MotionEvent.ACTION_DOWN -> touchStart()  
        MotionEvent.ACTION_MOVE -> touchMove()  
        MotionEvent.ACTION_UP -> touchUp()  
    }  
    return true  
}
```

CUSTOM VIEW

- ▶ function - touchStart

```
private fun touchStart() {  
    path.reset()  
    path.moveTo(motionTouchEventX, motionTouchEventY)  
    currentX = motionTouchEventX  
    currentY = motionTouchEventY  
}
```

CUSTOM VIEW

- ▶ function - touchMove
- ▶ function - touchUp

```
private fun touchMove() {  
    val dx: Float = abs( x: motionTouchEventX - currentX)  
    val dy: Float = abs( x: motionTouchEventY - currentY)  
    if (dx >= touchTolerance || dy >= touchTolerance) {  
        path.quadTo(currentX, currentY, x2: (motionTouchEventX + currentX) / 2,  
            y2: (motionTouchEventY + currentY) / 2)  
        currentX = motionTouchEventX  
        currentY = motionTouchEventY  
        extraCanvas.drawPath(path, paint)  
    }  
    invalidate()  
}  
  
private fun touchUp() {  
    path.reset()  
}
```

CUSTOM VIEW

- ▶ MainActivity.kt
- ▶ What is difference about this activity from previous activities you have created?

```
class MainActivity : AppCompatActivity() {  
  
    override fun onCreate(savedInstanceState: Bundle?) {  
        super.onCreate(savedInstanceState)  
        val mCanvasView = MyCanvasView( context: this@MainActivity)  
        mCanvasView.systemUiVisibility = SYSTEM_UI_FLAG_FULLSCREEN  
        setContentView(mCanvasView)  
    }  
}
```