Clap App

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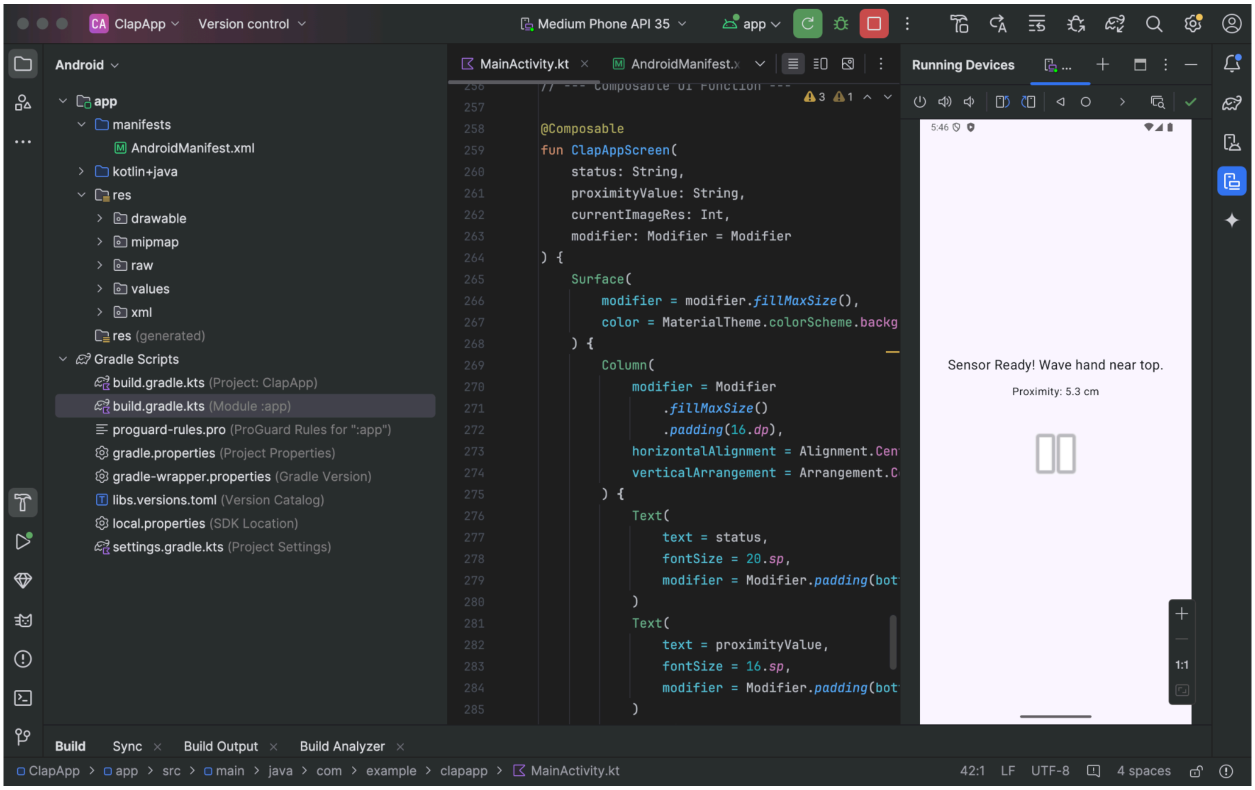
Learning Objective: using Proximity (TYPE_PROXIMITY) sensor, develop mobile clap app. The goal is to simulate clapping using a mobile phone and hand.

Objective: Build an Android app that simulates a "clap" by detecting when a hand moves close to the phone's front sensor.

1. **Sensor Usage:** We accessed the device's SensorManager and specifically registered a listener for the Sensor.TYPE_PROXIMITY.
2. **Clap Detection Logic:** Inside the onSensorChanged listener callback, we monitored the proximity sensor's value. A "clap" was registered **only** when the value transitioned from a "far" state (higher value) to a "near" state (typically 0.0 cm), preventing continuous triggers.
3. **Feedback Implementation:** Upon detecting the clap transition:
   - Played a pre-loaded sound effect using SoundPool for low latency.
   - Triggered a short vibration using Vibrator (required adding the VIBRATE permission to the AndroidManifest.xml).
   - Updated the Jetpack Compose UI by changing an Image resource, using MutableState for reactivity and a Coroutine (lifecycleScope.launch with delay) to revert the image after a short pause.
4. **UI (Jetpack Compose):** We built the user interface using Jetpack Compose, displaying status text, the live proximity value, and the visual feedback image, all driven by MutableState.
5. **Lifecycle Management:** We used a DisposableEffect composable along with a LifecycleObserver to correctly register the sensor listener when the app resumed and unregister it when paused, ensuring efficient resource usage.


CA ClapApp
Version control
Medium Phone API 35
app
Android
app
manifests
AndroidManifest.xml
kotlin+java
res
drawable
mipmap
raw
values
xml
res (generated)
Gradle Scripts
build.gradle.kts (Project: ClapApp)
build.gradle.kts (Module :app)
proguard-rules.pro (ProGuard Rules for ":app")
gradle.properties (Project Properties)
gradle-wrapper.properties (Gradle Version)
libs.versions.toml (Version Catalog)
local.properties (SDK Location)
settings.gradle.kts (Project Settings)
MainActivity.kt
AndroidManifest.x
Running Devices
Build
Sync
Build Output
Build Analyzer
ClapApp > app > src > main > java > com > example > clapapp > MainActivity.kt
42:1
LF
UTF-8
4 spaces
5:46
1:1

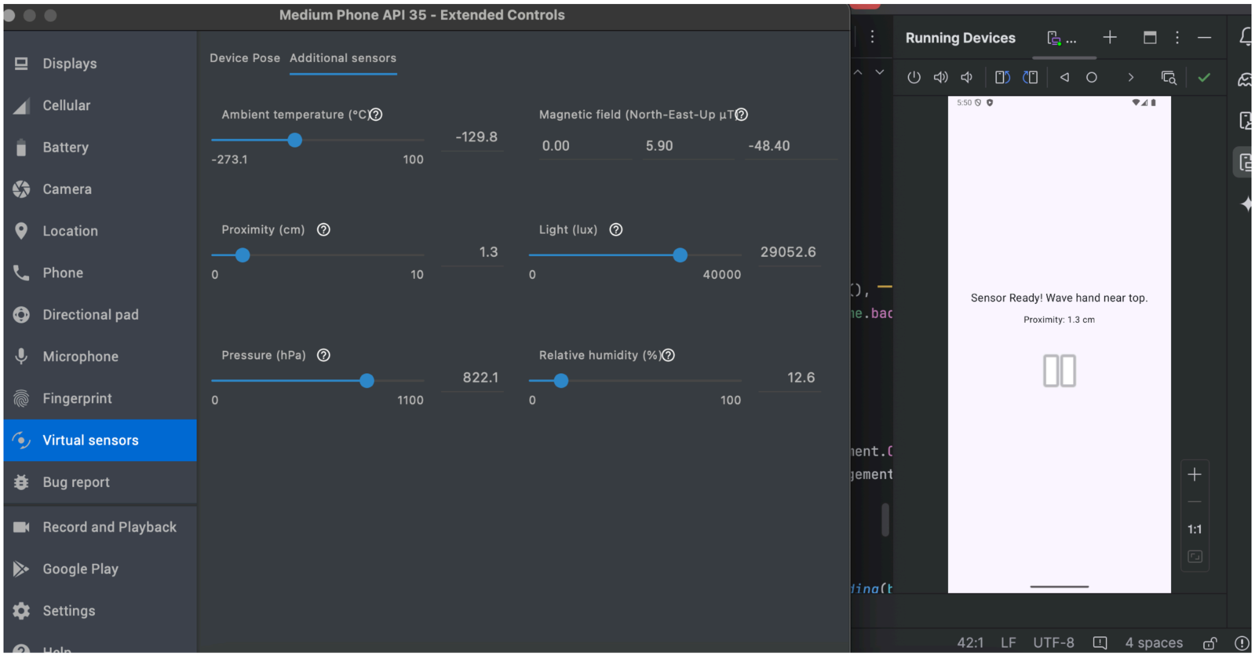
```kotlin
// --- Composable UI Function ---

@Composable
fun ClapAppScreen(
    status: String,
    proximityValue: String,
    currentImageRes: Int,
    modifier: Modifier = Modifier
) {
    Surface(
        modifier = modifier.fillMaxSize(),
        color = MaterialTheme.colorScheme.backg
    ) {
        Column(
            modifier = Modifier
                .fillMaxSize()
                .padding(16.dp),
            horizontalAlignment = Alignment.Cen
            verticalArrangement = Arrangement.C
        ) {
            Text(
                text = status,
                fontSize = 20.sp,
                modifier = Modifier.padding(bot
            )
            Text(
                text = proximityValue,
                fontSize = 16.sp,
                modifier = Modifier.padding(bot
            )
```

Sensor Ready! Wave hand near top.

Proximity: 5.3 cm

Change the proximity to hear the clap sound



Ambient temperature (°C) -129.8 (-273.1 – 100)

Magnetic field (North-East-Up µT) 0.00 5.90 -48.40

Proximity (cm) 1.3 (0 – 10)

Light (lux) 29052.6 (0 – 40000)

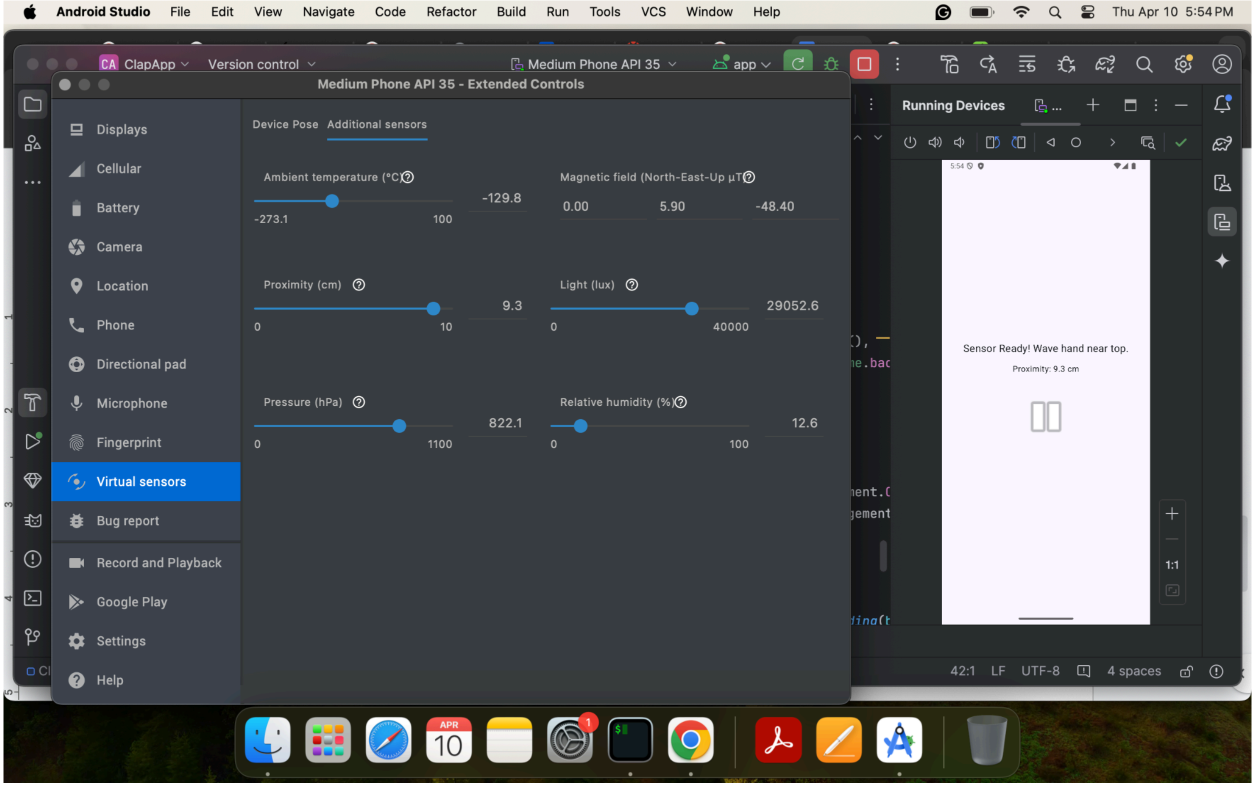
Pressure (hPa) 822.1 (0 – 1100)

Relative humidity (%) 12.6 (0 – 100)

Sensor Ready! Wave hand near top.

Proximity: 1.3 cm

Change to right most to hear again



Medium Phone API 35 - Extended Controls

Ambient temperature (°C) -129.8 (-273.1 – 100)

Magnetic field (North-East-Up µT) 0.00 5.90 -48.40

Proximity (cm) 9.3 (0 – 10)

Light (lux) 29052.6 (0 – 40000)

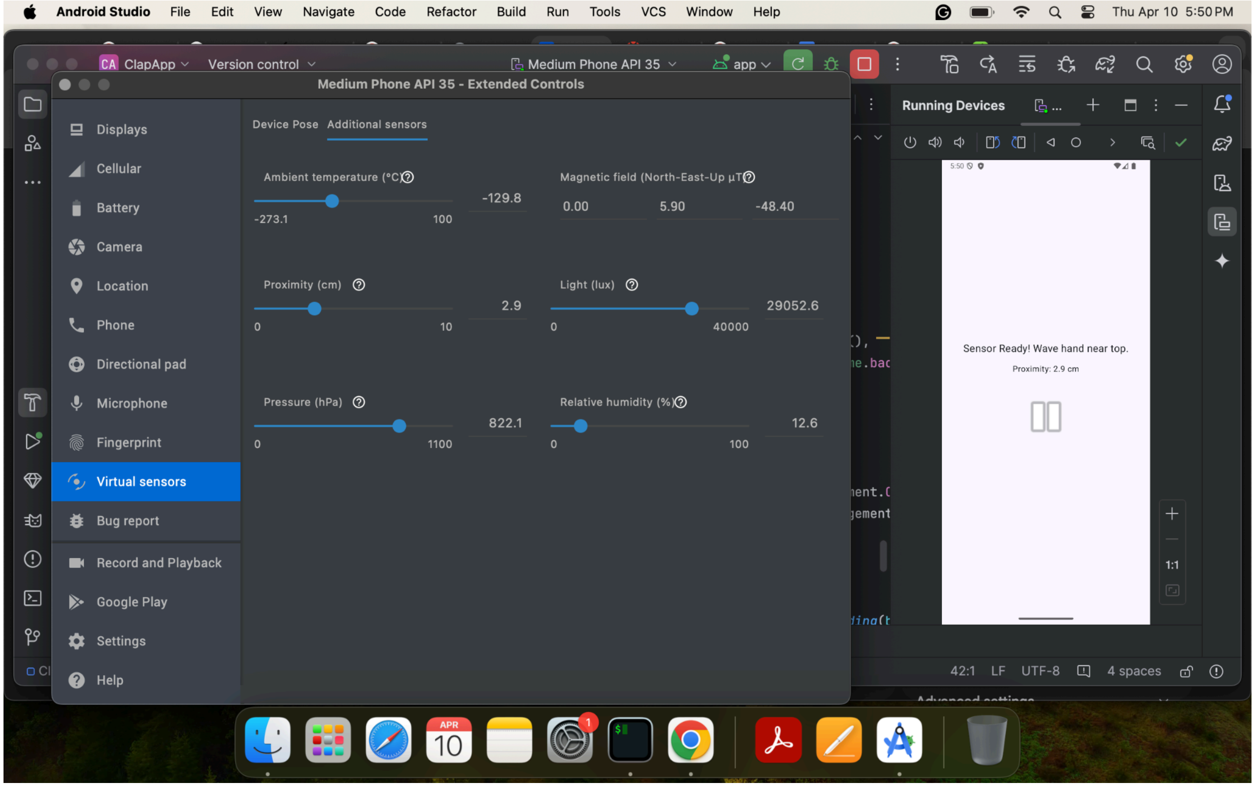
Pressure (hPa) 822.1 (0 – 1100)

Relative humidity (%) 12.6 (0 – 100)

Sensor Ready! Wave hand near top.

Proximity: 9.3 cm

To hear again



Medium Phone API 35 - Extended Controls

Ambient temperature (°C) -129.8 (-273.1 – 100)

Magnetic field (North-East-Up µT) 0.00 5.90 -48.40

Proximity (cm) 2.9 (0 – 10)

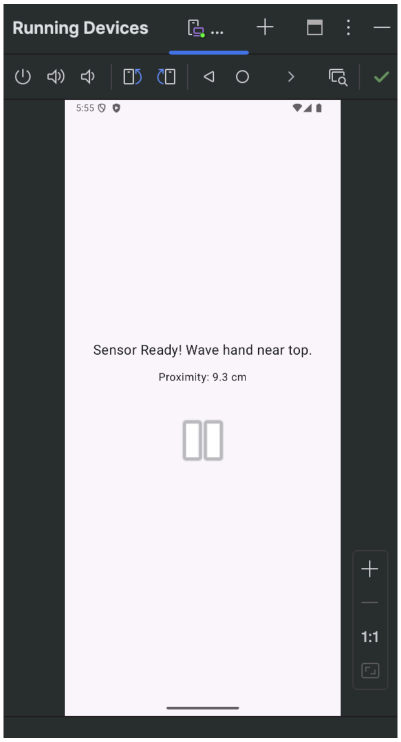
Light (lux) 29052.6 (0 – 40000)

Pressure (hPa) 822.1 (0 – 1100)

Relative humidity (%) 12.6 (0 – 100)

Sensor Ready! Wave hand near top.

Proximity: 2.9 cm



Sensor Ready! Wave hand near top.

Proximity: 9.3 cm

Github link for codes : https://github.com/ananya101001/Android-ClapApp