

Mobile Applications for Sensing and Control

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Week 2

Review

- Building your first app and uploading it onto your phone

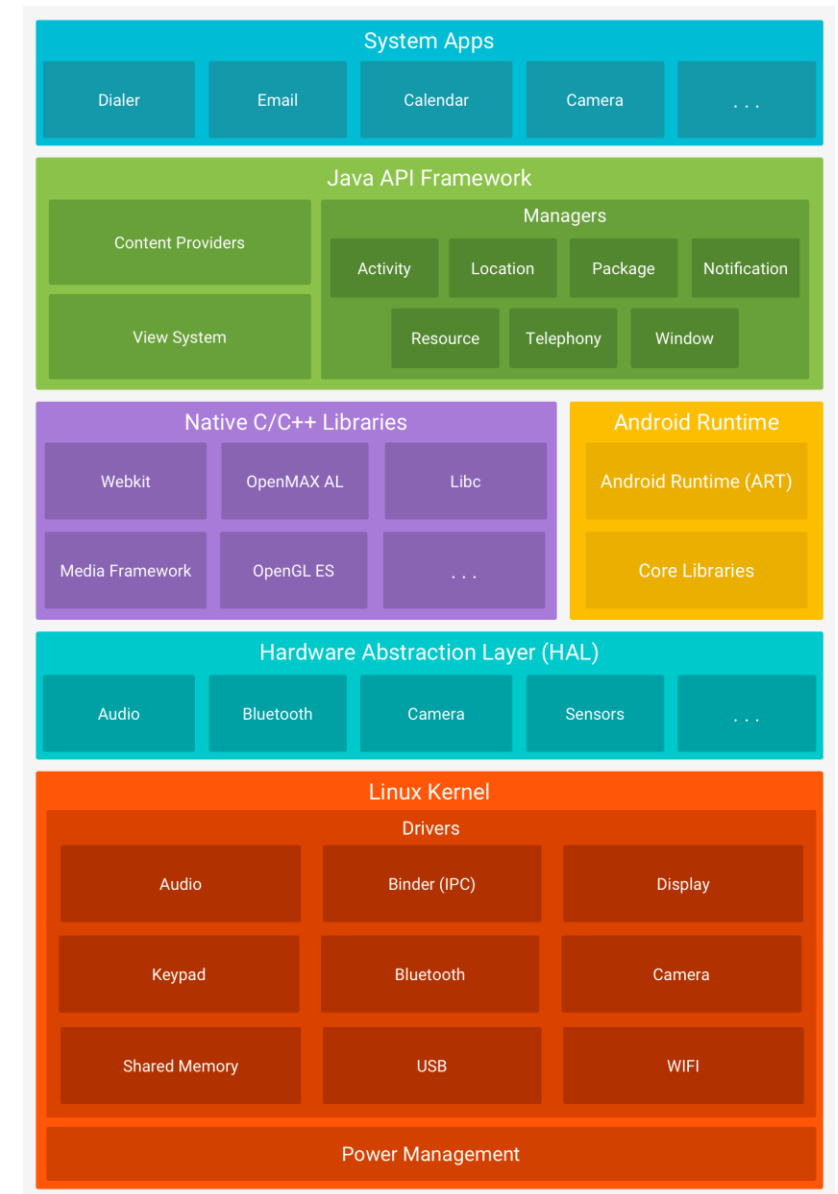
Accessing Sensors

How to Interact with the Physical World



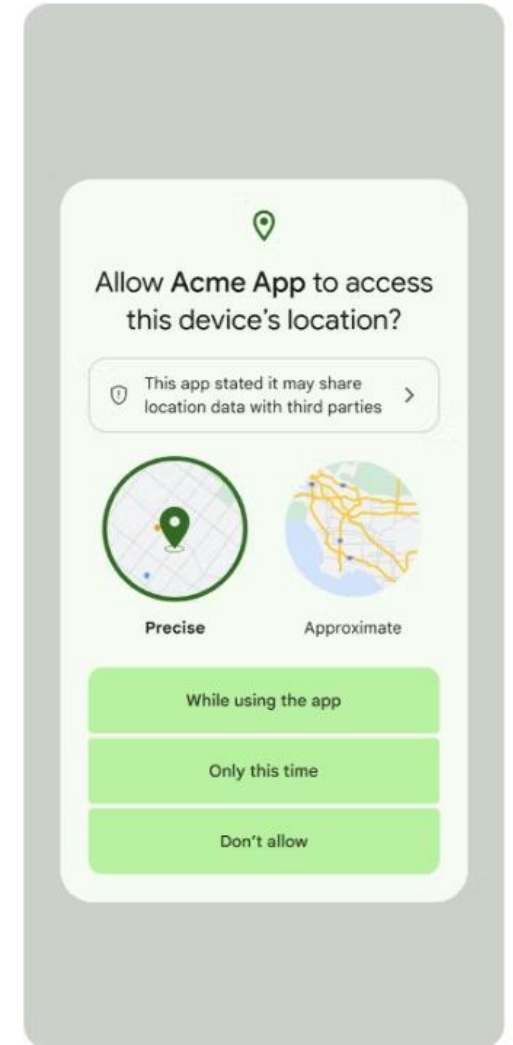
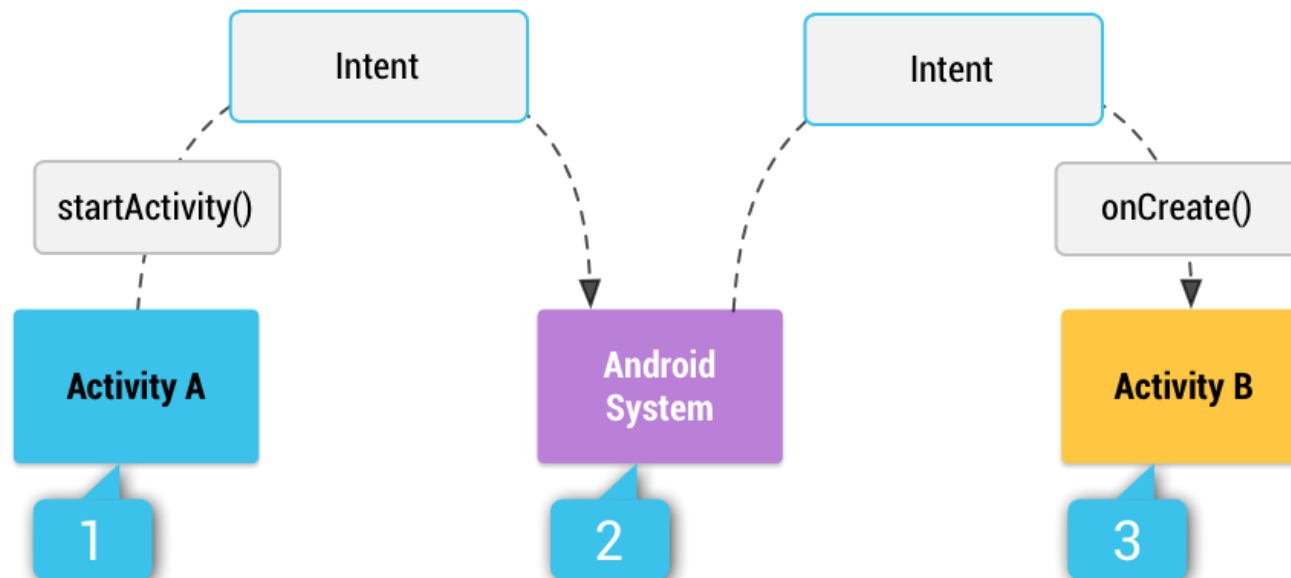
What Are Sensors? Intro + System Architecture

- Most sensors are not accessed directly. Instead, Android provides standardized **APIs** and tools so you can interact with them safely.



What Happens When You Access Hardware?

- Permissions (declared in manifest + requested at runtime)
- System dialogs (user must approve)
- Intents as **safe bridges** between your app and another system app (like the camera)



How do we access Sensors

- Built-in sensors we will use: Camera, Microphone, Accelerometer, Gyroscope, GPS, Light, etc.
- There are 2 ways sensors are accessed:
 - Direct API (e.g., accelerometer)
 - Using Intents (e.g., Camera)
- Today's focus = CAMERA

Accessing the Camera – Concepts & Permissions

- Process:
 - App sends Intent to open camera app
 - User takes photo
 - Result is returned to your app
- Android does not allow apps to access the camera directly without user approval.

Accessing the Camera – Concepts & Permissions

- How do we ask user for their permission?
- Manifest permissions:
 - `<uses-permission android:name="android.permission.CAMERA"/>`
- Must request permission at runtime for $\text{SDK} \geq 23$
- Use `ContextCompat.checkSelfPermission()`

HW 1

- Creating a ToDoList App

HW1

- A button to add new Task Items to the list.
- A button to Remove items from the list.
- The ability to display the number of items in the list.
- Add Time Deadline to Task Item using Time Picker Dialog.
- You can use the following components:
- TextInput, Button, Recycler View, Images, and Text to create the user interface for the app.

HW1

- A .zip file containing the source code for your app or a GitHub release Link
- . If you decide to use a GitHub release link, make sure you share it with us @sosper30 and @Tejashrichatbot.
- A readme file inside the zip file briefly explains the working of your app, how many hours it took you to complete it, and what the most challenging parts are. Please cite any websites or any other sources you used.
- A video showcasing the working of your app may include your voice; it is not compulsory. Your video should show all the assignment requirements.

ICTE 2