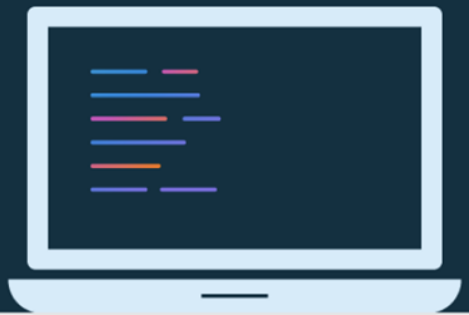
Android Development with Kotlin



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About this course

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Prerequisites

- Experience in an object-oriented programming language
- Comfortable using an IDE
- Familiar with using GitHub
- Access to a computer and internet connection
- (Optional) Android device and USB cable

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What you'll learn

- How to build a variety of Android apps in Kotlin
- Kotlin language essentials
- Best practices for app development
- Resources to keep learning

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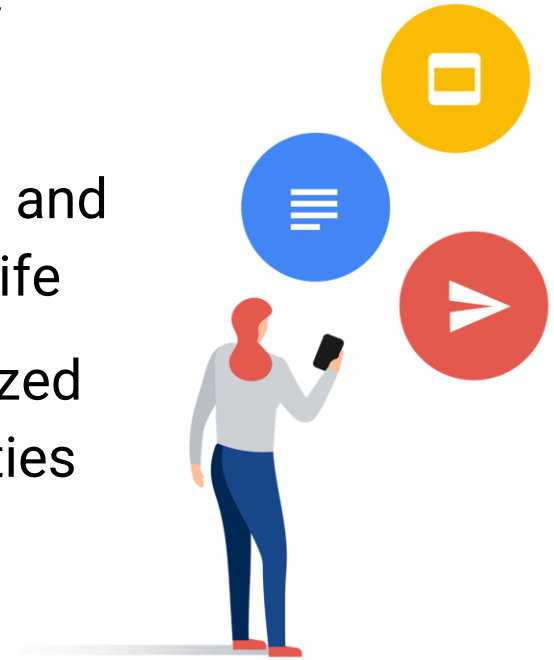
The opportunity

- Mobile devices are becoming increasingly commonplace
- Mobile apps connect users to information and services that can improve their quality of life
- Many industries have yet to be revolutionized through mobile, and offer great opportunities for new businesses and solutions



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Android

- Open-source mobile platform
- 16 major platform releases so far
- 3+ billion monthly active Android devices
- 2+ billion monthly active Google Play users
- 2.6+ million apps on the store in 2023
  which were downloaded 113 billion times

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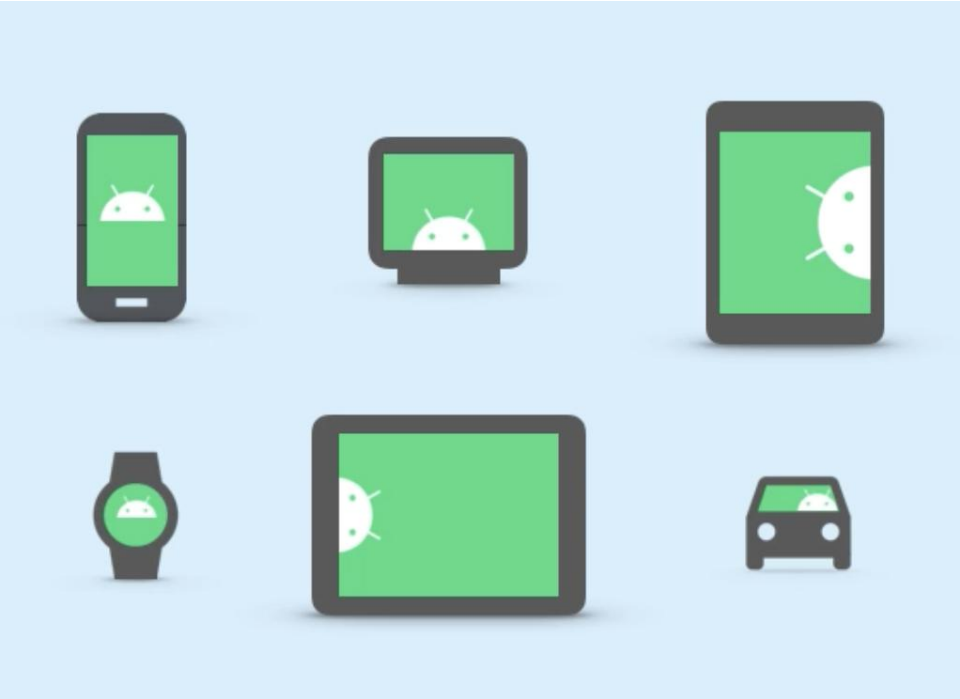
Available across different form factors



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Android Studio

- Official Android IDE
- Develop, run, debug, test, and package apps
- Monitors and performance tools
- Virtual devices
- Project views
- Visual layout editor

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Challenges

- Multiple screen sizes and resolutions.
- It should handle memory efficiently.
- Performance: make your apps responsive and smooth. (low power consumption & low footprint)
- Security: keep source code and user data safe
- Compatibility: runs well on older platform versions. (Reliable and Stable)

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Build Android apps in Kotlin

+

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Kotlin

A modern programming language that helps developers be more productive.

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Benefits of Kotlin

- Expressive and concise
- Safer code (Null Safety)
- Interoperable
- JVM language
- Less ceremony than Java
- Structured Concurrency (Coroutines)

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Idiomatic Kotlin

- Kotlin is at its best when used idiomatically
- Avoid just translating Java into Kotlin
- As you learn more Kotlin,
  you'll find easier, more concise ways to do things
- For a list of common Kotlin idioms, refer to the Kotlin Language Guide on Idioms

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Learning experience

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Course structure

4 units with a total of 13 lessons across 13 weeks

Unit 1 (3 weeks)

Get Started with Kotlin

Basics, Functions, Classes & Objects, Extensions

Unit 2 (3 weeks)

Introduction to Android

First App, Layouts, Navigation

Unit 3 (6 weeks)

Android App Architecture

App Architecture, Data Persistence, Display Lists, Connect to Internet, Background Work

Unit 4 (1 week)

App Design

App UI Design

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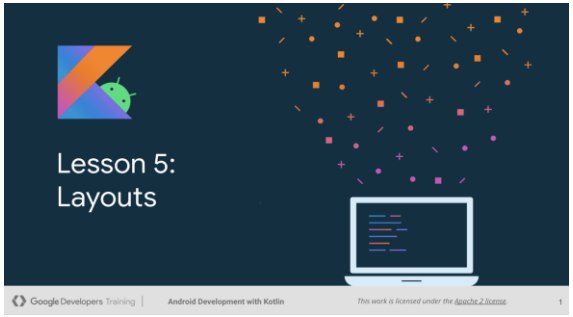
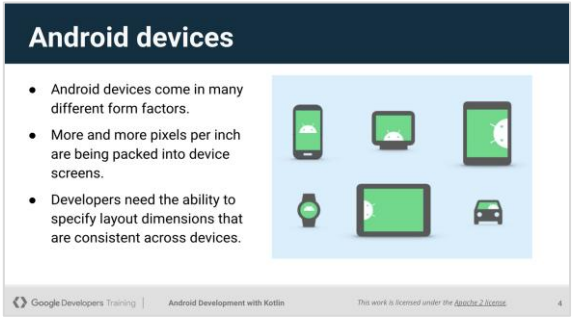
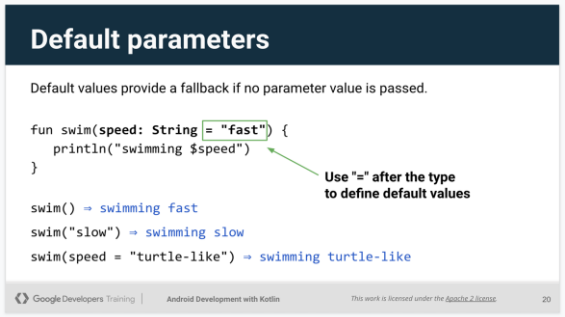
Lectures

We'll cover important topics together as a class.







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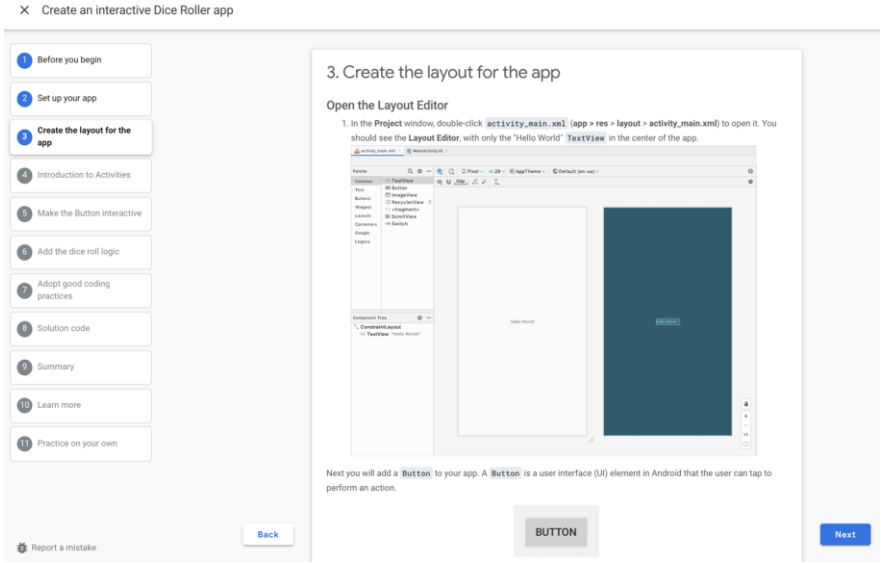
Learning pathways

After each class, complete the corresponding learning pathway with articles and codelabs to practice what you learned.



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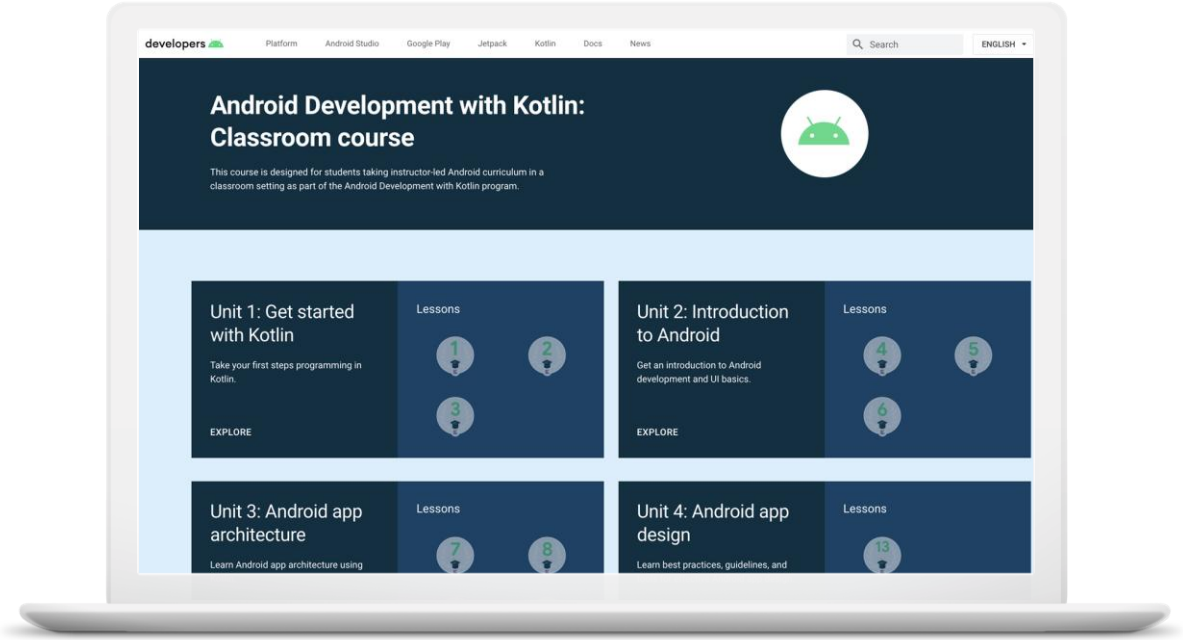
Accessing the pathways



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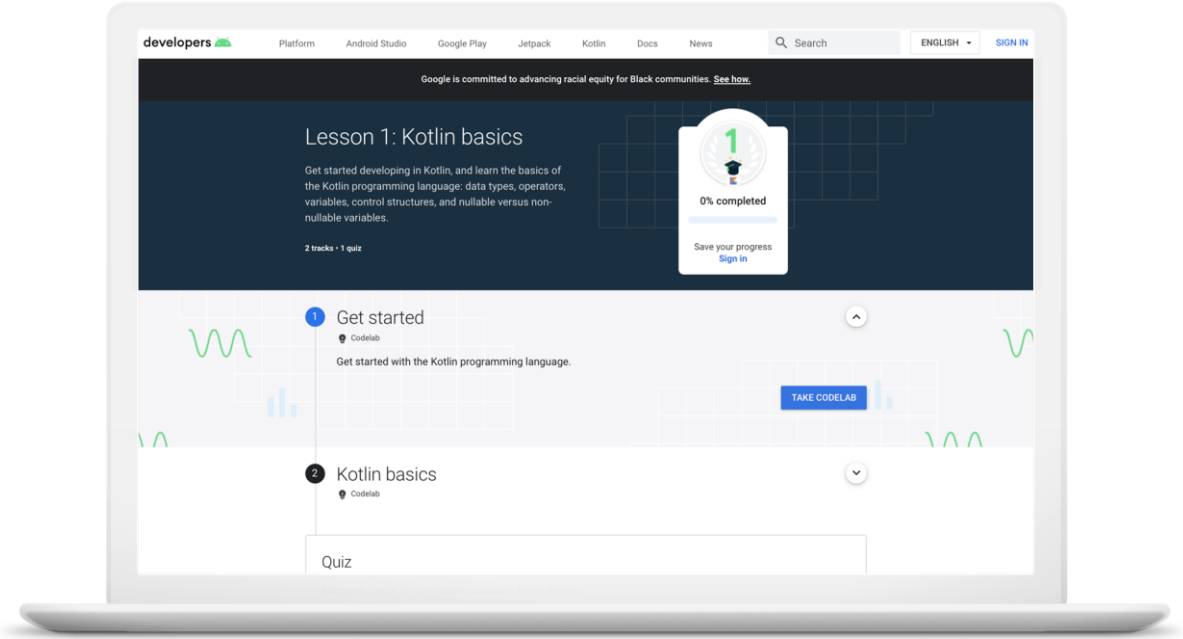
Pathway



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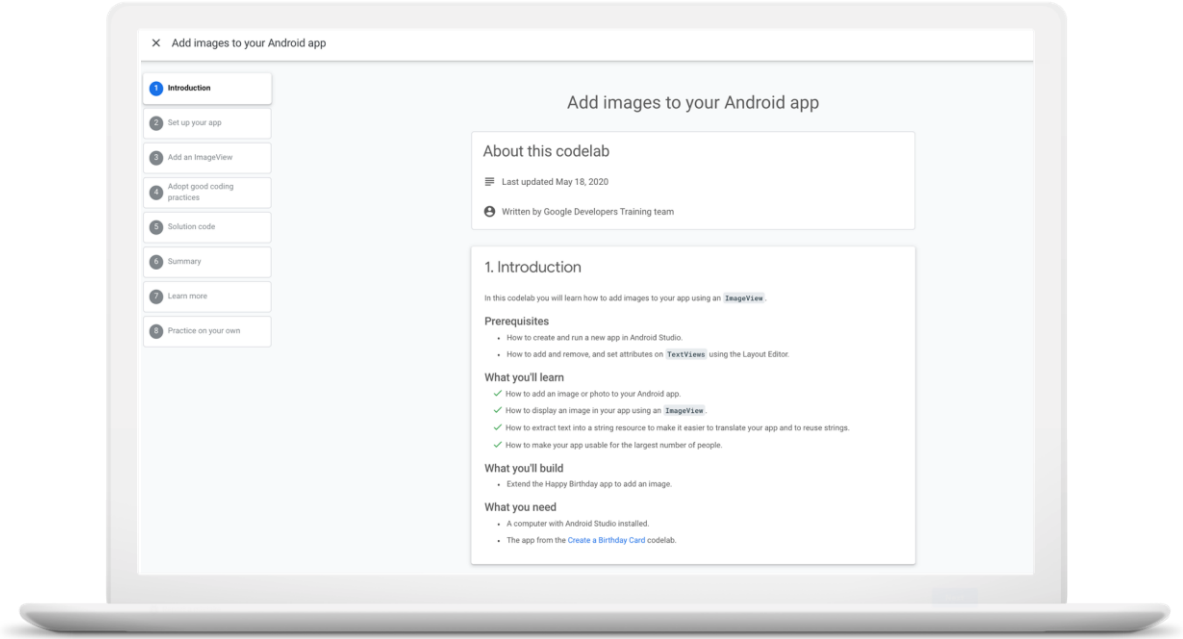
Codelab



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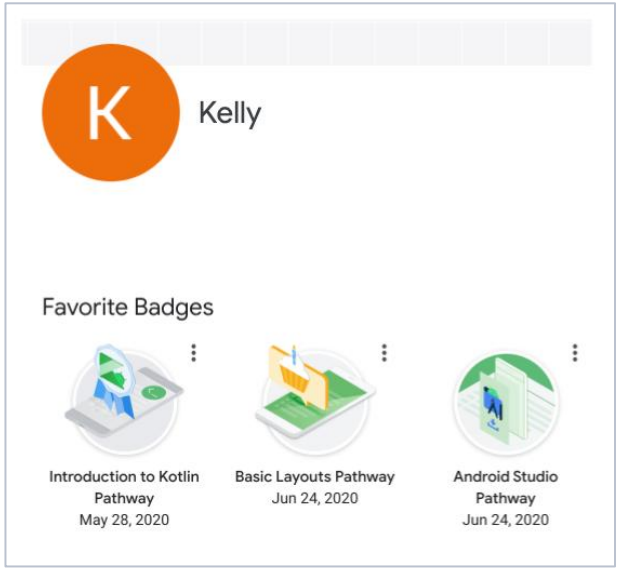
Earn badges for your developer profile



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What you need

To work through the Kotlin and Android examples
in the *Android Development with Kotlin* labs
you'll need to install the following software on your computer:

- Java Development Kit
- Java Runtime Engine (Windows only)
- IntelliJ IDEA
- **Android Studio**

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Why Do You Develop For Android ™?

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Development Point of View

- Simple and powerful SDK
- Libraries (maps, wearables)
- Excellent documentation (developers.android.com)
- Sample code
- No licensing fees
- Thriving developer community

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Android Versions

Cupcake

1.5

Donut

1.6

Eclair

2.0/2.1

Froyo

2.2

Gingerbread

2.3

Honeycomb

3.0/3.1

Ice Cream Sandwich

4.0

Jelly Bean

4.1/4.2/4.3

Kitkat

4.4

Lollipop

5.0

Marshmallow

6.0

Pie

9.0

Oreo

8.0

Nougat

7.0

10

11

12

13

Android 4.4 KitKat

- Runs on entry-level devices.
- Better memory management.
- New NFC capabilities through Host Card Emulation.
- Printing framework.
- Storage access framework.
- Low-power sensors (Step Detector and Step Counter Sensor)
- More

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Android 5.0 Lollipop

- Material Design.
- Android now runs exclusively on the new **ART runtime**.
- Notifications in Android 5.0
  are more visible, accessible, and configurable.
- Android TV provides a complete TV platform
  for your app's big-screen experience.
- Advanced Connectivity.
- More

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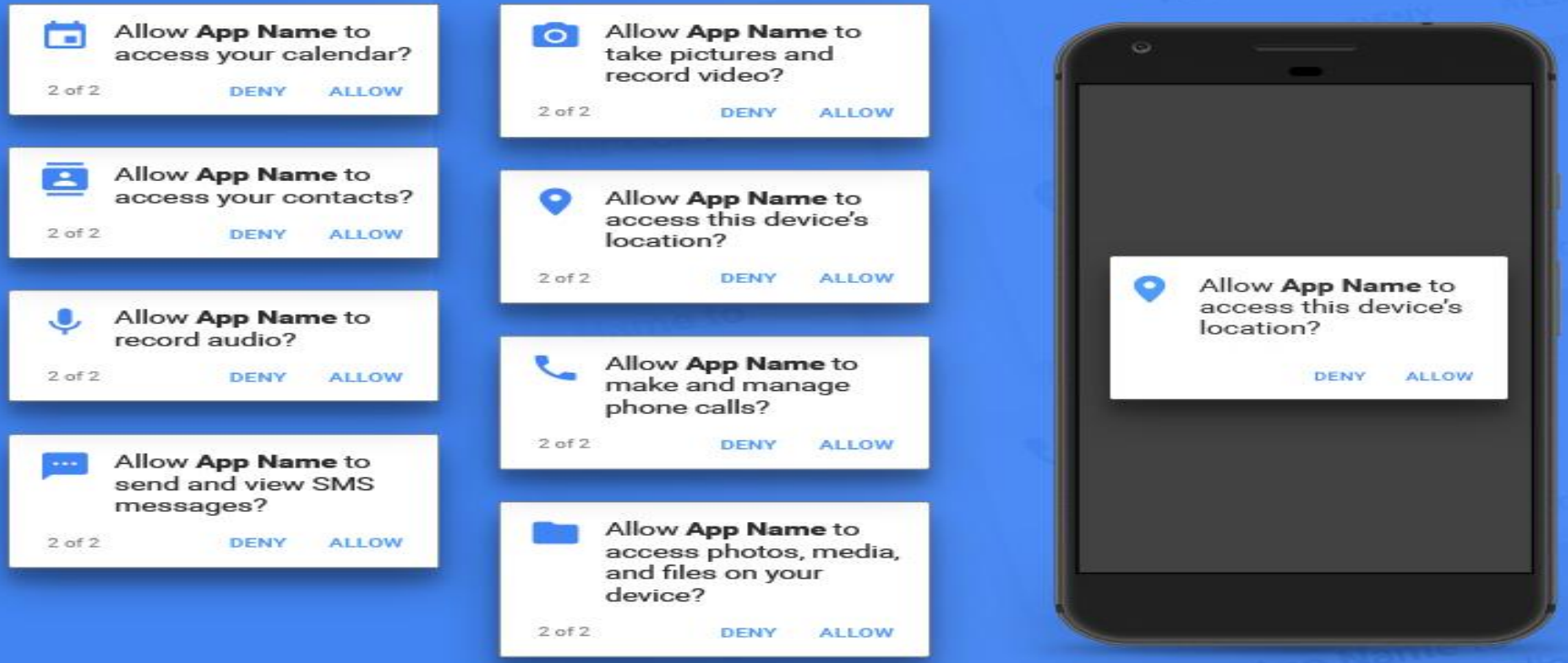
Android 6.0 Marshmallow



Android 7.0 Nougat

- Multi-window Support
- Notification Enhancements
- Data Saver
- Vulkan API
- Quick Settings Tile API
- Number Blocking
- More

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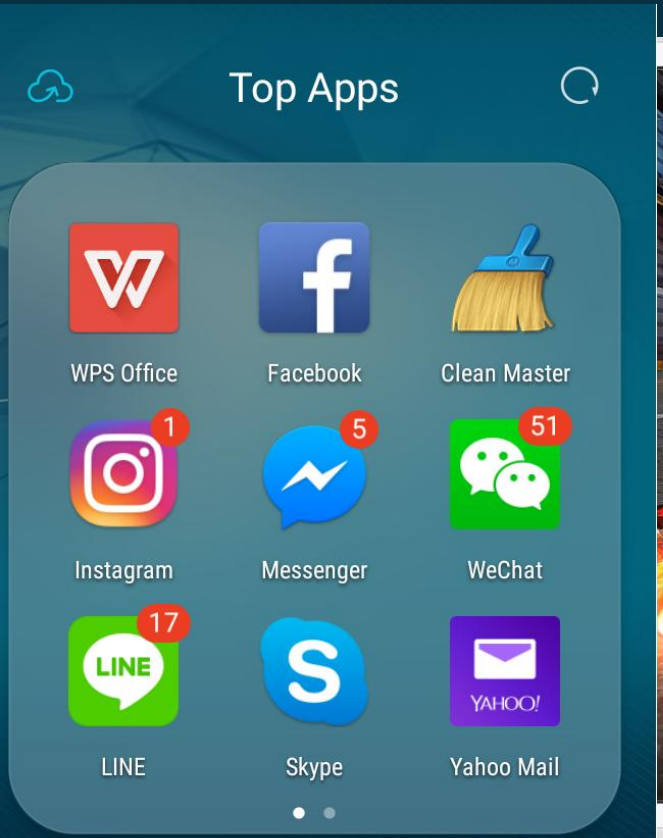
Android 8.0 Oreo



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Android 9.0 Pie

- Indoor positioning with Wi-Fi RTT
- Display cutout support
- Multi-camera support
- Unified biometric authentication dialogue

- More

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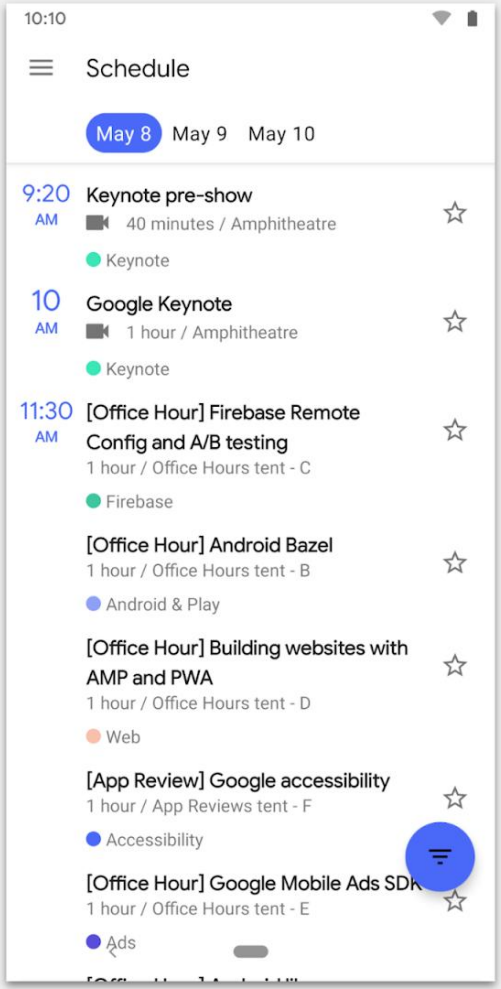
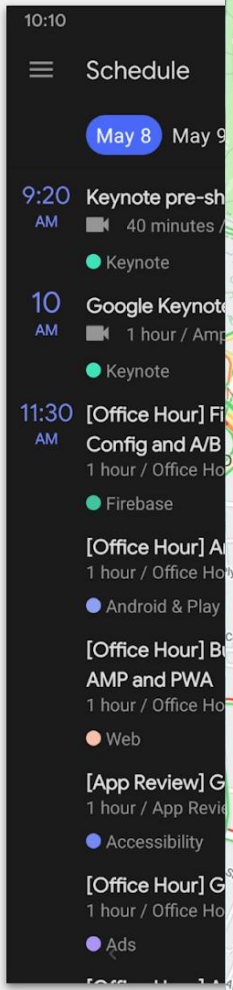
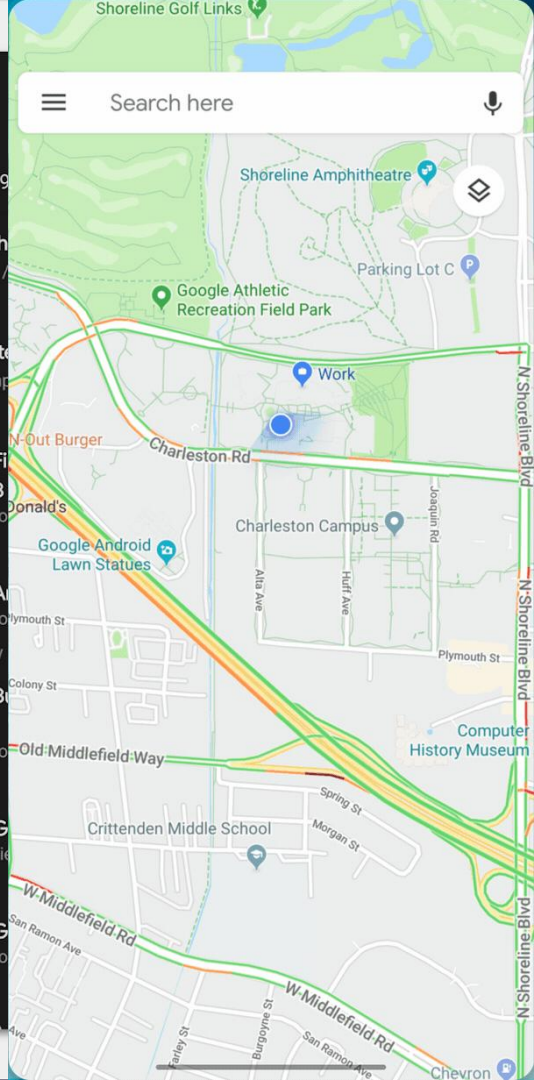
Android

- Supports fo
- Supports 5(
- ML edge
- Smart Reply
- Dark Theme
- Gesture Nav
- More

Light theme







Android 11

- **Conversations:** Get all your message in one place. (Bubbles)
- **Device controls:** Android 11 allows us to control all our connected devices (IOT) from a single point.
- **Content capture:** Android 11 comes with a screen recording feature that captures our phone's current screen activity.
- **Predictive tools:** By predicting our habits and patterns of working, it suggests accordingly.
- **Media:** We can play music from other devices connected to our phones.

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Android

m3.material.io/blog/announcing

Home

Get started

Develop

Foundations

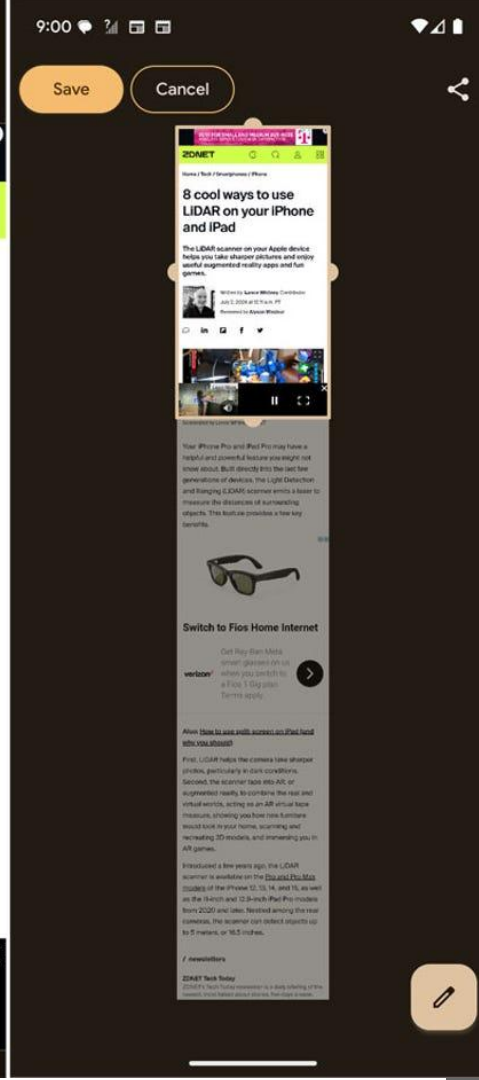
Styles

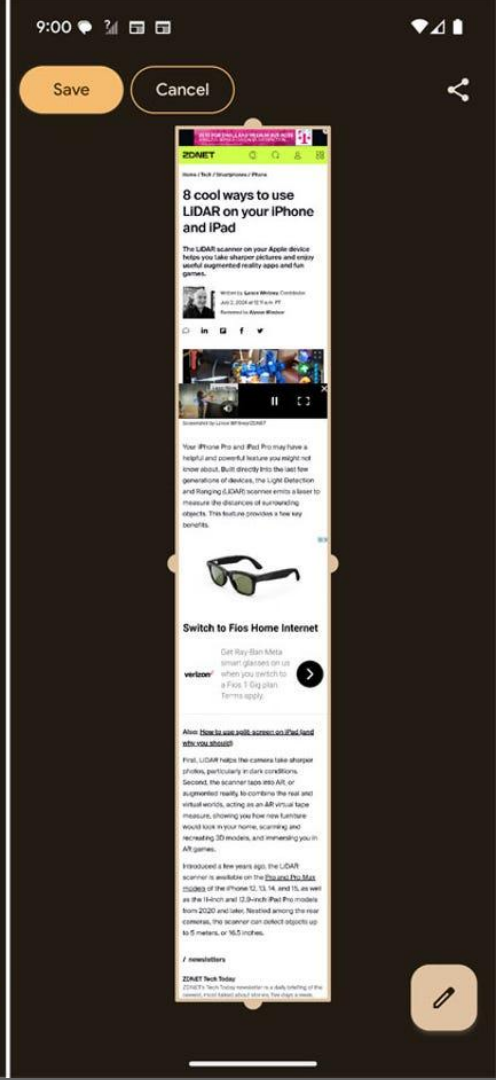
Components

May 18, 2021

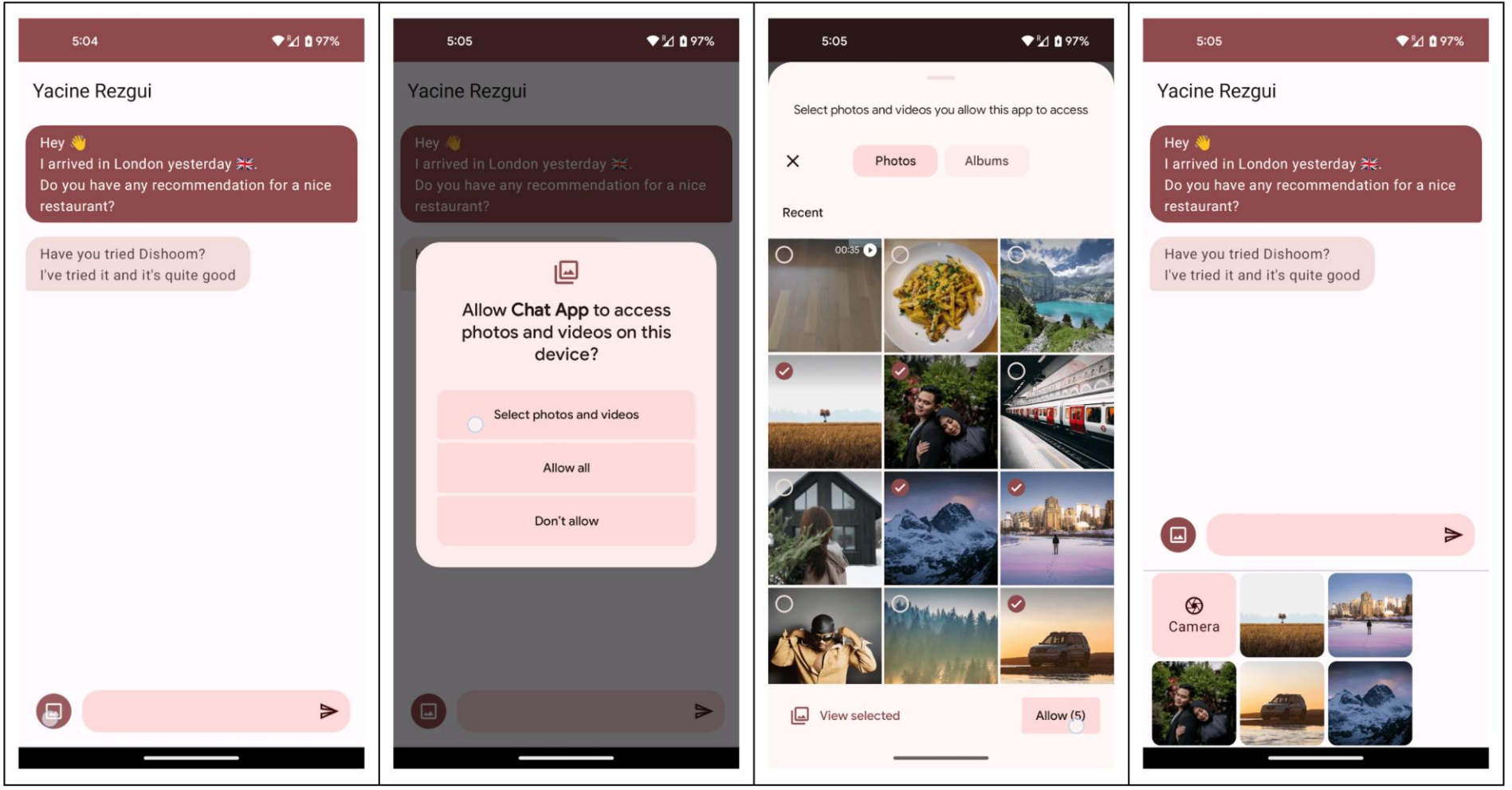
Unveiling

The next stage for Material





Google Developers Training


5:04
97%
Yacine Rezgui
Hey 👋
I arrived in London yesterday 🇬🇧.
Do you have any recommendation for a nice restaurant?
Have you tried Dishoom?
I've tried it and it's quite good
5:05
97%
Yacine Rezgui
Hey 👋
I arrived in London yesterday 🇬🇧.
Do you have any recommendation for a nice restaurant?
Allow Chat App to access photos and videos on this device?
Select photos and videos
Allow all
Don't allow
5:05
97%
Select photos and videos you allow this app to access
Photos
Albums
Recent
00:35
View selected
Allow (5)
5:05
97%
Yacine Rezgui
Hey 👋
I arrived in London yesterday 🇬🇧.
Do you have any recommendation for a nice restaurant?
Have you tried Dishoom?
I've tried it and it's quite good
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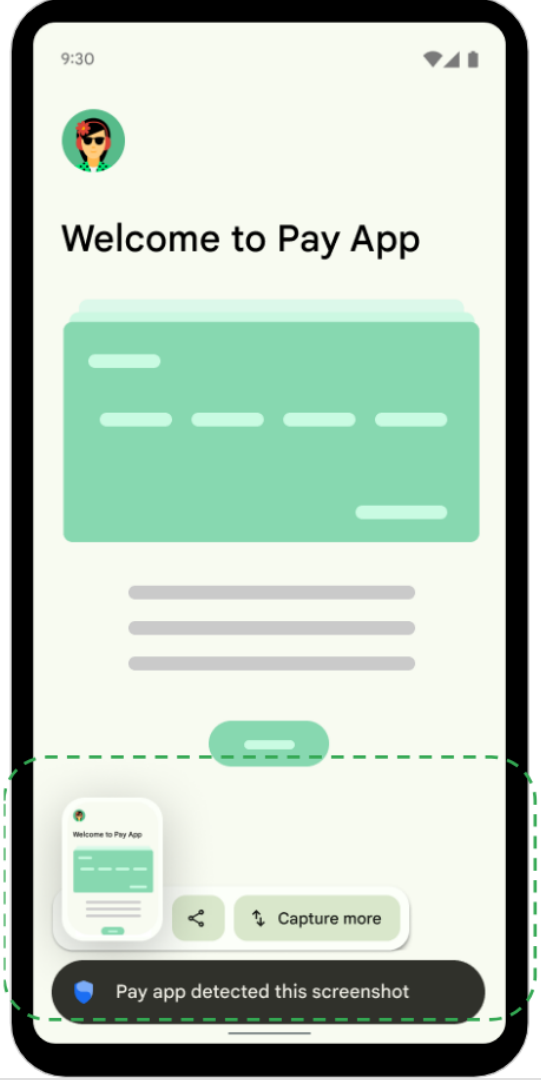
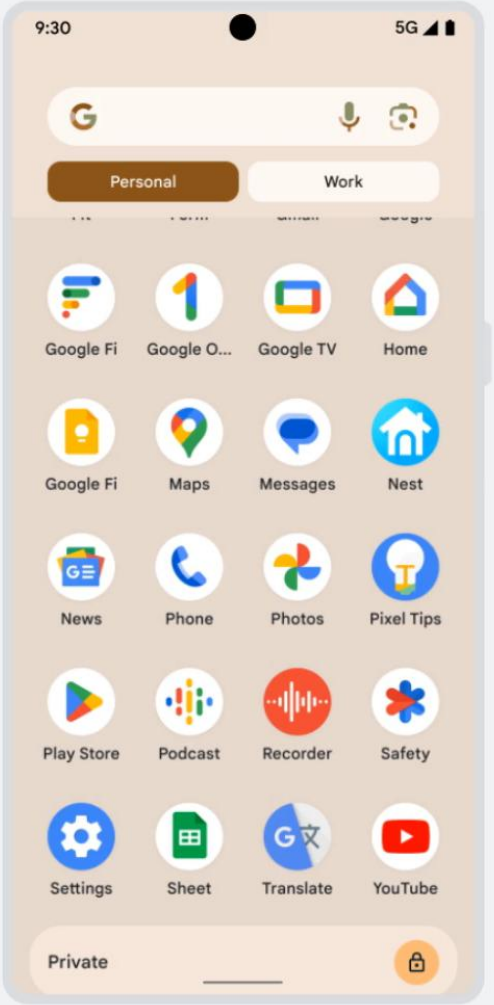
- More



Android 15

- Private space.
- App screen sharing
- Theft protection.
- Pinnable taskbar.
- App pairs.
- App archiving
- Health Connect
- More



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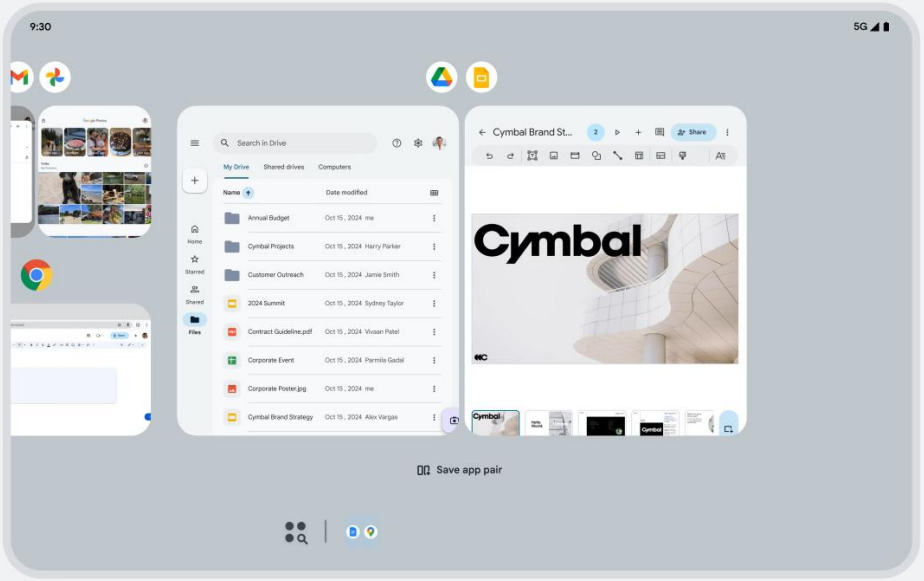
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Annual Budget
Cymbal Projects
Customer Outreach
2024 Summit
Contract Guideline.pdf
Corporate Event
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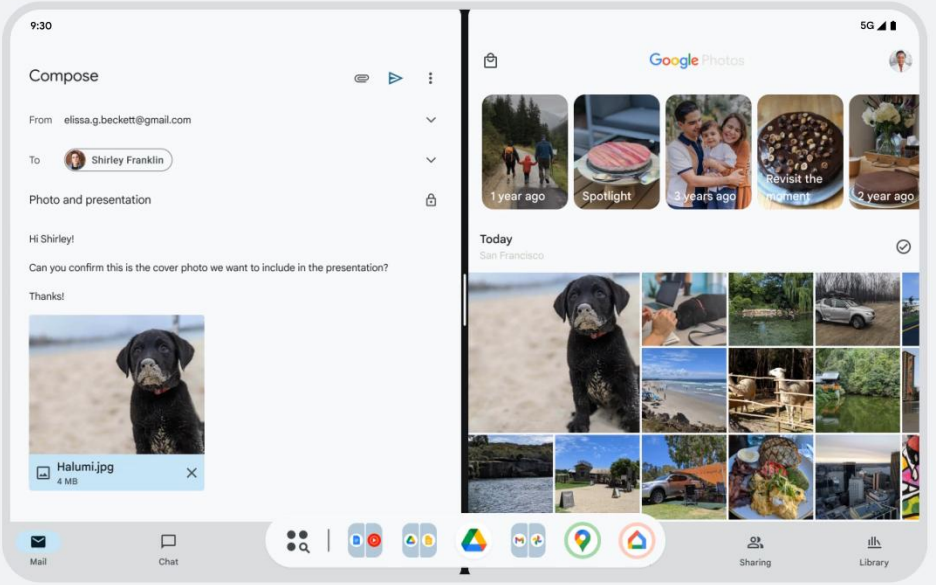
9:30
5G
Compose
From elissa.g.beckett@gmail.com
To Shirley Franklin
Photo and presentation
Hi Shirley!
Can you confirm this is the cover photo we want to include in the presentation?
Thanks!
Halumi.jpg
4 MB
Google Photos
1 year ago
Spotlight
3 years ago
Revisit the moment
2 year ago
Today
San Francisco
Mail
Chat
Sharing
Library

Android 16

- User experience and system UI
- Developer Productivity and tools
- Performance and battery
- Accessibility
- Camera, Media, Graphics
- Privacy
- More

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Resources

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Kotlin resources

- Learn Kotlin for a list of official reference materials
- Kotlin Language Documentation (downloadable PDF)
- Kotlin Koans for more snippets to practice with
- Coding Conventions for a coding style guide for the Kotlin language
- Learn Kotlin by Example for a set of small and simple annotated examples

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Android and other resources

- Official Android developer website
- Android Developers Blog
- Android Developers Medium blog
- Android Developers YouTube channel
- @AndroidDev on Twitter
- Android Developer Newsletter
- Stack Overflow
- Offline documentation through SDK Manager

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