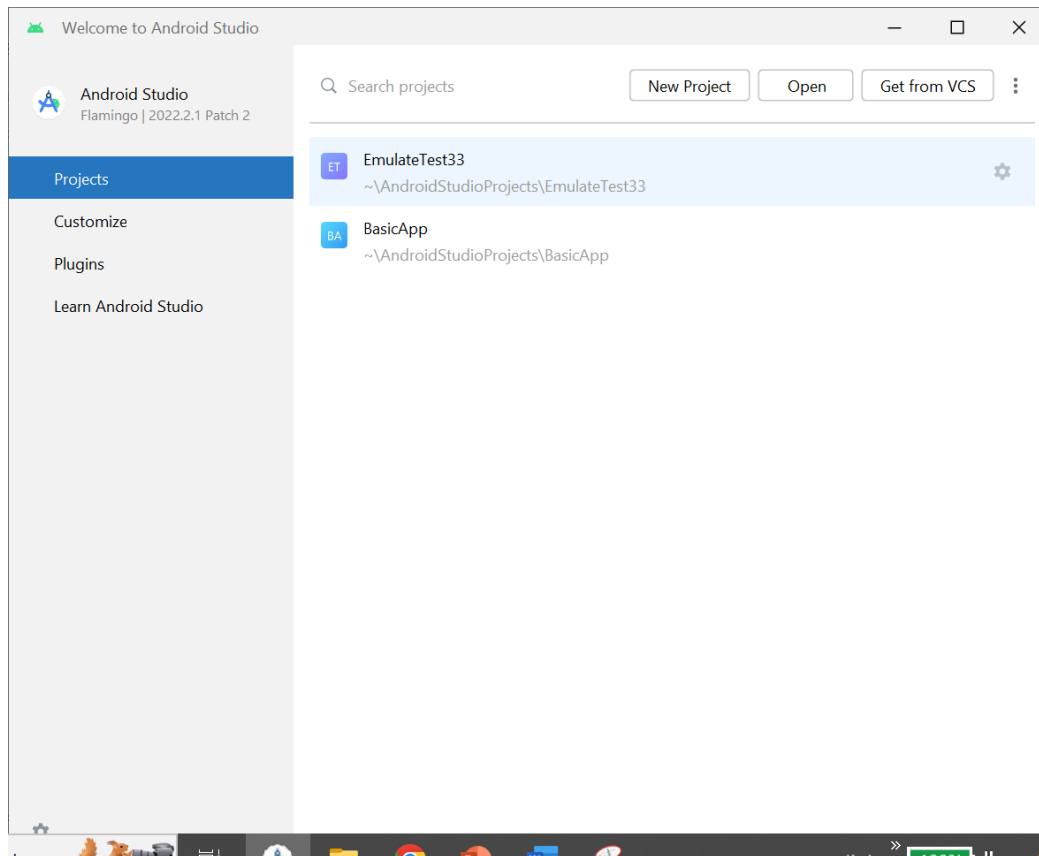


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## CEN 4360 Mobile Device Software Development

### Android Studio emulator

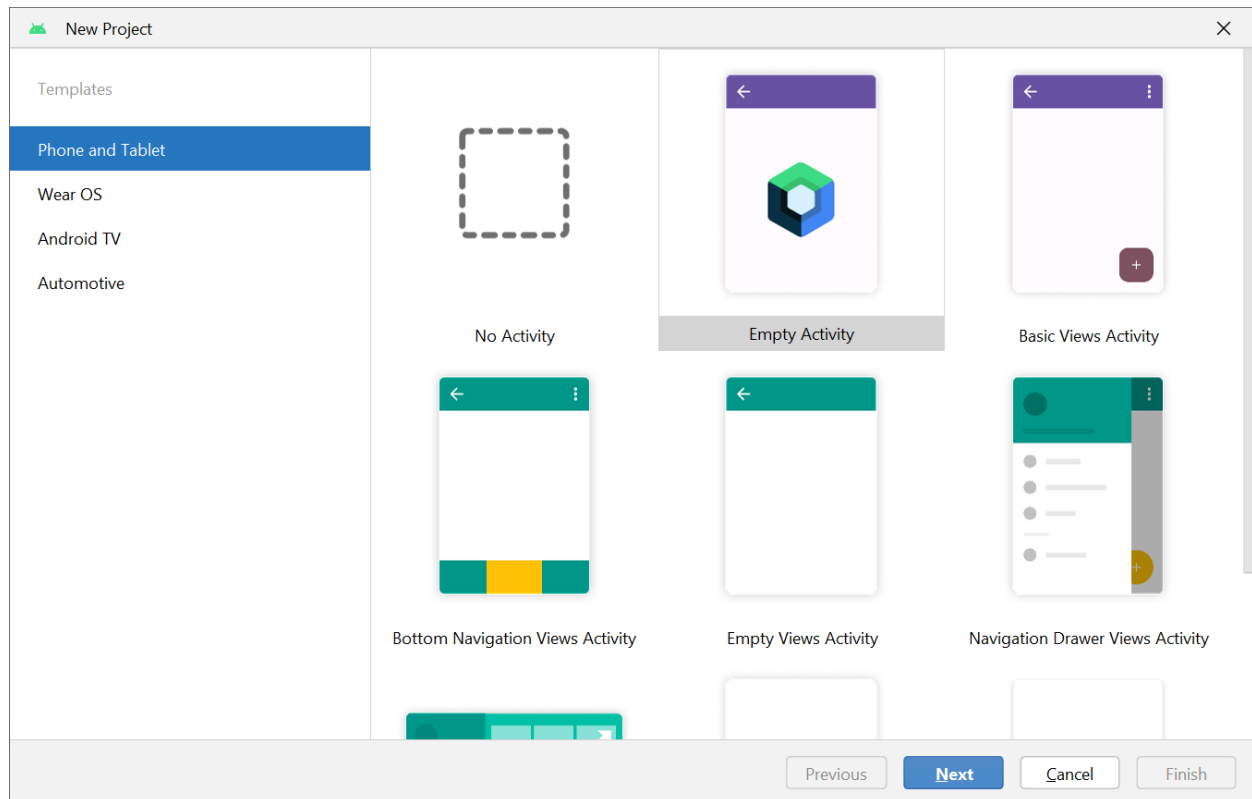
- Each instance of the Android Emulator uses an *Android virtual device (AVD)* to specify the Android version and hardware characteristics of the simulated device.
  - To effectively test an app, create an AVD that models each device the app is designed to run on.
  - Each AVD functions as an independent device with its own private storage for user data, SD card, and so on.
  - By default, the emulator stores the user data, SD card data, and cache in a directory specific to that AVD.
  - When launching the emulator, it loads the user data and SD card data from the AVD directory.
1. Create an Android project
    - a. Launch Android Studio
    - b. Create a new project



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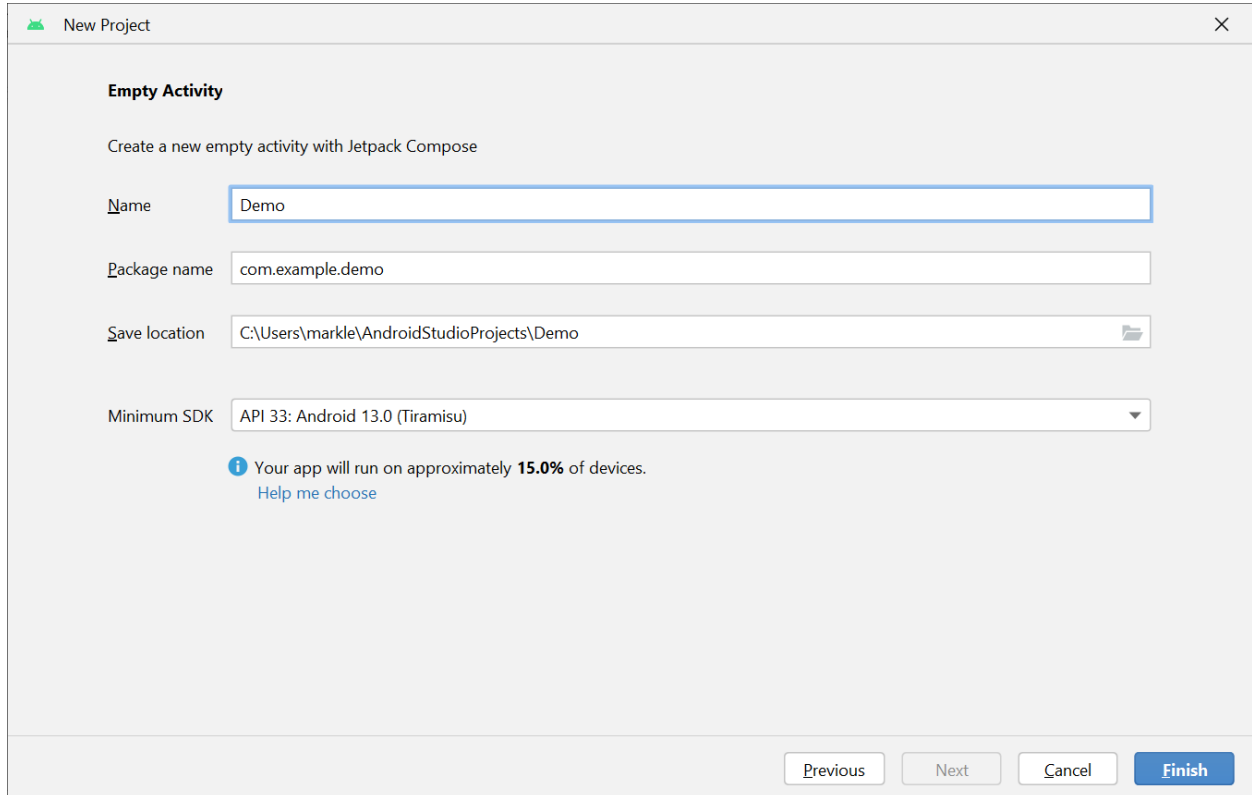
- c. Ensure **Phone and Tablet** tab is selected
- d. Select **Empty Activity**



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- e. Name field: name project
- f. Package name: leave intact
- g. Save location: leave intact; ensure directory location has **NO** spaces
- h. Minimum SDK: API 33: Android 13.0 (Tiramisu)
- i. **The Emulator version and SDK version MUST be compatible!**



New Project

**Empty Activity**

Create a new empty activity with Jetpack Compose

Name: Demo

Package name: com.example.demo

Save location: C:\Users\markle\AndroidStudioProjects\Demo

Minimum SDK: API 33: Android 13.0 (Tiramisu)

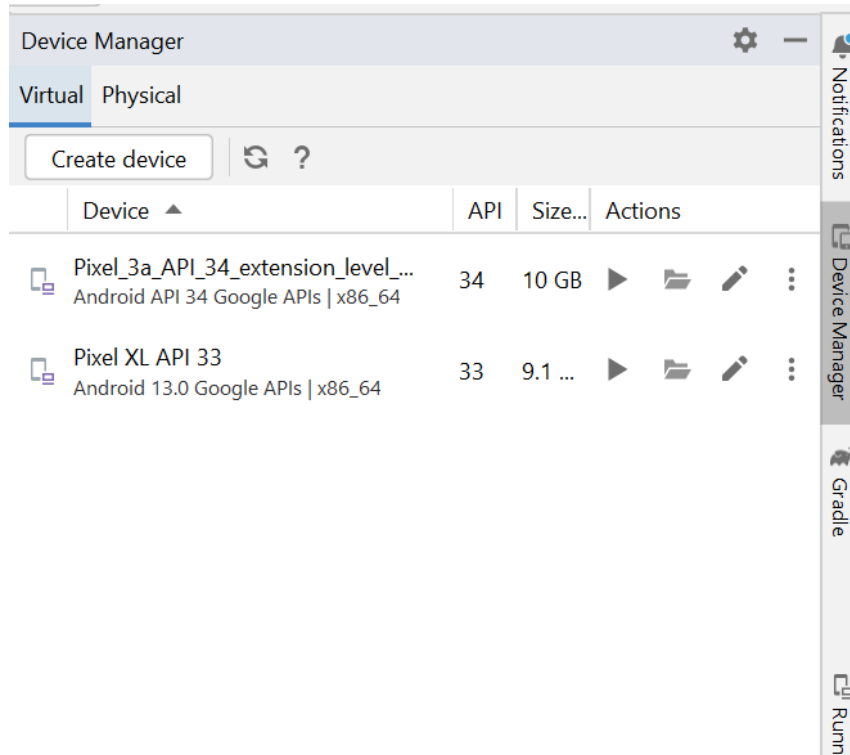
*i* Your app will run on approximately **15.0%** of devices.  
[Help me choose](#)

Previous Next Cancel Finish

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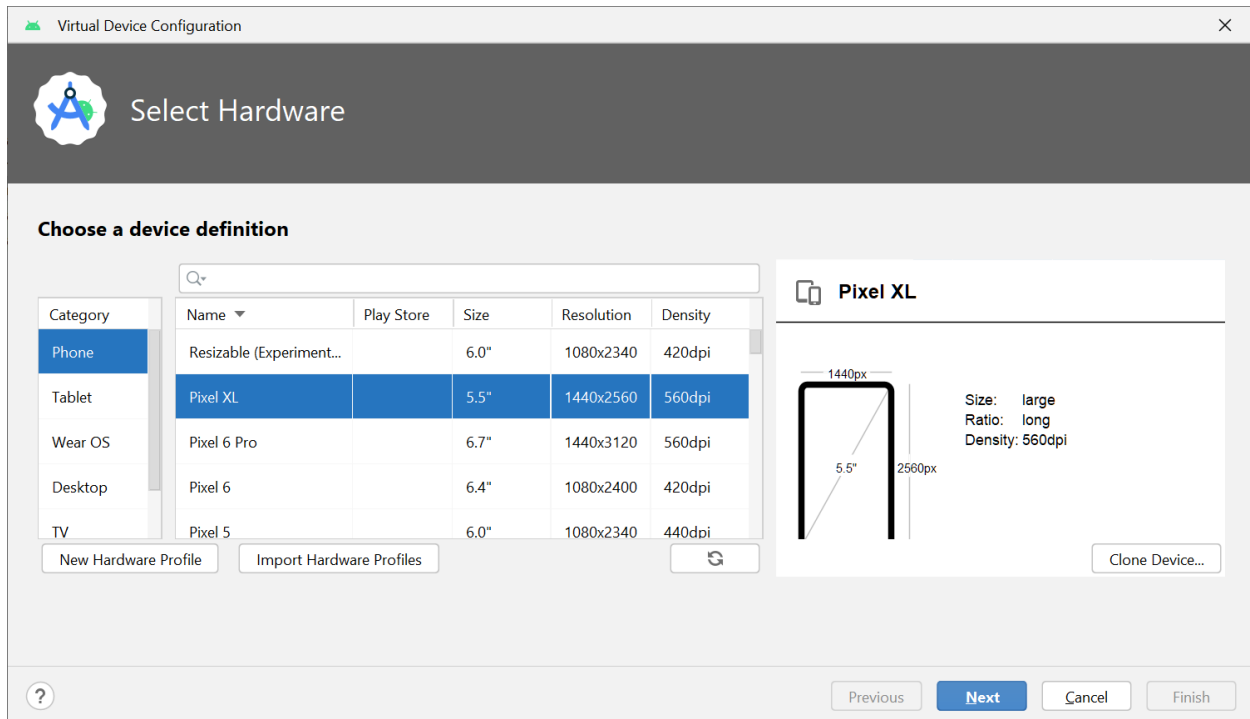
2. Create an Android Virtual Device
  - a. <https://developer.android.com/studio/run/managing-avds?hl=en>
  - b. Launch the Device Manager
  - c. Click **Create device**



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- d. The hardware profile defines the characteristics of a device as shipped from the factory. The Device Manager comes pre-loaded with certain hardware profiles, such as Pixel devices, and you can define or customize the hardware profiles as needed. Select the hardware configuration
- Phone
  - Pixel #



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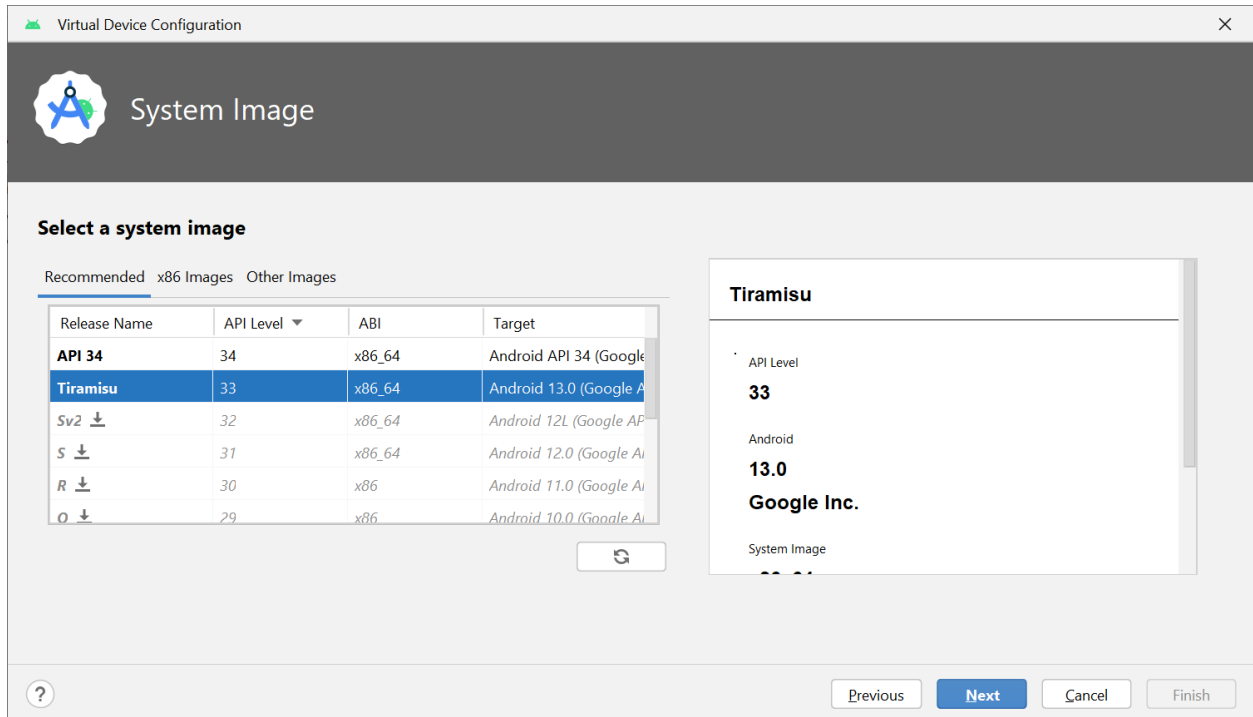
- e. A system image labeled with Google APIs includes access to Google Play services. The Recommended tab lists recommended system images. The other tabs include a more complete list. The right pane describes the selected system image. The API level of the target device is important, because an app doesn't run on a system image with an API level that's lower than the one required by the app, as specified in the minSdk attribute in the app manifest file.
- f. **If there is a download icon next to a system image, that image isn't currently installed on the development machine. Click the icon to download the system image. You must be connected to the internet to download system images.**
- g. To determine which Android system images are installed, in a file browser, browse to the logged in user's AppData\Local\Android\Sdk\platforms folder.  
Example: C:\Users\markle\AppData\Local\Android\Sdk\platforms

Users > markle > AppData > Local > Android > Sdk > platforms					Search platforms	
Name		Date modified	Type	Size		
android-33		8/18/2023 8:48 PM	File folder			
android-34		7/12/2023 3:45 PM	File folder			

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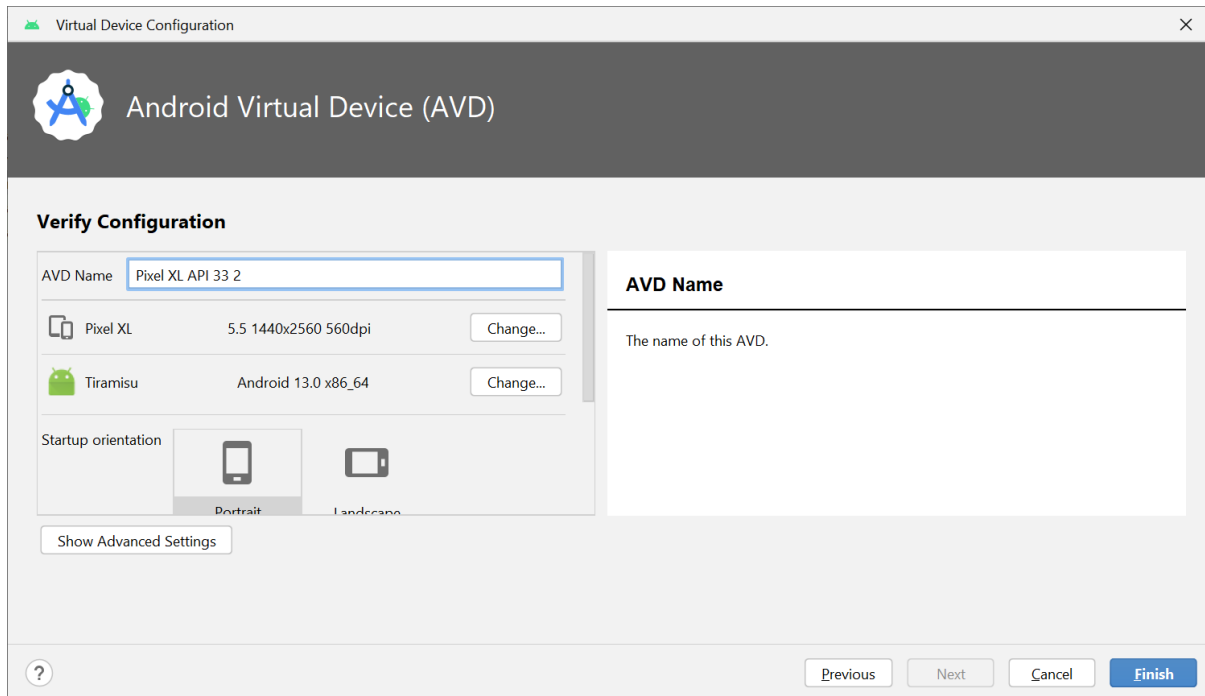
- h. Select the system image
  - i. Tiramisu



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### i. Verify configuration



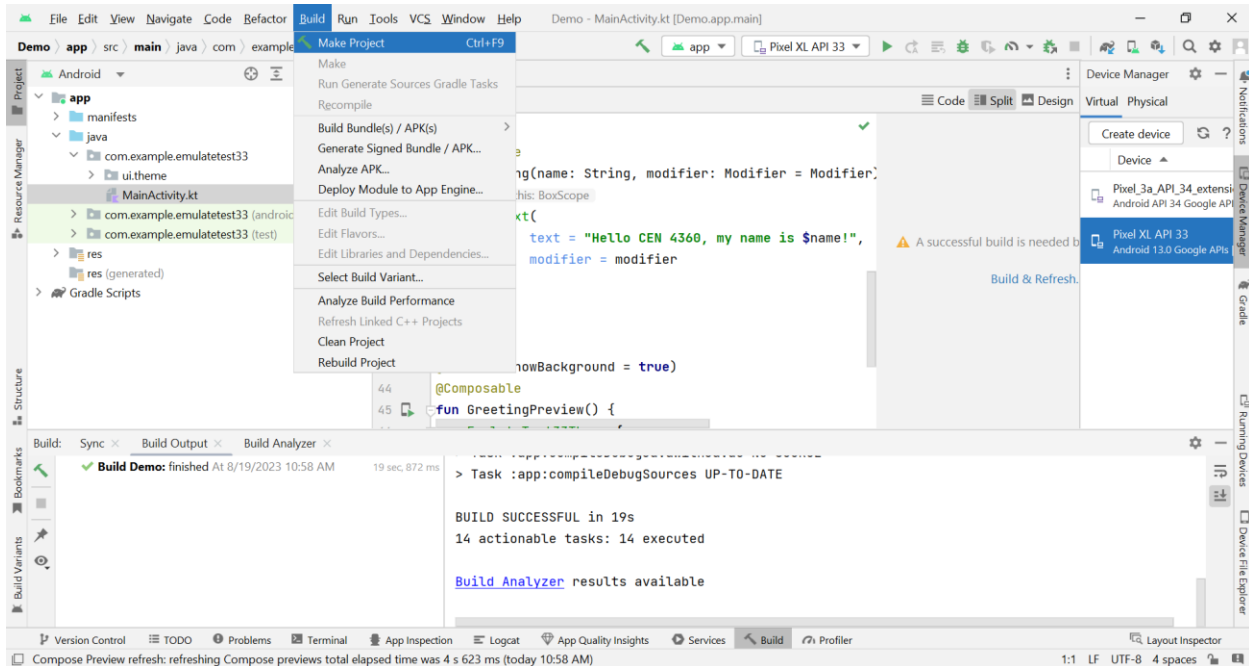
The image shows the 'Virtual Device Configuration' window in an IDE. The title bar says 'Virtual Device Configuration' with a close button. Below the title bar is a header with the Android logo and the text 'Android Virtual Device (AVD)'. The main area is titled 'Verify Configuration'. It contains a form with the following fields: 'AVD Name' (text input with 'Pixel XL API 33 2'), 'Pixel XL' (device icon, '5.5 1440x2560 560dpi', 'Change...' button), 'Tiramisu' (Android logo icon, 'Android 13.0 x86\_64', 'Change...' button), 'Startup orientation' (radio buttons for 'Portrait' and 'Landscape', with 'Portrait' selected), and a 'Show Advanced Settings' button. To the right of the form is a large text area titled 'AVD Name' with the text 'The name of this AVD.' Below the form is a 'Previous' button, a 'Next' button, a 'Cancel' button, and a 'Finish' button. A help icon (?) is in the bottom left corner.



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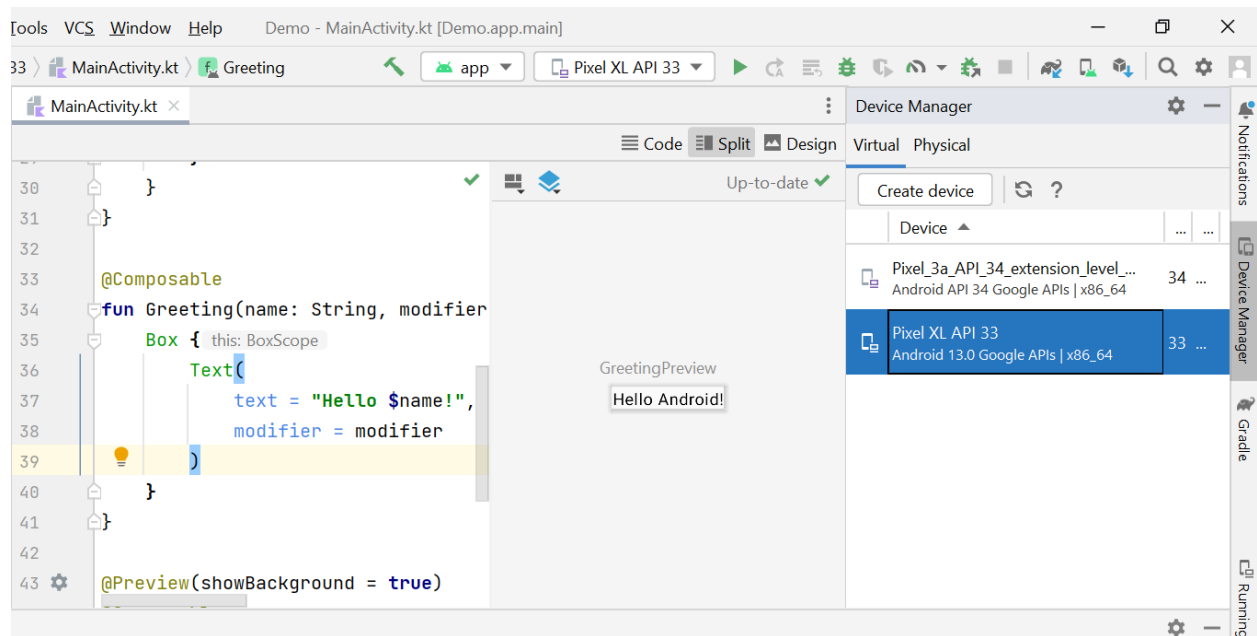
3. Test Android app in Preview and emulator
  - a. Test Android app in Preview
    - i. Build the application
    - ii. Build & Refresh the application then the Preview is updated



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- b. Test Android app in emulator
  - i. Select the desired emulator in the Device Manager window
  - ii. Click the Run app button
  - iii. To navigate the emulator screen,  
<https://developer.android.com/studio/run/emulator?hl=en>



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