HUST

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HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY

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BÁCH KHOA HÀ NỘI
HANOI UNIVERSITY
OF SCIENCE AND TECHNOLOGY

LẬP TRÌNH ỨNG DỤNG DI ĐỘNG

Mobile Application Programming

ET4710

PGS. TS. Đỗ Trọng Tuấn
Viện Điện tử Viễn thông * Đại học Bách Khoa Hà Nội

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CHƯƠNG 10.

Lập trình di động đa nền tảng và lập trình mã native

(Mobile Cross-platform Programming, Mobile Native Programming)

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Lập trình di động đa nền tảng và lập trình mã native (Mobile Cross-platform Programming, Mobile Native Programming)

10.1 Giới thiệu lập trình React-Native

(React-Native Programming Introduction)

10.2 Lập trình mã native trên android

(Android Native Programming)

React Native Overview

- React Native is a cross platform development library built on top of React by Facebook, for mobile development platforms.
- React Native was developed in 2013 as a hackthon project inside Facebook and was later released for public use in 2015.
- It gained huge popularity in the developer community and multiple tech companies adopted it as a mobile development solution because React Native apps share a single codebase for both iOS and Android and could hardly be distinguished from truly native apps.

What is React Native?

- React Native is a hybrid mobile development library;
- React Native apps are written in JSX & JavaScript; compiled into native code;
- React Native apps contain 85-90% shared JavaScript and JSX code;
- Targets multiple platforms (iOS, Android, Web, TVOS) with the same codebase and effort; Has a large and growing community that is there to provide adequate support; Has native support meaning that you can customize the native code to suit your use-case/business logic; Has a feature: Fast Refresh (Hot Reloading).

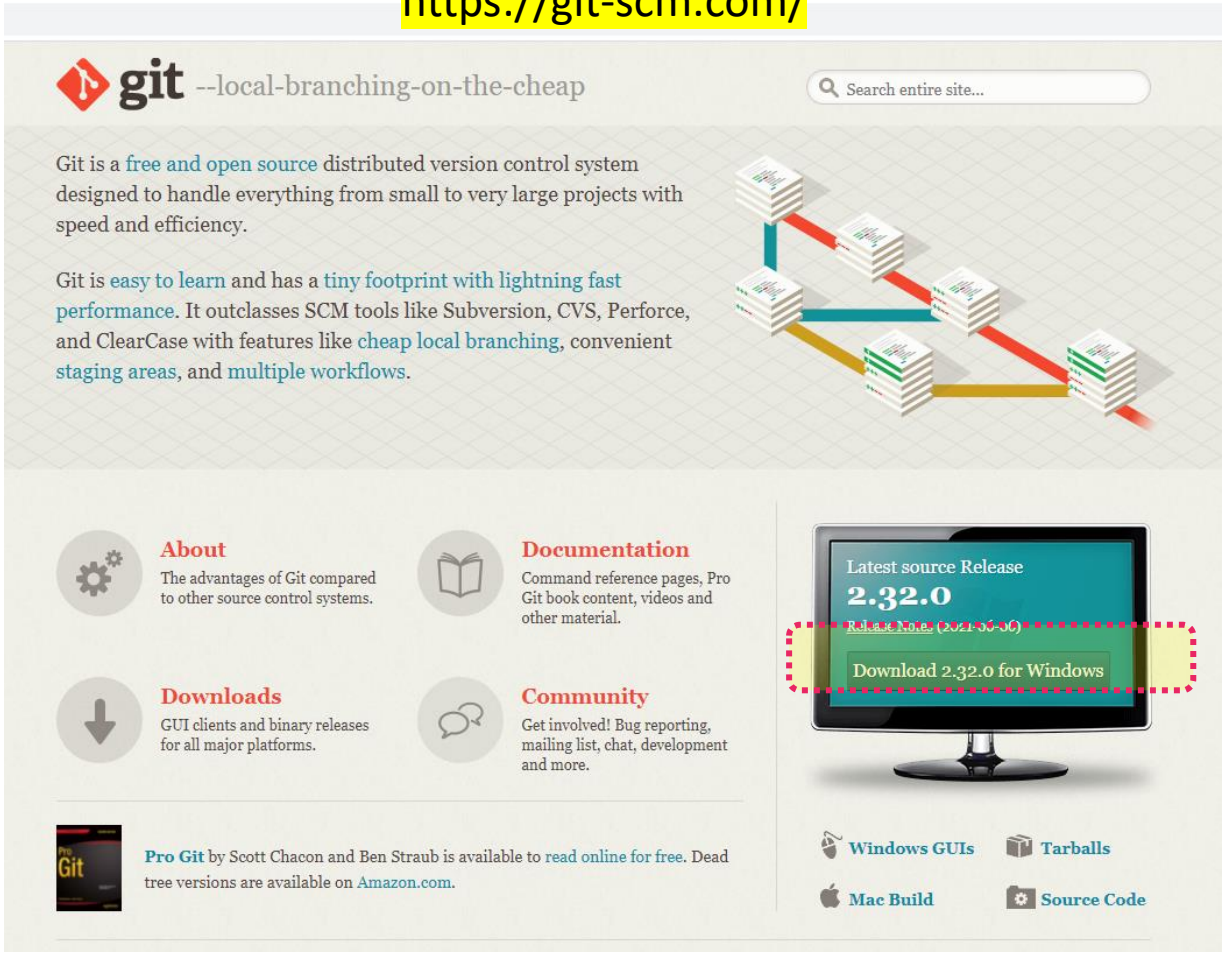
Setting up the development environment

- The easiest way to get started is with Expo CLI.
- Expo is a set of tools built around React Native, such as:
  - Creating new projects
  - Developing your app: running the project server, viewing logs, opening your app in a simulator
  - Publishing your app JavaScript and other assets and managing releasing them over the air
  - Building binaries (apk and ipa files) to be uploaded to the App Store and Play Store
  - Managing Apple Credentials and Google Keystores
- You will only need a recent version of Node.js and a phone or emulator.

Setting up the development environment

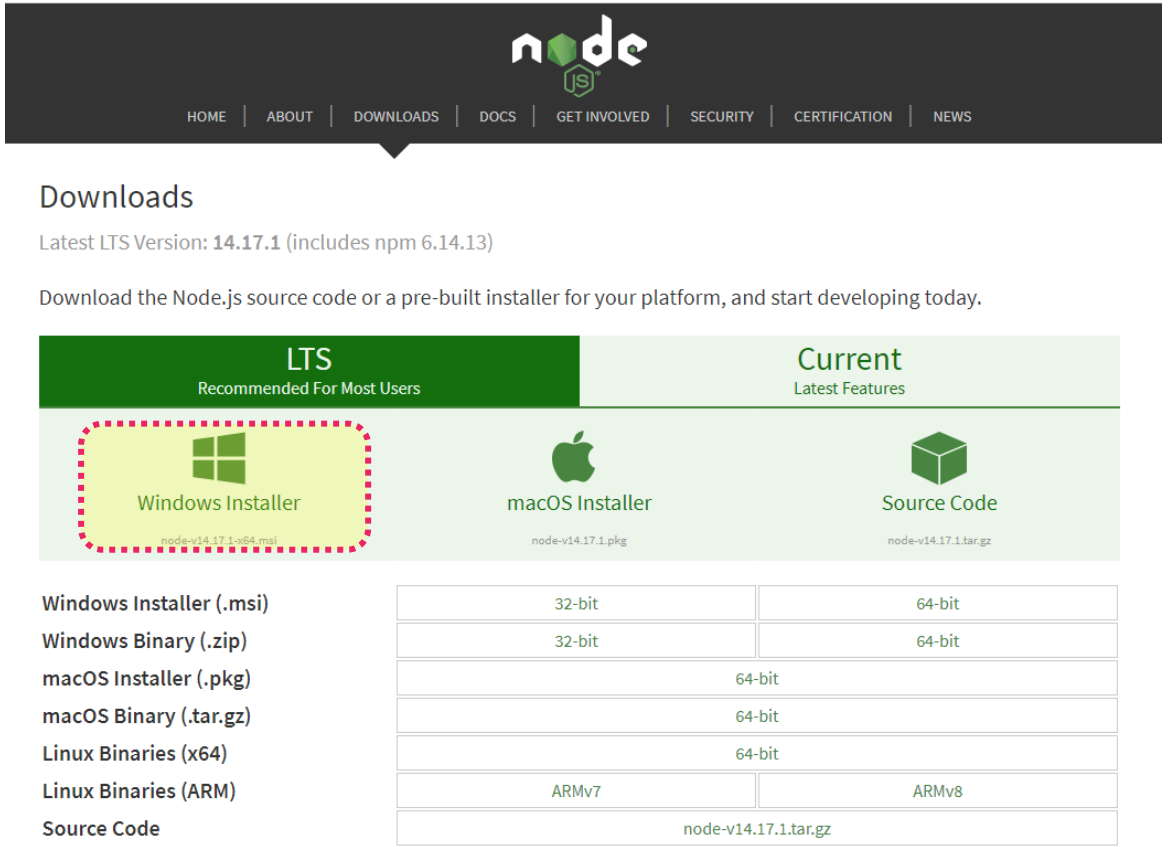
Step 1: Install **Git tool**

https://git-scm.com/



Step 2: Install **Node JS**

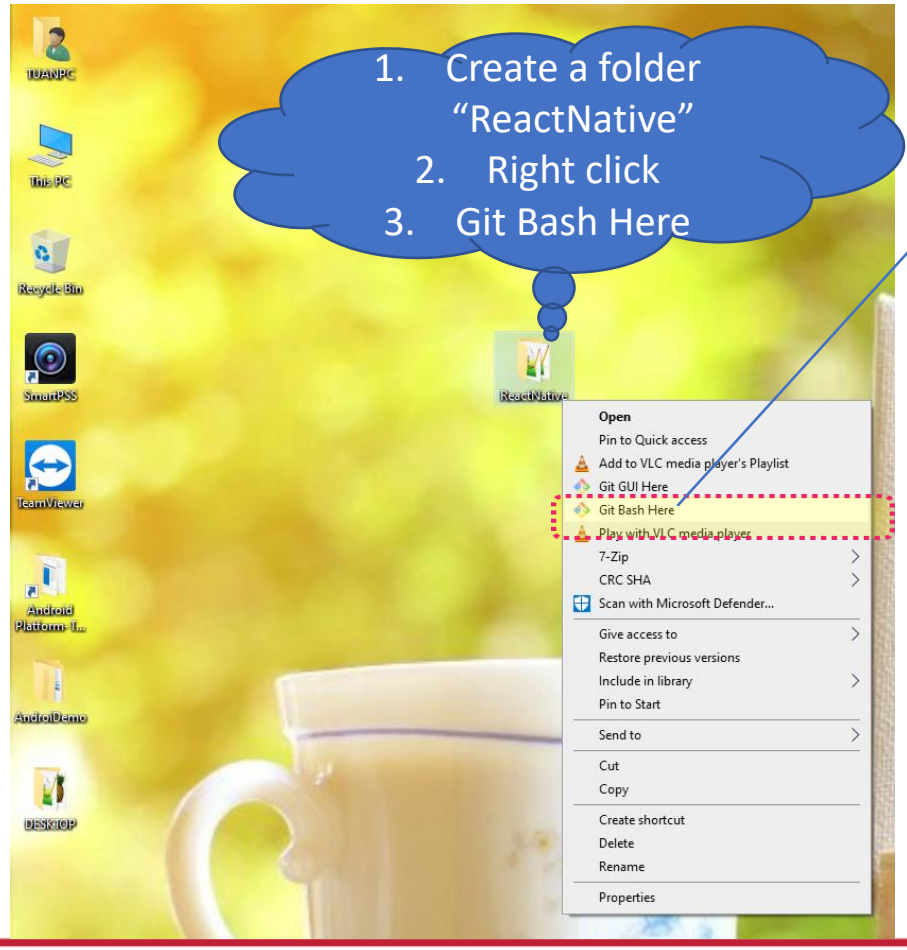
https://nodejs.org/en/download/



https://reactnative.dev/docs/environment-setup

Setting up the development environment

Step 3: Use **npm** to install : (1) **Expo CLI** command line utility; and (2) **yarn** tool




```
MINGW64:/c/Users/D4-P4-H04/Desktop/ReactNative

D4-P4-H04@TUANPC MINGW64 ~/Desktop/ReactNative
$ node -v
v14.17.1

D4-P4-H04@TUANPC MINGW64 ~/Desktop/ReactNative
$ npm -v
6.14.13

D4-P4-H04@TUANPC MINGW64 ~/Desktop/ReactNative
$ npm install -g expo-cli yarn
```

1. use npm to install the **expo-cli** & **yarn** tool

https://reactnative.dev/docs/environment-setup

Build Your First React Native App

Step 1: Create a New React Native App

```
1.  expo init firstapp
```

Select the '***blank***' project

Select '***Y*** to work with yarn.

Once you click Yes, Expo will work its magic and create all the necessary files for you. You can take a look at the directory structure to get an idea of what is going on in the project.

```
D4-P4-H04@TUANPC MINGW64 ~/Desktop/ReactNative
$ expo init firstapp
? Choose a template: » - Use arrow-keys. Return to submit.
    ----- Managed workflow -----
>   blank                   a minimal app as clean as an empty canvas
    blank (TypeScript)      same as blank but with TypeScript configuration
    tabs (TypeScript)       several example screens and tabs using react-navigation and TypeScript
    ----- Bare workflow -----
    minimal                 bare and minimal, just the essentials to get you started
    minimal (TypeScript)    same as minimal but with TypeScript configuration
```

Press Enter

```
D4-P4-H04@TUANPC MINGW64 ~/Desktop/ReactNative
$ expo init firstapp
√ Choose a template: » blank                   a minimal app as clean as an empty canvas
› Downloaded and extracted project files.
› Using Yarn to install packages.  Pass --npm to use npm instead.
| Installing JavaScript dependencies.
```

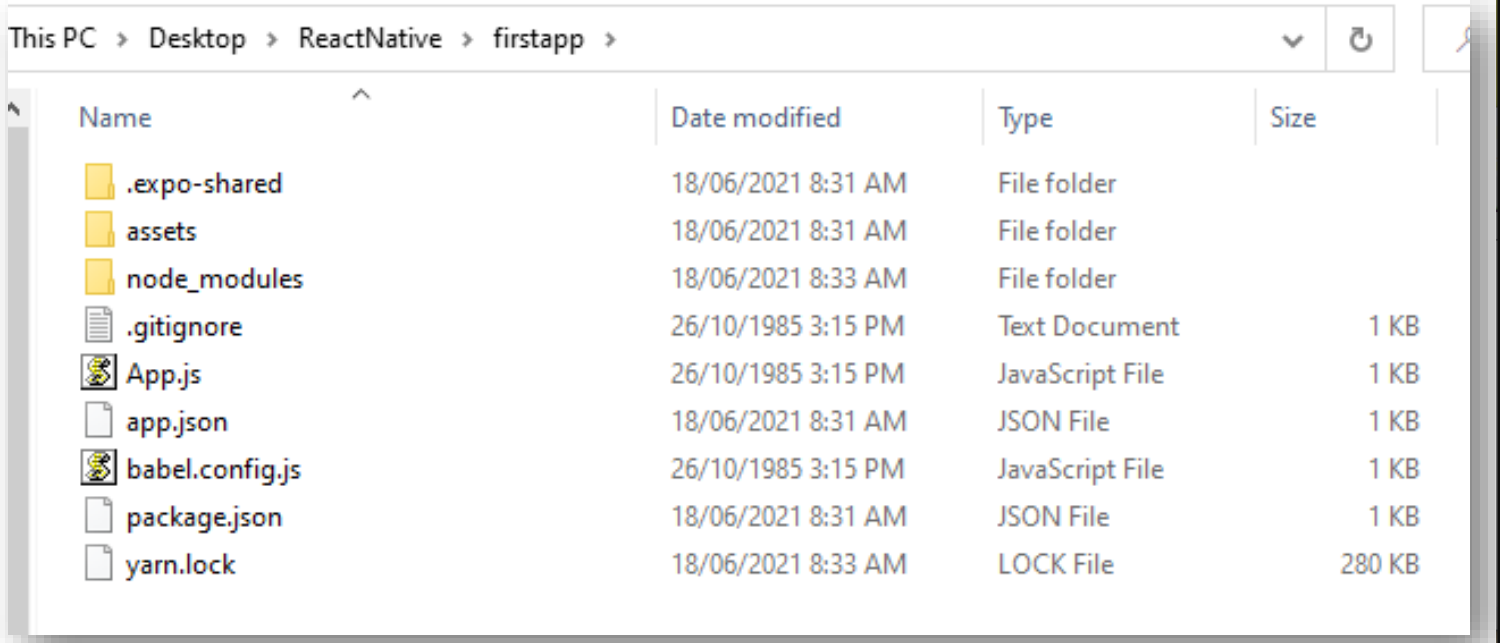
Result

```
› Your project is ready!

To run your project, navigate to the directory and run one of the following yarn commands.

- cd firstapp
- yarn start # you can open iOS, Android, or web from here, or run them directly with the commands below.
- yarn android
- yarn ios # requires an iOS device or macOS for access to an iOS simulator
- yarn web

D4-P4-H04@TUANPC MINGW64 ~/Desktop/ReactNative
$
```

Build Your First React Native App

Step 2: Run Your First React Native App

```
1.  cd firstapp
2.  yarn start
```




```
D4-P4-H04@TUANPC MINGW64 ~/Desktop/ReactNative
$ cd firstapp/

D4-P4-H04@TUANPC MINGW64 ~/Desktop/ReactNative/firstapp (master)
$ yarn start
yarn run v1.22.10
$ expo start
Starting project at C:\Users\D4-P4-H04\Desktop\ReactNative\firstapp
Developer tools running on http://localhost:19002
Opening developer tools in the browser...
Starting Metro Bundler
```

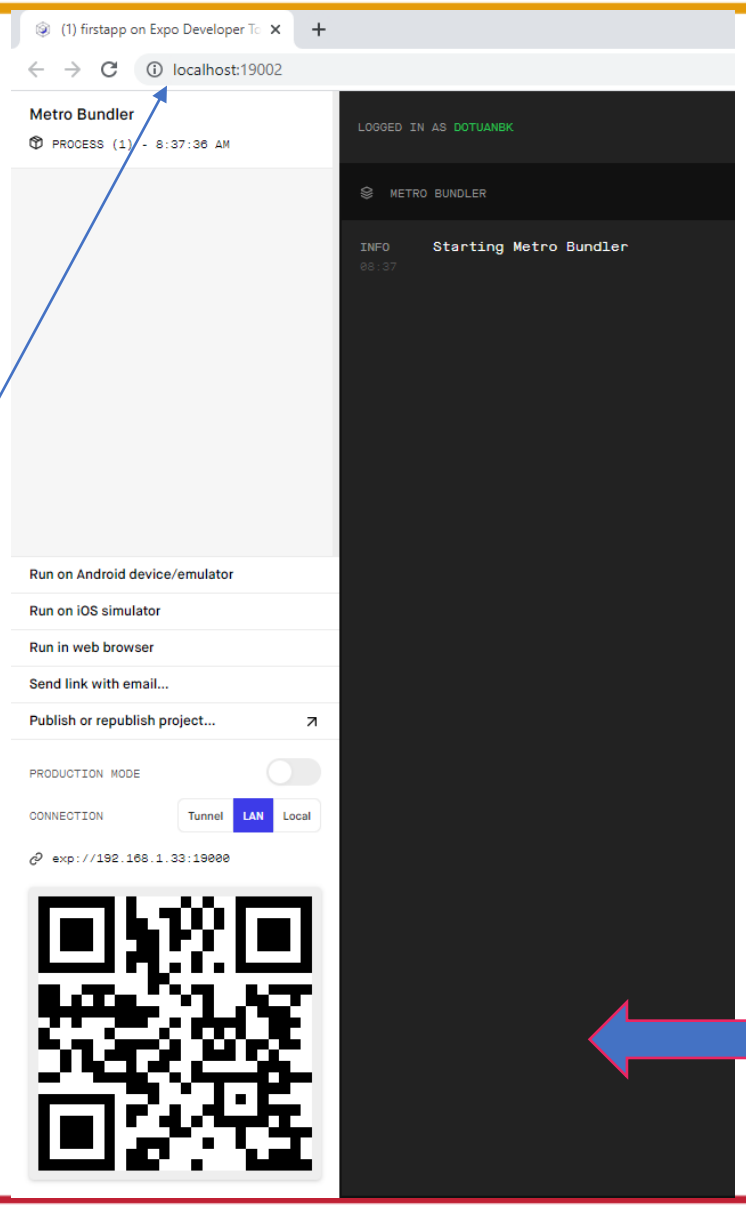
```
› Waiting on exp://192.168.1.33:19000
› Scan the QR code above with Expo Go (Android) or the Camera app (iOS)

› Press a | open Android
› Press w | open web

› Press r | reload app
› Press m | toggle menu
› Press d | show developer tools
› shift+d | toggle auto opening developer tools on startup (enabled)

› Press ? | show all commands

Logs for your project will appear below. Press Ctrl+C to exit.
```

First React Native App

Step 2: Run Your First React Native App

Web Browser Display

localhost:19002

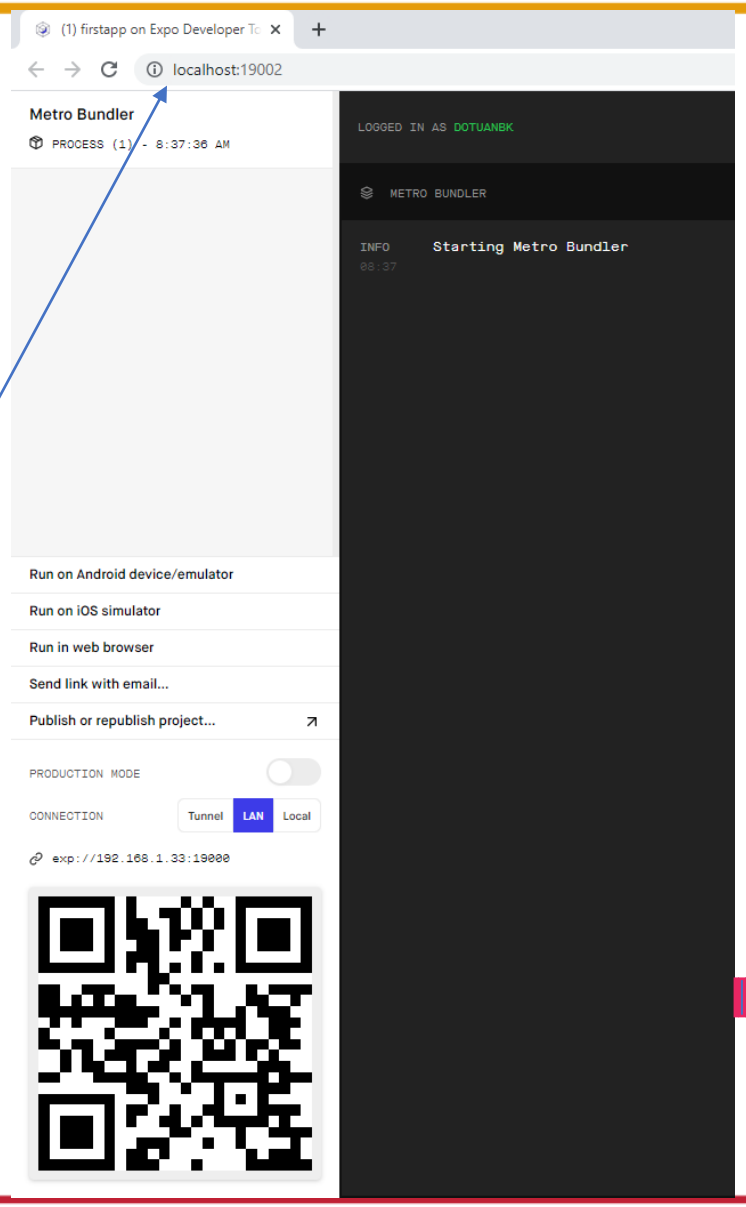


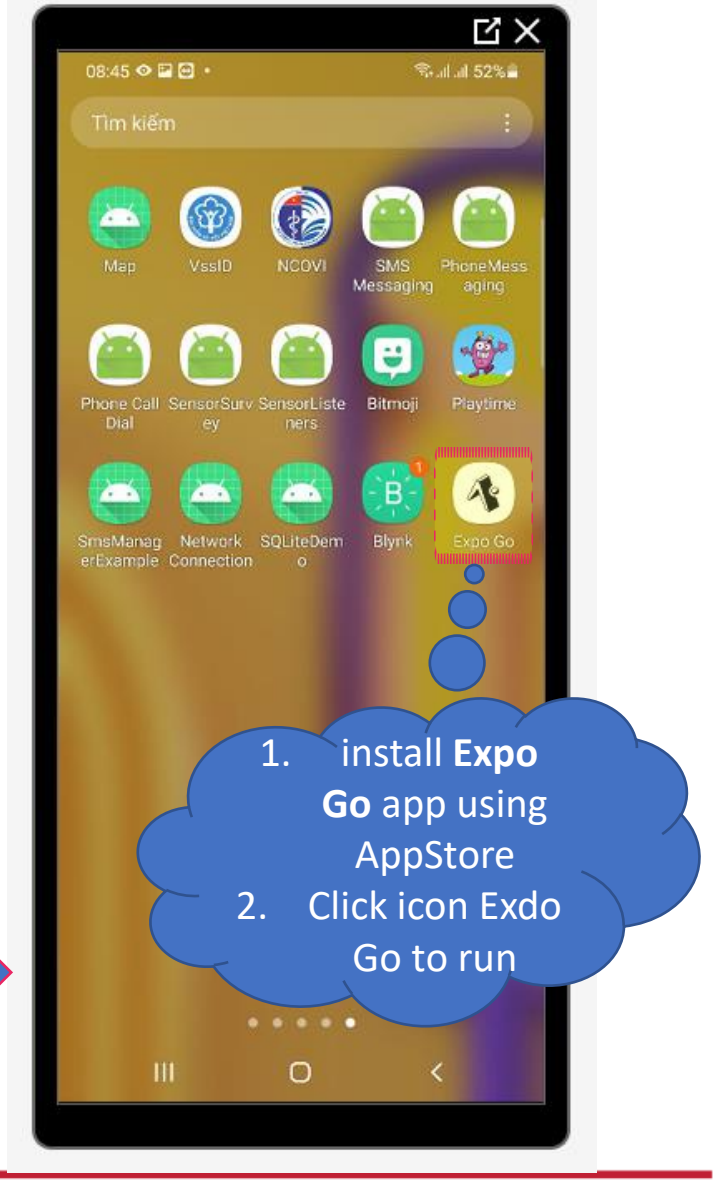
First React Native App

Step 2: Run Your First React Native App

Web Browser Display

localhost:19002



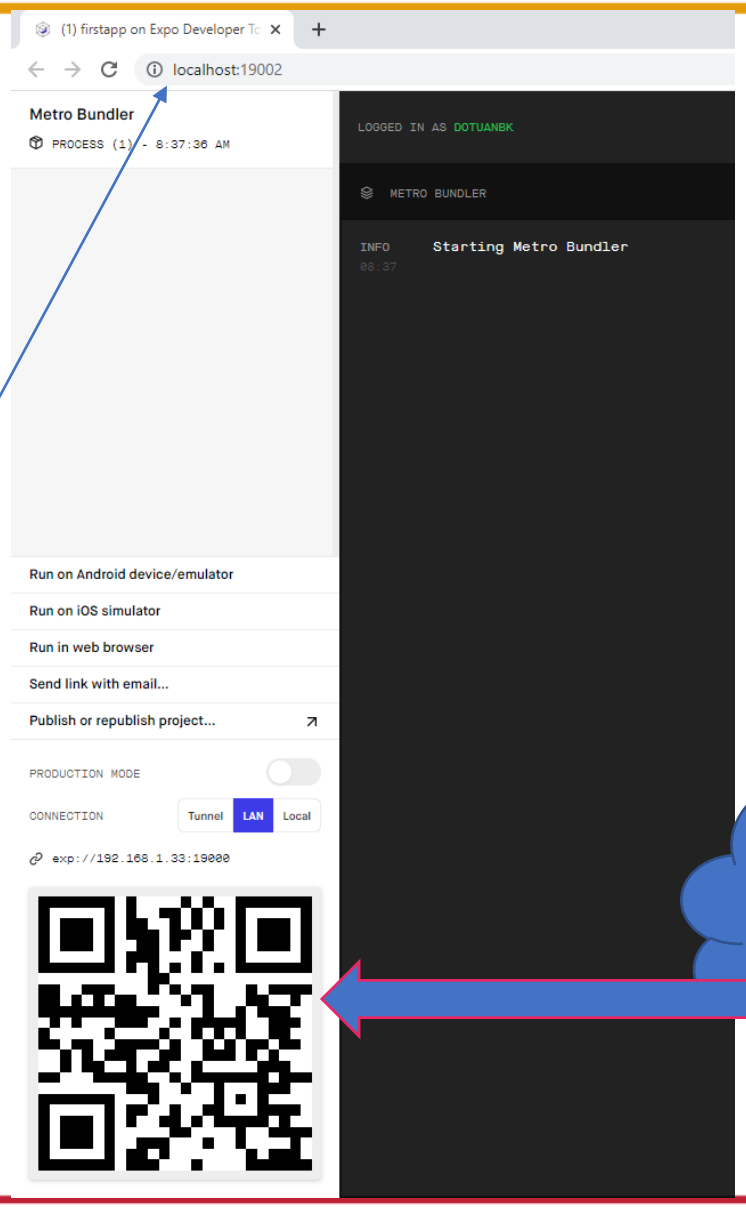


First React Native App

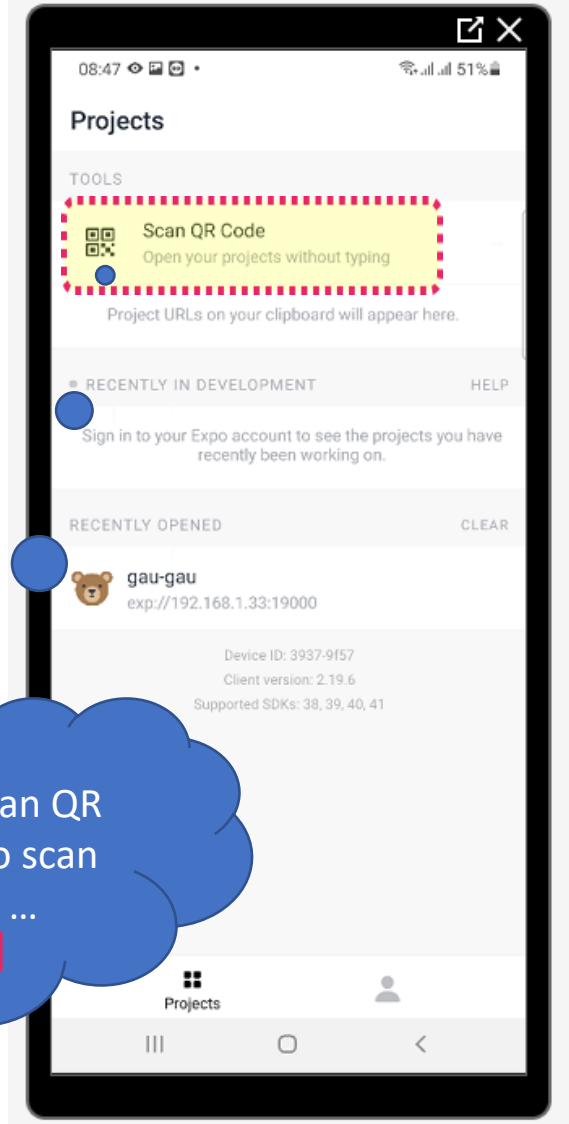
Step 2: Run Your First React Native App

Web Browser Display

localhost:19002



1. Click Scan QR Code to scan this ...

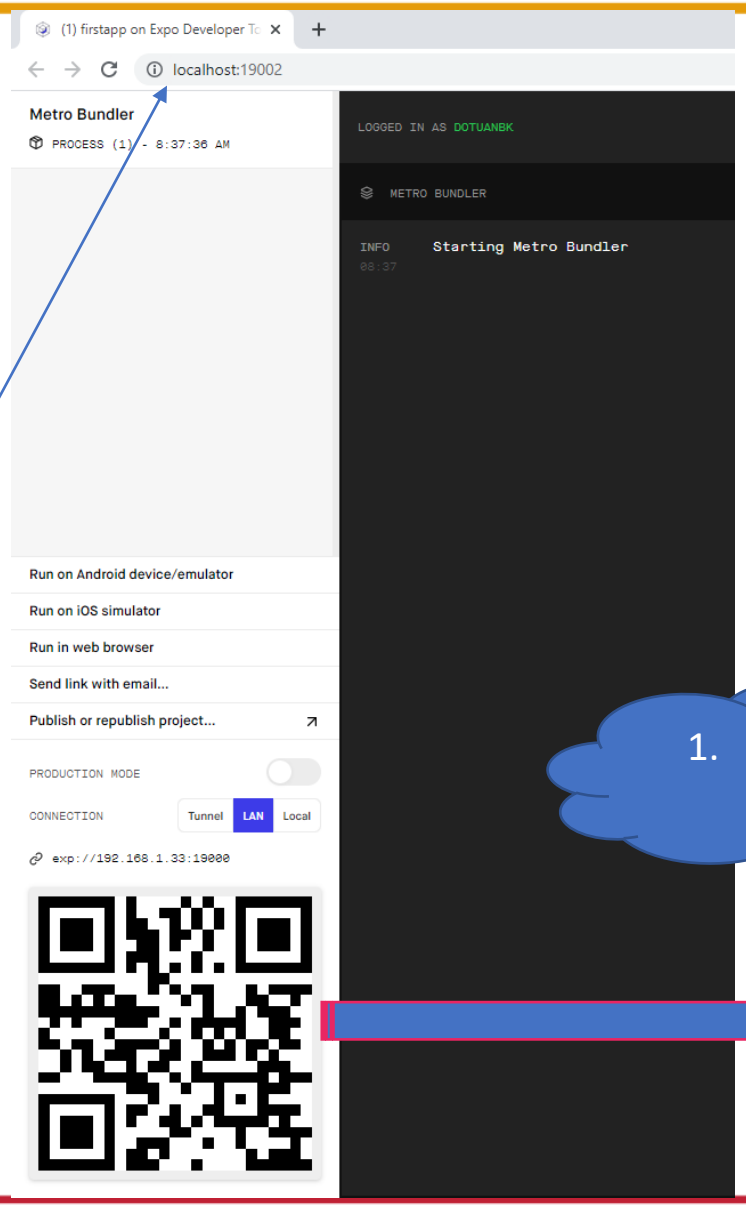


First React Native App

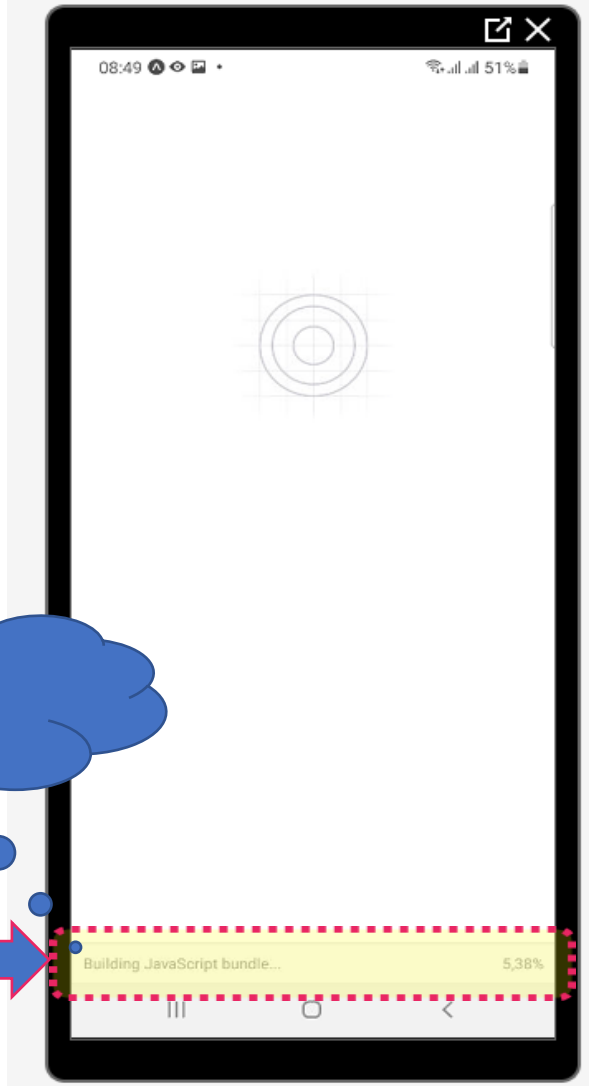
Step 2: Run Your First React Native App

Web Browser Display

localhost:19002



1. Wait for a while ...

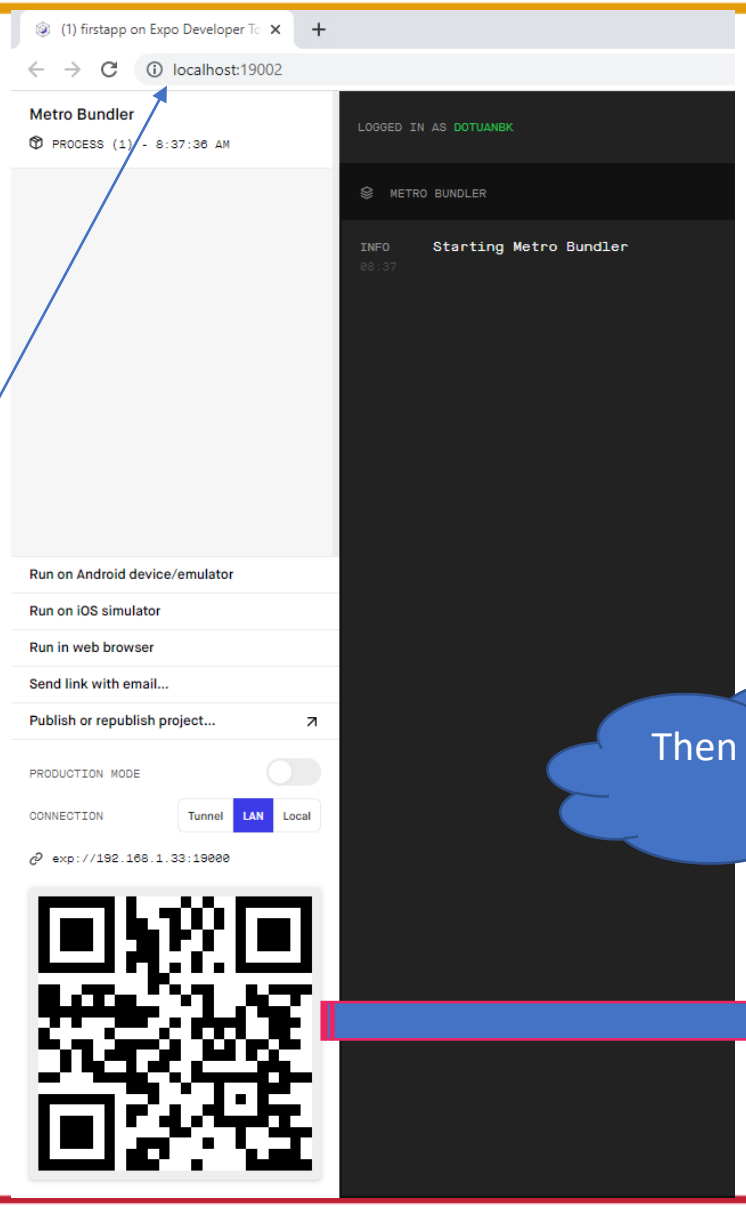


First React Native App

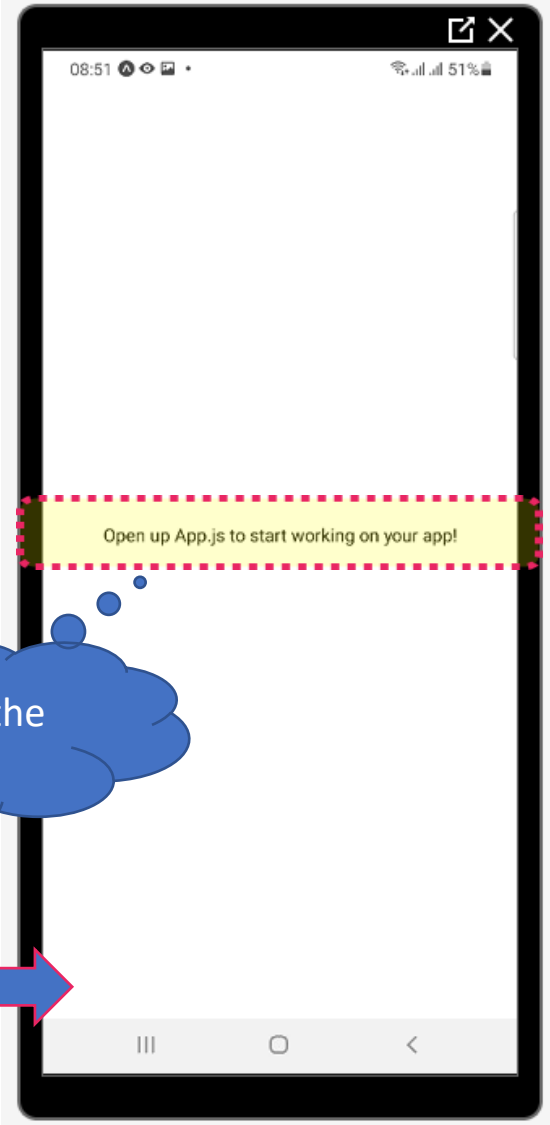
Step 2: Run Your First React Native App

Web Browser Display

localhost:19002

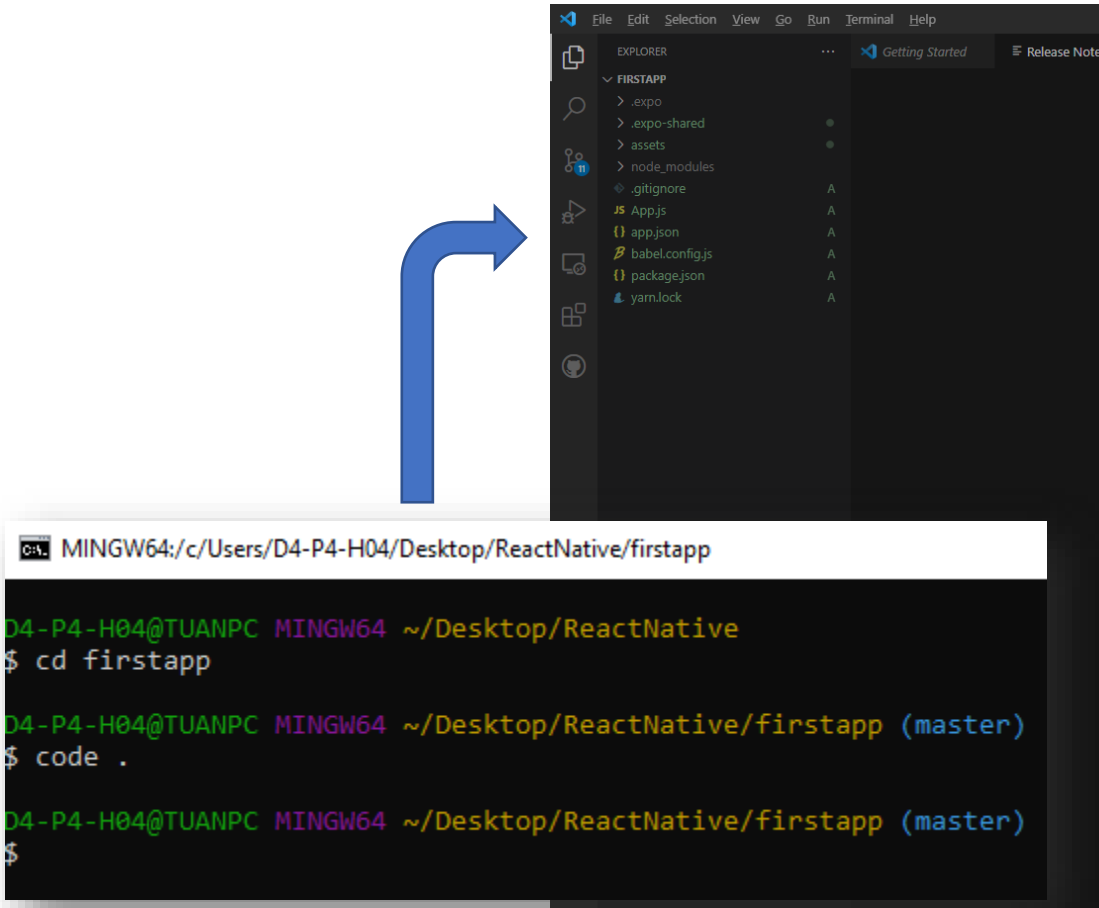


Then .. Here is the result !



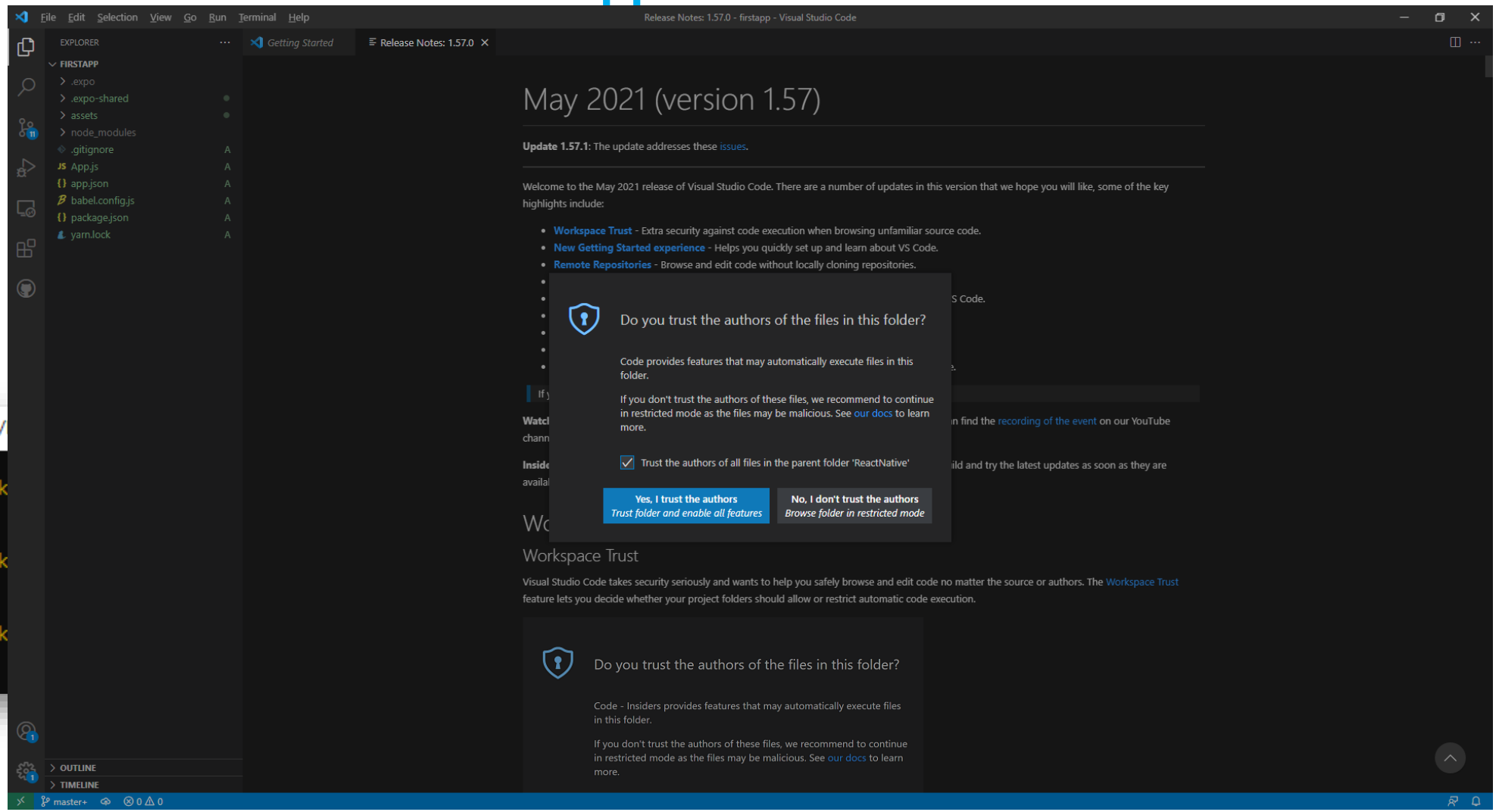
Giới thiệu lập trình React-Native

Extent/Customize the First React Native App

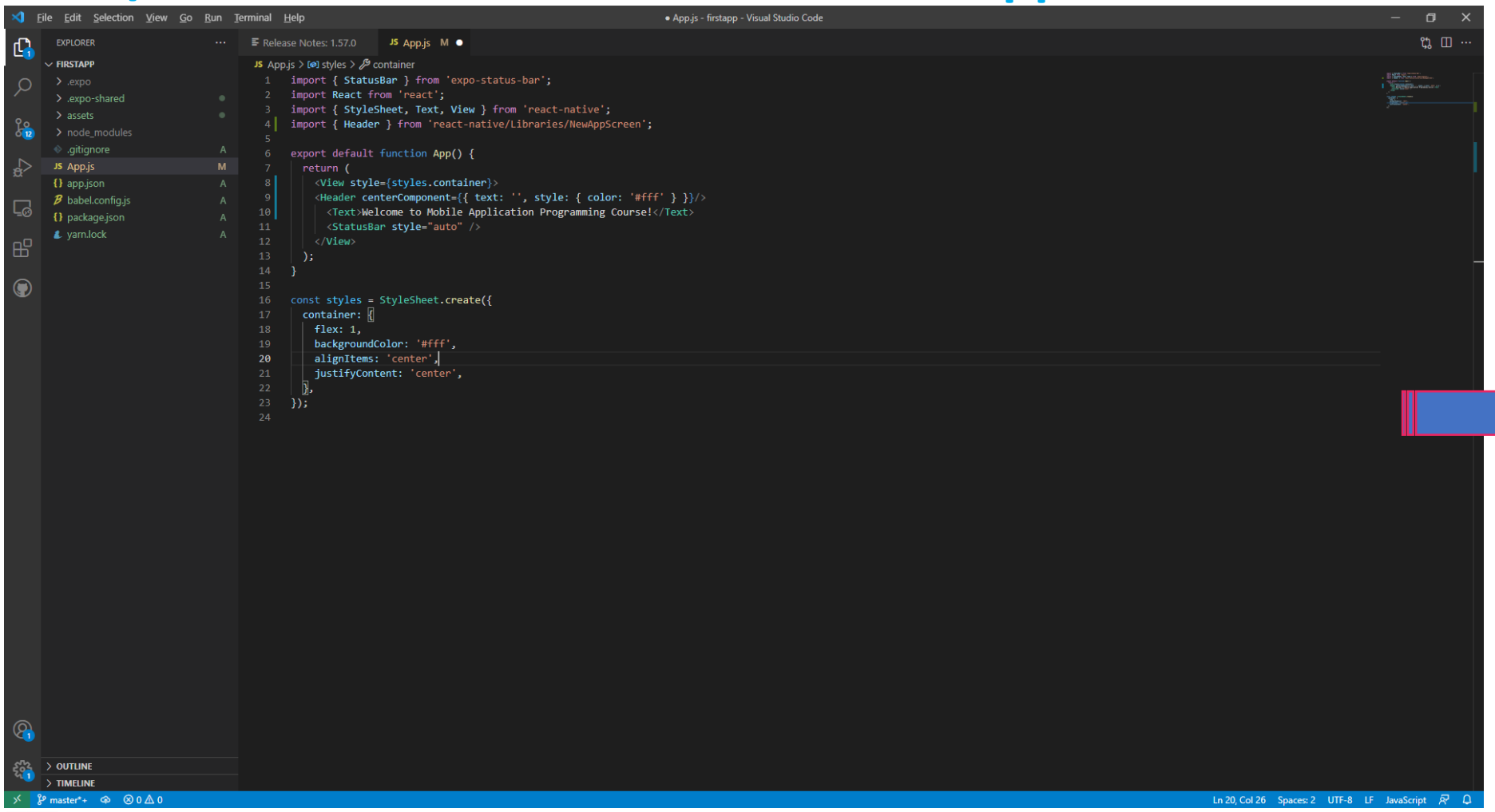


Giới thiệu lập trình React-Native

Extent/Customize the First React Native App



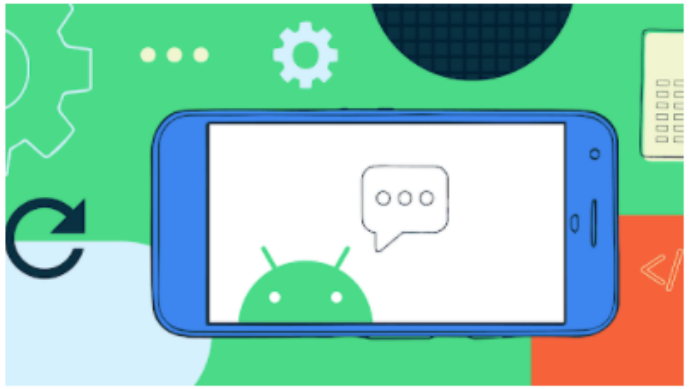
Extent/Customize the First React Native App



Lập trình mã native trên android

Android NDK

The Android NDK is a toolset that lets you implement parts of your app in native code, using languages such as C and C++. For certain types of apps, this can help you reuse code libraries written in those languages.



BLOG

Native Dependencies in Android Studio 4.0

One thing that NDK users struggle with is managing native dependencies: With version 4.0 of the Android Gradle Plugin, we've addressed these issues by adding support for distributing and exposing native libraries...

Android Developers
February 21, 2020

https://developer.android.com/ndk/guides

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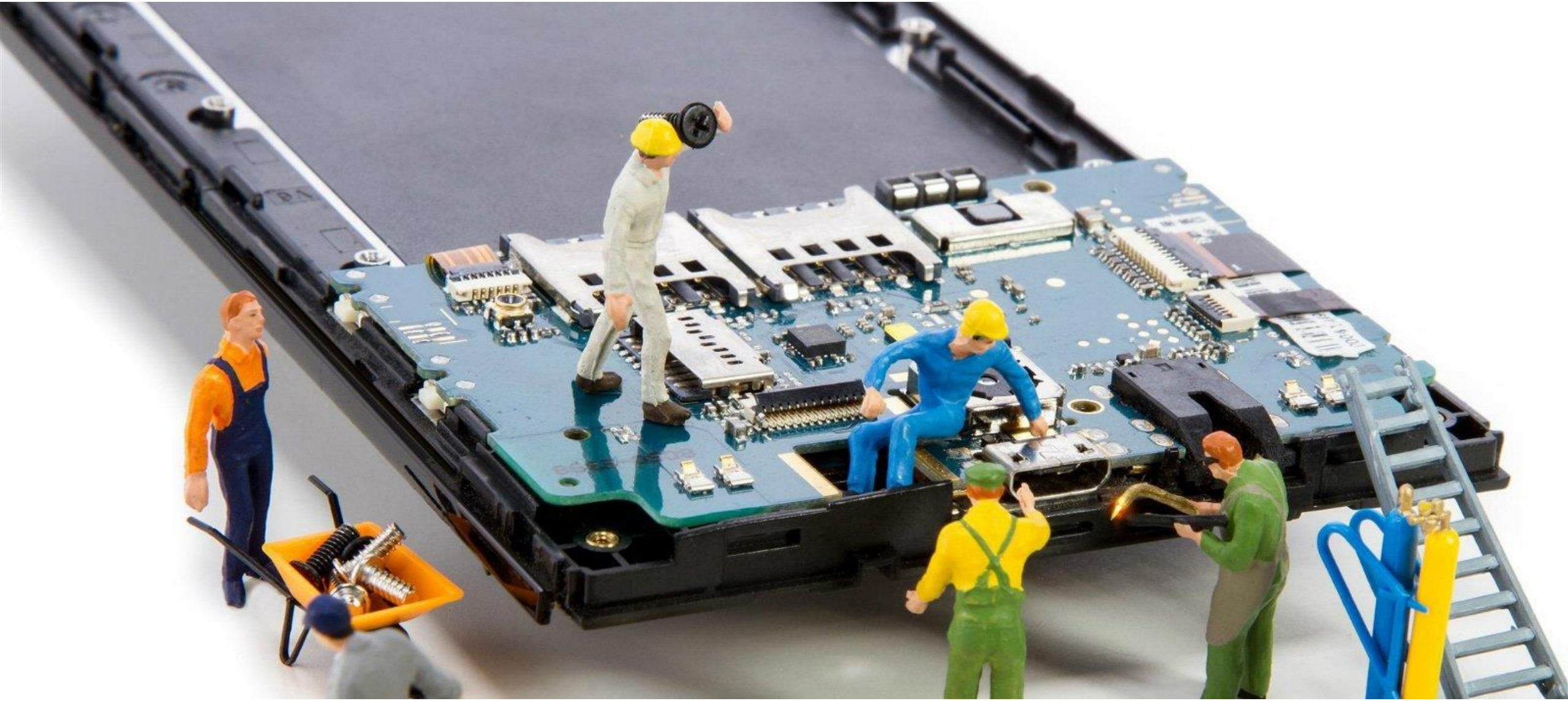

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THANK YOU !

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