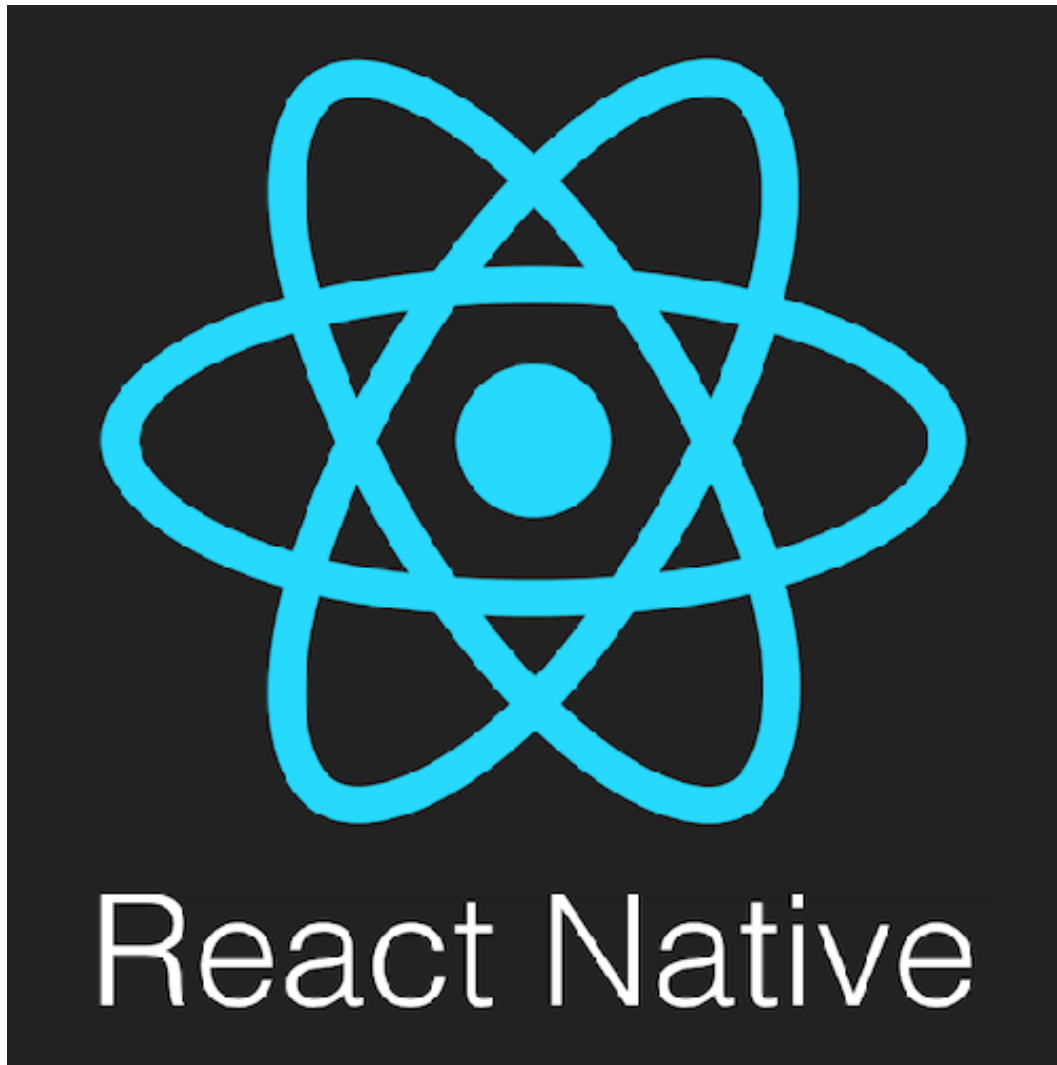


# React Native

## Beginner User Guide

Created by  
Morinne Kearns  
Exploreum Enterprises



# **Beginner User Guide**

2021.1  
July 2021

Adapted from the React Native online documentation  
by  
Morinne Kearns  
Explorem Enterprises

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# Chapter 1 - Overview

## 1.1 What is React Native?

React Native is an open-source framework for writing mobile apps using JavaScript. It combines React, a JavaScript library for building user interfaces, with the native capabilities of Android or iOS app platforms. It eliminates the need to know Kotlin or Java for Android development or Swift or Objective-C for iOS. React Native allows you to create the same user view as the native language without needing to know the native language.

## 1.2 What do you need to know to use React Native?

To be able to create apps using React Native, you need to be familiar with<sup>1</sup>:

- React - A JavaScript library for building user interfaces. When you are ready to start developing your own apps, you should be familiar with the following React concepts:

Concept	Description
Components	Independent, reusable bits of code that return HTML elements
JSX	JavaScript XML that allows you to write HTML in React
Props	Properties that let you customize React components
State	An object that stores property values for components that will change over time

- JavaScript - A scripting language that allows you to create dynamic content
- How to install various programs onto your computer

## 1.3 Who is this user guide for?

This user guide is designed for someone new to React Native and mobile app development. A basic understanding of JavaScript and React is helpful but not required. (See "Useful Links" on page A to learn more.) If you have already done some app development and have a development environment set up, you can find directions for working with React Native at <https://reactnative.dev/docs/environment-setup>.

---

<sup>1</sup>Knowledge of React concepts and JavaScript is not required to follow this user guide.

## 1.4 What is covered in this user guide?

This user guide will help you install a development environment for React Native and build and modify a basic "Hello World" app that you can view on your phone.

# Chapter 2 - Installing the Development Environment

## 2.1 Computer Installation

You will need to install two programs on your computer<sup>1</sup> and one app on your phone in order to build and test your app. On your computer, you will install Node.js, an open-source server environment that allows you to run and test JavaScript programs outside of a web browser, and Expo CLI, a command line app that allows you to create new projects, run the project server, view logs, and open your app in a simulator.<sup>2</sup>

If you run into any difficulties installing these programs, a link to troubleshooting help can be found in "Troubleshooting" on page C.

### 2.1.1 Install Node.js

1. Visit <https://nodejs.org/en/download/>. Choose the appropriate version for your operating system (Windows, macOS, or Linux/32- or 64-bit).

#### Downloads

Latest LTS Version: 14.17.2 (includes npm 6.14.13)

Download the Node.js source code or a pre-built installer for your platform, and start developing today.

The screenshot shows the Node.js download page with two main sections: LTS (Recommended For Most Users) and Current (Latest Features). Below these are three main download options: Windows Installer, macOS Installer, and Source Code. A table below lists various download options for different operating systems and architectures.

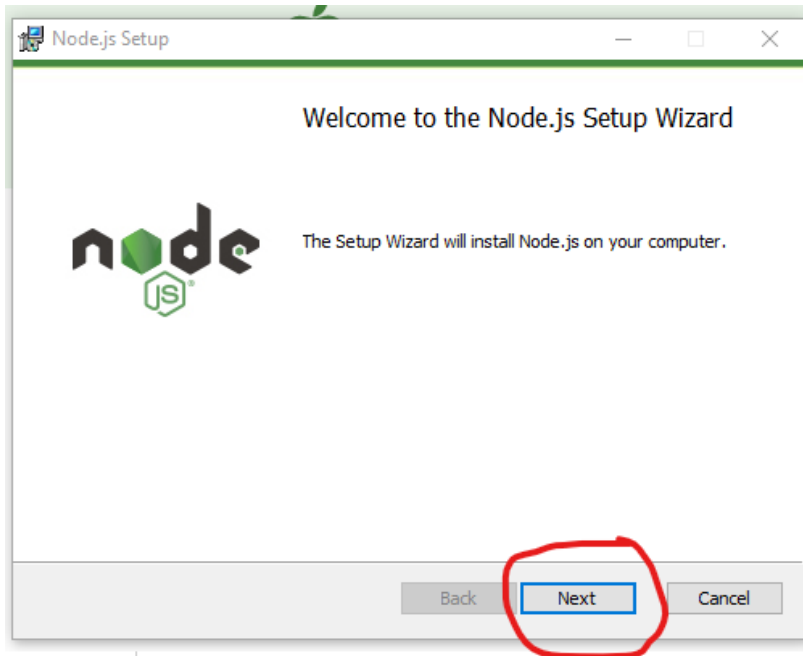
	LTS	Current
Windows Installer (.msi)	node-v14.17.2-x64.msi	
Windows Binary (.zip)		
macOS Installer (.pkg)	node-v14.17.2.pkg	
macOS Binary (.tar.gz)		
Linux Binaries (x64)		
Linux Binaries (ARM)	ARMv7	ARMv8
Source Code	node-v14.17.2.tar.gz	

<sup>1</sup>All images in this tutorial are for Windows installation. The process for other operating systems will be similar but will look different.

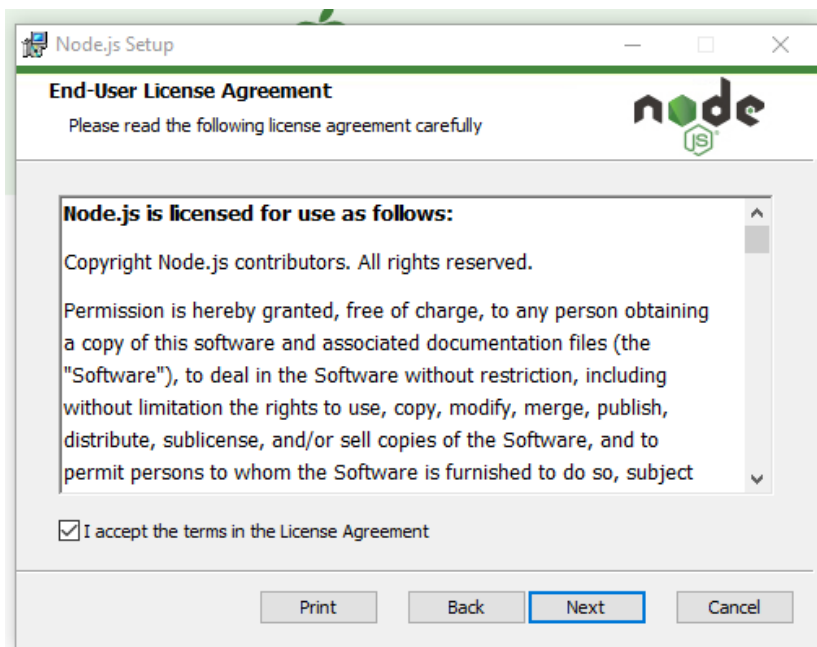
<sup>2</sup>Links to detailed information about each program can be found in "Useful Links" on page A



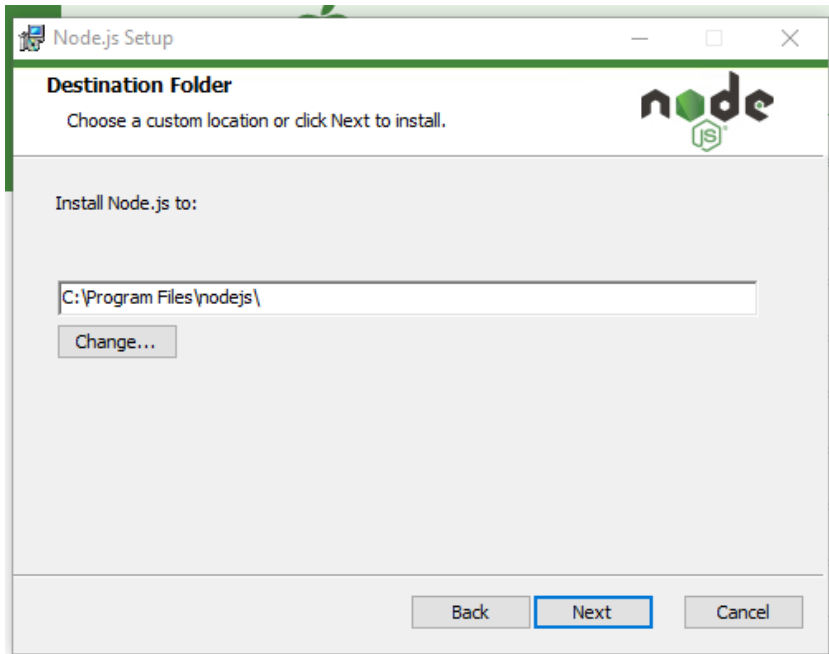
2. Once it has finished downloading onto your computer, open the file. The Node.js Setup Wizard will begin. Click “Next.”



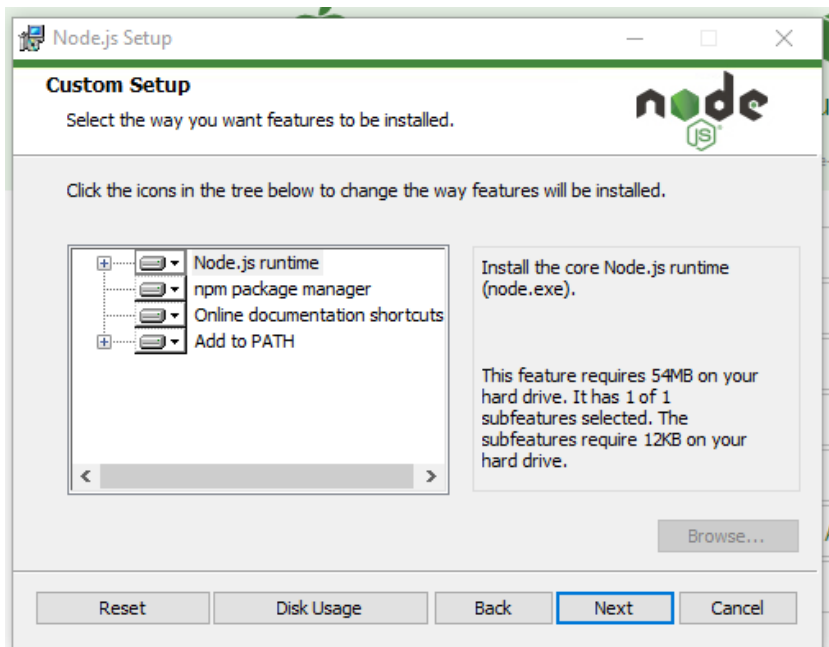
3. Read through the End-User License Agreement, check “I accept the terms in the License Agreement,” and click “Next.”



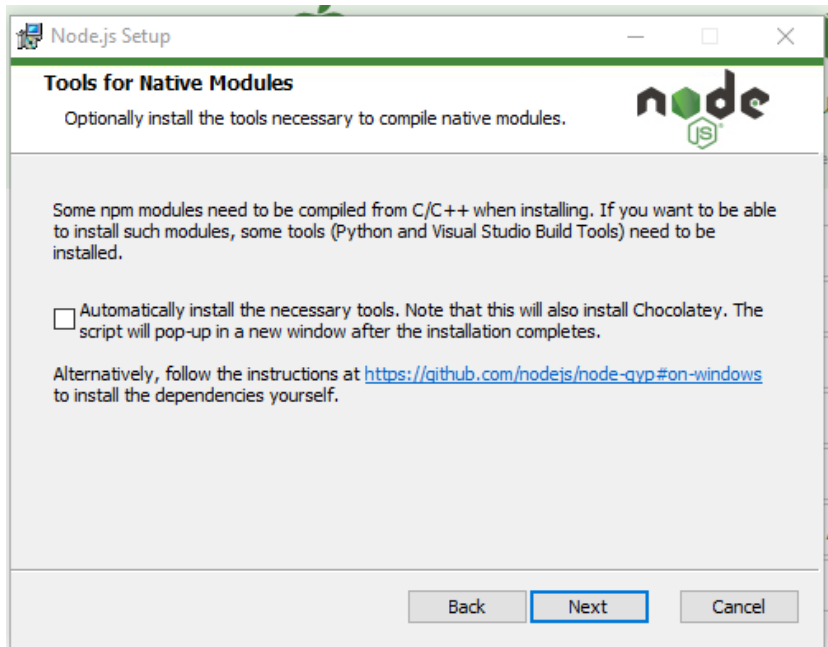
4. Choose the location to store the file. Click “next” to install.



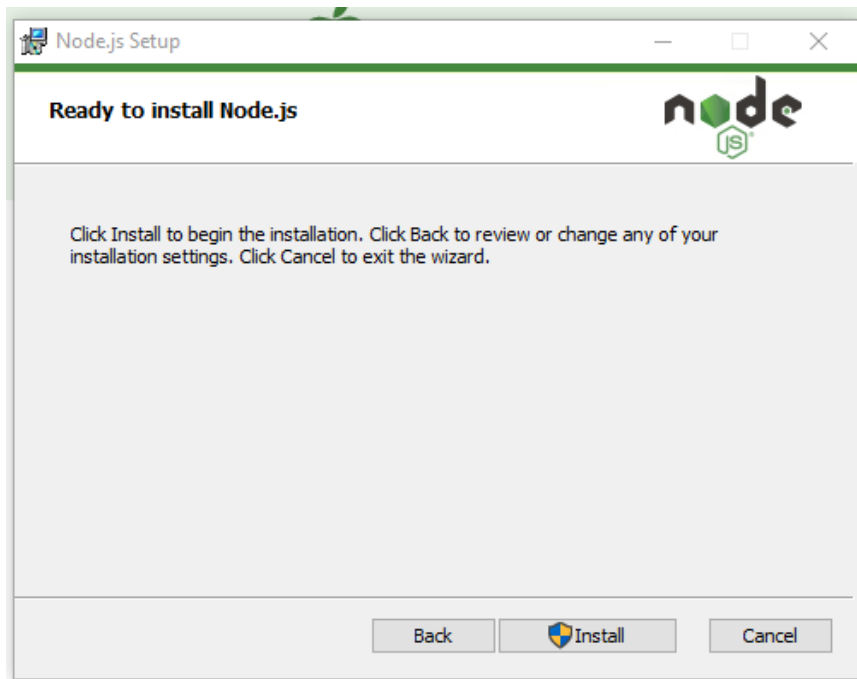
5. Select the features you would like to install. Since we will only be using core features for this tutorial, simply click “Next” to install the core version.



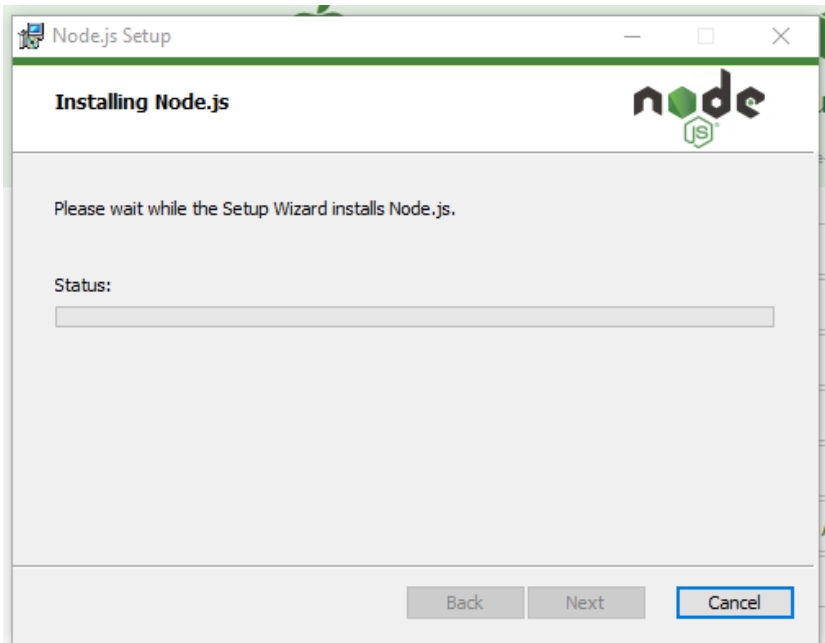
- The next screen will allow tools to compile from C/C++. This is not necessary for this tutorial, so simply click “Next.” Alternatively, if you know you will need this in the future, you can click the option button then click next.



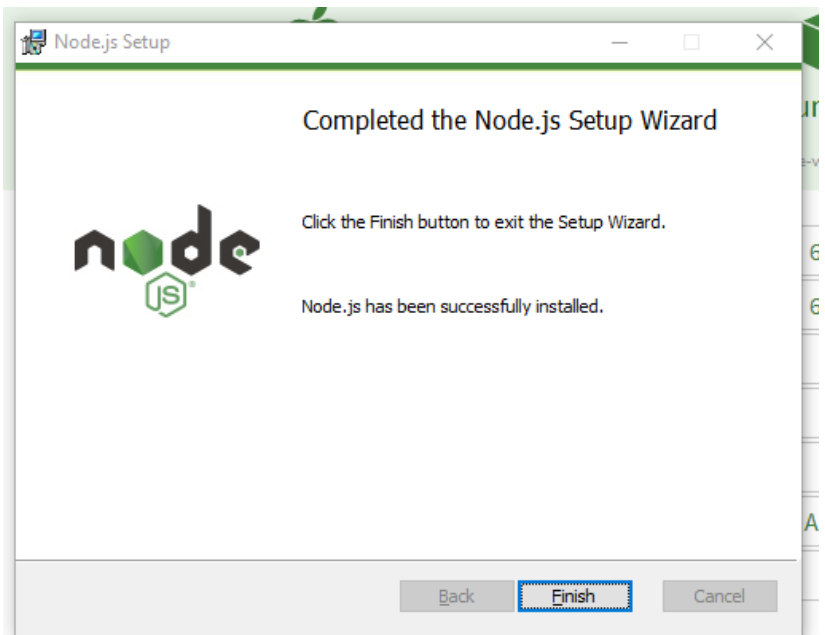
- Click “Install” to complete installation. Depending on your system setup, you may need to approve the installation on a separate pop-up screen.



8. The installation status screen will appear.

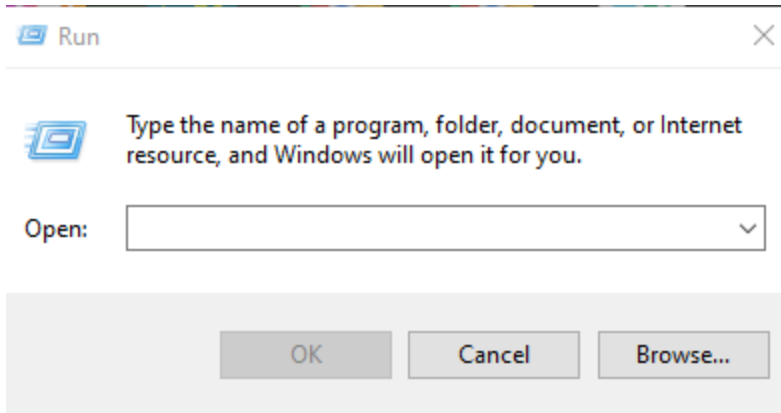


9. When Node.js the Node.js Setup Wizard is complete, you will see this screen. Click "Finish" to complete the installation.

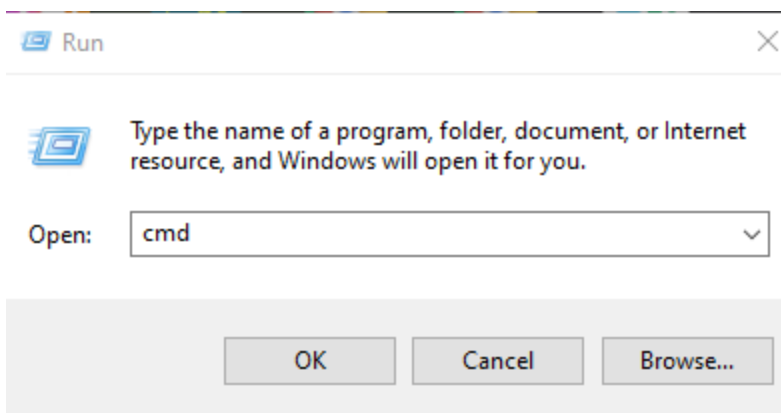


## 2.1.2 Install Expo CLI

1. To install Expo CLI, you need to open a Command Prompt<sup>1</sup>. On Windows, press the Windows (⊞) + R buttons together to open the "Run" box:



2. Type "cmd" and hit "Enter" or click "OK" to open the Command Prompt.



3. The following window will open:



---

<sup>1</sup>Those new to using command prompts can find a basic introduction in Appendix A, "Command Prompt: What It Is and How to Use It" on page A

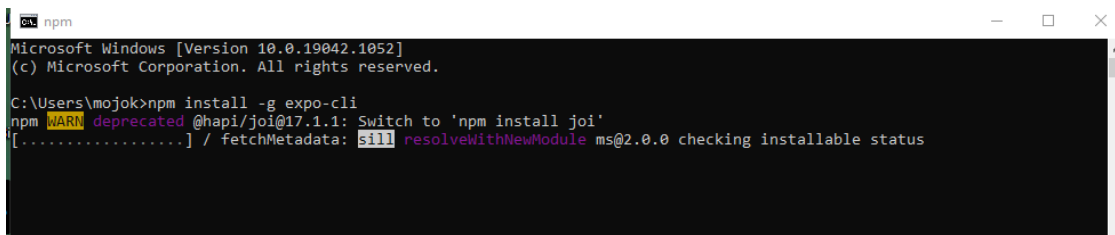
- To install Expo CLI, type "npm install -g expo-cli" on the command line and press "Enter."  
(npm stands for node package manager. This is how you use Node.js!)



```
C:\Windows\system32\cmd.exe
Microsoft Windows [Version 10.0.19042.1052]
(c) Microsoft Corporation. All rights reserved.

C:\Users\mojok>npm install -g expo-cli
```

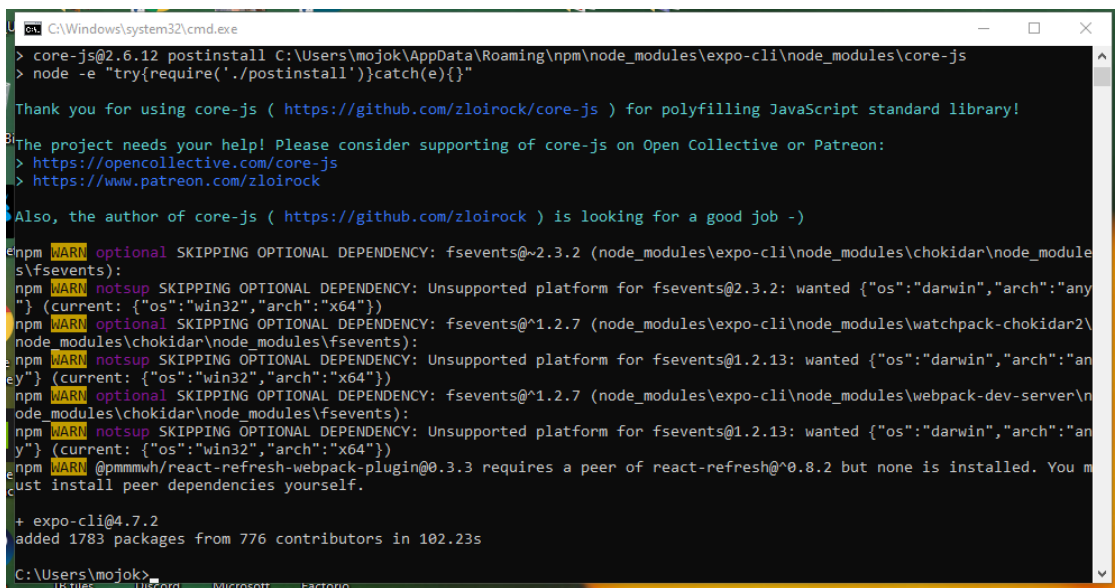
- Your computer will begin installing Expo CLI:



```
npm
Microsoft Windows [Version 10.0.19042.1052]
(c) Microsoft Corporation. All rights reserved.

C:\Users\mojok>npm install -g expo-cli
npm WARN deprecated @hapi/joi@17.1.1: Switch to 'npm install joi'
[.....] / fetchMetadata: sill resolveWithNewModule ms@2.0.0 checking installable status
```

- When it is complete, you will see the following:



```
C:\Windows\system32\cmd.exe
> core-js@2.6.12 postinstall C:\Users\mojok\AppData\Roaming\npm\node_modules\expo-cli\node_modules\core-js
> node -e "try{require('./postinstall')}catch(e){}"

Thank you for using core-js ( https://github.com/zloirock/core-js ) for polyfilling JavaScript standard library!

The project needs your help! Please consider supporting of core-js on Open Collective or Patreon:
> https://opencollective.com/core-js
> https://www.patreon.com/zloirock

Also, the author of core-js ( https://github.com/zloirock ) is looking for a good job -)

npm WARN optional SKIPPING OPTIONAL DEPENDENCY: fsevents@~2.3.2 (node_modules\expo-cli\node_modules\chokidar\node_modules\fsevents):
npm WARN notsup SKIPPING OPTIONAL DEPENDENCY: Unsupported platform for fsevents@2.3.2: wanted {"os":"darwin","arch":"any"} (current: {"os":"win32","arch":"x64"})
npm WARN optional SKIPPING OPTIONAL DEPENDENCY: fsevents@^1.2.7 (node_modules\expo-cli\node_modules\watchpack-chokidar2\node_modules\chokidar\node_modules\fsevents):
npm WARN notsup SKIPPING OPTIONAL DEPENDENCY: Unsupported platform for fsevents@1.2.13: wanted {"os":"darwin","arch":"any"} (current: {"os":"win32","arch":"x64"})
npm WARN optional SKIPPING OPTIONAL DEPENDENCY: fsevents@^1.2.7 (node_modules\expo-cli\node_modules\webpack-dev-server\node_modules\chokidar\node_modules\fsevents):
npm WARN notsup SKIPPING OPTIONAL DEPENDENCY: Unsupported platform for fsevents@1.2.13: wanted {"os":"darwin","arch":"any"} (current: {"os":"win32","arch":"x64"})
npm WARN @pmmmwh/react-refresh-webpack-plugin@0.3.3 requires a peer of react-refresh@^0.8.2 but none is installed. You must install peer dependencies yourself.

+ expo-cli@4.7.2
added 1783 packages from 776 contributors in 102.23s

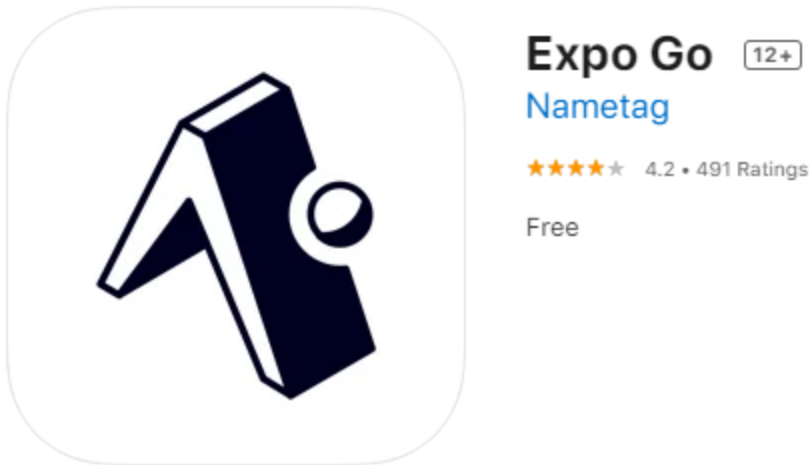
C:\Users\mojok>
```

**CONGRATULATIONS! You're now ready to start your first app!** But first you need to set up your phone so you can see your app in action.

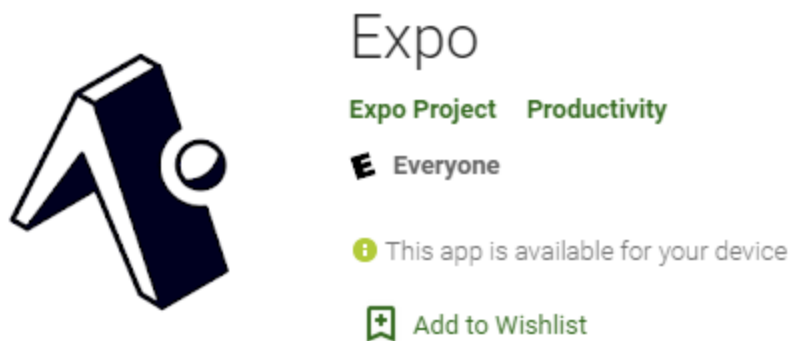
## 2.2 Phone Installation (either iOS or Android)

### 2.2.1 Install Expo Go Client app

1. Go to the app store on your phone to download the Expo Go app. On iPhones, the app is called Expo Go and is found in the App Store:



On Android phones, it is called Expo and is found in the Google Play Store:



## 2.2.2 Connect to the same wireless network as your computer

In order for Node.js to be able to link to Expo Go, you need to be sure the computer running Node.js and the phone running Expo Go are both using the same wireless network.

If you don't know how to check your Wi-Fi network, see the following websites:

- [iPhone](#)
- [Android phones](#)
- [Computer with Windows Operating System](#)
- [Mac Computer](#)





# Chapter 3 - Create Your First App

## 3.1 Upload your first app

Your first app is a simple one-line display that says, "Open up App.js to start working on your app!" It is the standard JavaScript file that is created when you create a project with Expo CLI. We will learn how to find and modify it in the next chapter. First, you need to create your project files.

1. Go back to your computer and the Command Prompt Window. If you had previously closed this window, reopen it following steps 1 and 2 from Chapter 2, Section "2.1.2 Install Expo CLI" on page 8.



```
C:\Windows\system32\cmd.exe
Microsoft Windows [Version 10.0.19042.1110]
(c) Microsoft Corporation. All rights reserved.

C:\Users\mojok>
```

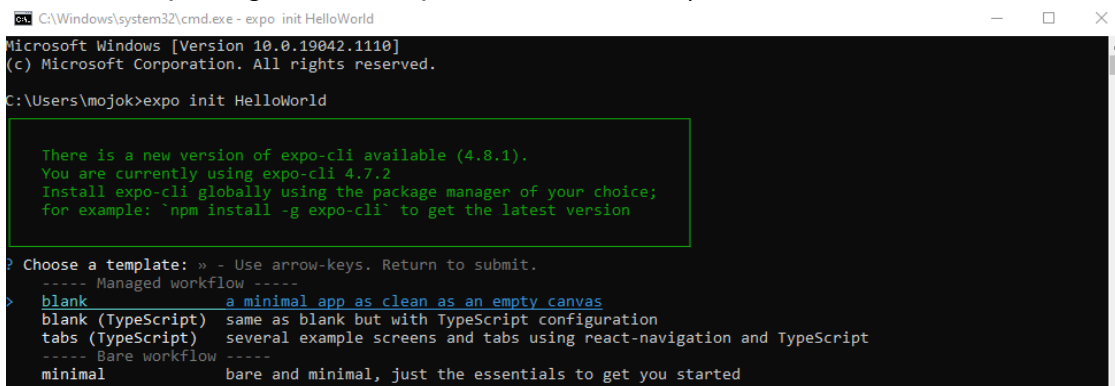
2. To initialize your new project, type "expo init HelloWorld" and hit "Enter." Note where you are creating this project. In this example, my project will be saved in a folder called "HelloWorld" on the C: drive inside other folders that can be found following the path Users > mojok. **Make sure you know where your project is being created because you'll need to find and open it later.**



```
C:\Windows\system32\cmd.exe
Microsoft Windows [Version 10.0.19042.1110]
(c) Microsoft Corporation. All rights reserved.

C:\Users\mojok>expo init HelloWorld
```

3. You will see the following, where you are given a few options for templates. For this project, we will use the blank template at the top, so simply hit "Enter." (You can have fun exploring the other options in the future.)



```
C:\Windows\system32\cmd.exe - expo init HelloWorld
Microsoft Windows [Version 10.0.19042.1110]
(c) Microsoft Corporation. All rights reserved.

C:\Users\mojok>expo init HelloWorld

There is a new version of expo-cli available (4.8.1).
You are currently using expo-cli 4.7.2
Install expo-cli globally using the package manager of your choice;
for example: `npm install -g expo-cli` to get the latest version

? 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
```

4. Your computer will run through many beeps and bloops as it creates your project. When it is done, you will see the following:

```
C:\Windows\system32\cmd.exe
Microsoft Windows [Version 10.0.19042.1110]
(c) Microsoft Corporation. All rights reserved.

C:\Users\mojok>expo init HelloWorld

  There is a new version of expo-cli available (4.8.1).
  You are currently using expo-cli 4.7.2
  Install expo-cli globally using the package manager of your choice;
  for example: `npm install -g expo-cli` to get the latest version

√ Choose a template: » blank          a minimal app as clean as an empty canvas
√ Downloaded and extracted project files.
☑ Using npm to install packages.
√ Installed JavaScript dependencies.

☑ Your project is ready!

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

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

C:\Users\mojok>
```

5. To start our project using Expo and see it on our phone, we need to go into the directory for the HelloWorld project. To do that type: `cd HelloWorld`

```
C:\Windows\system32\cmd.exe
Microsoft Windows [Version 10.0.19042.1110]
(c) Microsoft Corporation. All rights reserved.

C:\Users\mojok>expo init HelloWorld

  There is a new version of expo-cli available (4.8.1).
  You are currently using expo-cli 4.7.2
  Install expo-cli globally using the package manager of your choice;
  for example: `npm install -g expo-cli` to get the latest version

√ Choose a template: » blank          a minimal app as clean as an empty canvas
√ Downloaded and extracted project files.
☑ Using npm to install packages.
√ Installed JavaScript dependencies.

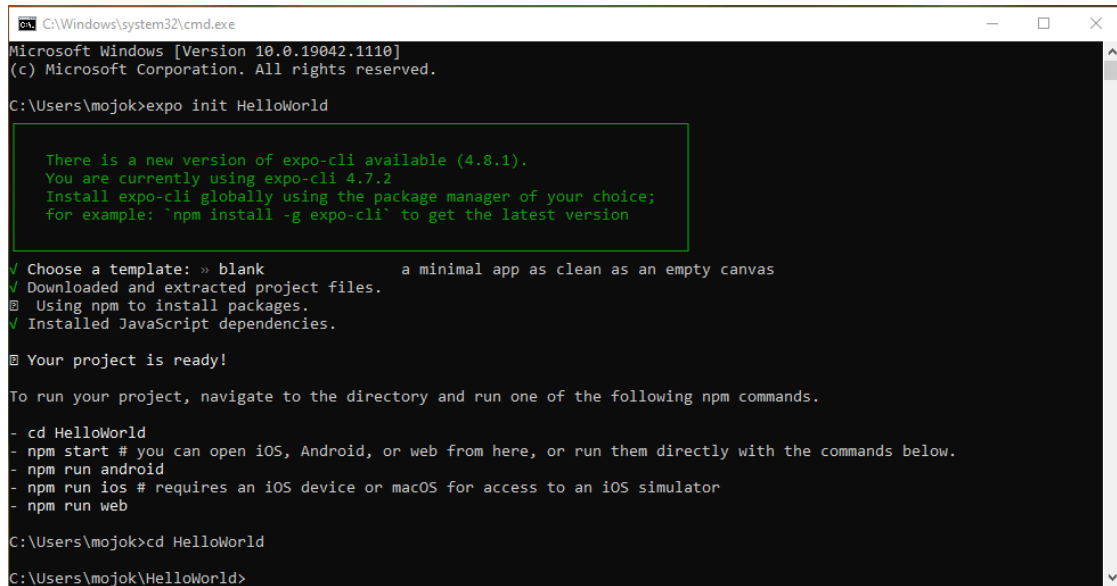
☑ Your project is ready!

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

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

C:\Users\mojok>cd HelloWorld
```

6. Your command line directory should now end with "/HelloWorld"



```
C:\Windows\system32\cmd.exe
Microsoft Windows [Version 10.0.19042.1110]
(c) Microsoft Corporation. All rights reserved.

C:\Users\mojok>expo init HelloWorld

  There is a new version of expo-cli available (4.8.1).
  You are currently using expo-cli 4.7.2
  Install expo-cli globally using the package manager of your choice;
  for example: `npm install -g expo-cli` to get the latest version

√ Choose a template: » blank          a minimal app as clean as an empty canvas
√ Downloaded and extracted project files.
☑ Using npm to install packages.
√ Installed JavaScript dependencies.

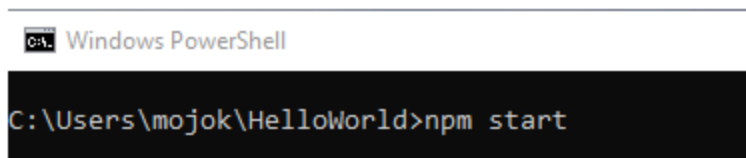
☑ Your project is ready!

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

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

C:\Users\mojok>cd HelloWorld
C:\Users\mojok\HelloWorld>
```

7. Now it's time to start expo by typing in "npm start" and hitting Enter.



```
C:\Windows\PowerShell\WindowsPowerShell>
C:\Users\mojok\HelloWorld>npm start
```

8. Two things will happen after you hit enter:

The Command Prompt window will start Expo, open developer tools in your browser, and create a QR code that you will need to open the project on your phone. It will also give you a menu of options.

Notice the QR code below? You'll use that to view the app on your phone in the next section.



```
Windows PowerShell
C:\Users\wojok\HelloWorld>npm start
> @ start C:\Users\wojok\HelloWorld
> expo start

There is a new version of expo-cli available (4.8.1).
You are currently using expo-cli 4.7.2
Install expo-cli globally using the package manager of your choice;
For example: 'npm install -g expo-cli' to get the latest version

Starting project at C:\Users\wojok\HelloWorld
Developer tools running on _____
Opening developer tools in the browser...
Starting Metro Bundler



> Waiting on _____
> Scan the QR code above with Expo Go (Android) or the Camera app (iOS)

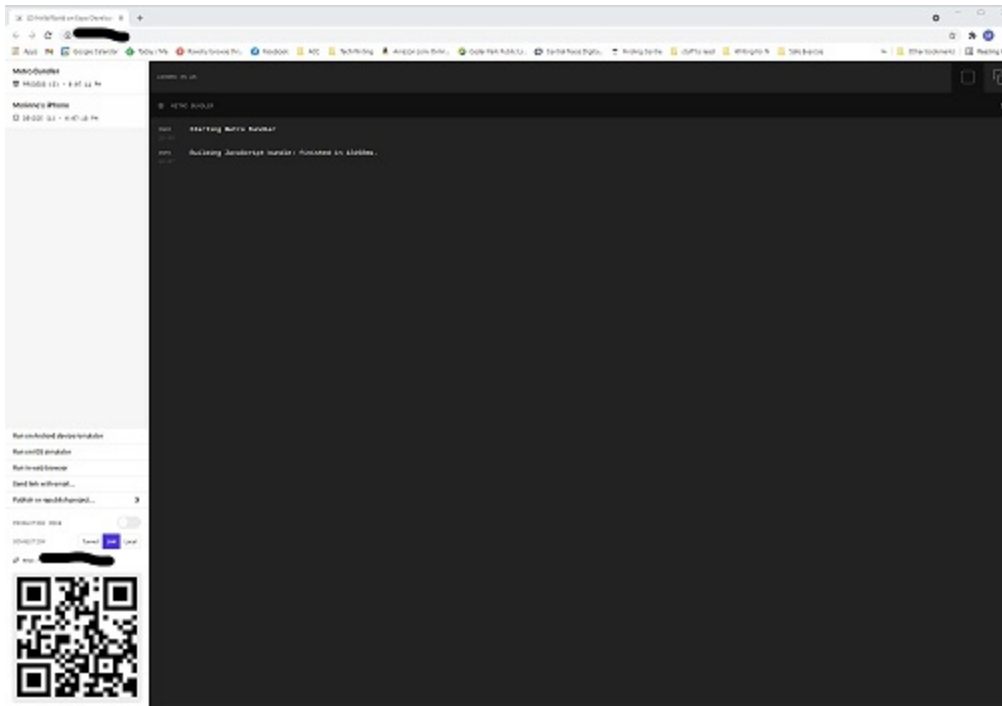
> Press a | open Android
> Press M | open web

> 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.
```

Next, a window will open on your browser with developer tools for Expo Go. Your app QR code is also displayed here (bottom left corner).

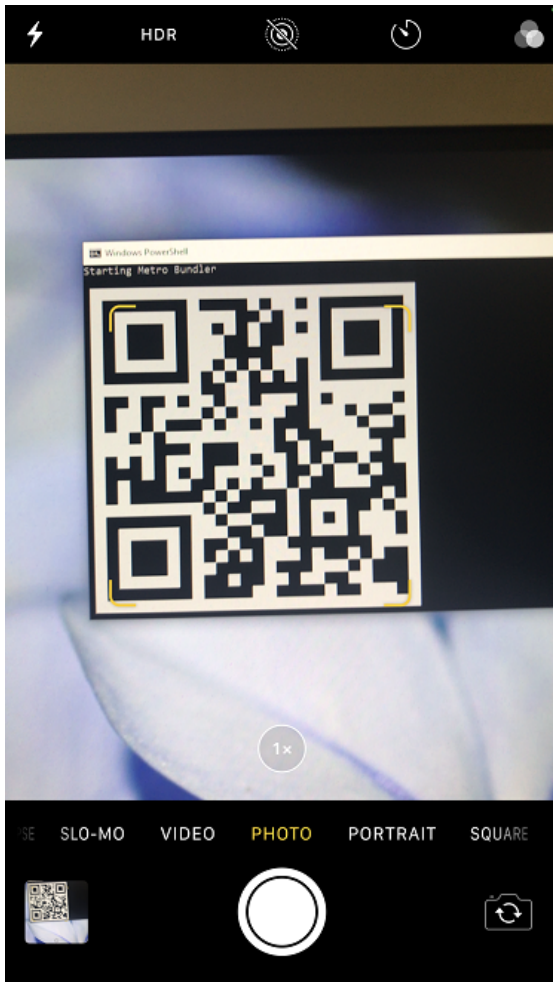


Your app is now ready to be viewed on your phone!

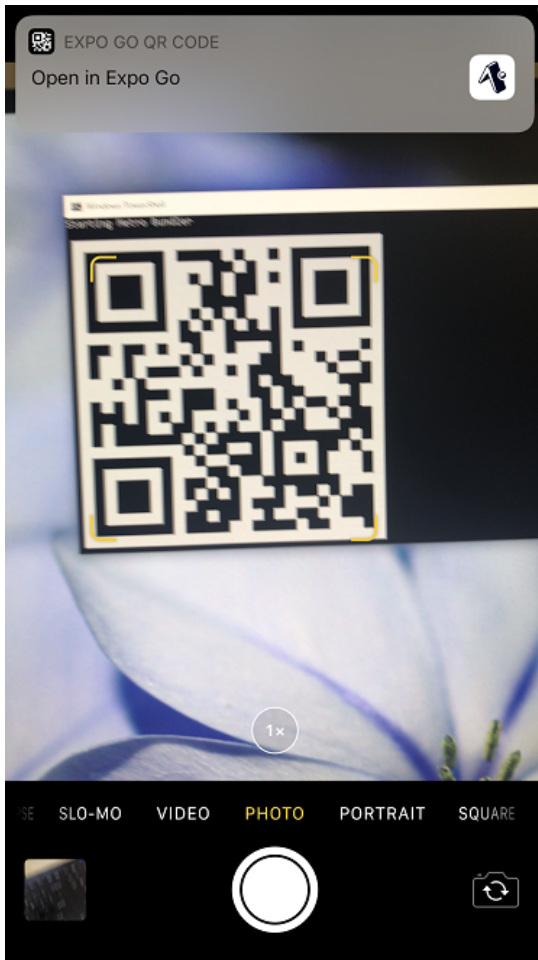
## 3.2 View your app on your phone

1. Opening your app on your phone is as easy as taking a picture!

On **iPhones** open your camera app and line up the QR code in the center of your screen, as if you're going to take a picture of it. (But don't take a picture!) On **Android phones**, open the Expo app for the QR scanner.

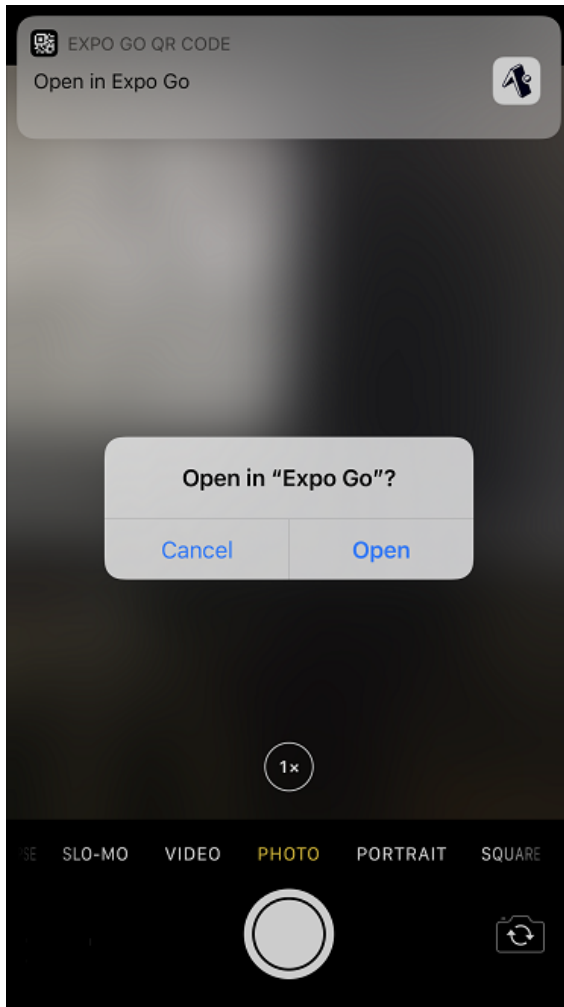


2. Once the image is picked up by your camera or Expo app, a notification will pop up asking if you want to open Expo Go. Tap that notification.

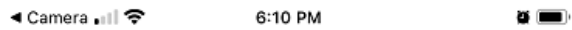




3. A pop-up will ask if you want to open the Expo Go app. Tap "Open."



4. Expo Go will open and run your app. (Give it a minute or two to load.) The basic app that is included when you set up the project, named App.js, will display the following:



Open up App.js to start working on your app!

**Congratulations! You just ran your first app!** It is a very basic template. Next, we'll open up and modify that JavaScript file.

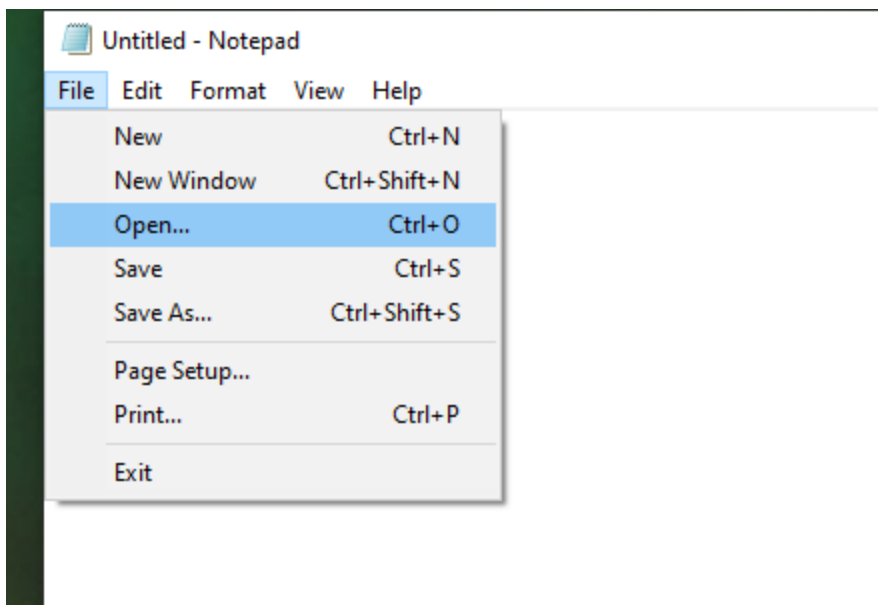


# Chapter 4 - Modify Your App

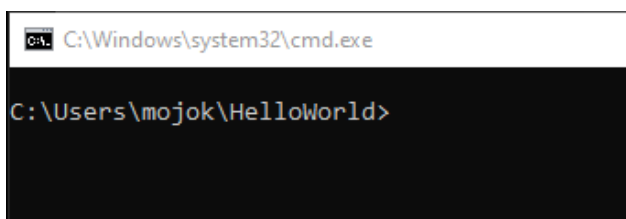
As is the ancient custom of our programming ancestors, we will start with the "Hello, world!" program by modifying the template JavaScript app file. First, you need to locate the file on your computer.

## 4.1 Find and Open your App.js file

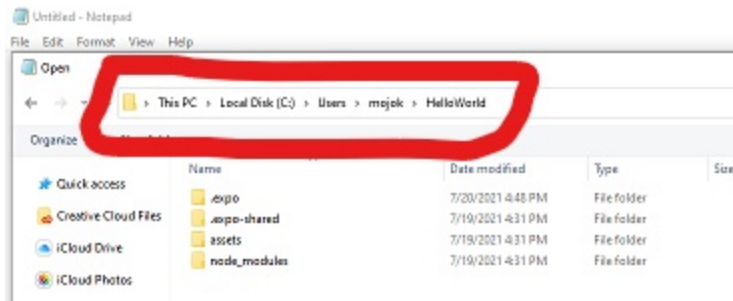
1. Now it's time to open and modify your App.js file. You can use any text editor of your choice, such as Notepad on Windows or TextEdit on Mac. Open your text editor, then open your App.js file in the text editing software.



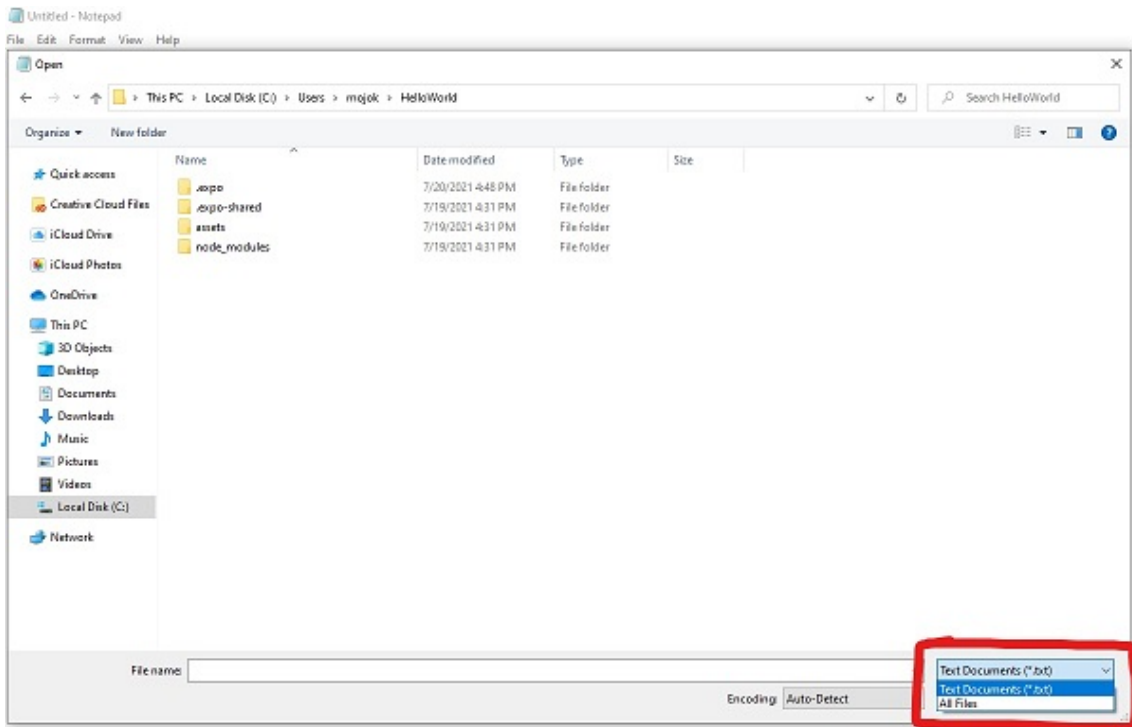
Hopefully, you noted the location where you created your HelloWorld project. Here is my project path in the Command Prompt window:



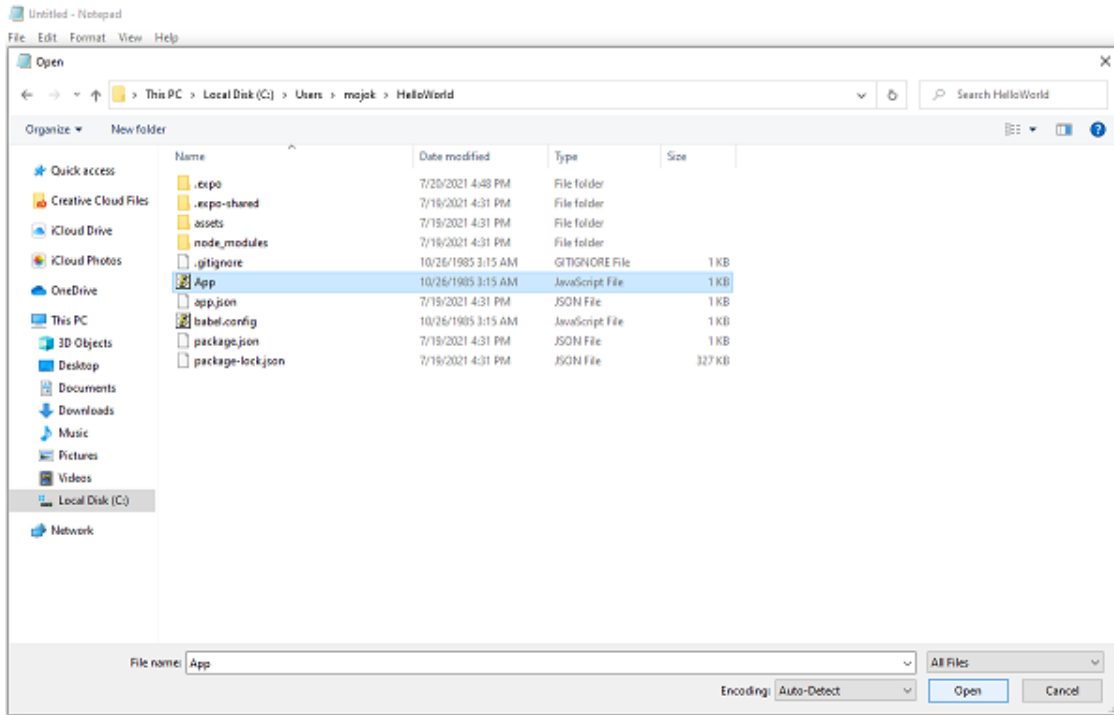
To open the file in Notepad, you will need to navigate to the HelloWorld folder:



If you get to the correct folder and don't see the App.js file, be sure to display All Files and not just Text Documents (\*.txt):



2. Select the "App.js" file and click "Open" or double click "App.js."



The following file will appear:

```
App - Notepad
File Edit Format View Help
import { StatusBar } from 'expo-status-bar';
import React from 'react';
import { StyleSheet, Text, View } from 'react-native';

export default function App() {
  return (
    <View style={styles.container}>
      <Text>Open up App.js to start working on your app!</Text>
      <StatusBar style="auto" />
    </View>
  );
}

const styles = StyleSheet.create({
  container: {
    flex: 1,
    backgroundColor: '#fff',
    alignItems: 'center',
    justifyContent: 'center',
  },
});
});
```

## 4.1 Modify your App.js file

1. Find the `<Text>` line with the phrase "Open App.js to start working on your app!" This is what you are seeing on your phone if you have Expo Go running. (And you should have Expo Go running so you can see the changes as you save them!)

```
App - Notepad
File Edit Format View Help
import { StatusBar } from 'expo-status-bar';
import React from 'react';
import { StyleSheet, Text, View } from 'react-native';

export default function App() {
  return (
    <View style={styles.container}>
      <Text>Open up App.js to start working on your app!</Text>
      <StatusBar style="auto" />
    </View>
  );
}



const styles = StyleSheet.create({
  container: {
    flex: 1,
    backgroundColor: '#fff',
    alignItems: 'center',
    justifyContent: 'center',
  },
});
```

2. Change the words between the `<Text></Text>` tags to "Hello, world!" and click File>Save.

```
*App - Notepad
File Edit Format View Help
import { StatusBar } from 'expo-status-bar'
import React from 'react';
import { StyleSheet, Text, View } from 'rea

export default function App() {
  return (
    <View style={styles.container}>
      <Text>Hello, world!</Text>
      <StatusBar style="auto" />
    </View>
  );
}
```

3. Watch your phone, wait a little bit, and TA DA, there's the change!

◀ Camera  

3:02 PM

Hello, world!

You can change the text to say whatever you want. Make the changes, save them, and watch the magic.



4. Let's play with the style settings. Go back into your file and change the background color by going to the line that says "backgroundColor: '#fff',":

```
App - Notepad
File Edit Format View Help
import { StatusBar } from 'expo-status-bar';
import React from 'react';
import { StyleSheet, Text, View } from 'react-native';

export default function App() {
  return (
    <View style={styles.container}>
      <Text>Hello, world!</Text>
      <StatusBar style="auto" />
    </View>
  );
}

const styles = StyleSheet.create({
  container: {
    flex: 1,
    backgroundColor: '#fff',
    alignItems: 'center',
    justifyContent: 'center',
  },
});
```

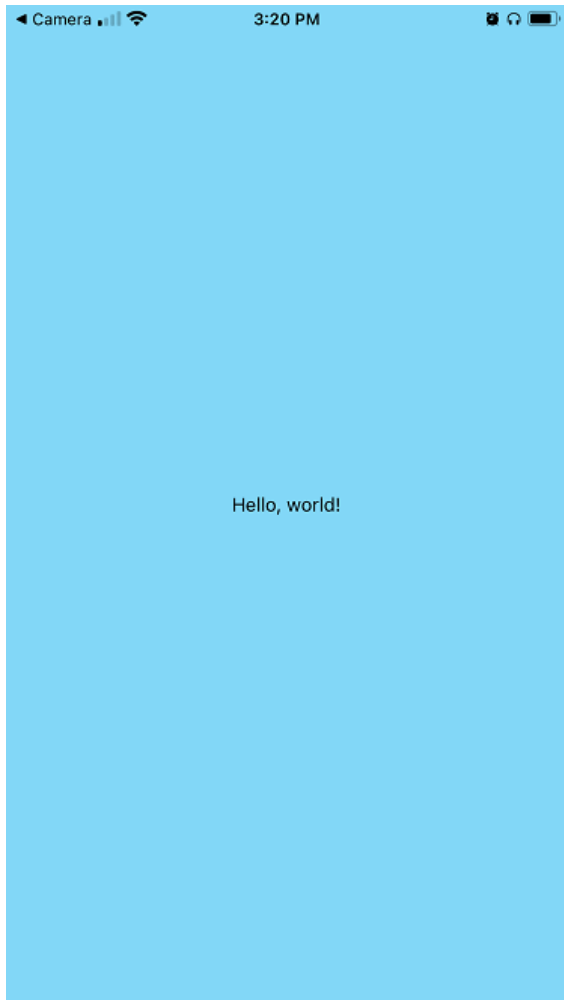
5. Let's change it to React Native blue by changing #fff to #61dafb:

```
App - Notepad
File Edit Format View Help
import { StatusBar } from 'expo-status-bar';
import React from 'react';
import { StyleSheet, Text, View } from 'react-native';

export default function App() {
  return (
    <View style={styles.container}>
      <Text>Hello, world!</Text>
      <StatusBar style="auto" />
    </View>
  );
}

const styles = StyleSheet.create({
  container: {
    flex: 1,
    backgroundColor: '#61dafb',
    alignItems: 'center',
    justifyContent: 'center',
  },
});
```

6. Then check your phone. Pretty!



**Congratulations! You modified your first app!** You're on your way to creating your own app!

Now you're ready to start learning React Native. Visit <https://reactnative.dev/docs/getting-started> to get started with the basics.



# Appendix A: Useful Links

## React Native Documentation

<https://reactnative.dev/docs/getting-started>

The React Native website has a variety of useful information about getting started including React fundamentals, testing your app, using libraries, changing styles, and much more.

## Mozilla JavaScript Tutorials

<https://developer.mozilla.org/en-US/docs/Web/JavaScript>

You need an understanding of JavaScript fundamentals to work with React Native. Mozilla provides a thorough set of tutorials.

## React JavaScript Library

<https://reactjs.org/>

The React JavaScript library is used in React Native to build your app. The React website has "Getting Started" information, as well as tutorials to learn more.

## Node.js

<https://nodejs.org/en/>

The Node.js website has download links and documentation about the program.

## Expo

<https://docs.expo.io/>

The Expo website houses excellent guides on a variety of topics related to Expo, including getting started, fundamentals, and distributing your app.

## Command Prompt: What It Is and How to Use It

<https://www.lifewire.com/command-prompt-2625840>

If you've never used the Windows Command Prompt before, this short guide is a useful introduction.



# Appendix B: Troubleshooting

## React Native Setup Troubleshooting Guide

<https://reactnative.dev/docs/troubleshooting>

React Native has put together a list of commonly encountered issues that you may come across while setting up React Native, including port errors, NPM locking errors, missing libraries, and shell command problems.



# Glossary

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## A

---

### app

An application, usually downloaded by a user on a mobile device.

## C

---

### Command Prompt

A command line interface that allows users to execute commands in Windows operating systems.

### Components

Independent, reusable bits of code used in React Native that return HTML elements

## D

---

### Development Environment

A software application that provides comprehensive utilities for programmers to develop software.

### Directory

A collection of files typically created for organizational purposes. Also known as a folder.

## E

---

### Expo CLI

A command line app that allows you to create new projects, run

## J

---

### JavaScript

A programming language that allows you to make web pages interactive. It is the world's most popular programming language.

### JSX

An XML/HTML-like syntax to JavaScript that allows you to write HTML in React

## K

---

### Kotlin

An open-source programming language used for cross-platform app creation that works with Java.

## N

---

### Node.js

An open-source, cross-platform JavaScript runtime environment that executes Javascript code outside a web browser.

## O

---

### Objective-C

A general-purpose programming language that can be used to program apps for Apple products.

---

the project server, view logs, and open your app in a simulator



---

## open-source

Software for which the original source code is made freely available and may be redistributed and modified.

---

## P

### Pop-up

A window that appears on a computer or phone screen.

### Props

Properties that let you customize React components

---

## Q

### QR code

A machine-readable code made up of an array of black and white squares, typically used for storing web addresses or other information for reading by the camera on a smartphone.

---

## R

### React

A free and open-source JavaScript library for building user interfaces. It is maintained by Facebook and a community of individual developers and companies.

### React Native

An open-source, cross-platform framework for writing mobile apps using JavaScript.

---

## S

### State

An object in React that stores property values for components that will change over time

### Swift

A programming language for Apple app development.

---

## W

### Wi-Fi Network

Wireless Fidelity Network. See Wireless Network.

### Wireless Network

A computer network that uses electromagnetic waves to connect stations or devices.

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