

MOBILE PROGRAMMING

LAB 1

Contents

Question 1. Github	2
Question 2. Development environment settings	7
1) Install an environment with Expo CLI	7
2) Install an environment with React native CLI	7
Question 3. Create Expo CLI apps	7
Question 4. Create React native CLI apps	9
Question 5. Publishing	12
Question 6. Build apps with props and state	14

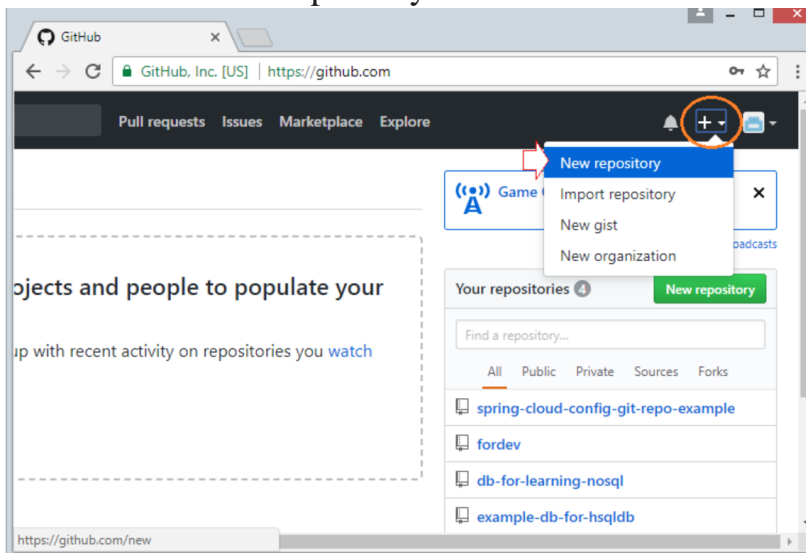
Question 1. Github

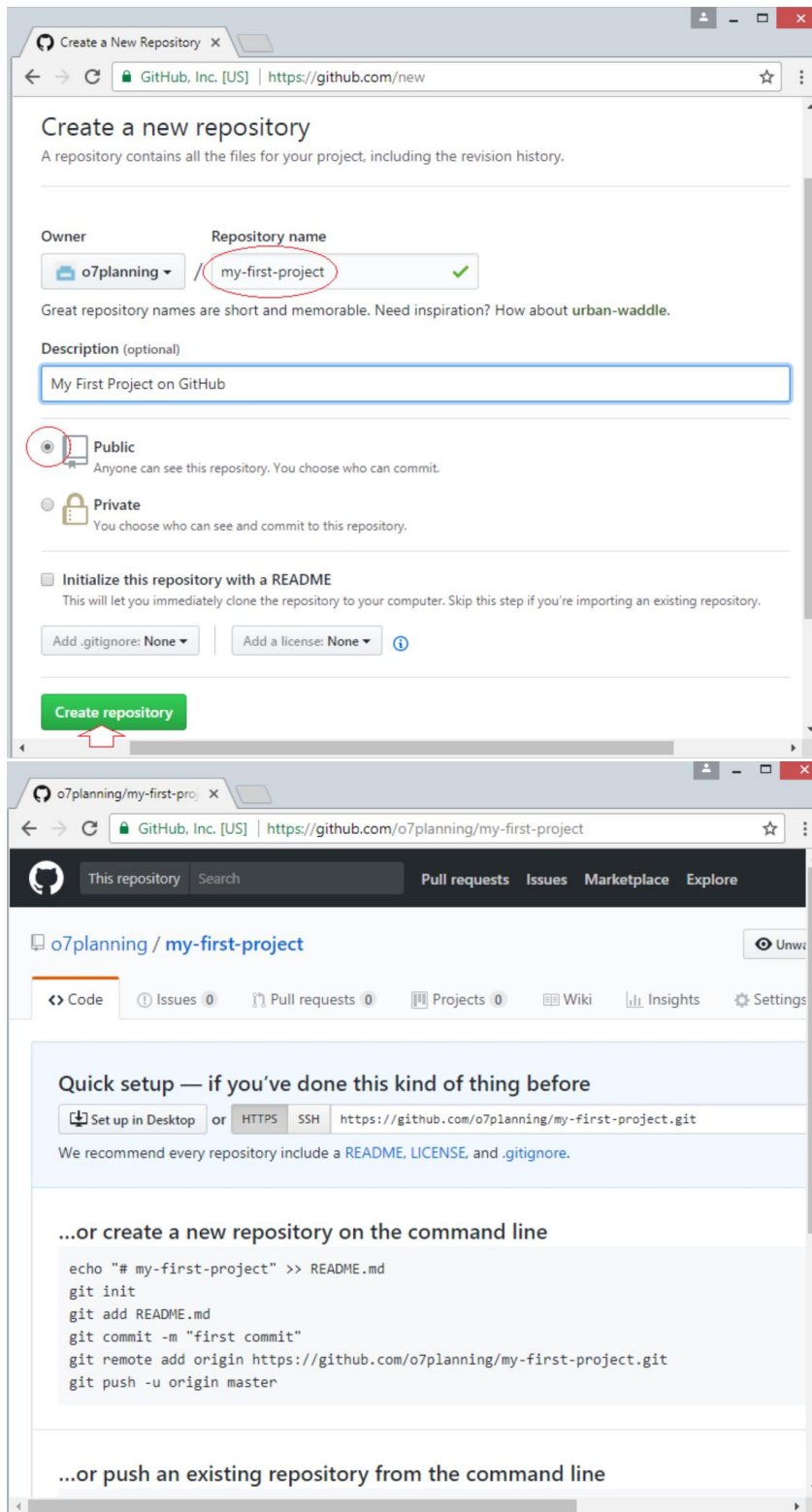


Create a Github account: <https://github.com/signup>

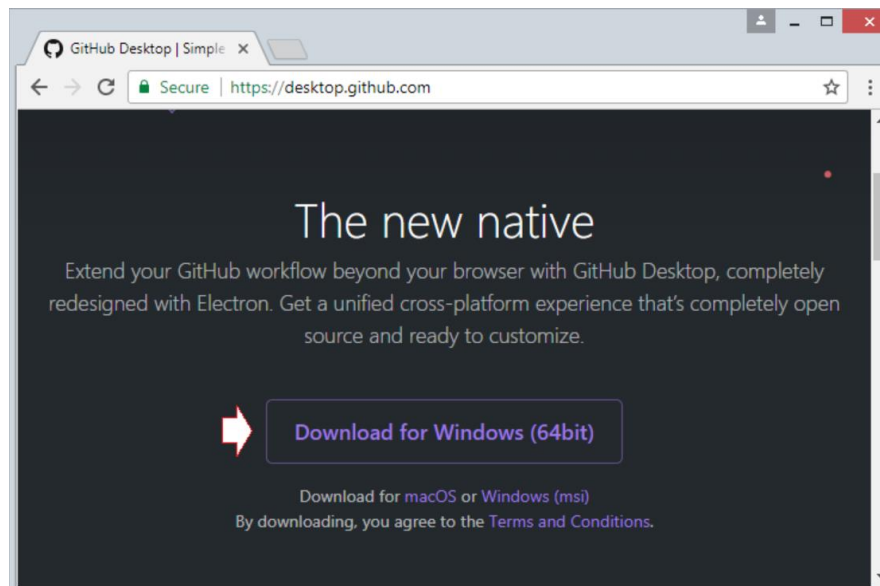
The screenshot shows the GitHub sign-up page in a web browser. The page has a dark header with the GitHub logo and the text "The world's leading software". Below the header, there is a white sign-up form with the following fields: "Username" (with a placeholder "Pick a username"), "Email" (with a placeholder "you@example.com"), and "Password" (with a placeholder "Create a password"). Below the password field, there is a note: "Use at least one letter, one numeral, and seven characters." At the bottom of the form is a green button labeled "Sign up for GitHub". Below the button, there is a line of text: "By clicking 'Sign up for GitHub', you agree to our [terms of service](#) and [privacy policy](#). We'll occasionally send you account related emails."

- Create GitHub Repository

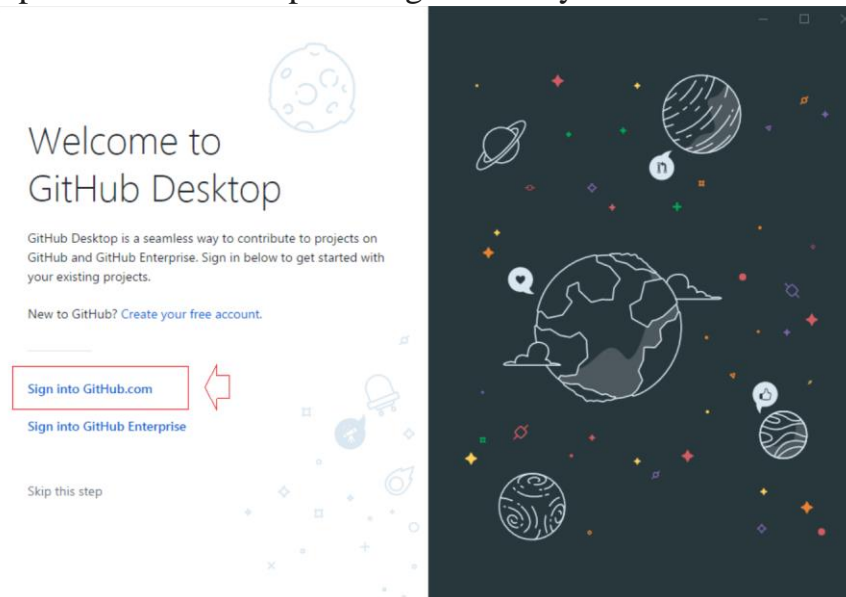




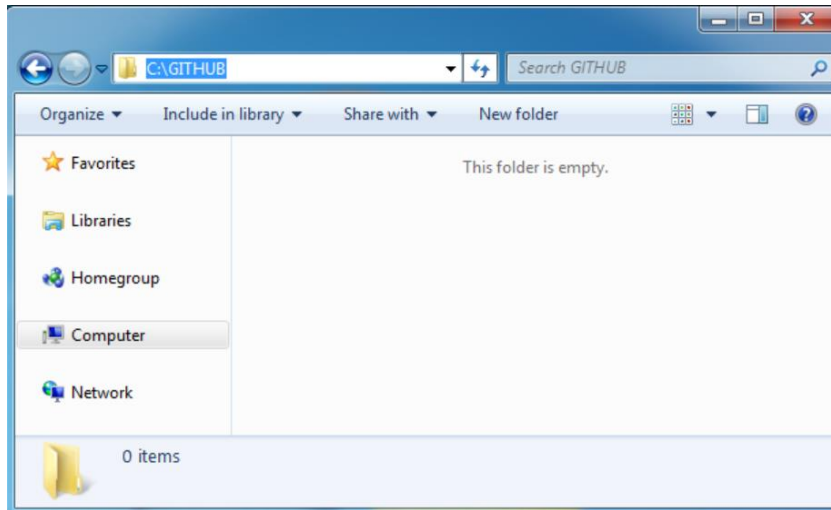
Download Github Desktop and install: <https://desktop.github.com/>



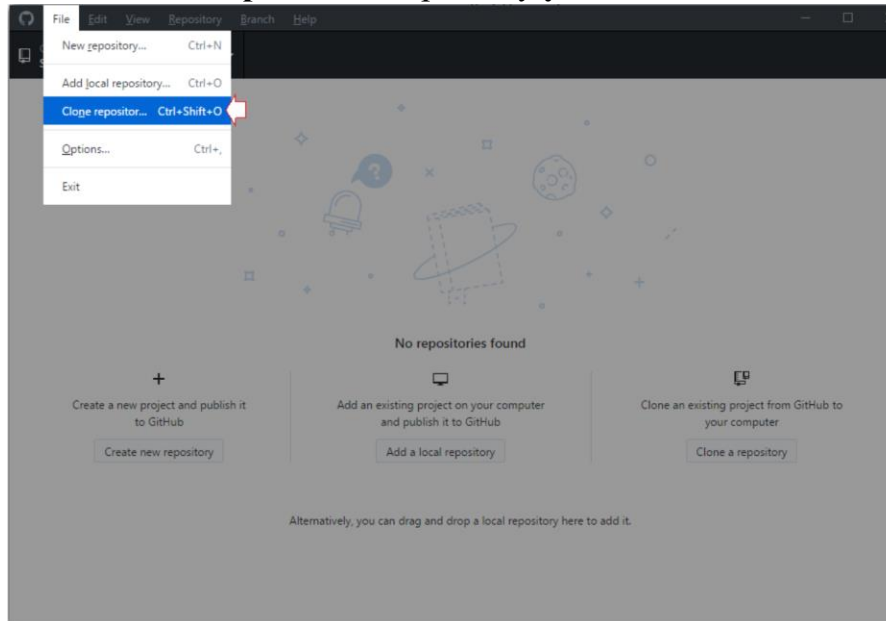
- Open Github Desktop and Sign in with your Github account

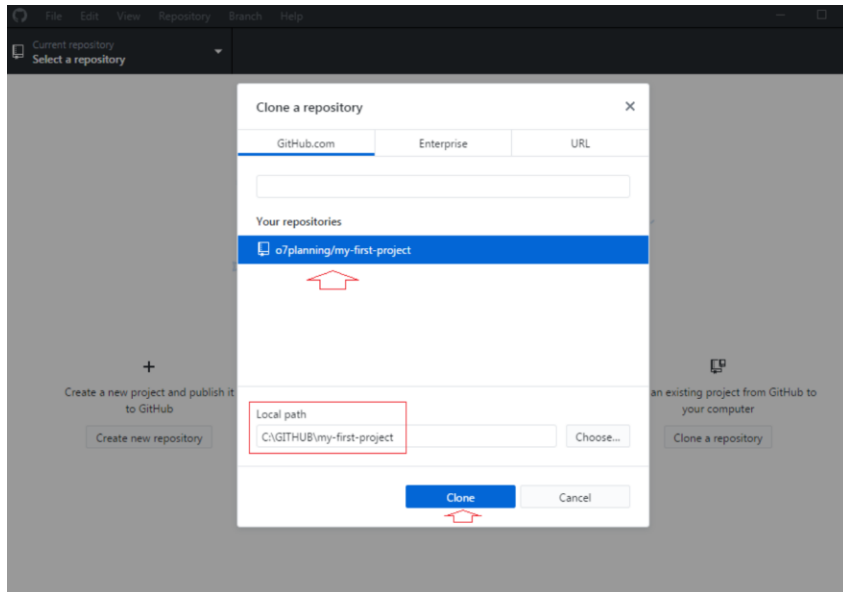


Create an empty folder to store assignment/Project.

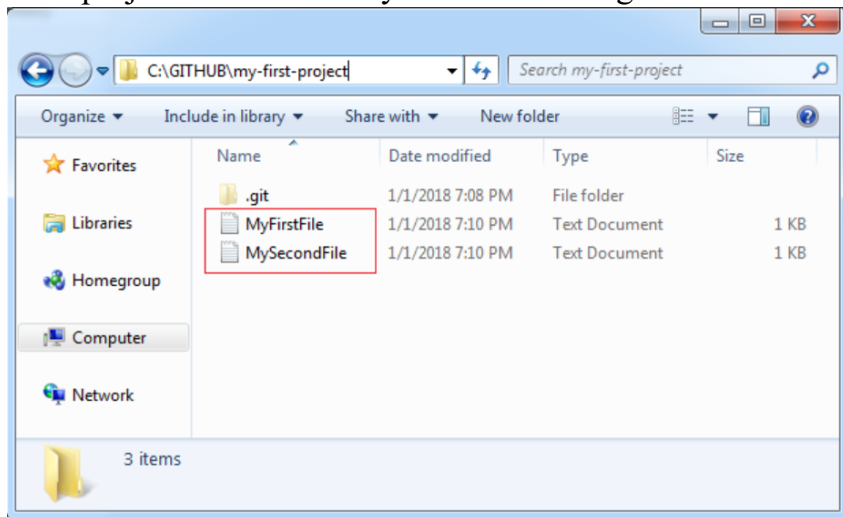


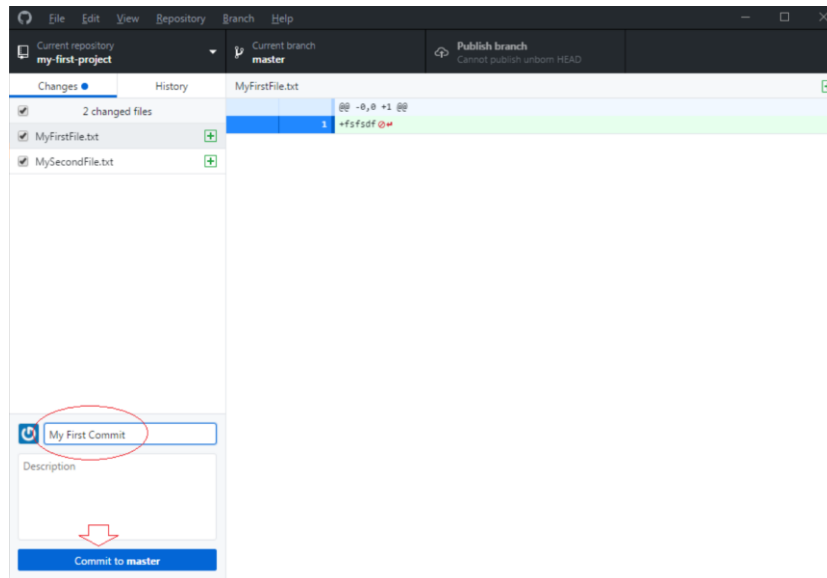
On **GitHub Desktop**, select a repository you created on GitHub to clone





Create a project to the directory and commit to github





Question 2. Development environment settings

1) Install an environment with Expo CLI

<https://docs.expo.dev/get-started/installation/>

or

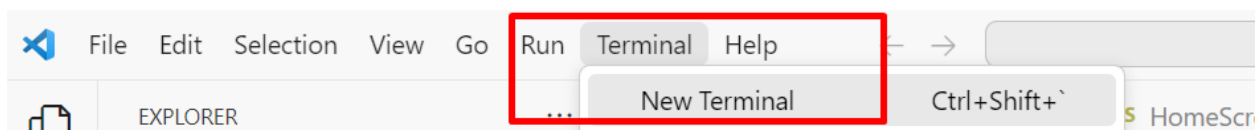
<https://reactnative.dev/docs/environment-setup?guide=quickstart>

2) Install an environment with React native CLI

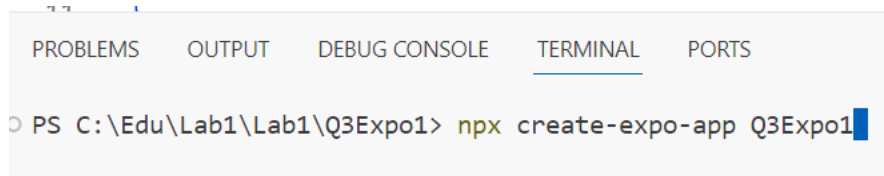
<https://reactnative.dev/docs/environment-setup?guide=native>

Question 3. Create Expo CLI apps

1. Open Visual code and New Terminal.



2. Create project:

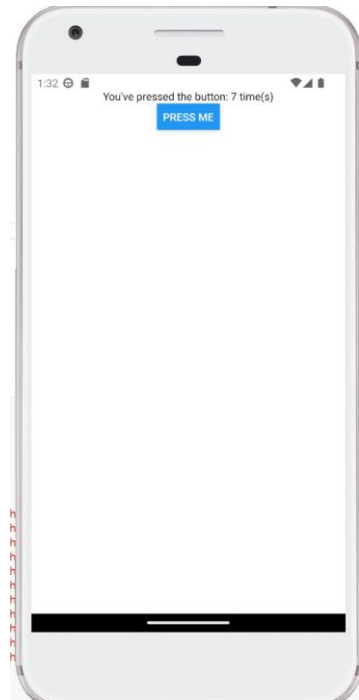


3. Open project "Q3Expo1" on Visual code: "File/Open folder"
4. Open file 'App.js' and enter the following source code.

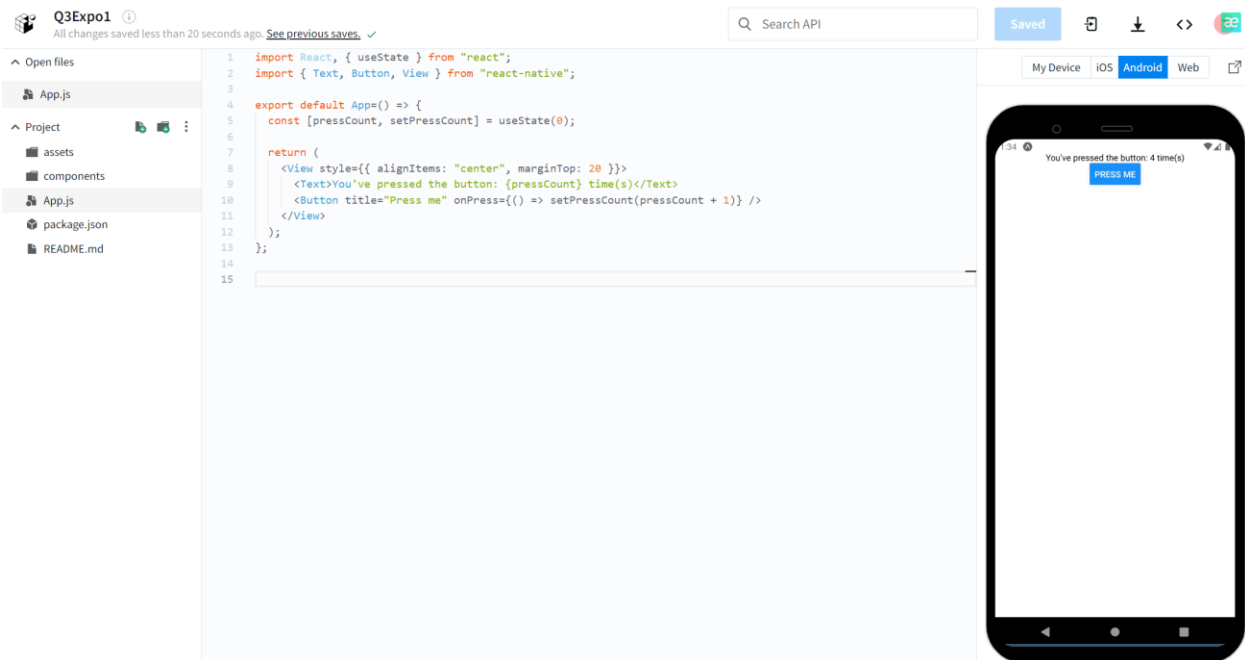
```
JS App.js •
JS App.js > default
1 import React, { useState } from "react";
2 import { Text, Button, View } from "react-native";
3
4 export default () => {
5   const [pressCount, setPressCount] = useState(0);
6
7   return (
8     <View style={{ alignItems: "center", marginTop: 20 }}>
9       <Text>You've pressed the button: {pressCount} time(s)</Text>
10      <Button title="Press me" onPress={() => setPressCount(pressCount + 1)} />
11    </View>
12  );
13 };
14
```

5. Run Expo CLI app.
Open file “package.json”. View commands that run across different environments.

```
JS App.js • {} package.json X
{} package.json > {} dependencies
1 {
2   "name": "q3expo1",
3   "version": "1.0.0",
4   "main": "node_modules/expo/AppEntry.js",
5   "scripts": {
6     "start": "expo start",
7     "android": "expo start --android",
8     "ios": "expo start --ios",
9     "web": "expo start --web"
10  },
11  "dependencies": {
12    "expo": "~49.0.13",
13    "expo-status-bar": "~1.6.0",
14    "react": "18.2.0",
15    "react-native": "0.72.5"
16  },
17  "devDependencies": {
18    "@babel/core": "^7.20.0"
19  },
20  "private": true
21 }
22
> expo start --android
```

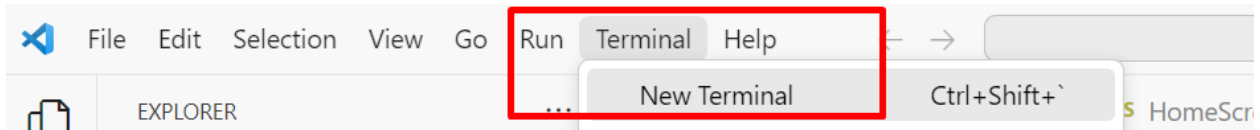



6. Another way to run the Expo app. Go to: <https://snack.expo.dev/>
You can view results with Web/Android/iOS interface



Question 4. Create React native CLI apps

1. Open Visual code and New Terminal.

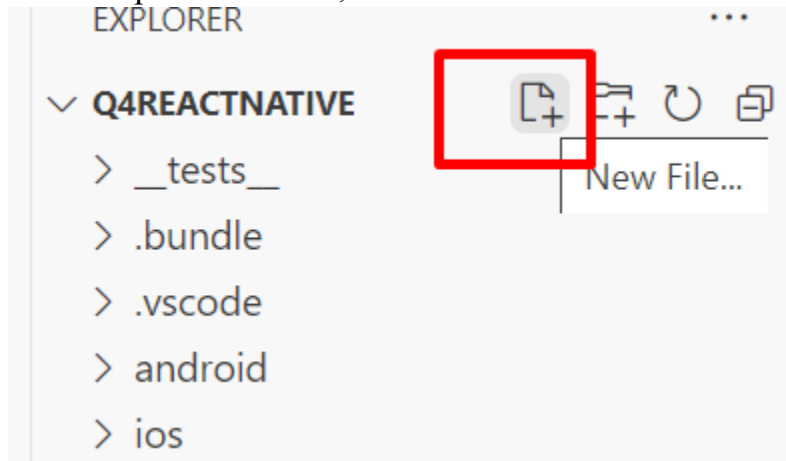


2. Create project with React native CLI:

```
PS C:\Edu\Lab1\Lab1> npx react-native init Q4ReactNative
```

3. Open project "Q4reactNative" on Visual code: "File/Open folder"

4. In the Explorer window, create a new file with the name "style.js"



5. Add the following code to the "style.js" file

```
TS App.tsx 1 JS style.js X JS Square.js JS Data.js
JS style.js > [?] default
1 import { StyleSheet } from "react-native";
2 export default styles = StyleSheet.create({
3   container: { backgroundColor: "#fff" },
4   box: {
5     width: 100,
6     height: 100,
7     justifyContent: "center",
8     alignItems: "center",
9     margin: 20,
10  },
11  });
```

6. Create a new file named "Data.js" and enter the following code.

```
TS App.tsx 1 JS style.js JS Square.js JS Data.js X
JS Data.js > [?] default
1 export default data = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15];
```

7. Create a new file named "Square.js" and enter the following code.

TS App.tsx 1	JS style.js	JS Square.js X	JS Data.js
--------------	-------------	----------------	------------

```

JS Square.js > ...
1  import React from "react";
2  import { View, Text, Alert, Button } from "react-native";
3  import styles from "../style";
4  function ClickOnTheSquare(value)
5  {
6      Alert.alert(value);
7  }
8  export default Square = ({ text }) => (
9      <View style={ [styles.box, { backgroundColor: "#7ce0f9" } ]}>
10         <Text>{text}</Text>
11         <Button title = 'Click' onPress = { () => ClickOnTheSquare(text) }></Button>
12     </View>
13 );

```

Import from style.js

8. Open the "App.tsx" file and enter the following code.

TS App.tsx 1 X	JS style.js	JS Square.js	JS Data.js
----------------	-------------	--------------	------------

```

TS App.tsx > default
1  import React from "react";
2  import { View, Text, StyleSheet, ScrollView, Button, Alert } from "react-native";
3  import data from '../Data'
4  import Square from '../Square'
5  import styles from "../style";
6
7  export default App=()=> {
8      return (
9          <ScrollView style={styles.container}>
10             {data.map((item, index) => (
11                 <Square key={item} text={`Square ${index + 1}`} />
12             ))}
13         </ScrollView>
14     );
15 };
16

```

Import from Data.js, Square.js, style.js

7. Run React native CLI app.

Open file "package.json". View commands that run across different environments.

```

Debug
"scripts": {
  "android": "react-native run-android",
  "ios": "react-native run-ios",
  "lint": "eslint .",
  "start": "react-native start",
  "test": "jest"
},

```

PS C:\Edu\Lab1\Lab1\Q4ReactNative> react-native run-android



Question 5. Publishing

Use the Project **Q4reactNative** in Question 4. Create the “**Q5**” folder in the “**.Lab1**” folder. Save 2 * files. AAB and *. APK to folder.

1. On Windows keytool must be run from C:\Program Files\Java\jdkx.x.x_x\bin, as administrator. Open powershell.

Run *keytool -genkeypair -v -storetype PKCS12 -keystore my-upload-key.keystore -alias my-key-alias -keyalg RSA -keysize 2048 -validity 10000*

```
Windows PowerShell
PS D:\jdk-11\bin> keytool -genkeypair -v -storetype PKCS12 -keystore my-upload-key.keystore -alias my-key-alias -keyalg
RSA -keysize 2048 -validity 10000
Enter keystore password:
Re-enter new password:
What is your first and last name?
[Unknown]: Tai Tran
What is the name of your organizational unit?
[Unknown]: CIT
What is the name of your organization?
[Unknown]: EIU
What is the name of your City or Locality?
[Unknown]: Binh Duong
What is the name of your State or Province?
[Unknown]: Binh Duong
What is the two-letter country code for this unit?
[Unknown]: VN
Is CN=Tai Tran, OU=CIT, O=EIU, L=Binh Duong, ST=Binh Duong, C=VN correct?
[no]: Y

Generating 2,048 bit RSA key pair and self-signed certificate (SHA256withRSA) with a validity of 10,000 days
for: CN=Tai Tran, OU=CIT, O=EIU, L=Binh Duong, ST=Binh Duong, C=VN
[Storing my-upload-key.keystore]
PS D:\jdk-11\bin>
```

2. Setting up Gradle variables

Place the **my-upload-key.keystore** file under the **android/app** directory in your project folder

Edit the file **~/.gradle/gradle.properties** or **android/gradle.properties**, and add the following (replace ********* with the correct keystore password, alias and key password)

```
MYAPP_UPLOAD_STORE_FILE=my-upload-key.keystore
MYAPP_UPLOAD_KEY_ALIAS=my-key-alias
MYAPP_UPLOAD_STORE_PASSWORD=*****
MYAPP_UPLOAD_KEY_PASSWORD=*****
```

3. Edit the file **android/app/build.gradle** in your project folder, and add the signing config

```
...
android {
    ...
    defaultConfig { ... }
    signingConfigs {
        release {
            if (project.hasProperty('MYAPP_UPLOAD_STORE_FILE')) {
                storeFile file(MYAPP_UPLOAD_STORE_FILE)
                storePassword MYAPP_UPLOAD_STORE_PASSWORD
                keyAlias MYAPP_UPLOAD_KEY_ALIAS
                keyPassword MYAPP_UPLOAD_KEY_PASSWORD
            }
        }
    }
}
```

```

    }
    buildTypes {
        release {
            ...
            signingConfig signingConfigs.release
        }
    }
}
...

```

4. Generating the release AAB (Support file deployed to google play)

npx react-native build-android --mode=release

Optional: divided by CPU type

```

android {
    splits {
        abi {
            reset()
            enable true
            universalApk false
            include "armeabi-v7a", "arm64-v8a", "x86", "x86_64"
        }
    }
}

```

Output file: *./android\app\build\outputs\bundle\release*

5. Build React native App to **apk** file

./gradlew assembleRelease

Output file: *./android\app\build\outputs\apk\release*

Question 6. Build apps with props and state.

1. Build an employee information entry screen with: full name, age, occupation specialized in training and an update button (display success message) (Component, Props).

2. Write a program to sum the first digit and the last digit of a number. (Component, State)
3. Write a program to find the minimum between three numbers. (Component & state)
4. Write a program that displays the Hailstone sequence: With some positive number ($n > 0$): (Component & State)
 - a. If n is an even number, divide by 2.
 - b. If n is an odd number, multiply it by 3 and add 1.
 - c. Repeat two steps above until n equals 1.

Note: Use Github commit. Lab1 folder and send Github link to Moodle (Note: link Git to public)