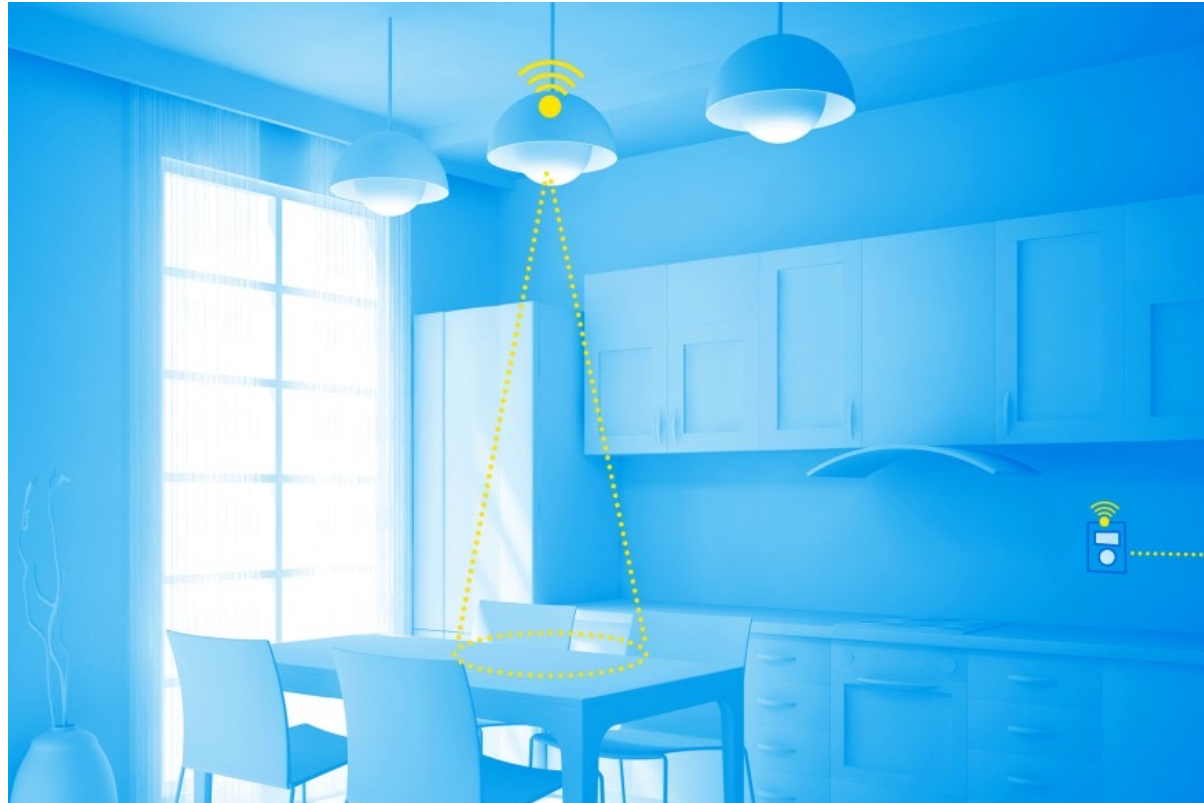


# 클라우드 데이터 베이스 연동 IoT 원격 LED ON/OFF 서비스 제작

Week13

# 무엇을 개발하나?

- 스마트 스위치 : 원격 LED ON/OFF



# 구현 중요 내용

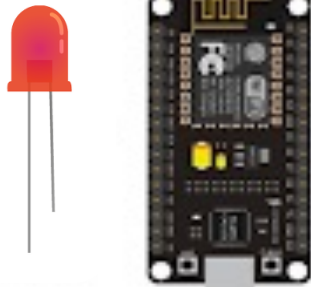
- LED ON/OFF 안드로이드 앱과 웹 앱이 Firebase의 데이터 베이스를 중심으로 완전 동기화 됨
- Firebase 안드로이드 이벤트 처리 함수 사용
- Firebase 웹 앱 이벤트 처리 함수 사용



**Mobile App**



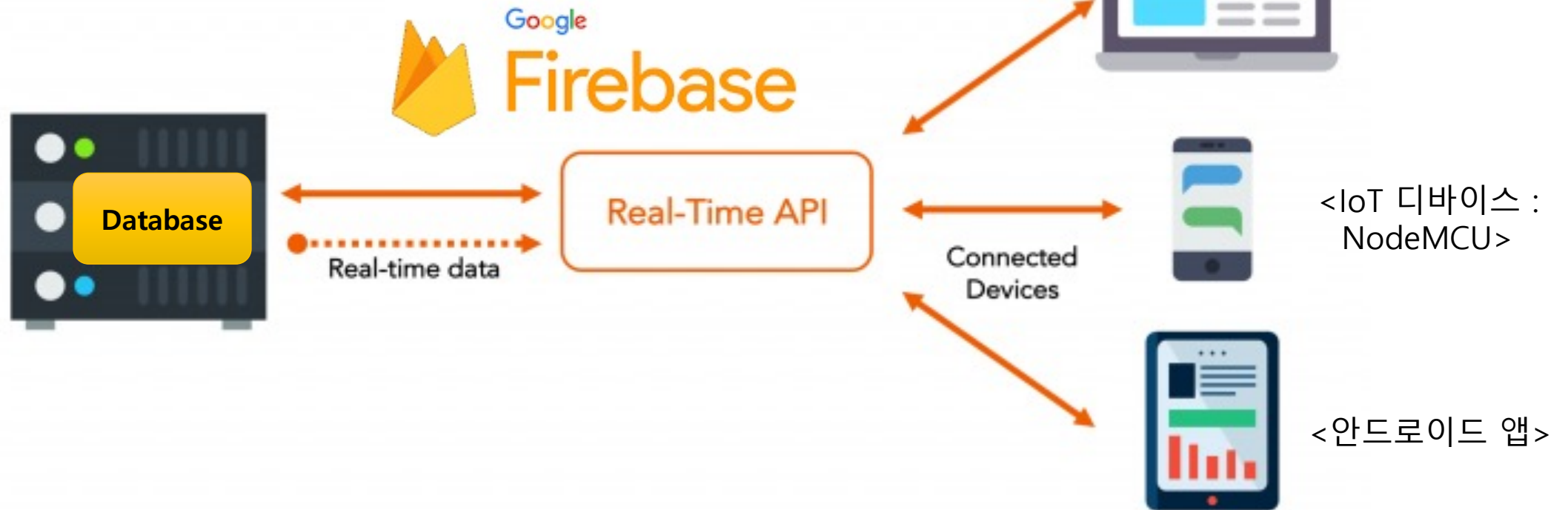
**Web App**



**ESP8266 Things**

# Firestore Real-Time Database : NoSQL

Real-Time Data



# Firestore 웹 앱 DB 이벤트

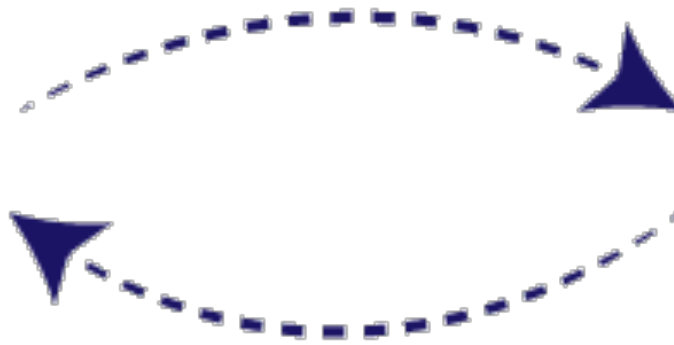
- Week09 강의자료 및 과제물 참조

## Firestore Read & Write

JavaScript Web App



`set(ref(db, 'LED_STATUS'), 'ON')`



```
onValue(dfRef, snapshot) => {  
  console.log(snapshot.val())  
})
```

# Firestore 웹 앱 DB 이벤트

```
// Initialize Firebase
const app = initializeApp(firebaseConfig);
const analytics = getAnalytics(app);
const db = getDatabase(app);
console.log(db);

var OnButton = document.getElementById("onBtn");
OnButton.addEventListener("click", onBtnClick, false);

var OffButton = document.getElementById("offBtn");
OffButton.addEventListener("click", offBtnClick, false);

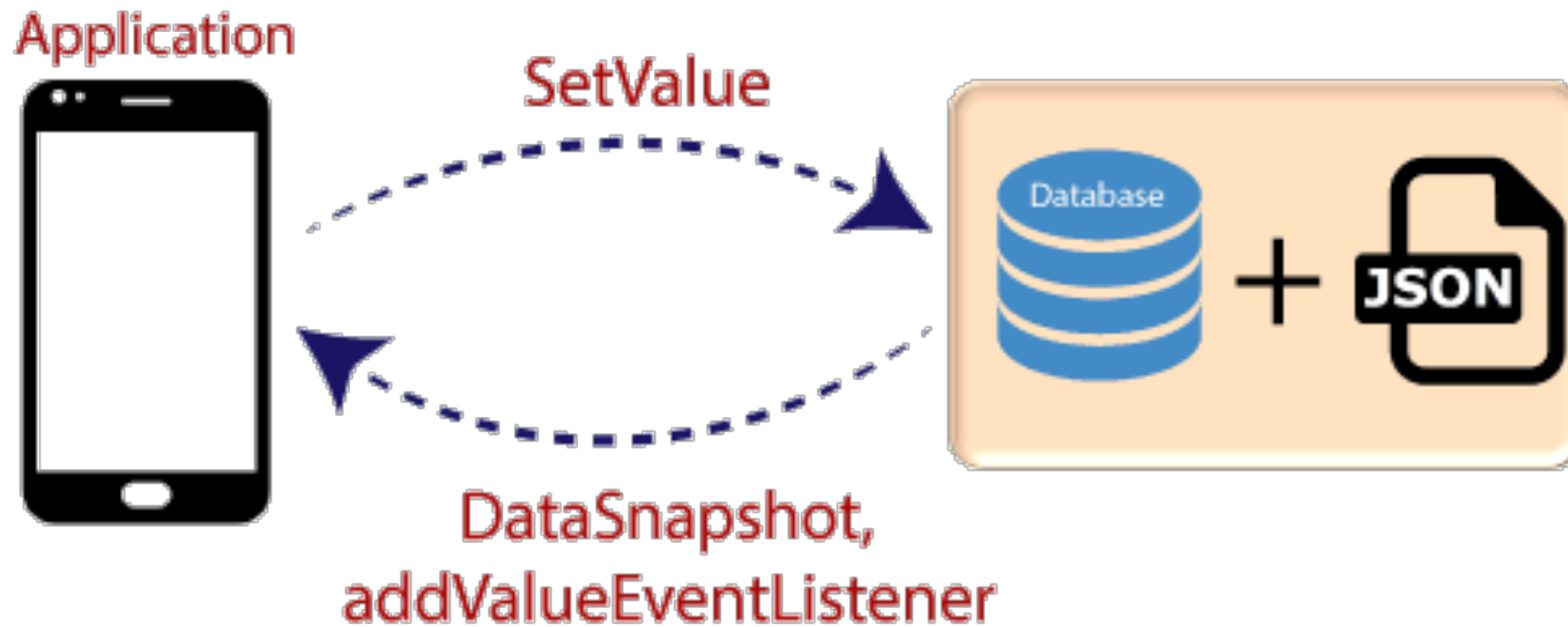
function onBtnClick(event) {
    set(ref(db, 'LED_STATUS'), 'ON');
    console.log("LED ON");
}

function offBtnClick() {
    set(ref(db, 'LED_STATUS'), 'OFF');
    console.log("LED OFF");
}

const dbRef = ref(db, 'LED_STATUS');
onValue(dbRef, (snapshot) => {
    console.log(snapshot.val());
    OUT_TEXT.innerText = 'LED is ' + snapshot.val();
})
```

# Firestore 안드로이드 DB 이벤트

## Firestore Read & Write





# Firestore 안드로이드 DB 값 변화 이벤트

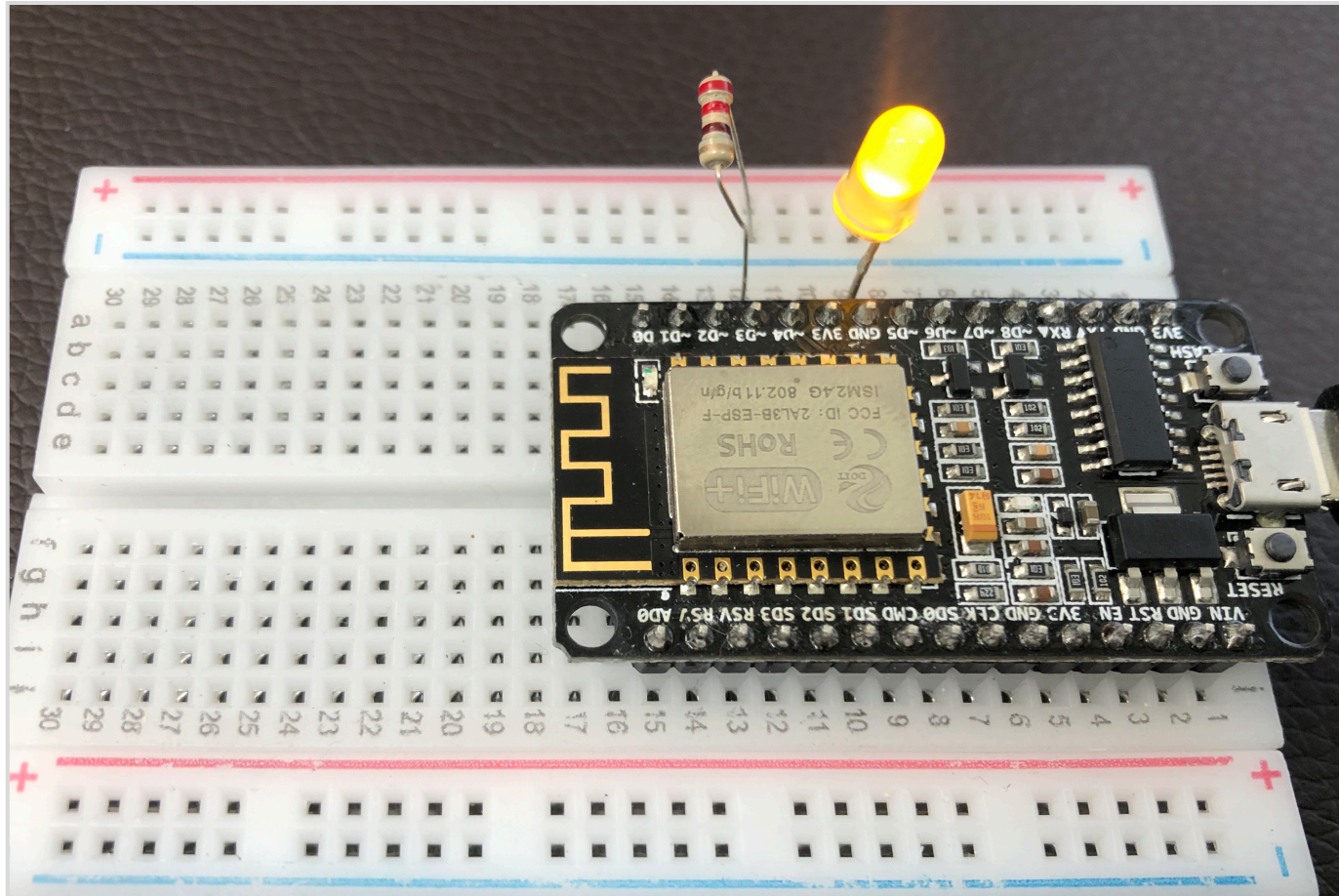
```
FirebaseDatabase.getInstance();  
DatabaseReference myRef = database.getReference("LED_STATUS");  
  
myRef.addValueEventListener (new ValueEventListener () {  
    @Override  
    public void onDataChange(@NonNull DataSnapshot dataSnapshot) {  
        String ledState = dataSnapshot.getValue (String.class);  
        textView.setText ("LED is " + ledState);  
    }  
    @Override  
    public void onCancelled(@NonNull DatabaseError databaseError) {  
    }  
});
```

# Firestore 안드로이드 DB write 이벤트

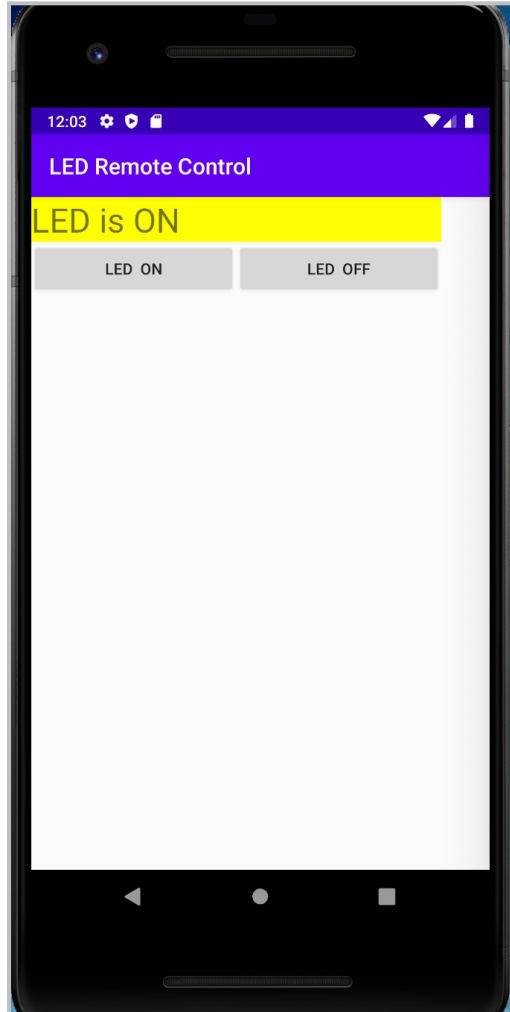
```
// DB에 "ON" 값 write
onButton.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View view) {
        textView.setBackgroundColor(Color.YELLOW);
        // write to the Database
        myRef.setValue("ON");
    }
})
```

```
// DB에 "OFF" 값 write
onButton.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View view) {
        textView.setBackgroundColor(Color.GREEN);
        // write to the Database
        myRef.setValue("OFF");
    }
})
```

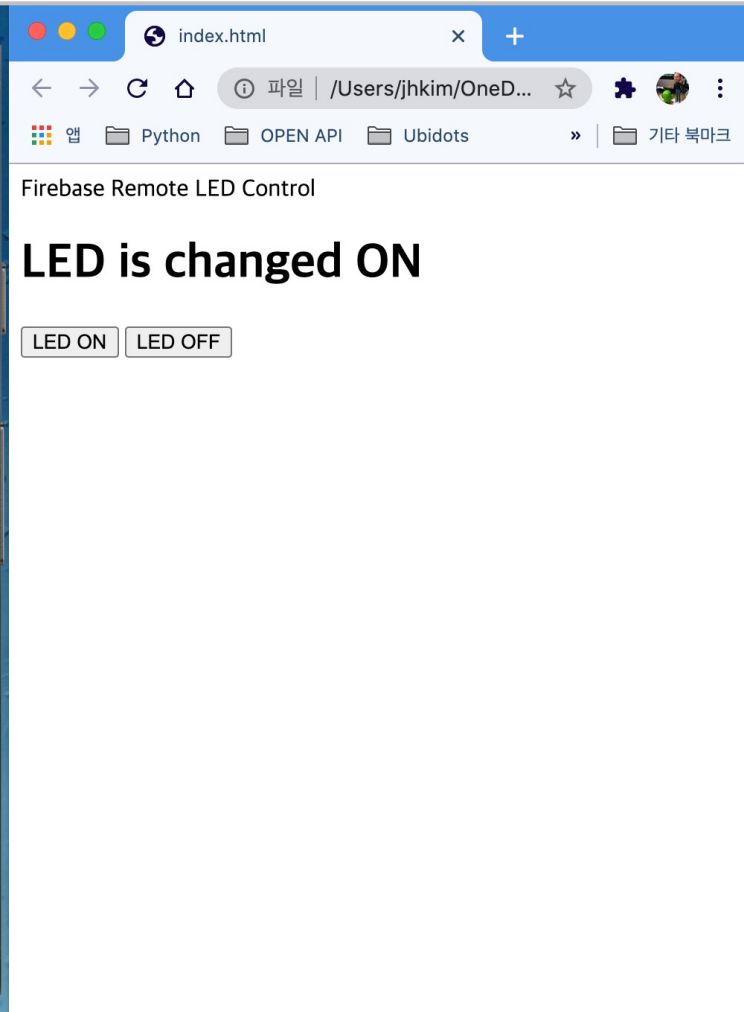
# IoT 디바이스 : NodeMCU 12E



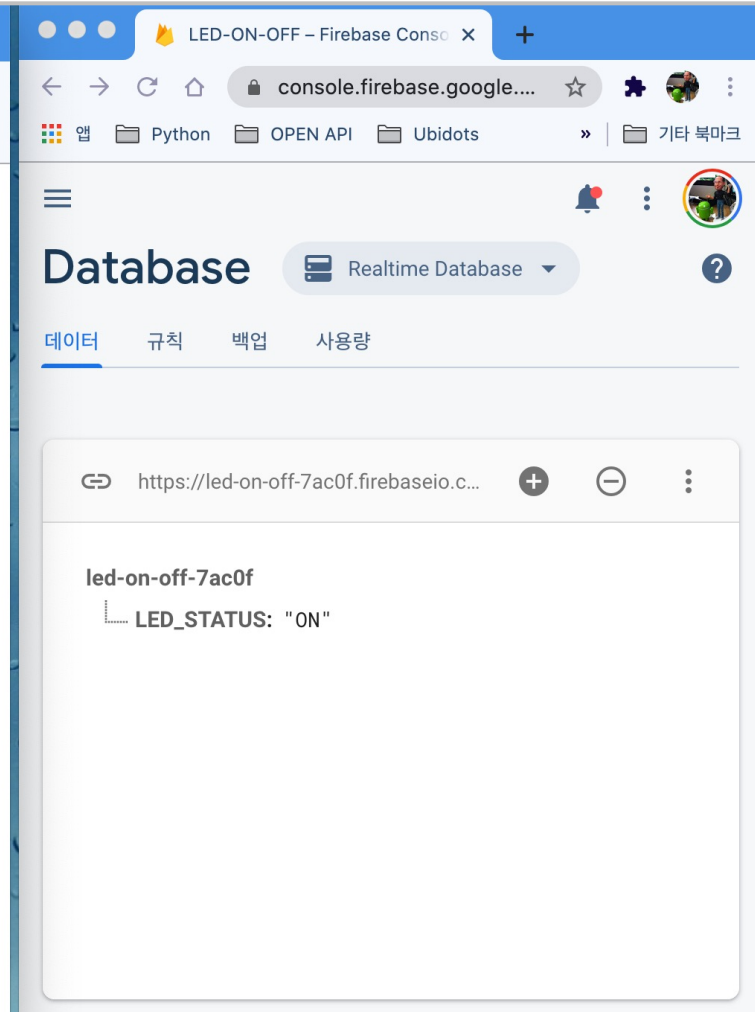
# LED ON 이벤트



<안드로이드 앱>

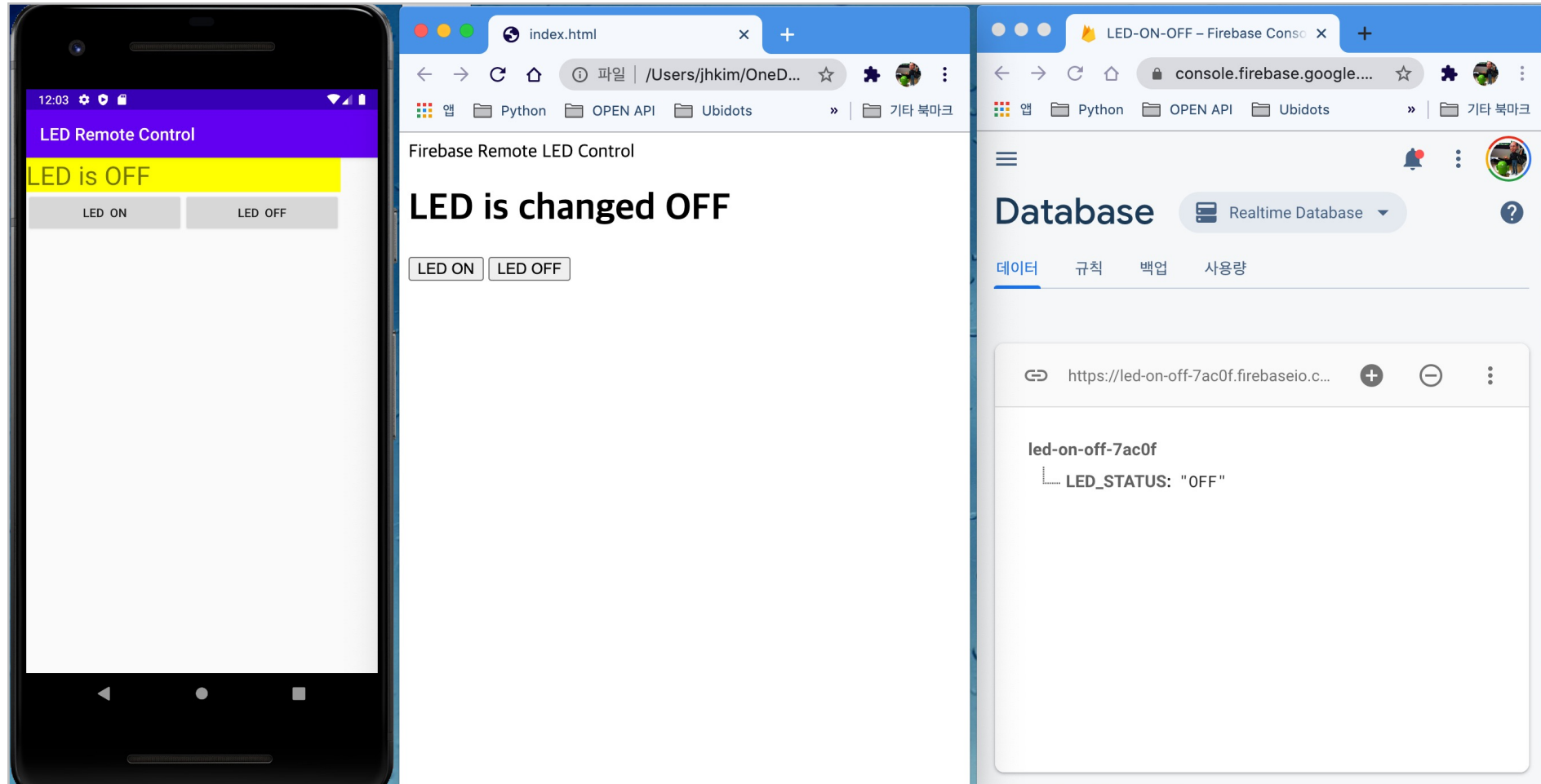


<웹 앱>



<Firebase 데이터베이스>

# LED OFF 이벤트

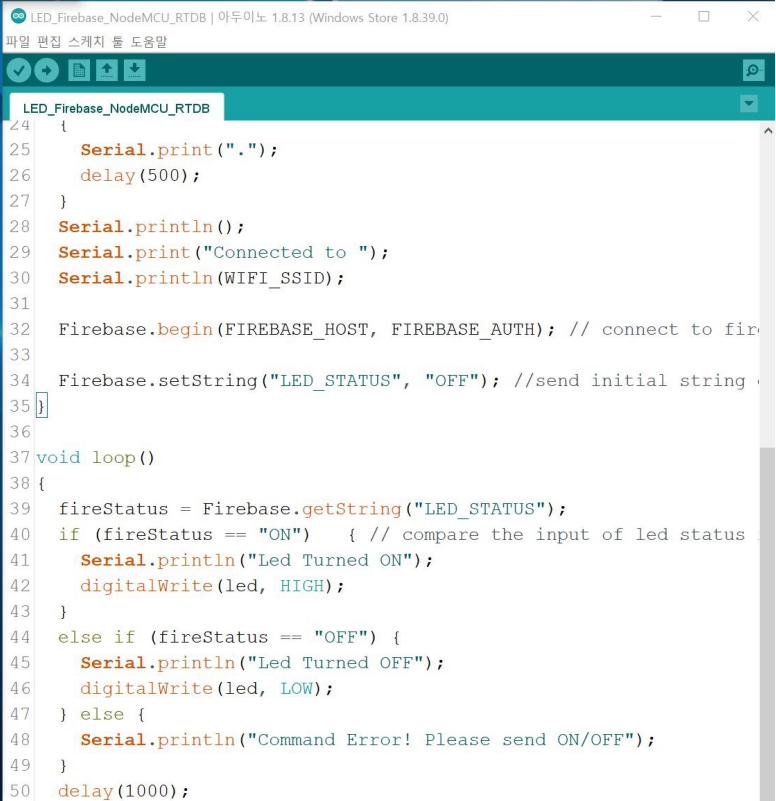
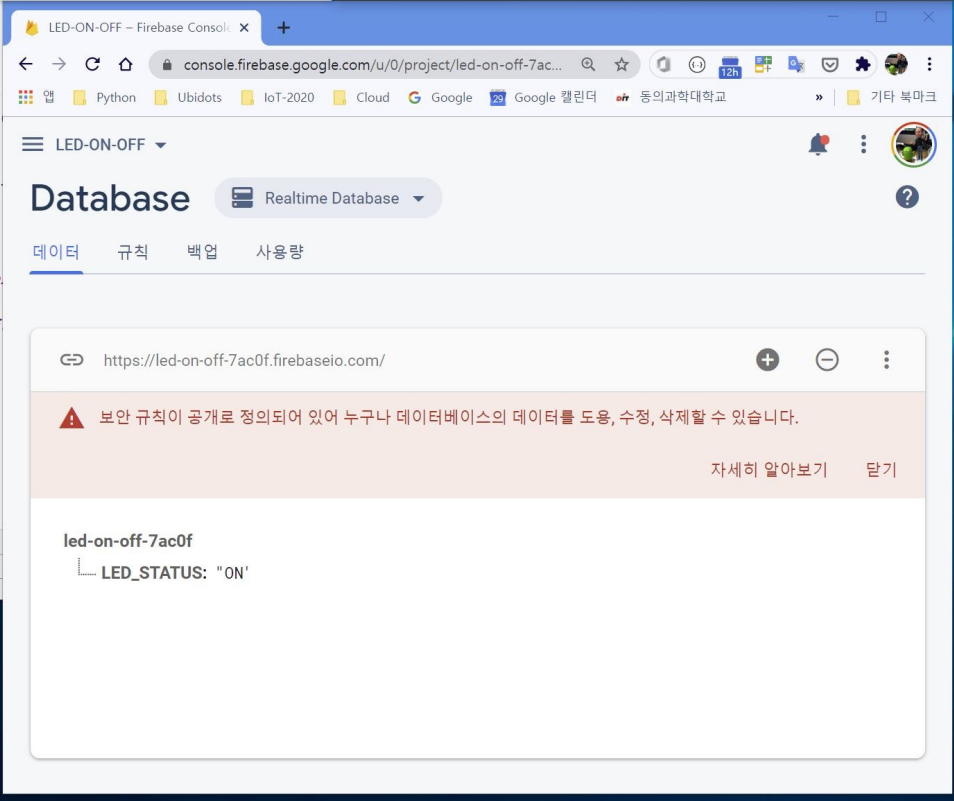
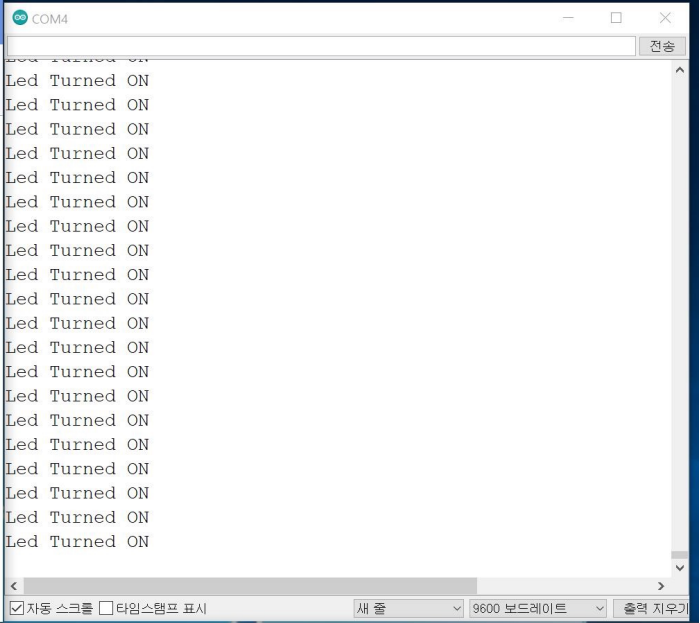
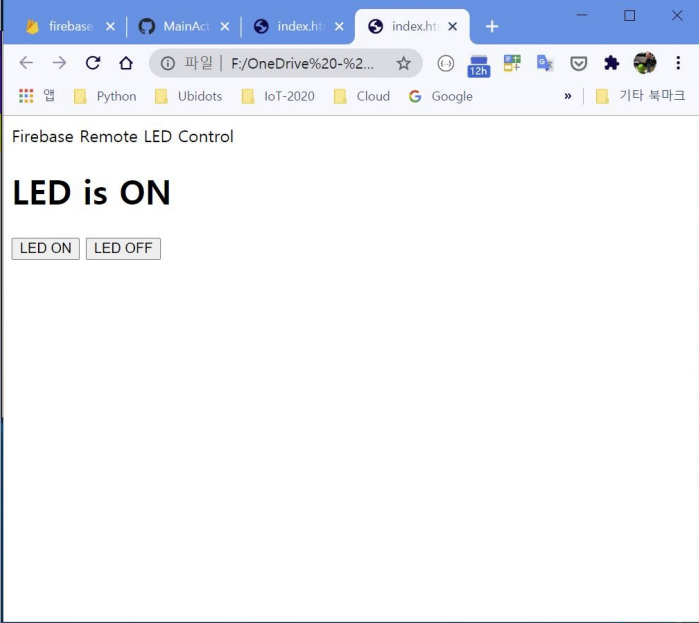
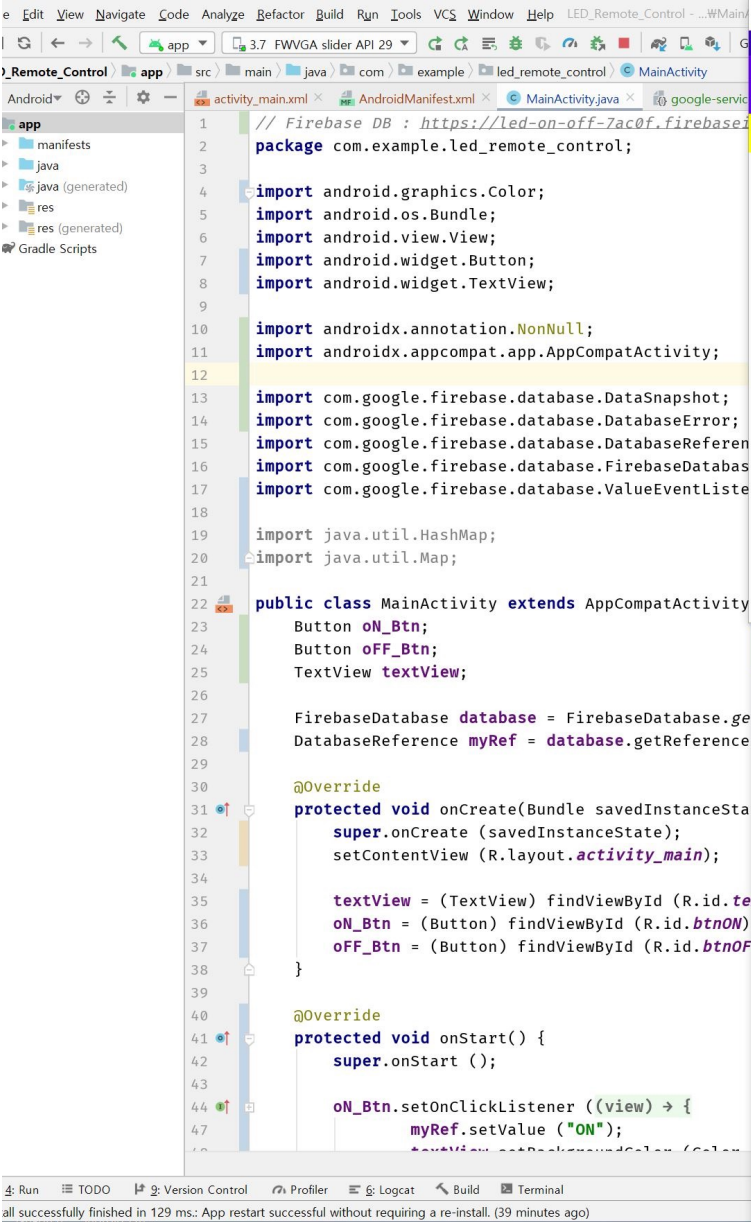


<안드로이드 앱>

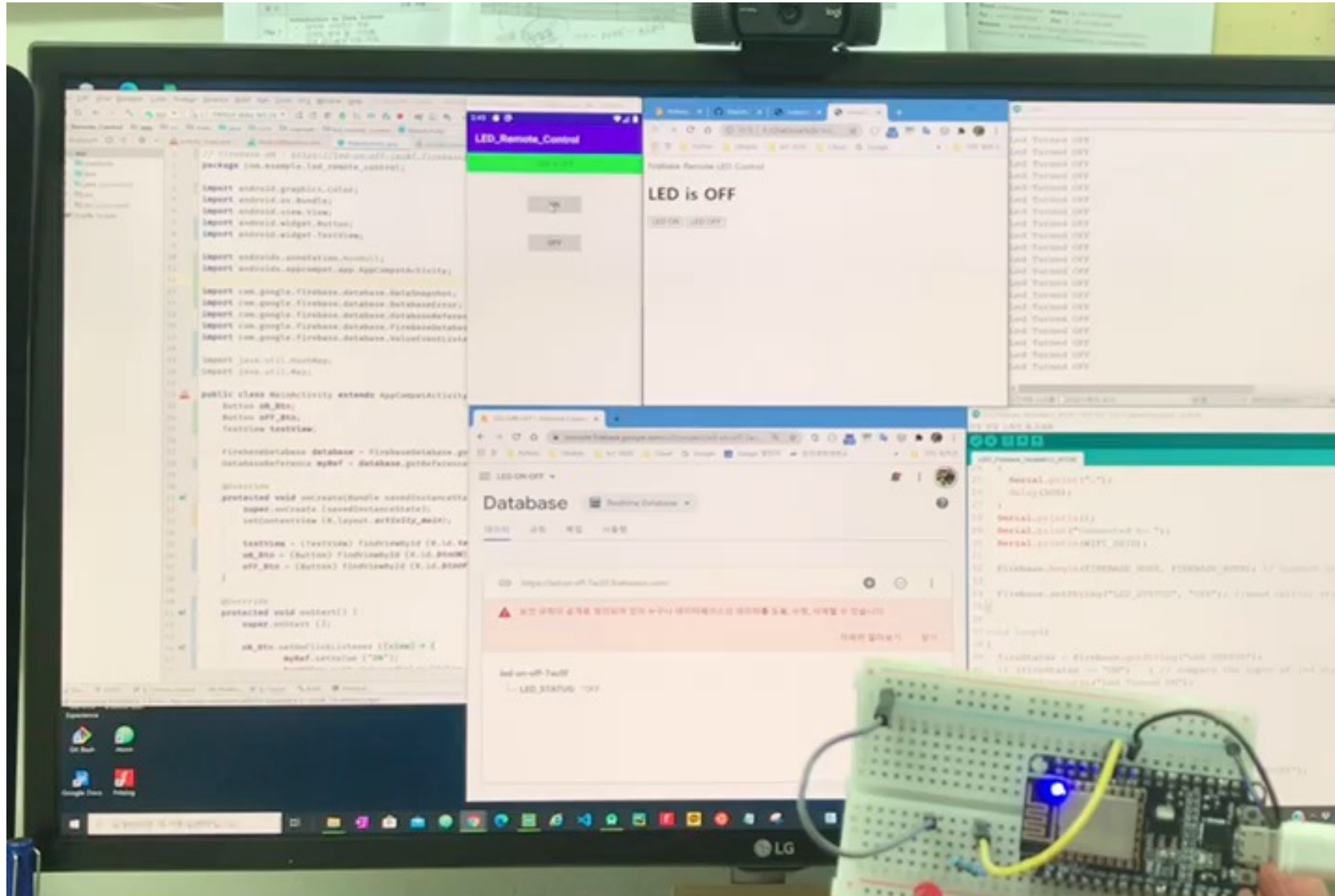
<웹 앱>

<Firebase 데이터베이스>





# 작동 동영상



# 소스 코드 참고

- JavaScript WebApp

- [https://github.com/DIT-IoT-Cloud-2021-2/Source/tree/main/LED\\_Control\\_FB\\_WebApp](https://github.com/DIT-IoT-Cloud-2021-2/Source/tree/main/LED_Control_FB_WebApp)

- 안드로이드

- [https://github.com/DIT-IoT-Cloud-2021-2/Source/tree/main/LED\\_Control\\_FB\\_Android](https://github.com/DIT-IoT-Cloud-2021-2/Source/tree/main/LED_Control_FB_Android)



# 기말과제

- 배운 수업 내용을 공부하여 Remote LED ON/OFF (1)웹 앱, (2) 안드로이드 앱을 Firebase Relatime Database와 연동하도록 제작하시오.
- 웹 앱과 안드로이드 앱의 UI를 CSS, Bootstrap, JavaScript, image 등을 사용하여 직관적이고 편리하도록 제작하시오.
  - 예 : UI에 light 이미지 활용

