



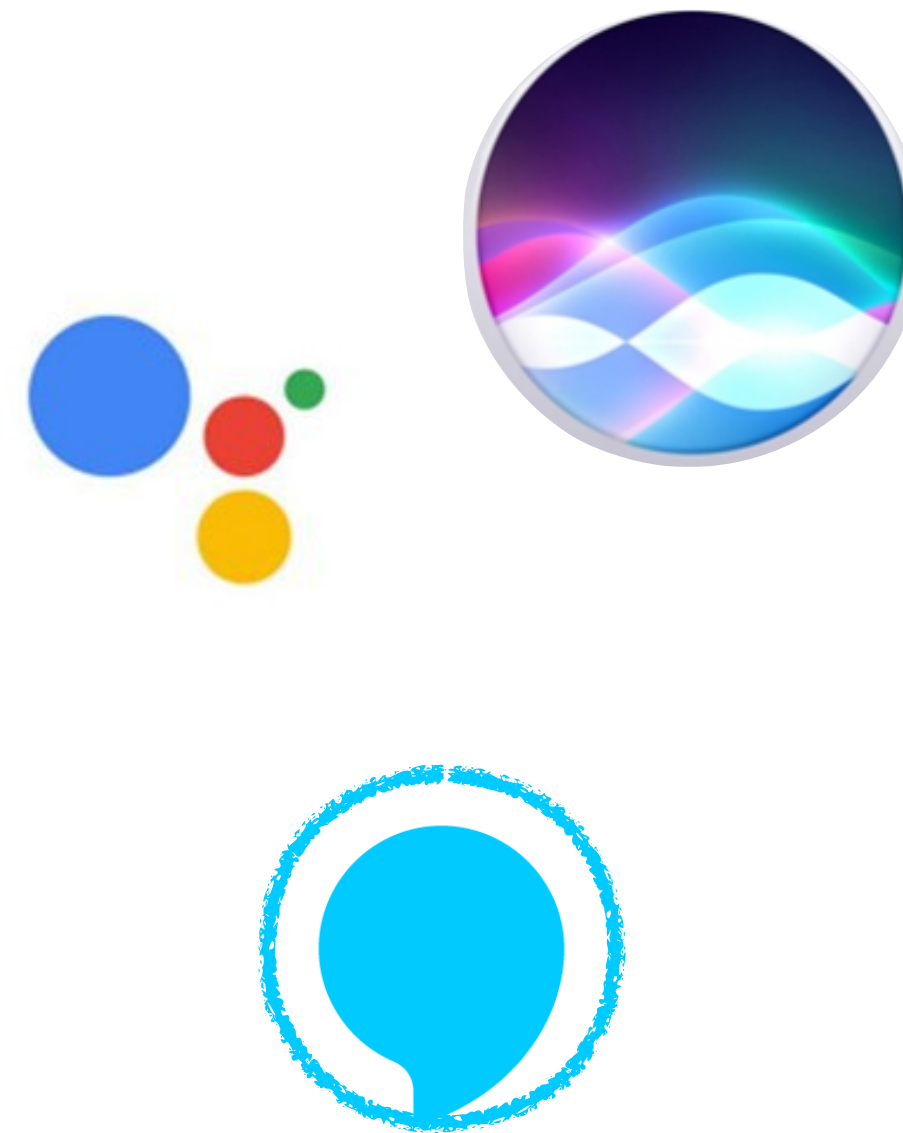
CLOVA

Voice Assistant

Edge Application
권문범 / 김민섭

Voice Assistant

- 앞 다뤄 시를 서비스에 적용
- 다양한 AI assistant
 - Siri
 - Google Assistant
 - Alexa



Voice Assistant

- 아쉬운 VA
 - 플랫폼의 한계
 - 구현 난이도
 - 낮은 한국어 인식률

Voice Assistant

- Clova

- 다양한 플랫폼 지원
- 쉬운 구현 난이도
- 높은 한국어 인식률



Voice Assistant

- CLOVA VA
 - State 패턴
 - Card list 구현
- Line VA
 - Packaging
 - 기능 별 결과 타입
- VA 연동 시연



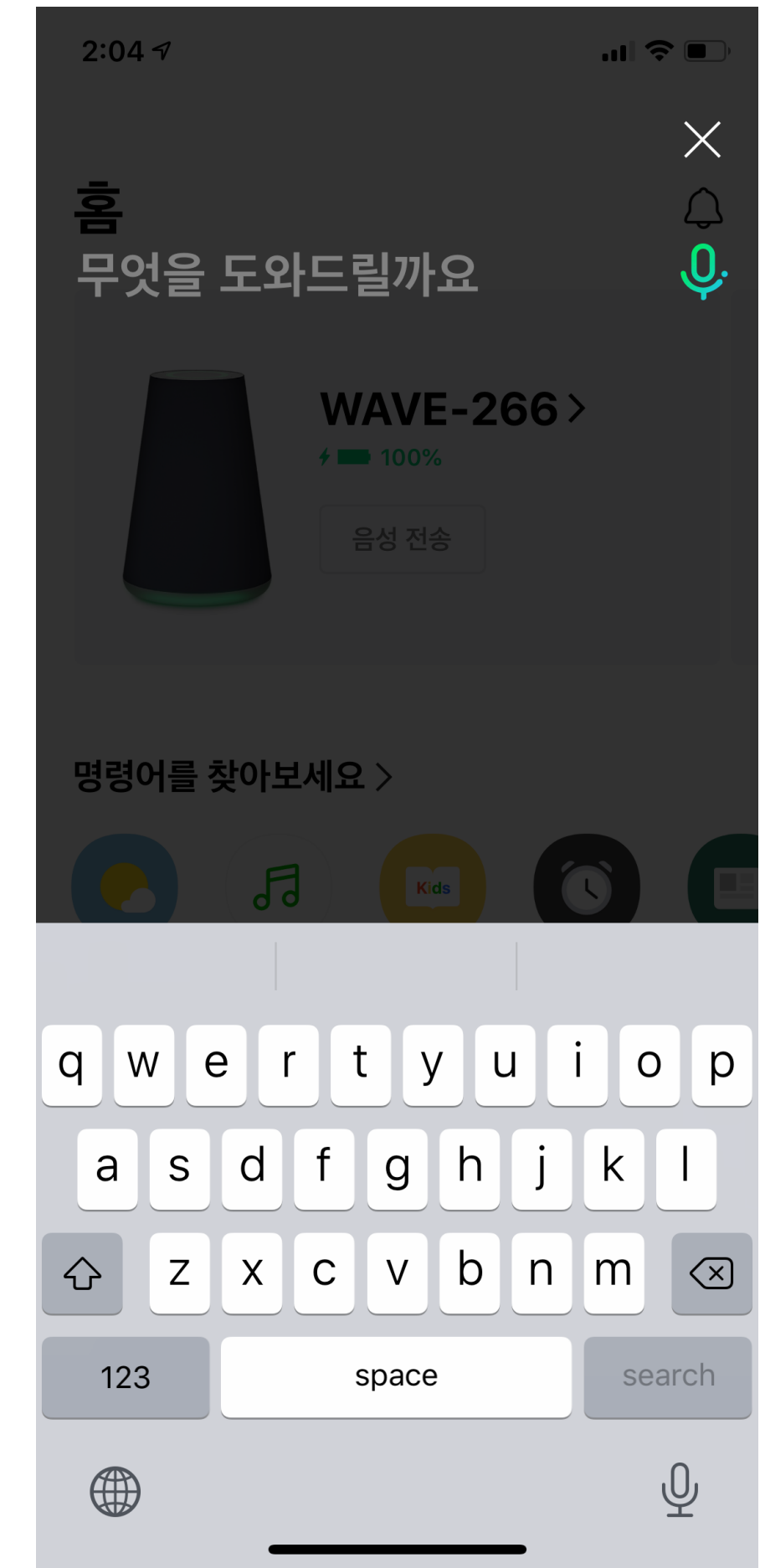
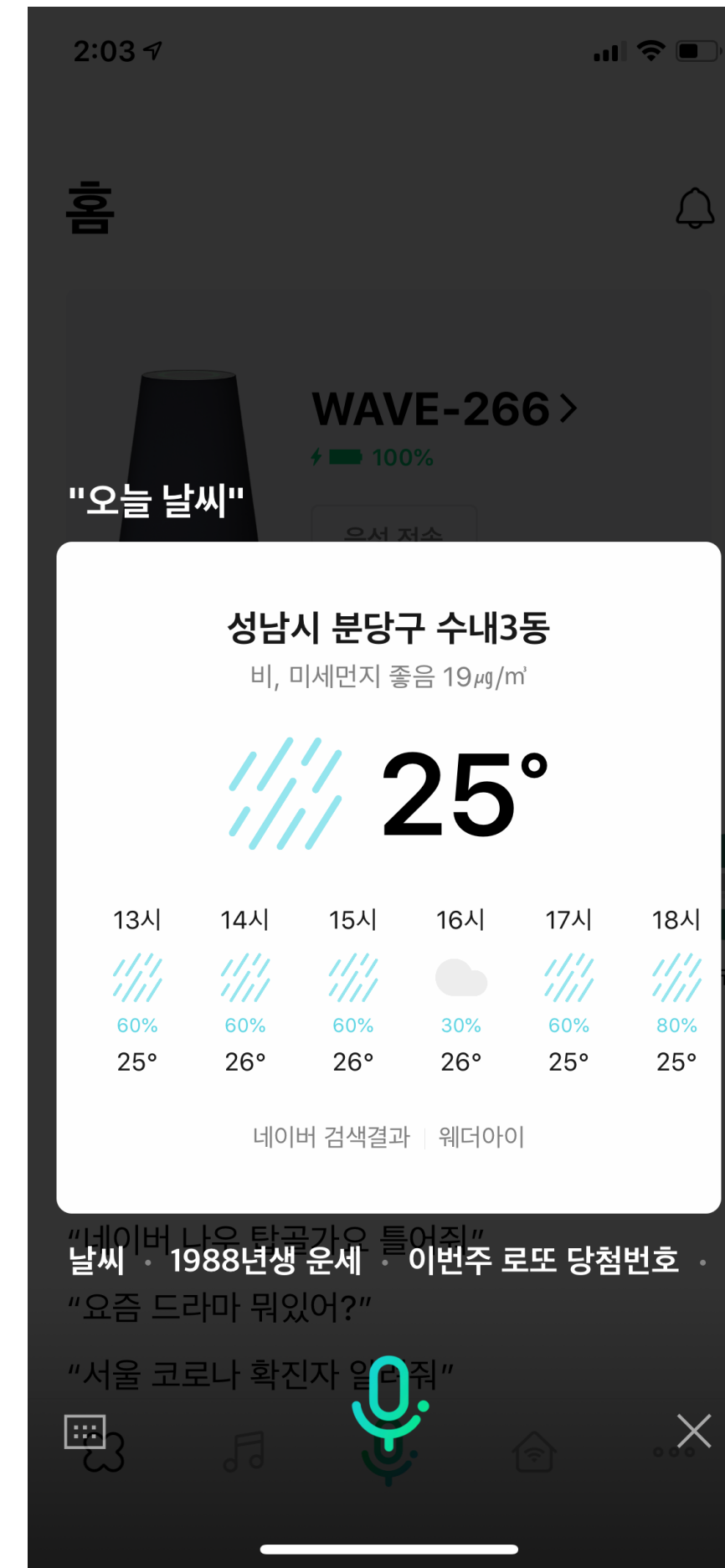
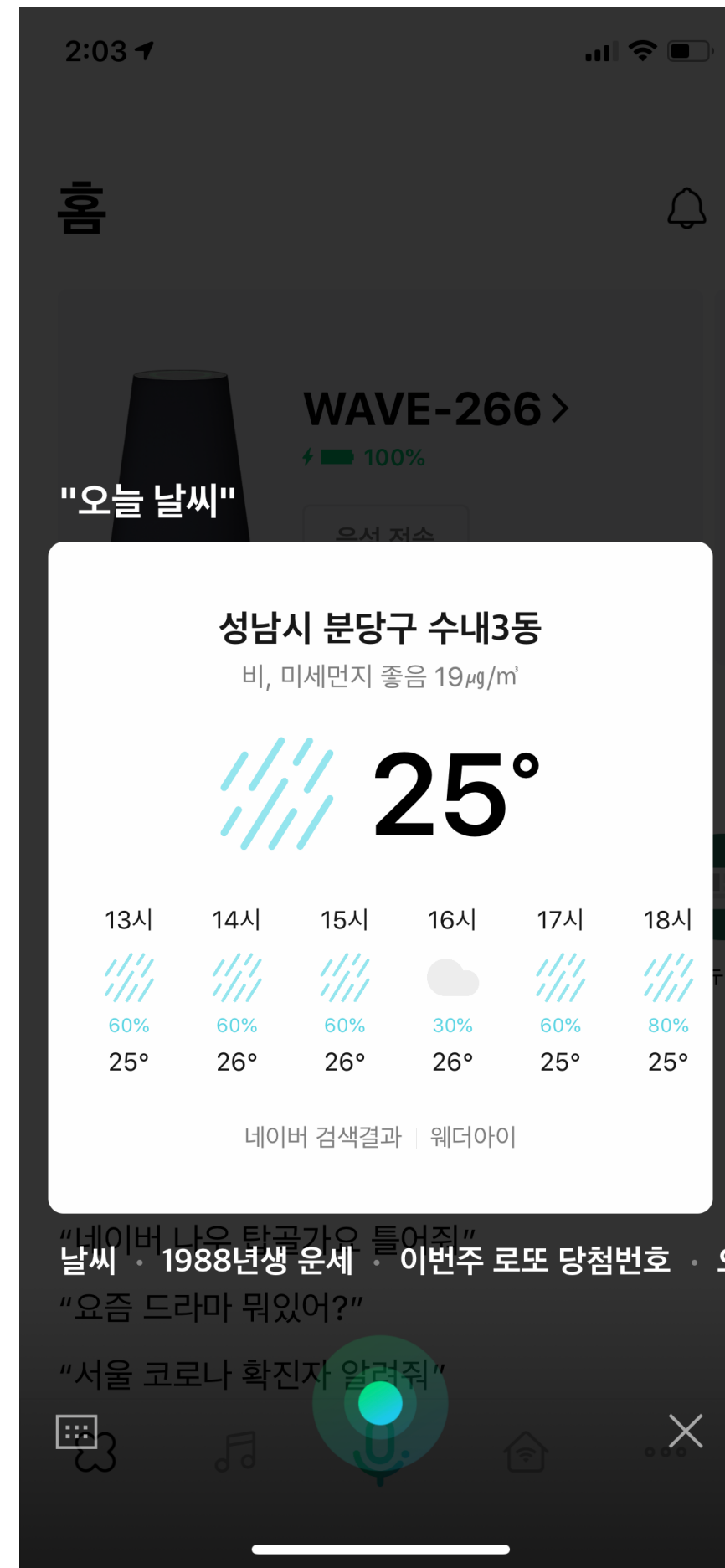
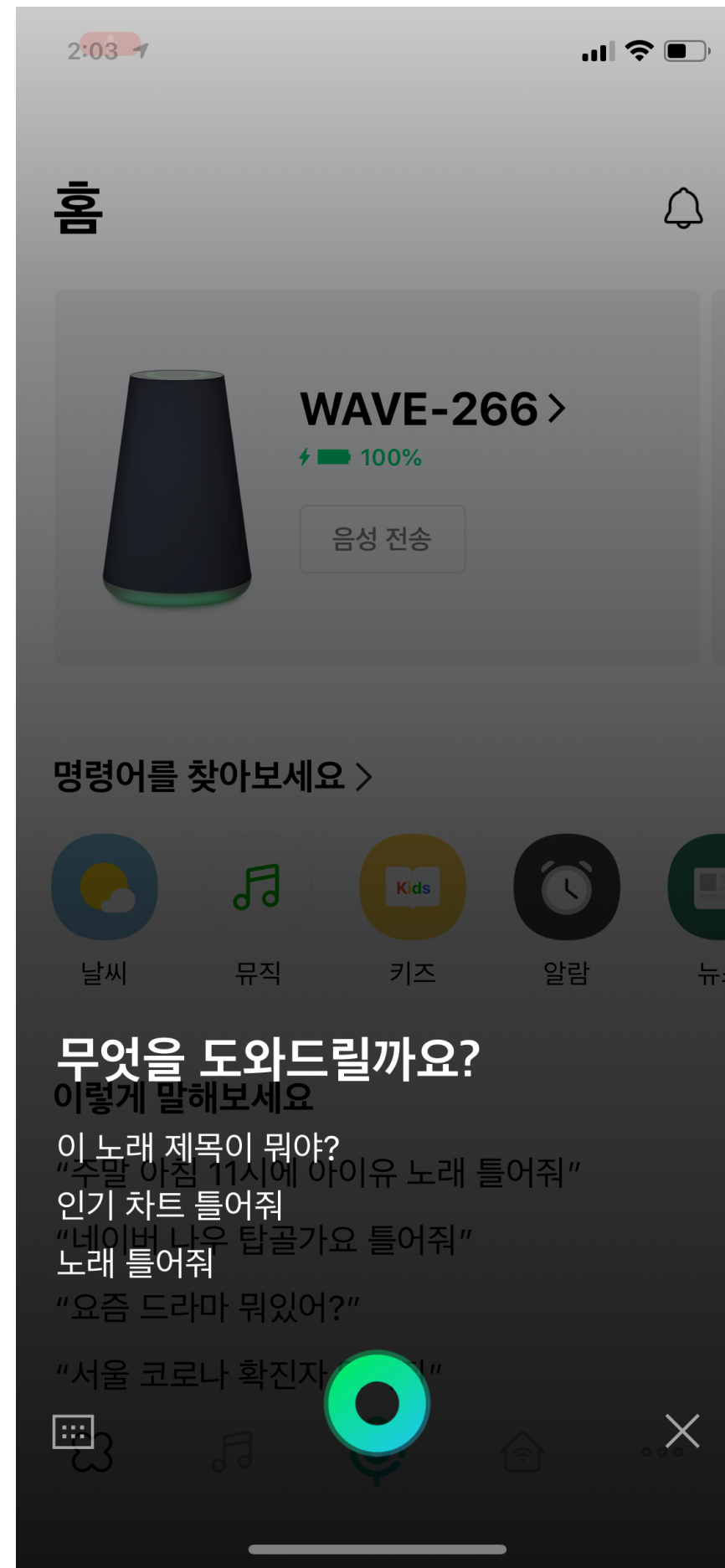
CLOVA VA

CLOVA VA

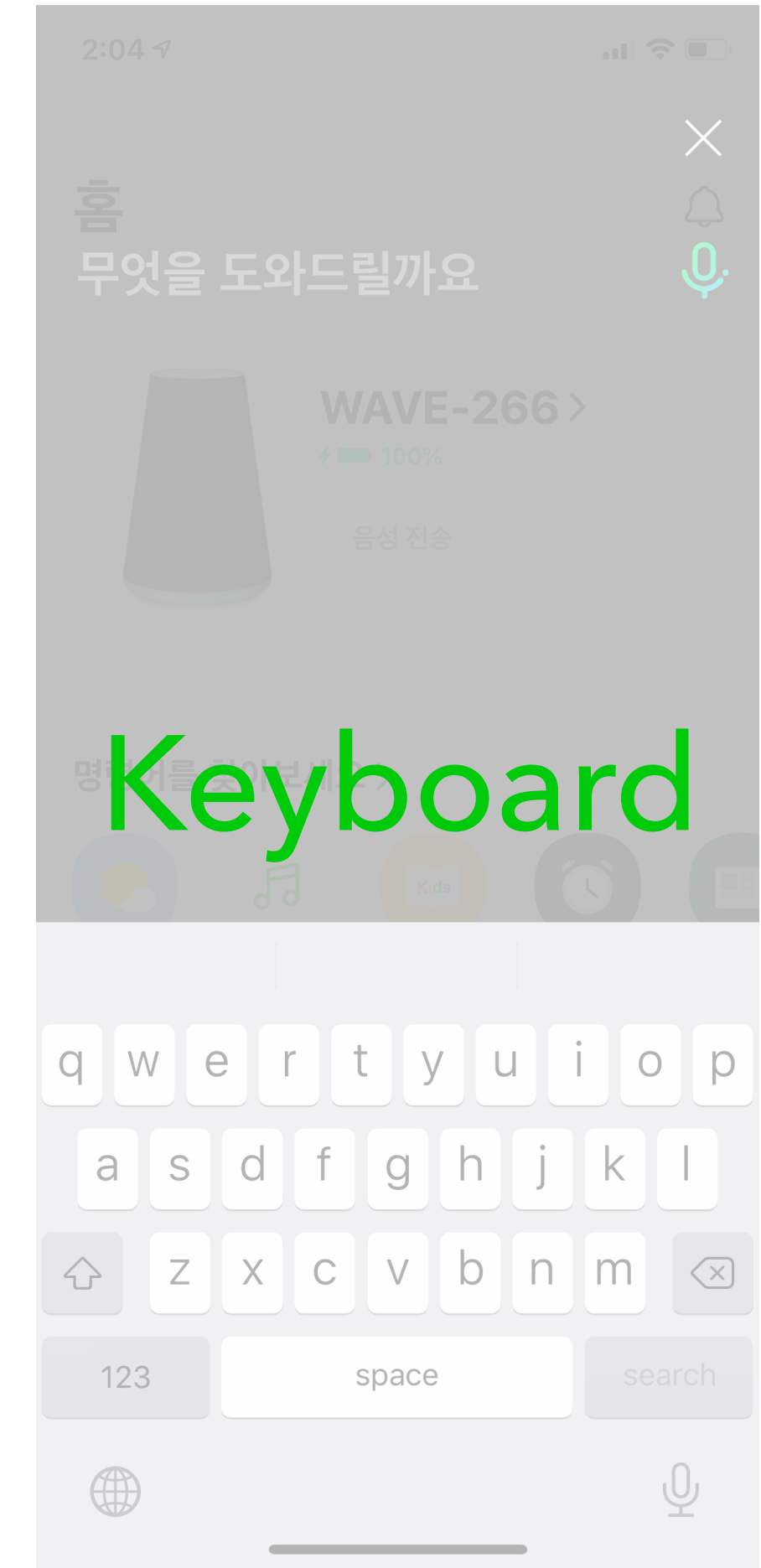
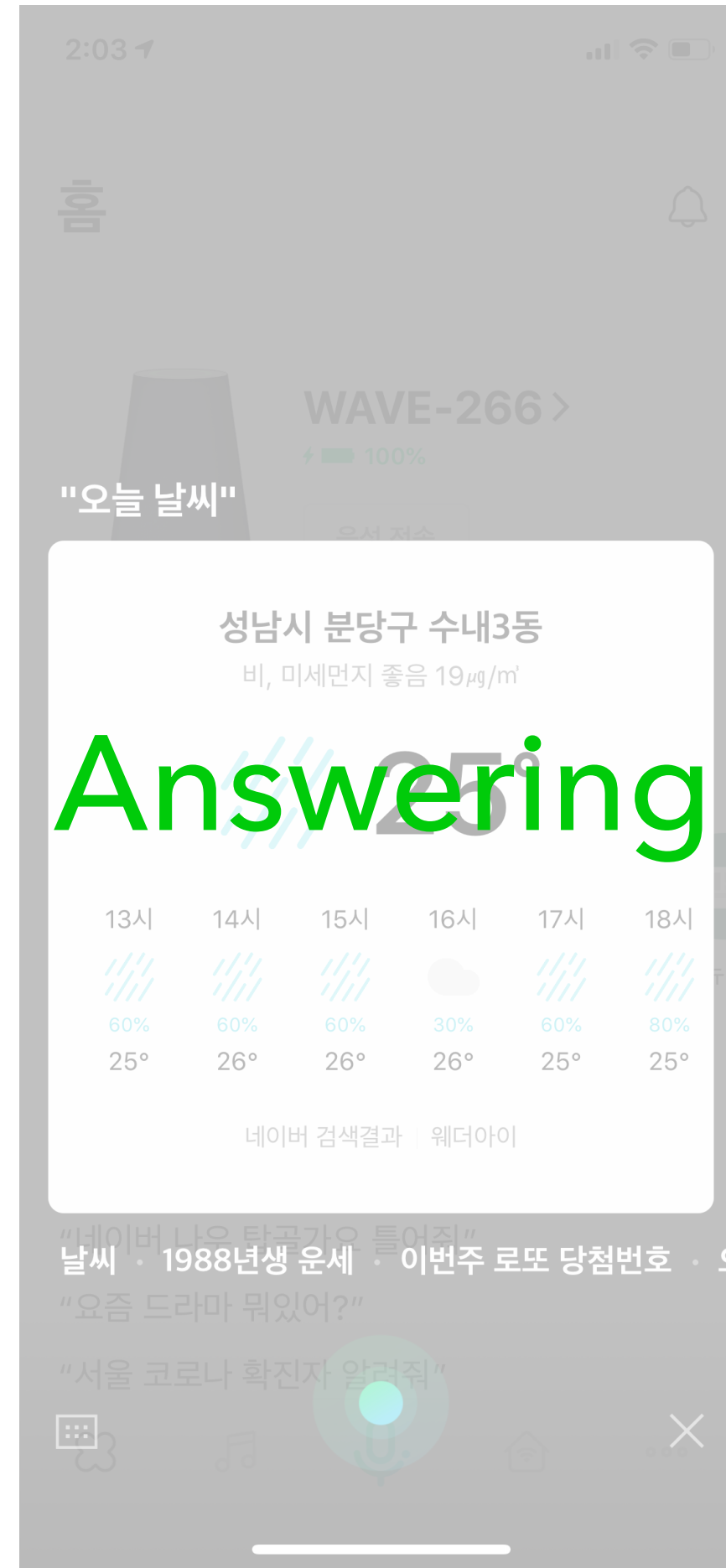
- 발화 입력
 - 음성인식
 - 키보드 입력
 - 추천 검색어
- 정보 안내
 - 정보 : 날씨, 주변맛집, 교통정보
 - 콘텐츠 : 영화, 음악, 뉴스, 오디오북
 - 스마트홈 : 기기 제어



State 패턴



State 패턴



State 패턴

Detecting



DETECTING STATE

Answering



ANSWERING STATE

Idle



IDLE STATE

Keyboard



KEYBOARD STATE

State 패턴

DETECTING STATE

ANSWERING STATE

IDLE STATE

KEYBOARD STATE

```
public enum LineVoiceAssistantViewStatus {  
    case intro  
    case idle(error: Error?)  
    case connecting  
    case detecting  
    case error(error: Error)  
    case guide  
    case processing(keyword: LineVoiceAssistantKeyword?, smParam: String?)  
    case result(keyword: LineVoiceAssistantKeyword, smParam: String?)  
    case keyboard  
    case close  
}
```

State 패턴

Transition

DETECTING STATE

Transition

ANSWERING STATE

Transition

IDLE STATE

Transition

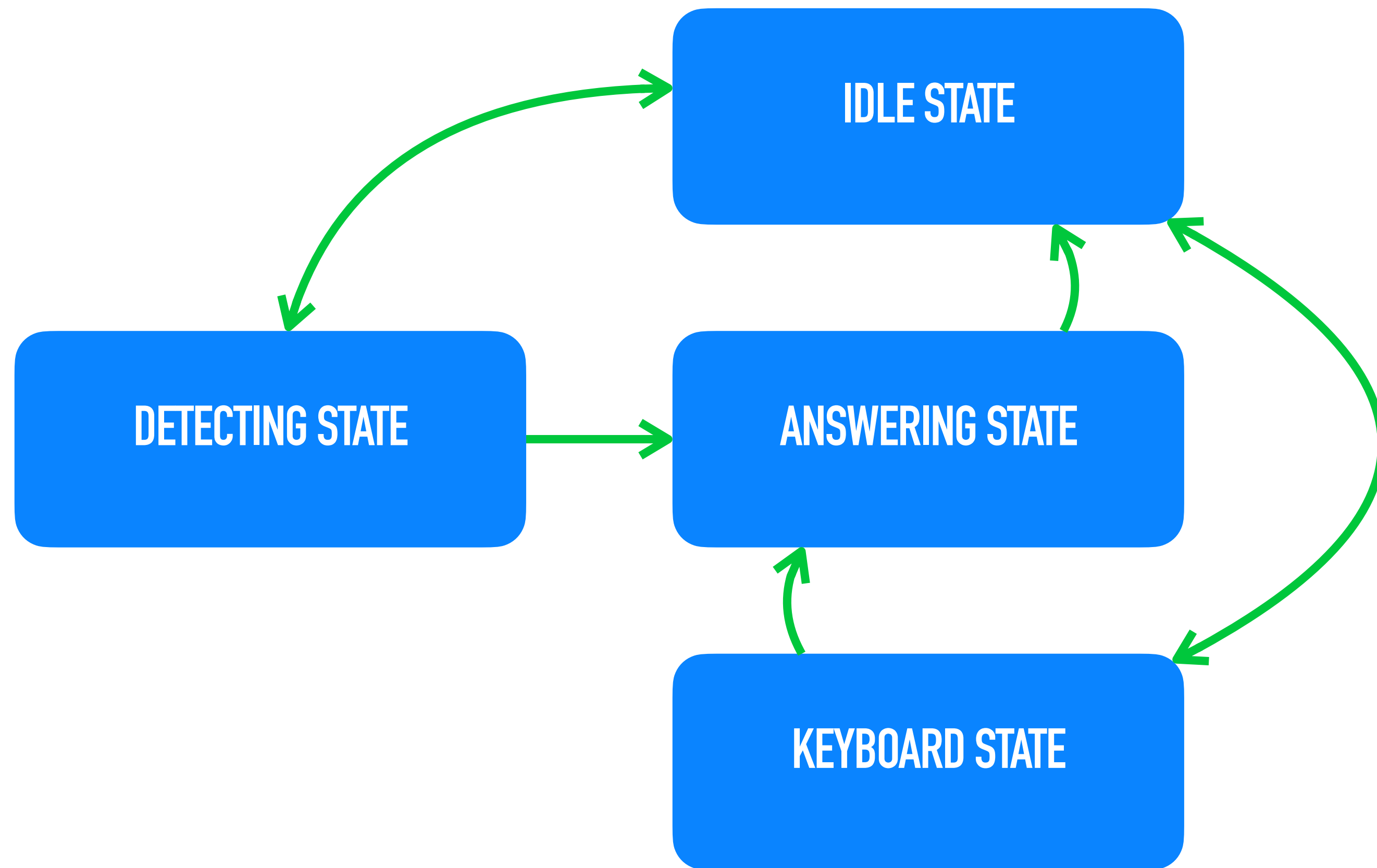
KEYBOARD STATE

```
struct IdleContentTransition: LineVoiceAssistantContentTransition {
    func animate(lineVoiceAssistant: LineVoiceAssistantViewController, animate: Bool) -> TimeInterval {
        let duration = animate ? 0.63 : 0.0
        lineVoiceAssistant.showStatusBar()

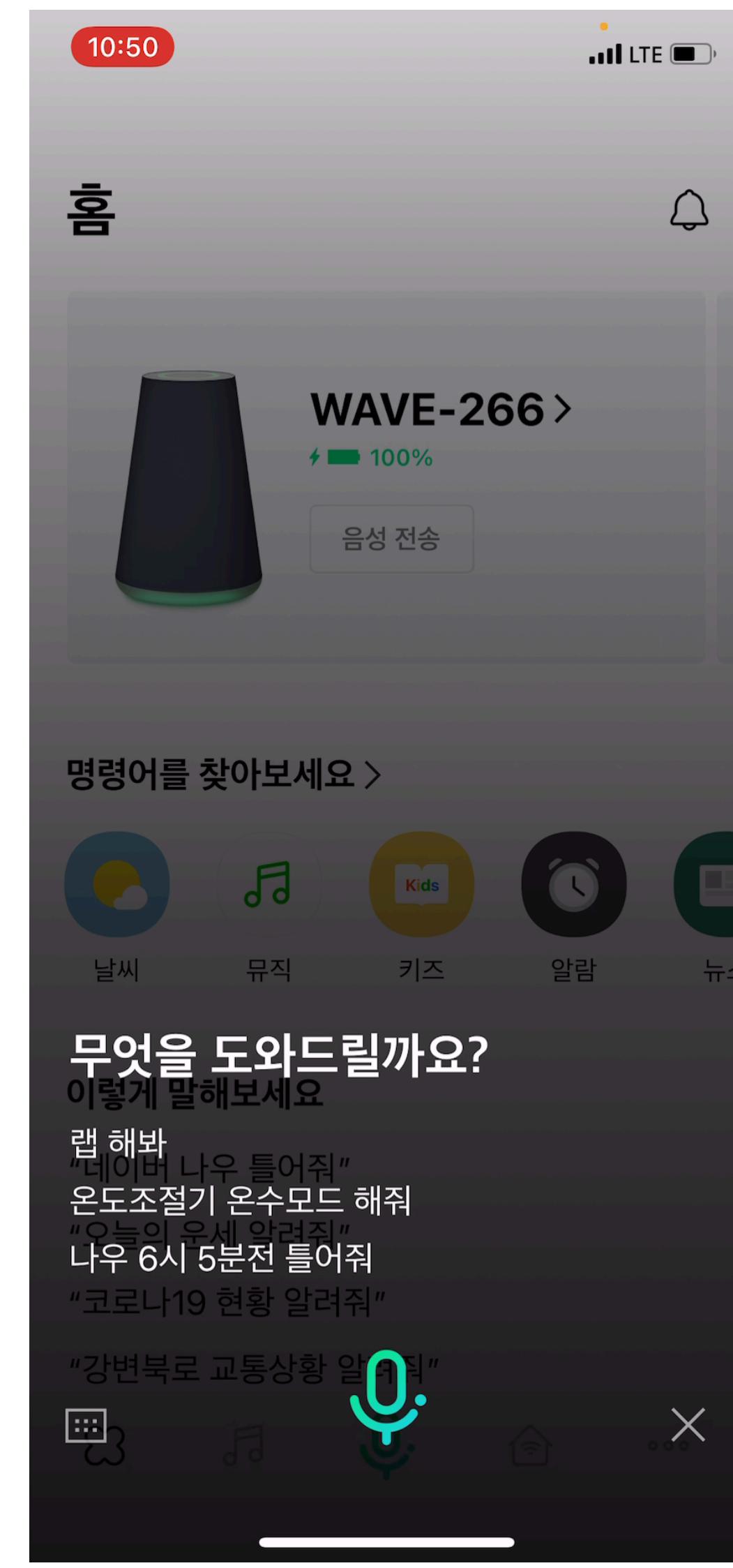
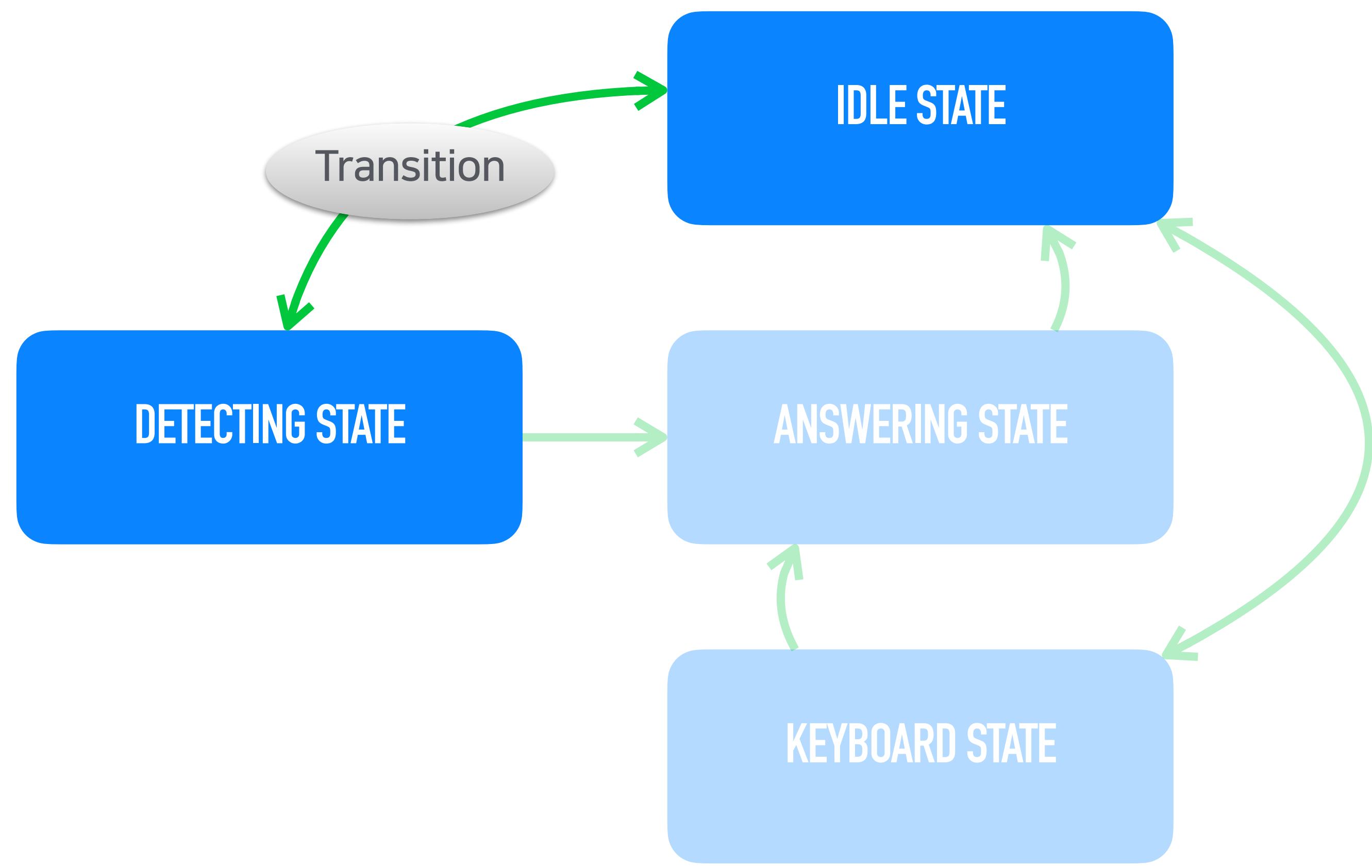
        // 애니메이션 코드 동작
        UIView.animate(duration, withDelay: 0, animations: {
        }, timingFunction: .easeOutQuint, completion: nil)
        return duration
    }

    func handleTopGesture(lineVoiceAssistant: LineVoiceAssistantViewController,
                          direction: LineVoiceAssistantViewController.TopHandleGesture.Direction,
                          animate: Bool) {
        // 제스처에 따른 다음 State 선택
        switch direction {
        case .up:
            lineVoiceAssistant.set(status: .guide, animate: animate, byGesture: true)
        case .down:
            lineVoiceAssistant.set(status: .close, animate: animate, byGesture: true)
        }
    }
}
```

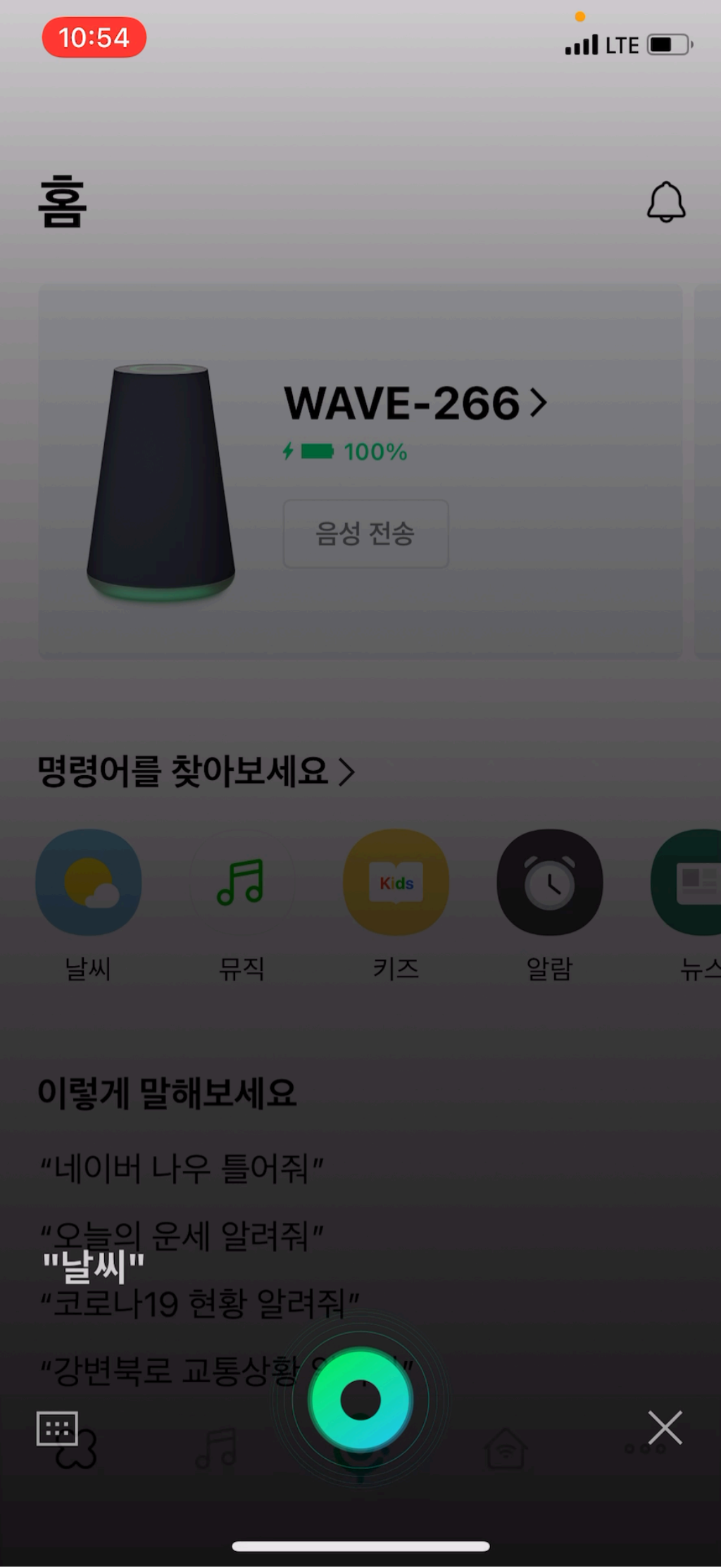
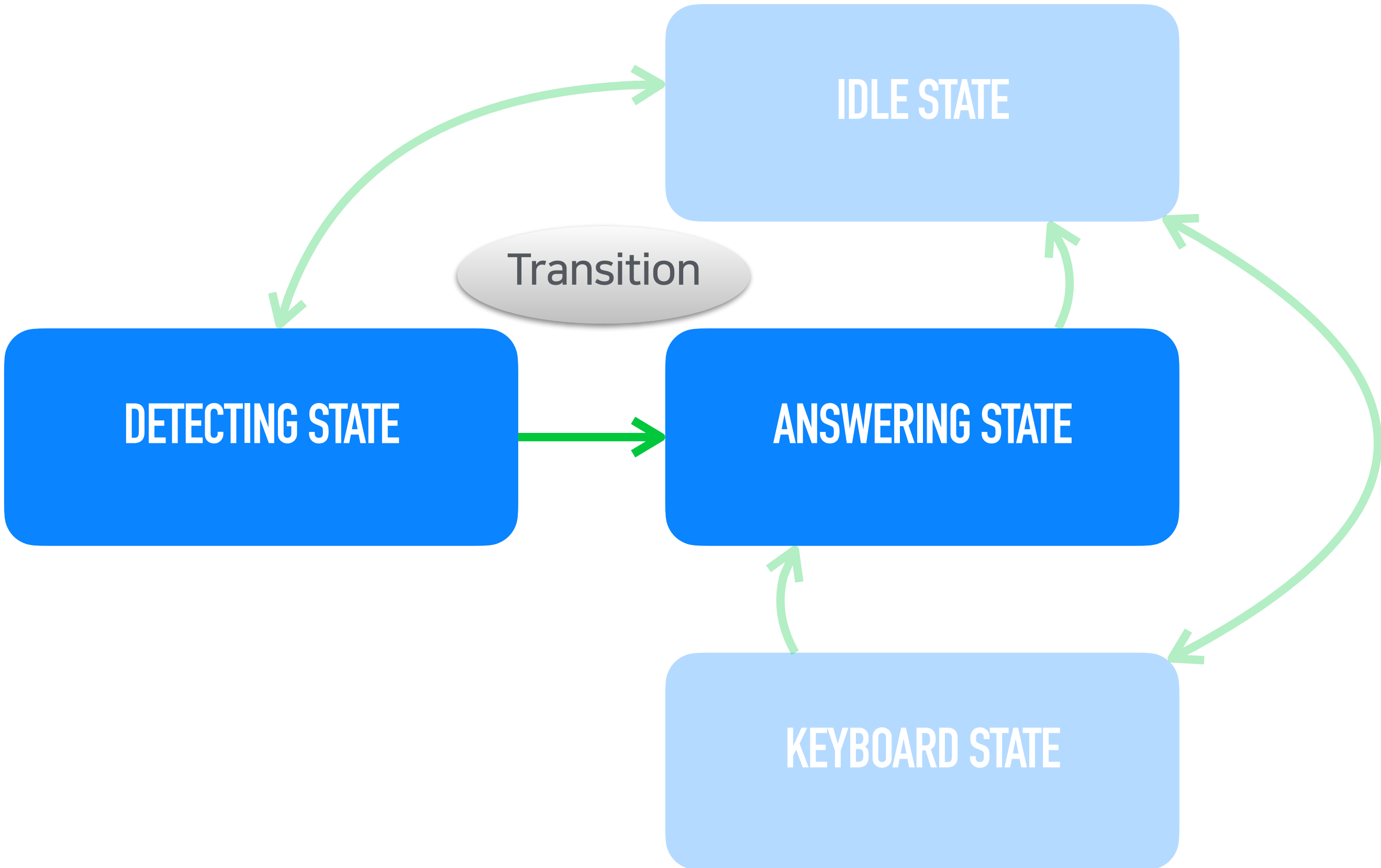
State 패턴



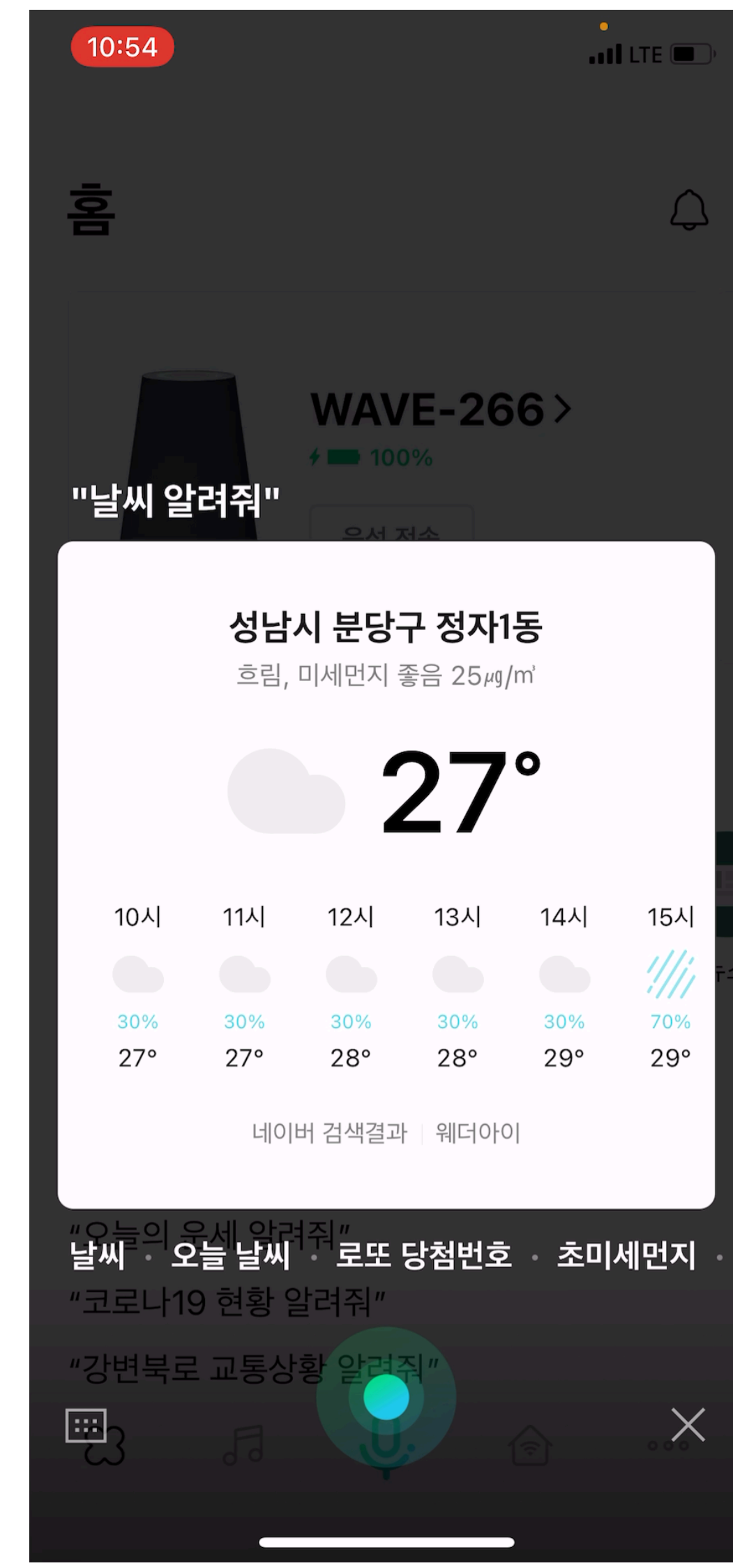
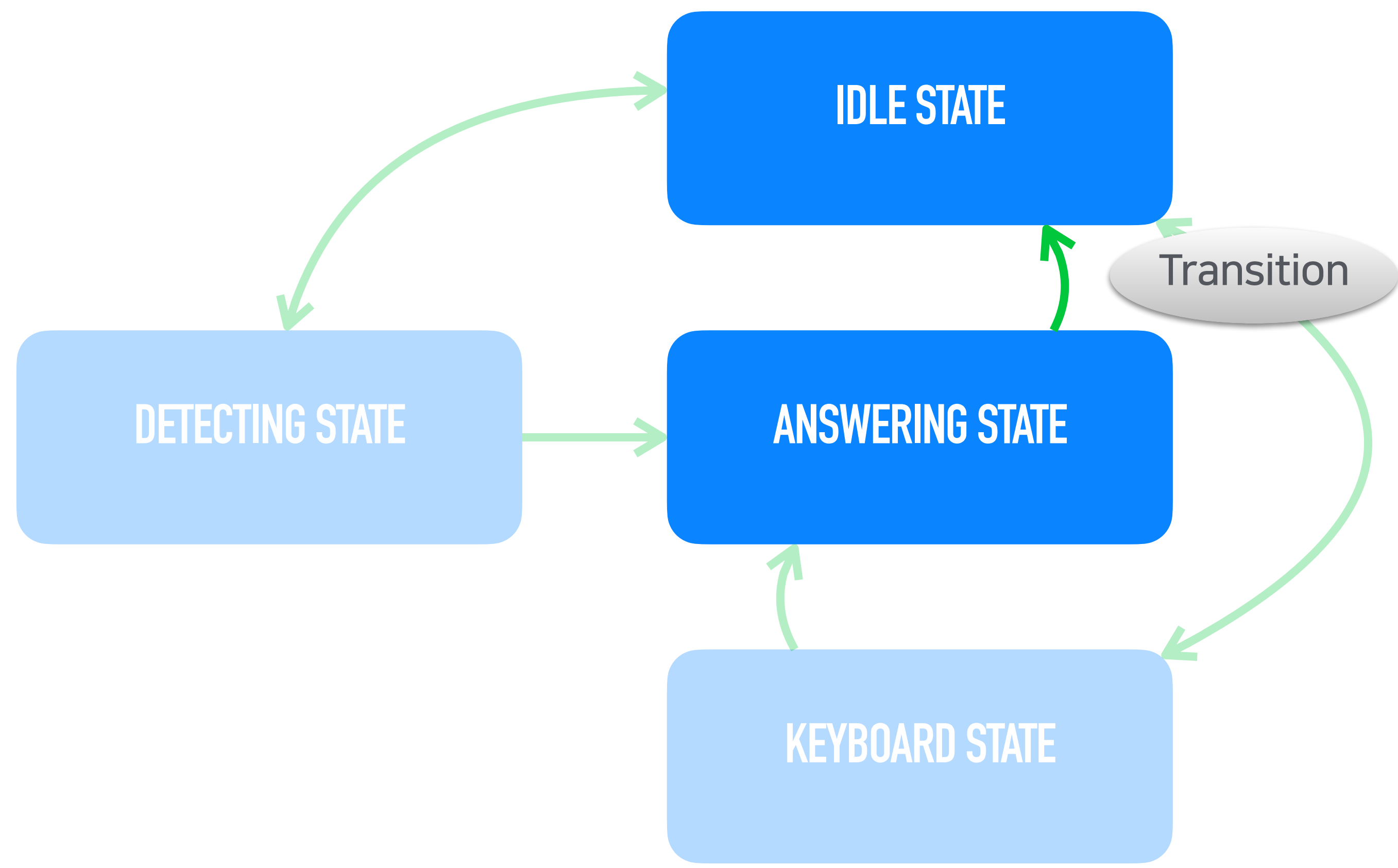
State 패턴



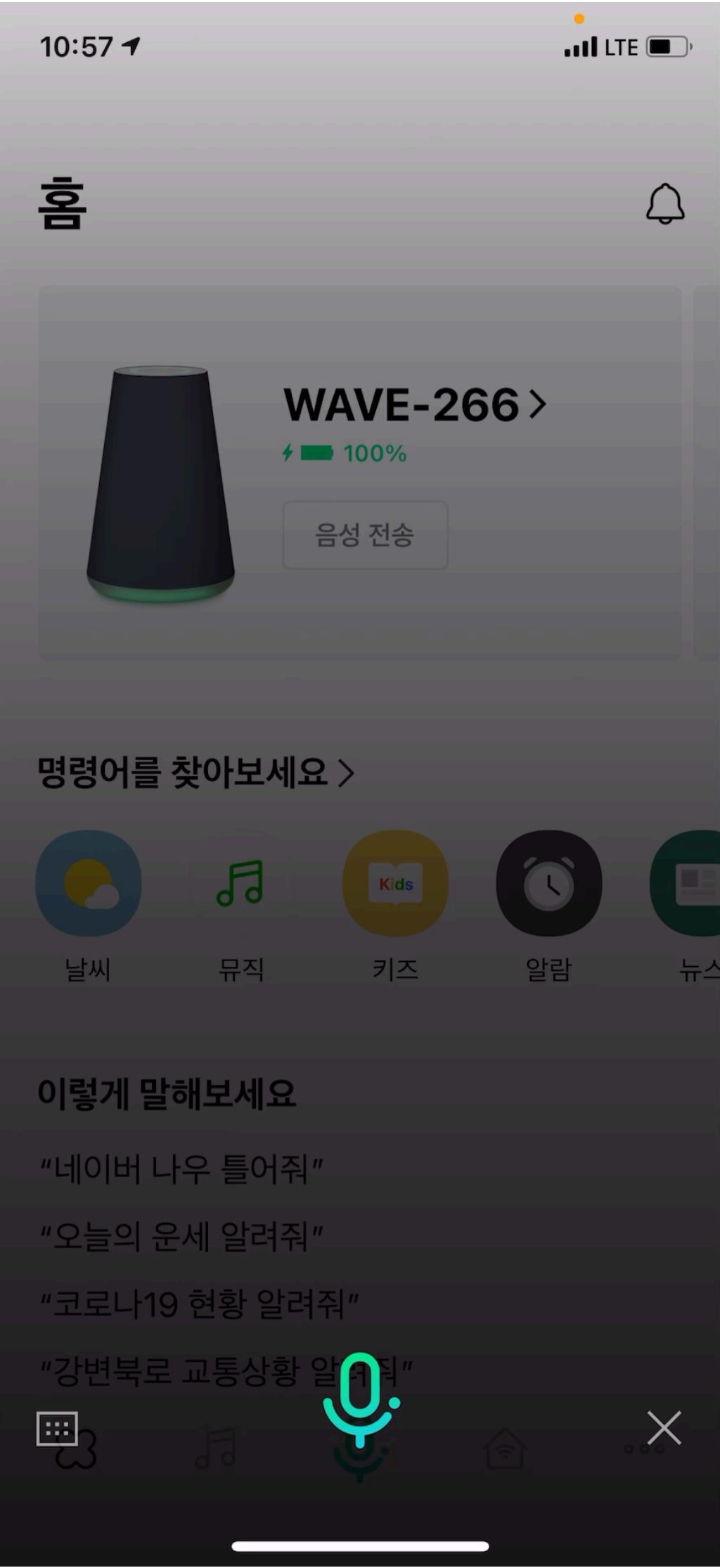
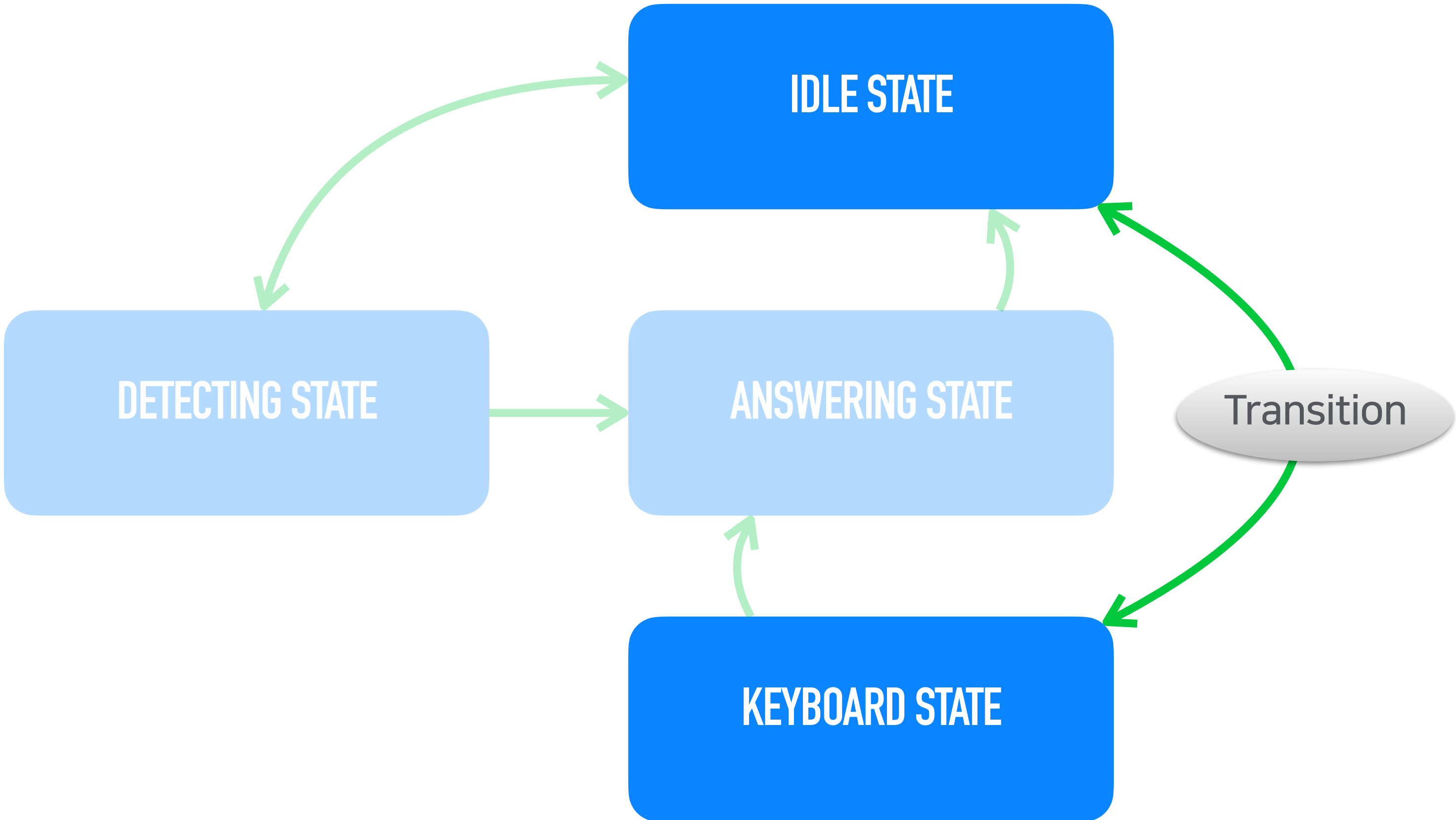
State 패턴



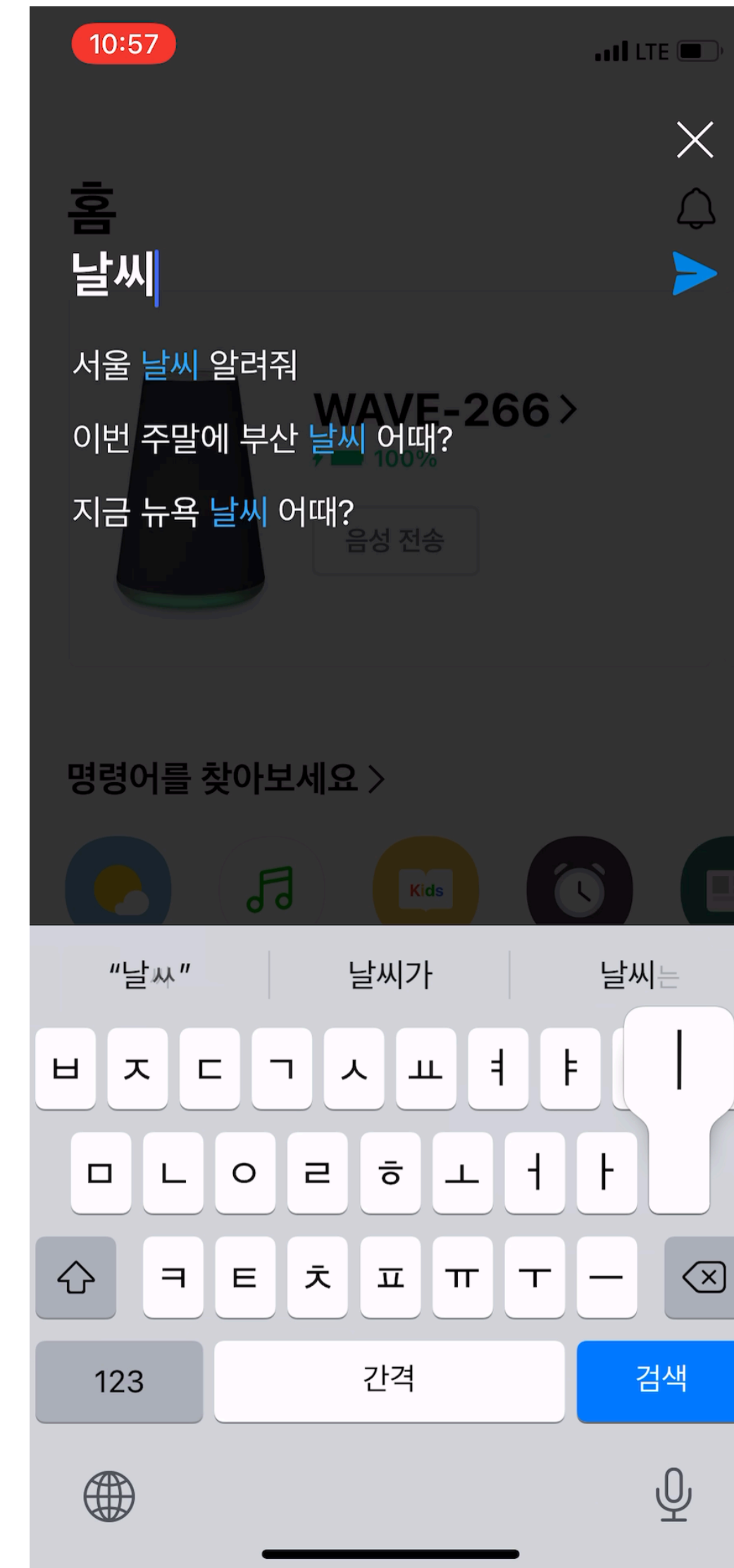
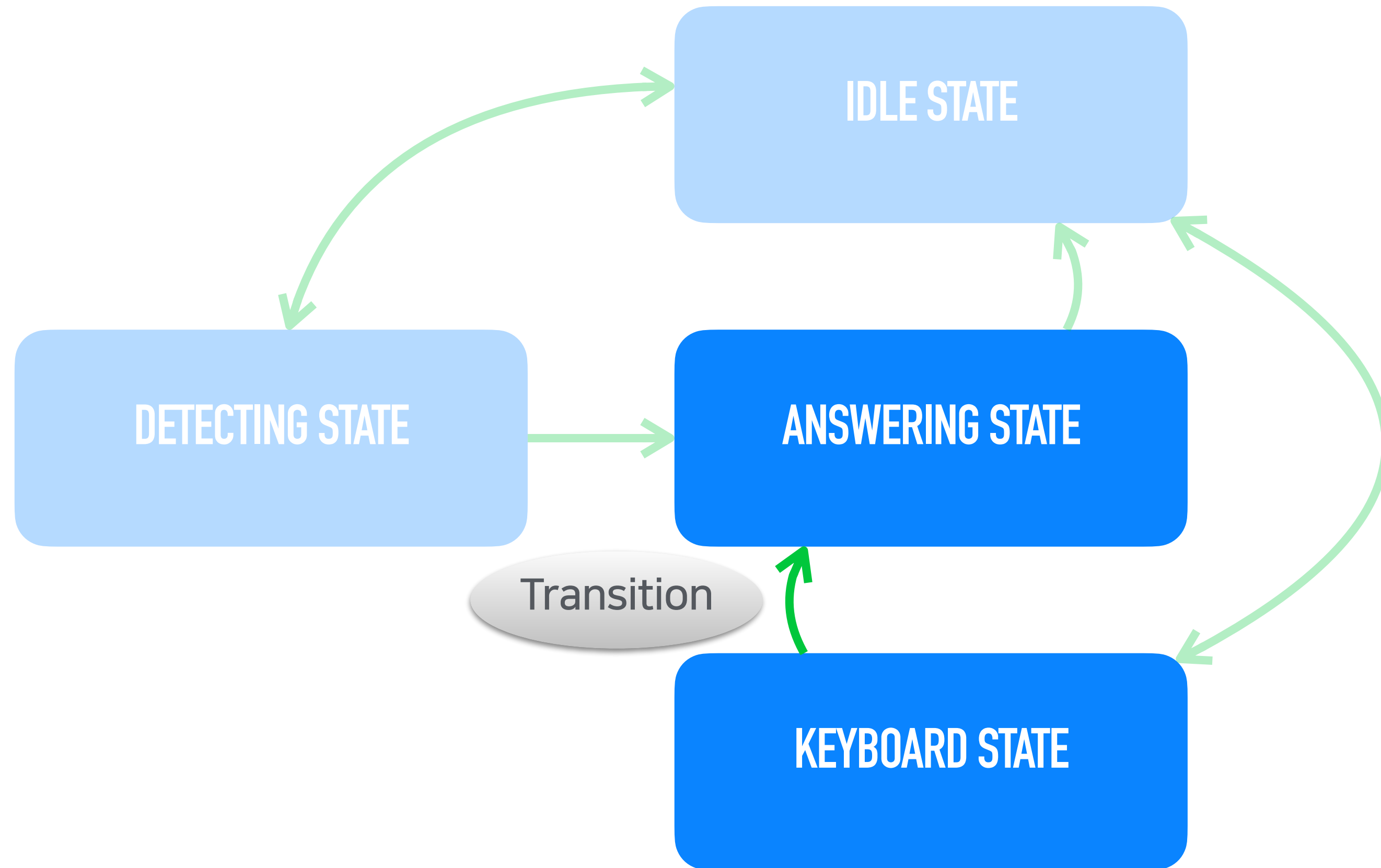
State 패턴



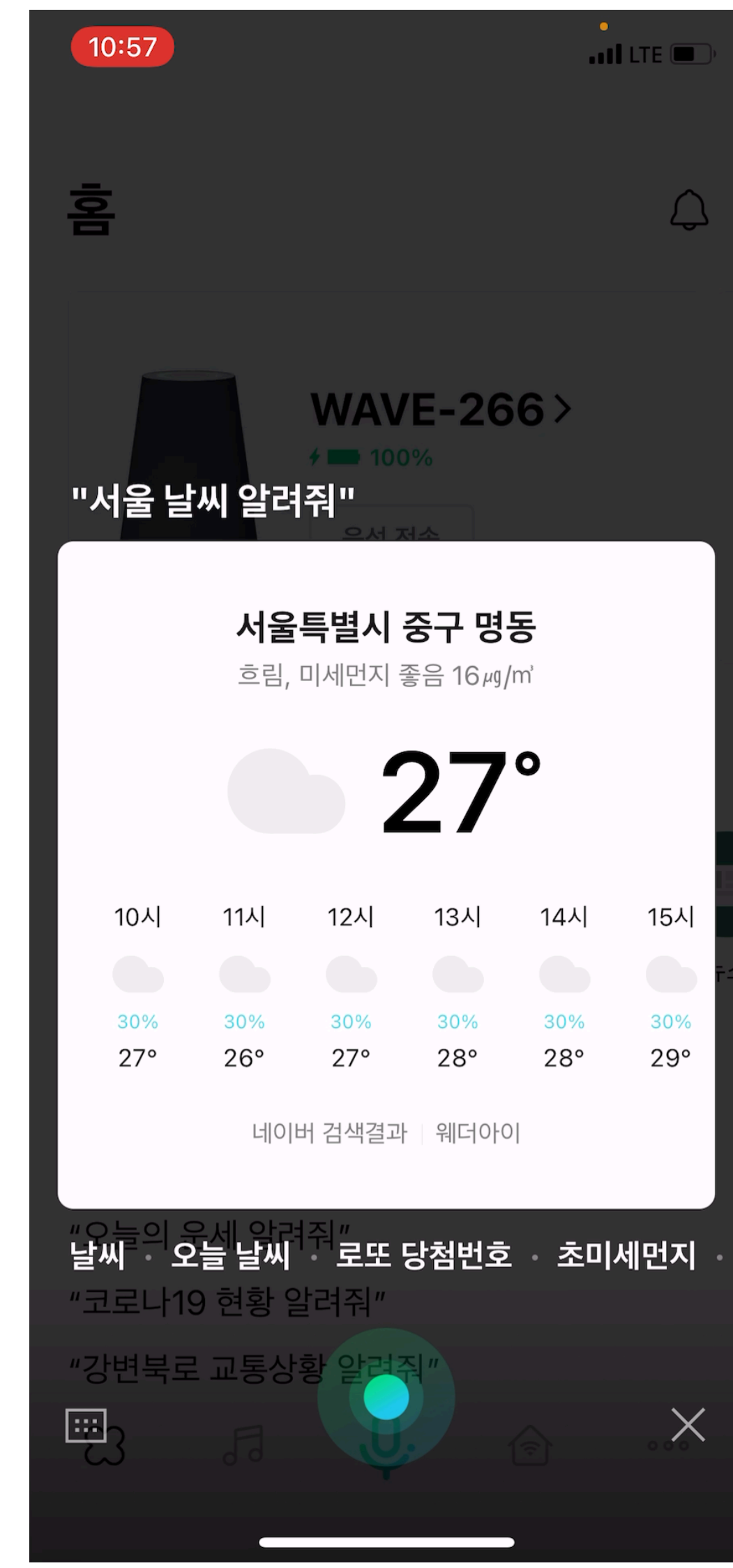
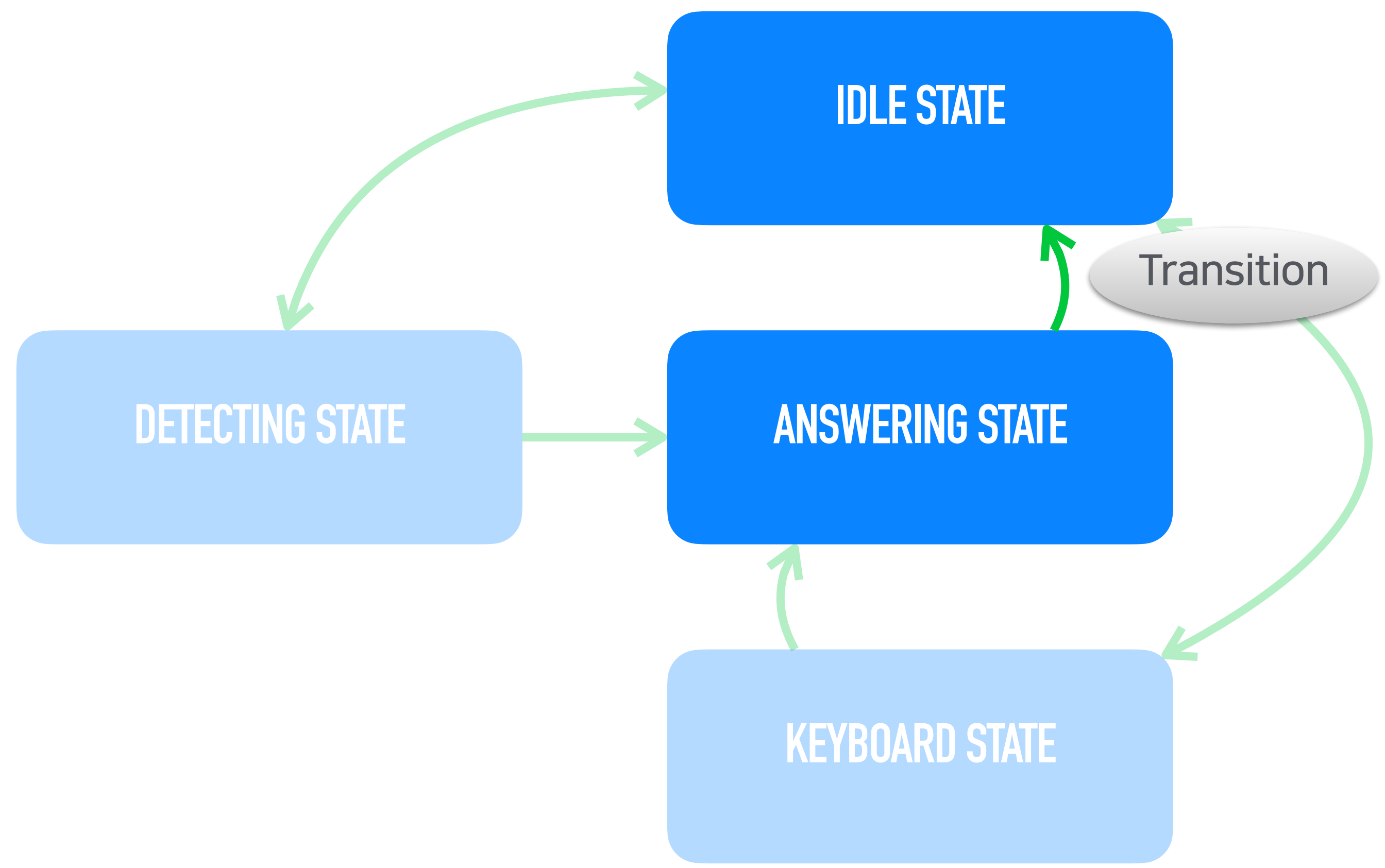
State 패턴



State 패턴

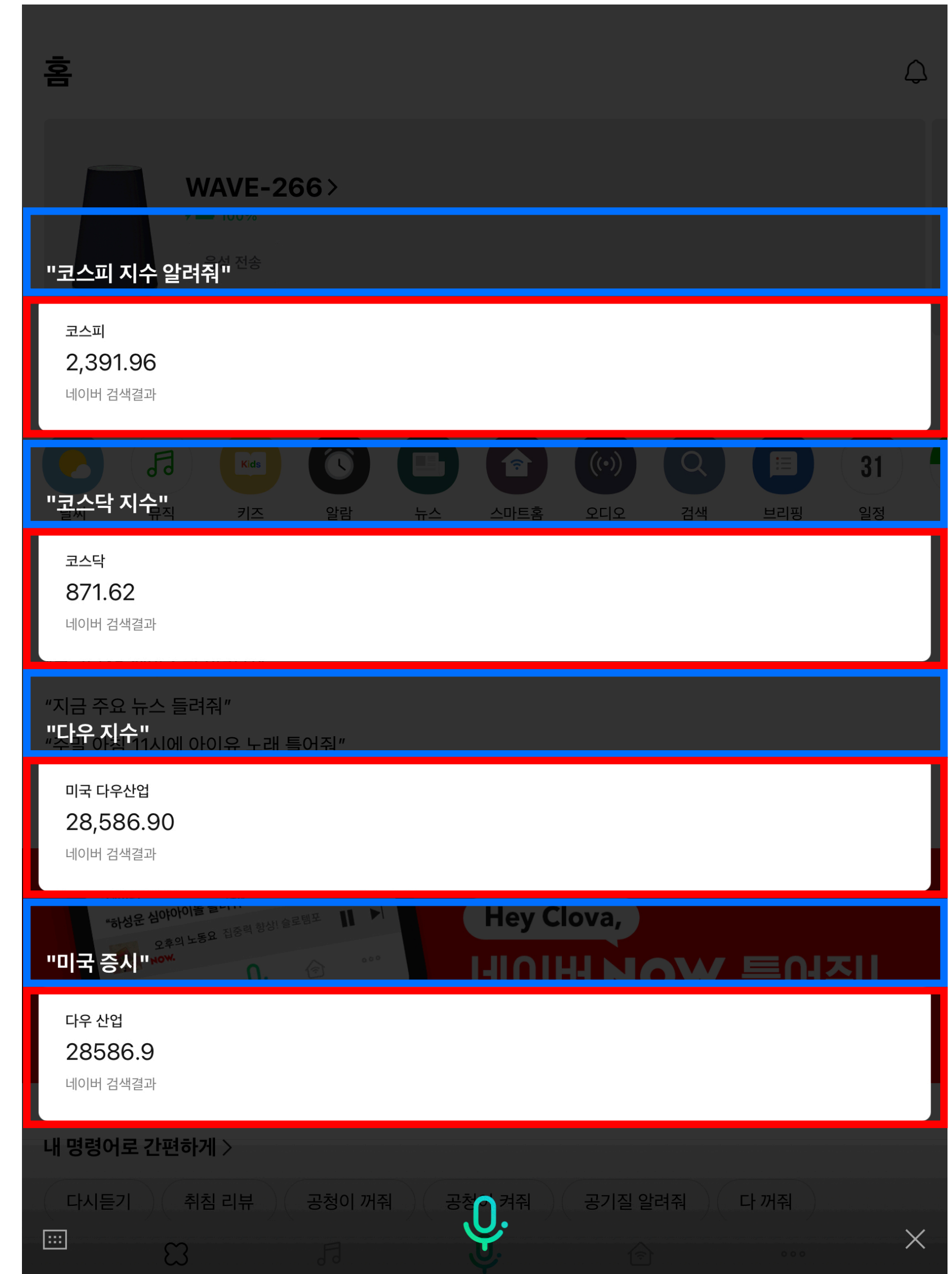


State 패턴



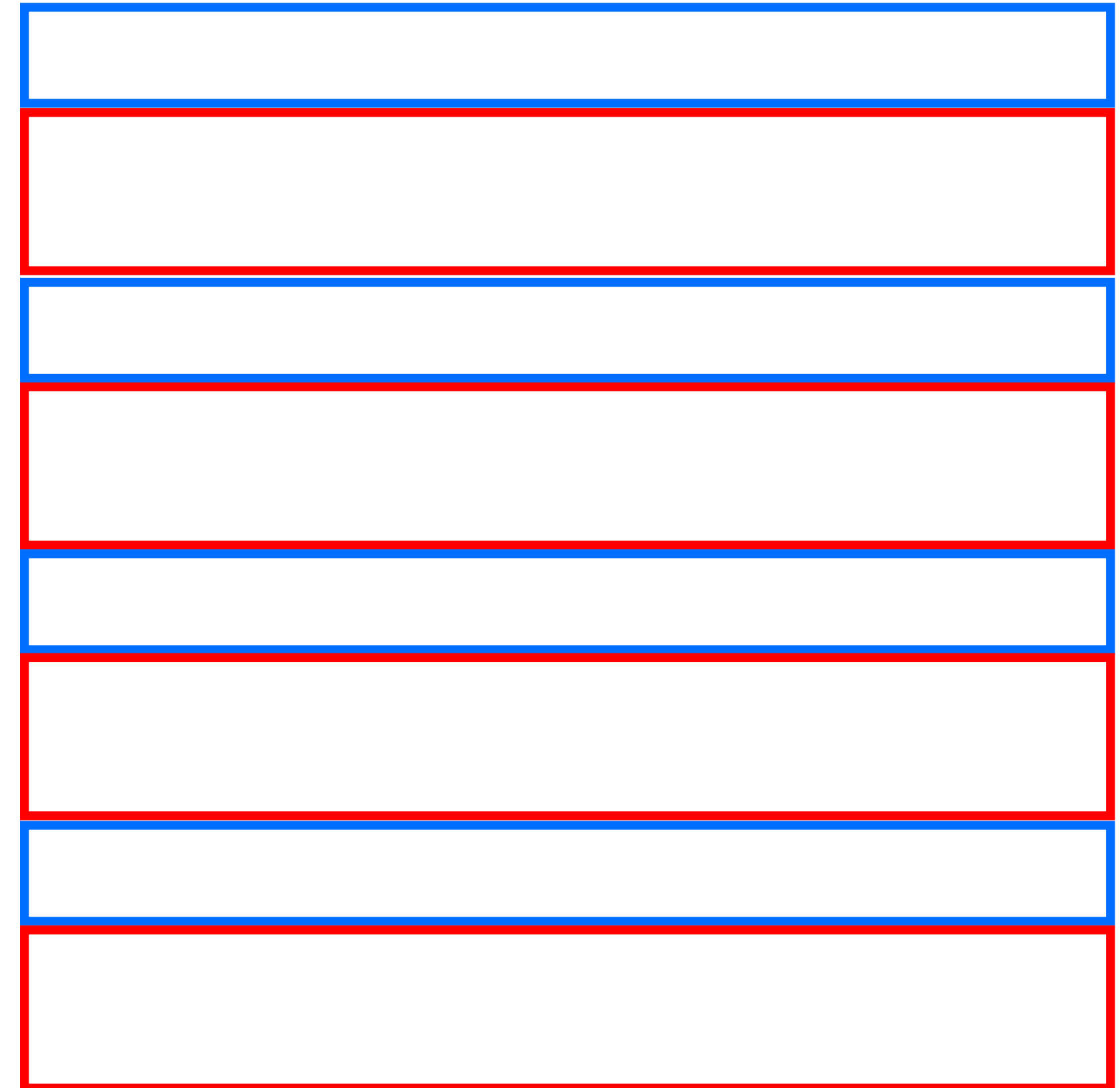
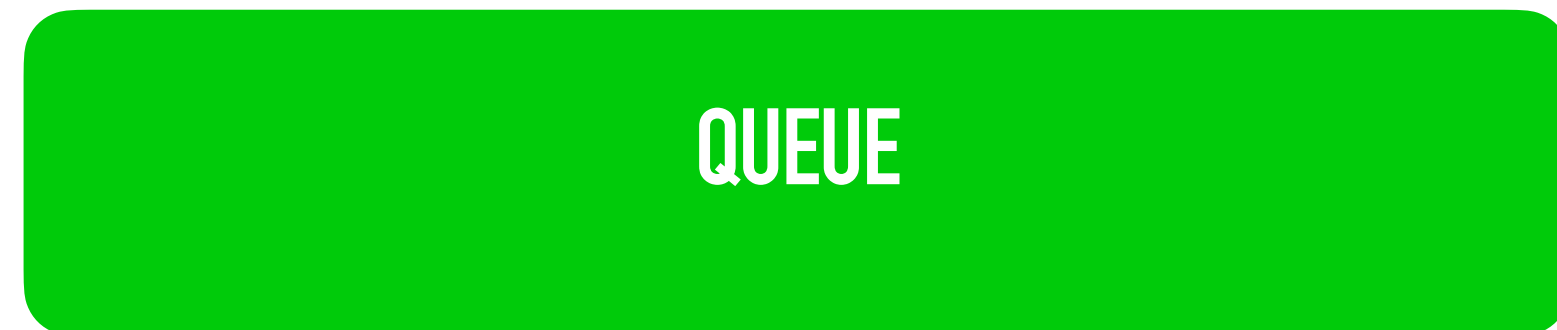
Card list 구현

- Layout 사용자화
- UICollectionViewFlowLayout



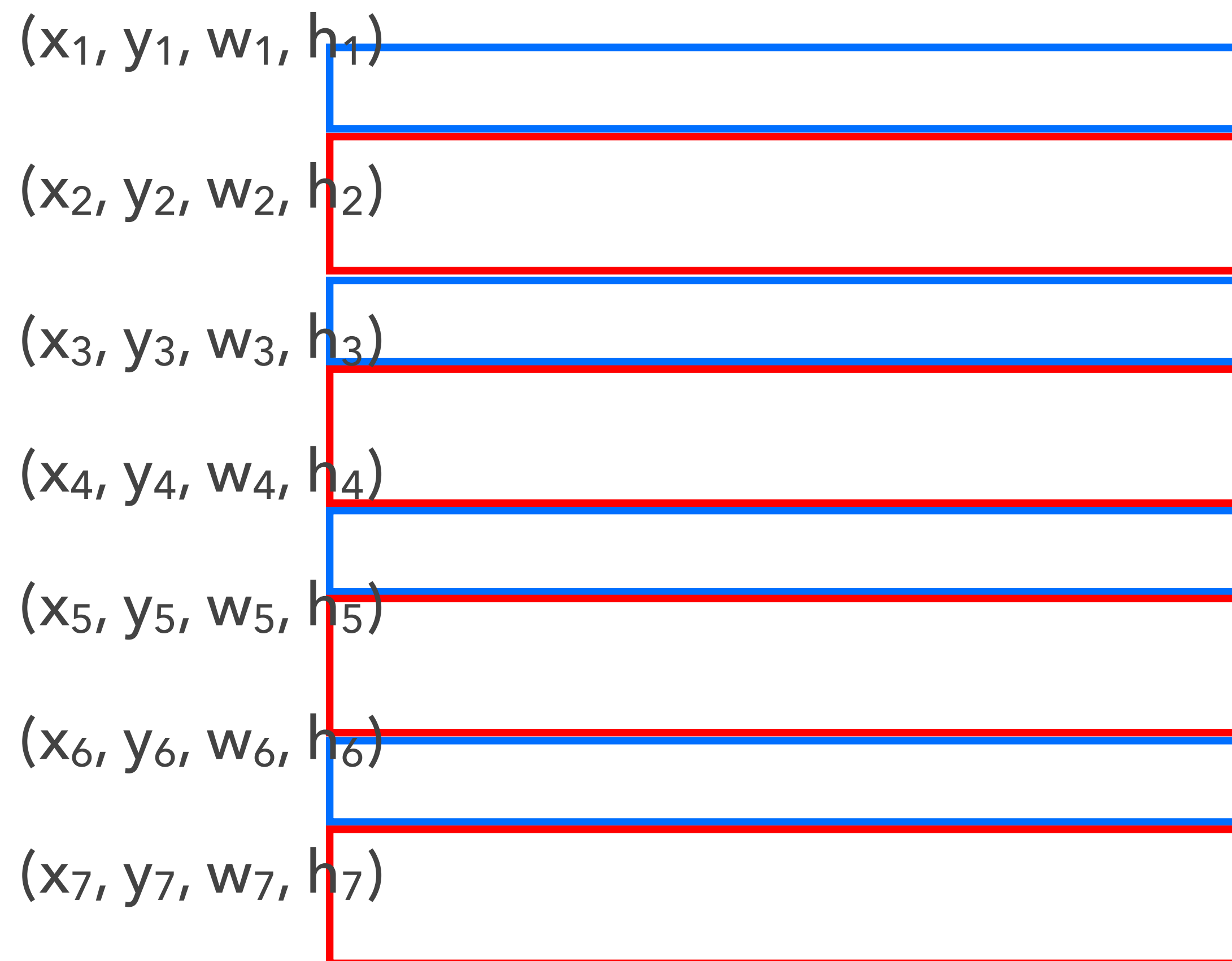
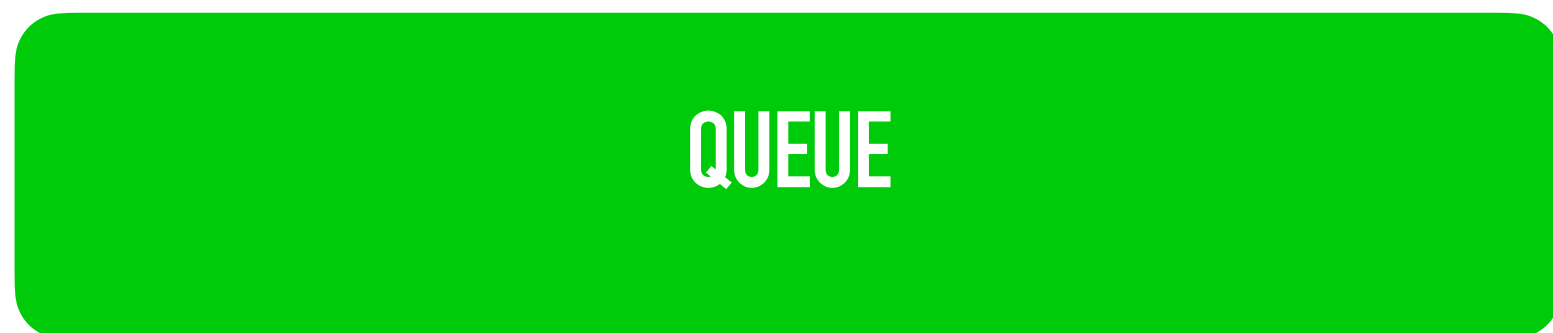
CollectionView layout

- Layout 사용자화
 - UICollectionViewFlowLayout
- View 재사용 - iOS 자체 지원



CollectionView layout

- Layout 사용자화
 - UICollectionViewFlowLayout
- View 재사용 - iOS 자체 지원
- Layout 정보 재사용 X

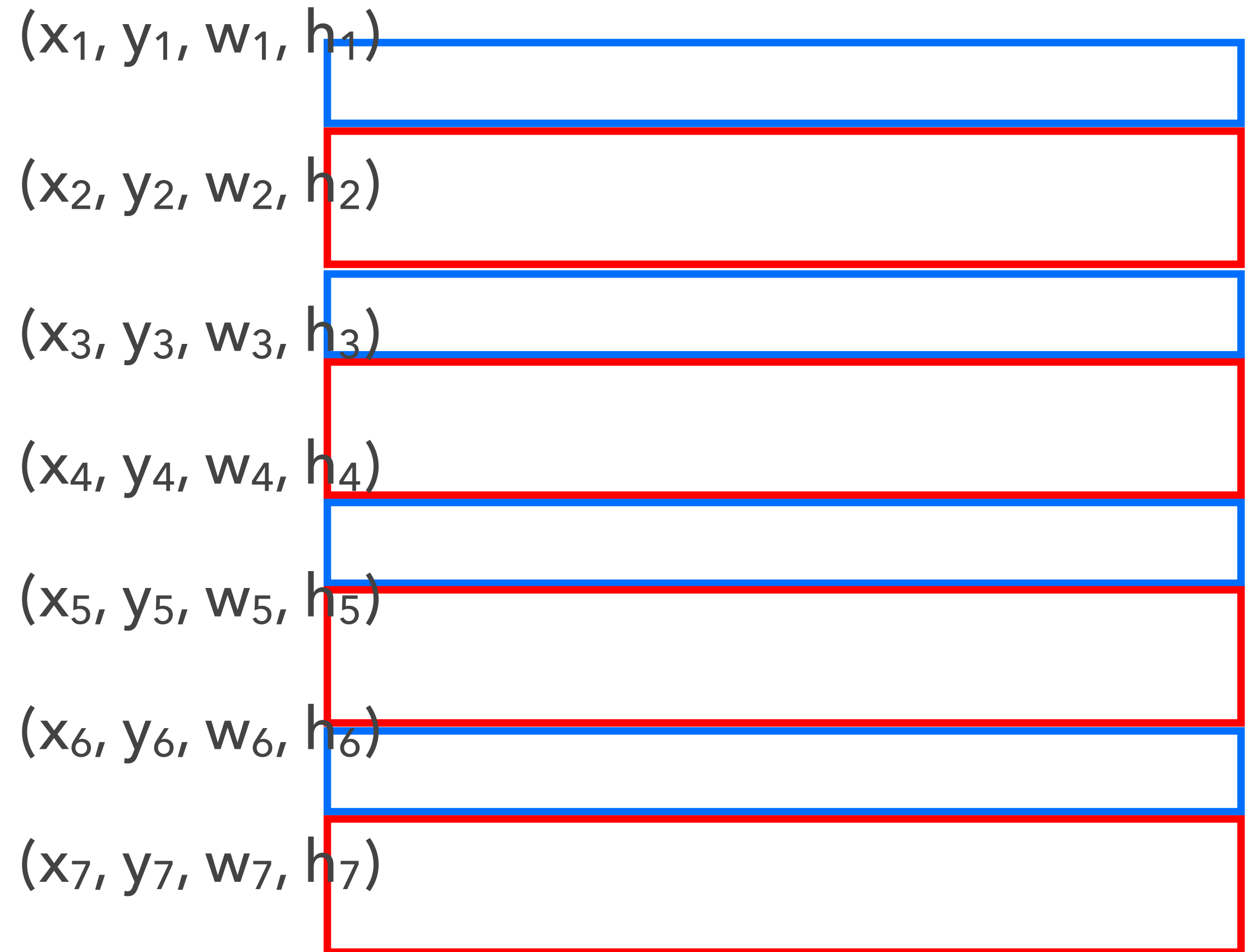


CollectionView layout

- Layout 사용자화
 - UICollectionViewFlowLayout
- View 재사용 - iOS 자체 지원
- Layout 정보 재사용을 위한 cache

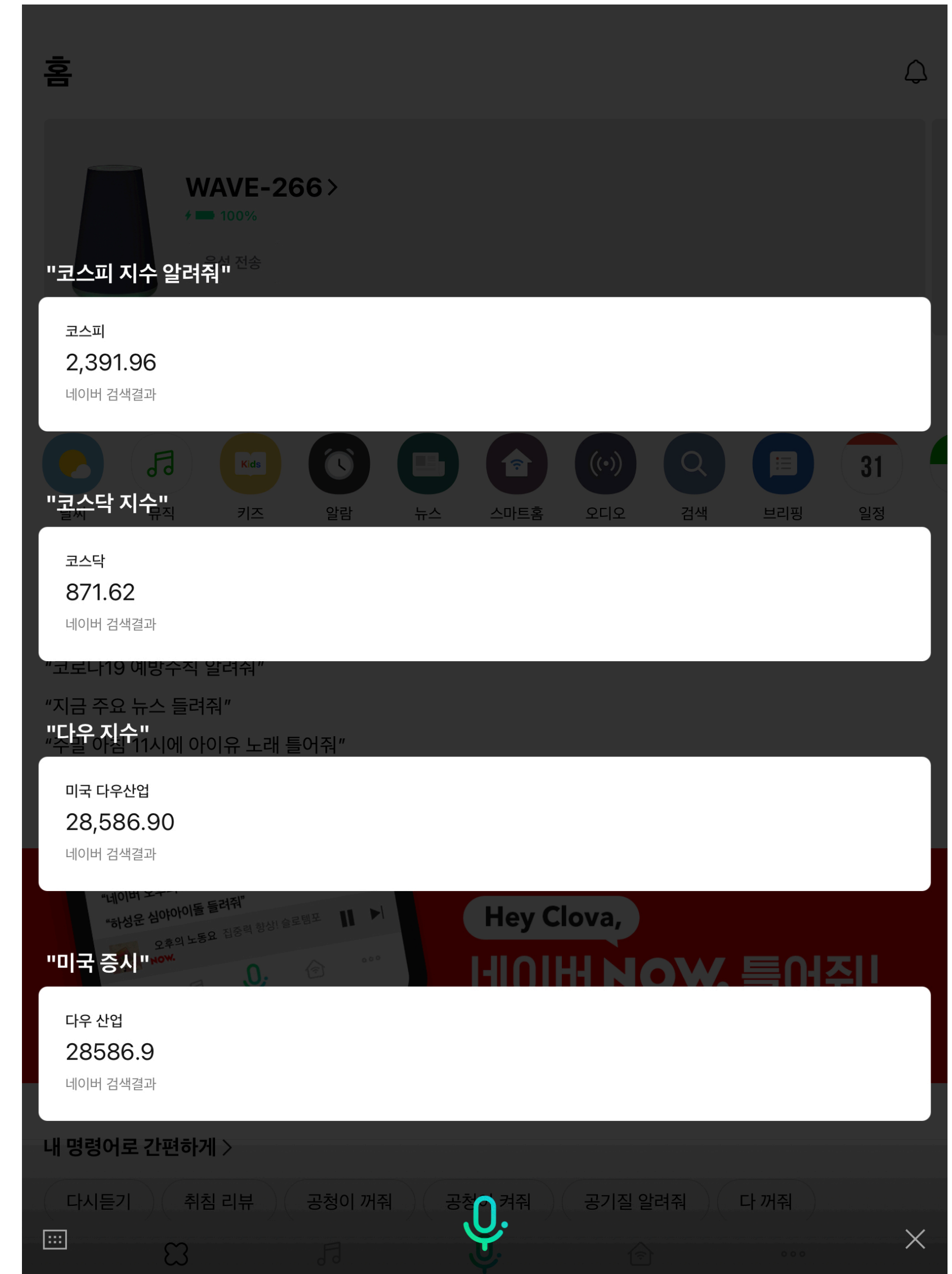
QUEUE

CACHE



CollectionView layout

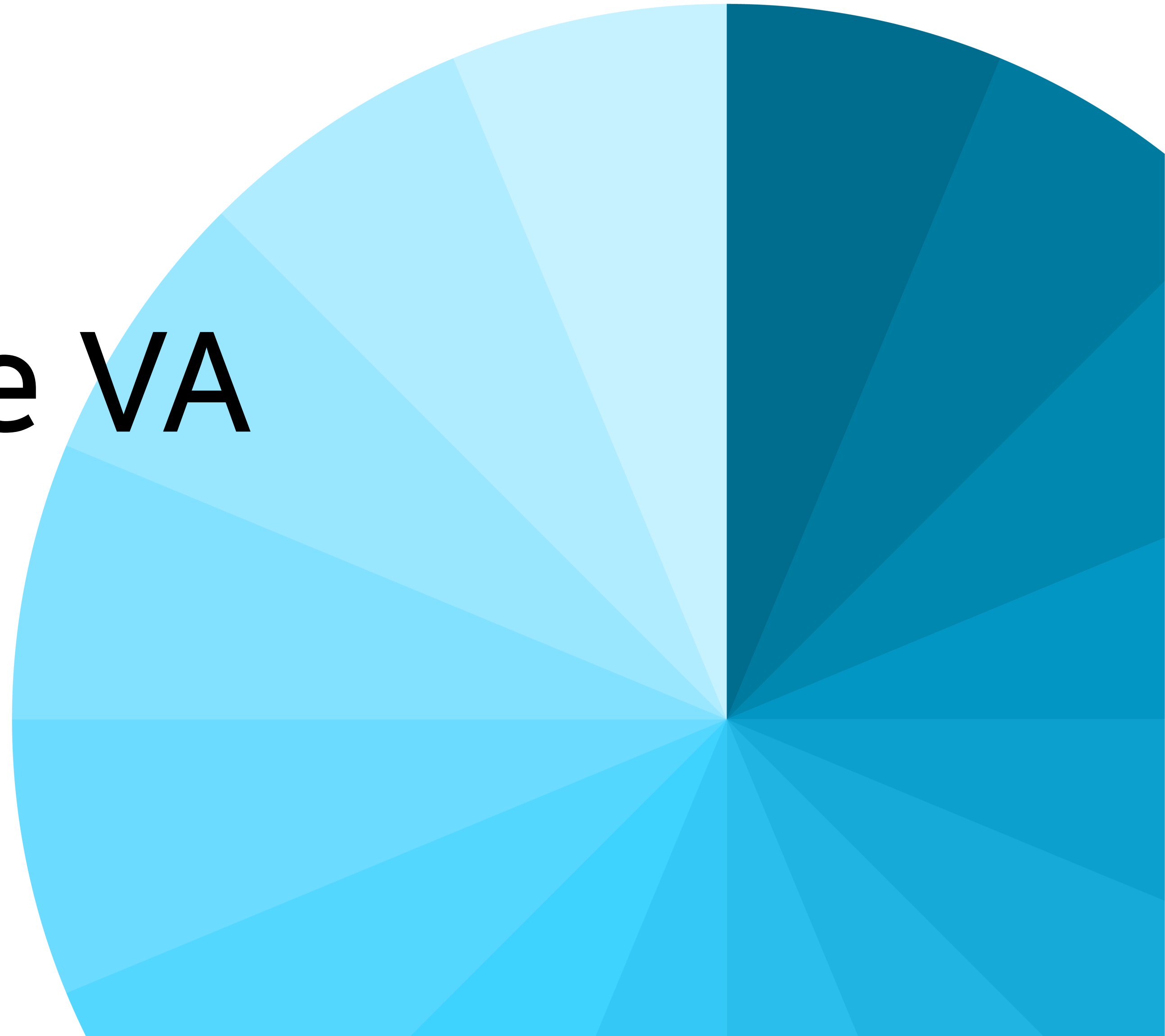
- Layout 사용자화
- UICollectionViewFlowLayout
- View 재사용 - iOS 자체 지원
- Layout 정보 재사용
 - UICollectionViewFlowLayout 상속
 - CachedFlowLayout 구현



CLOVA VA

- 지속적으로 UI/UX 개선
 - 네이버 앱, 네이버 지도, 클로바 앱, 라인 메신저 등
- 지원 플랫폼
 - 모바일 : iOS, Android
 - 임베디드 : ESP 32
- 지원 계획
 - 웹 : Clova SDK for Javascript

Line VA

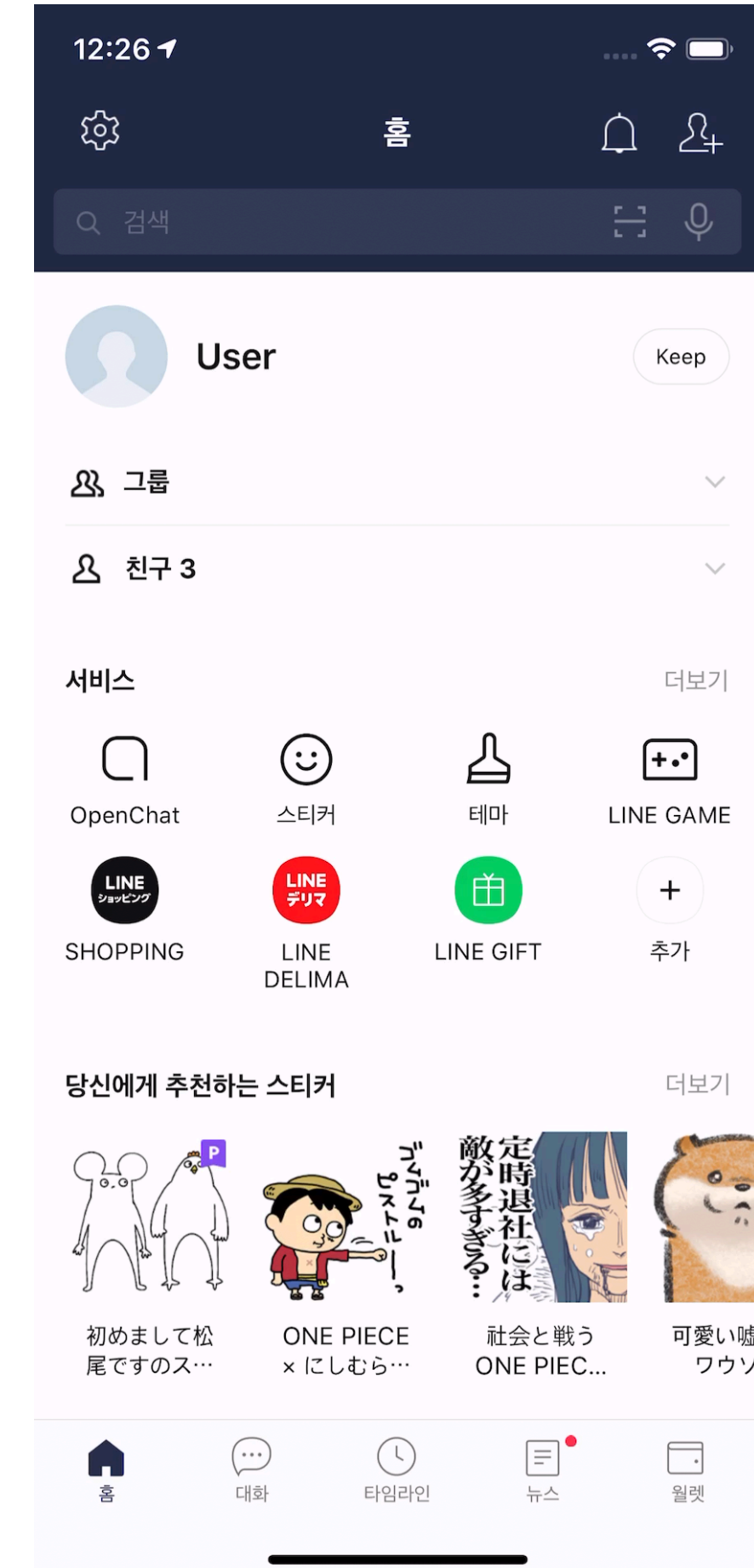


Line VA

- Packaging
- 기능 별 결과 타입
- VA 적용

Line VA

- 제공 기능
 - 음성 인식
 - 키보드 인식
 - 음악 검색



외부 서비스 설정

CICClientInfo  CICExternalClientInfo

clientID	클로바 모듈을 사용하기 위해 등록된 고유 ID 값
clientSecret	클로바 모듈을 사용하기 위해 등록된 Secret 값
namespace	모듈에게 어느 서비스에서 사용하는지 알려주기 위한 값
userAgent	App의 이름/버전 정보 등 구분하는 User-Agent
helpURL	도움말 페이지 URL
channelAccessToken	클로바 모듈을 사용하기 위한 3rd party 인증 Token
tokenVersion	내부적으로 사용하는 AccessToken 버전
featureOption	모듈 UI/권한 등 기능 사용 여부.(default는 모두 사용)

서버 및 국가 설정

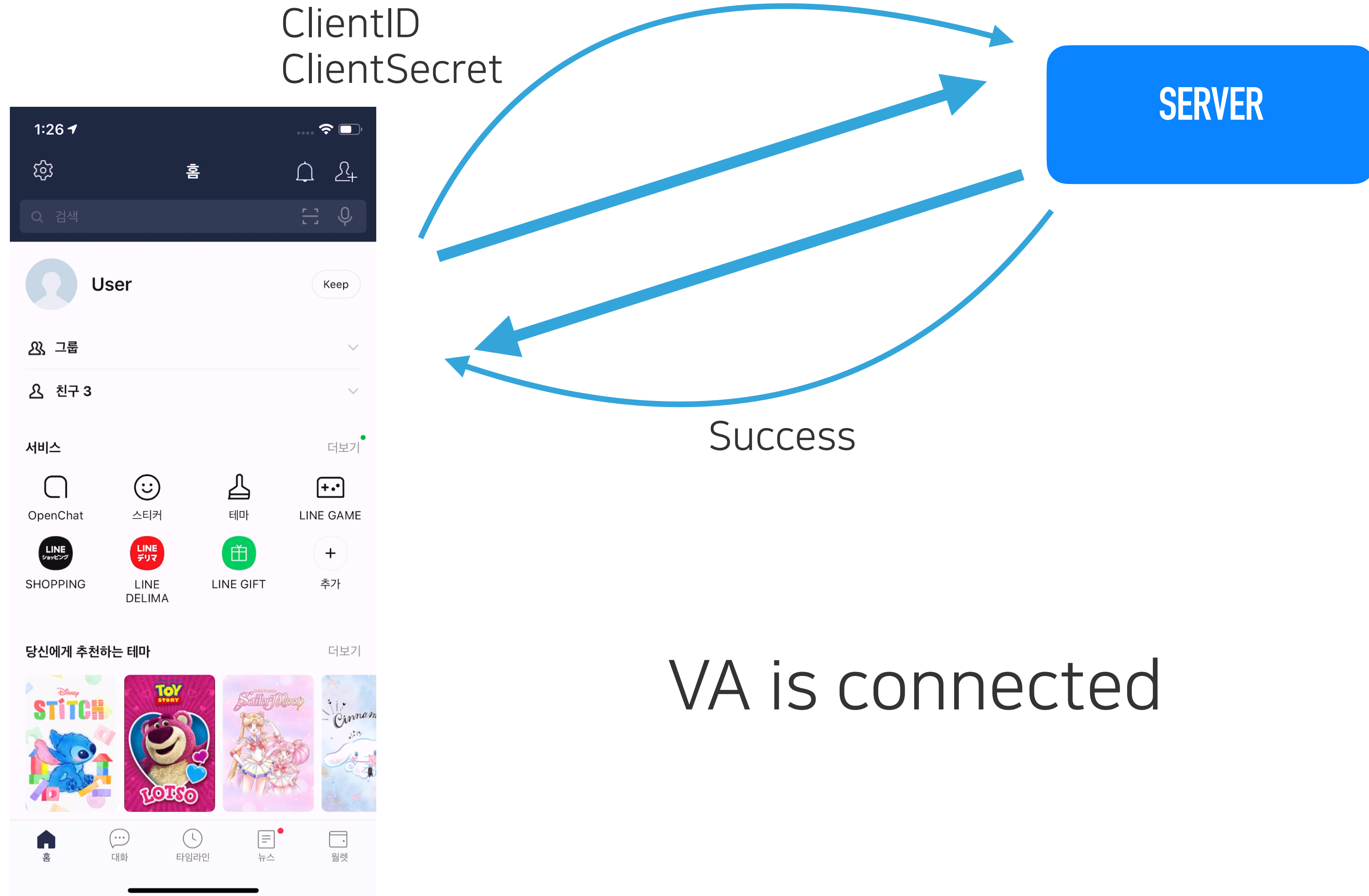
SERVER

- Dev
- Beta
- RC (Real Candidate)
- Real

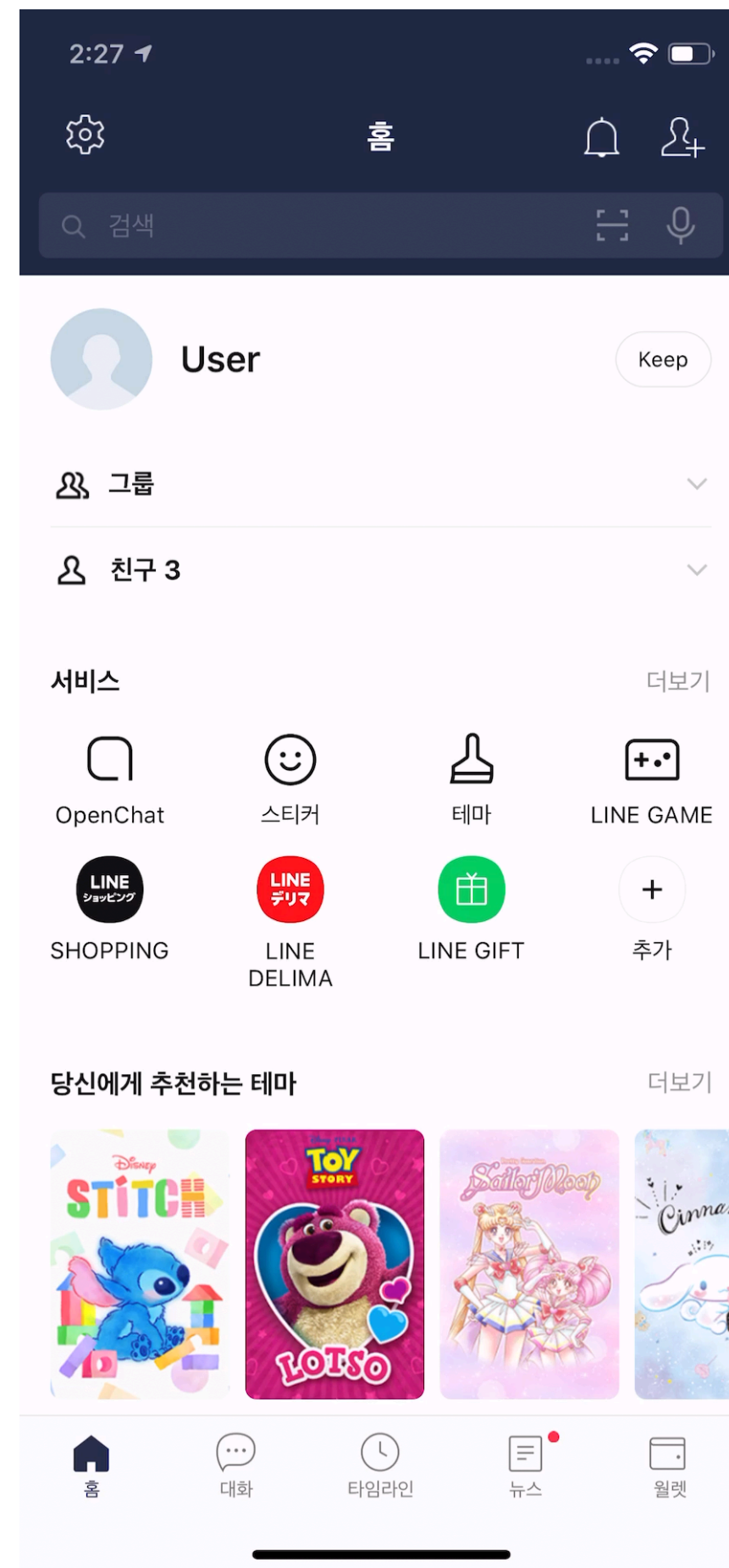
COUNTRY

- KR
- JP

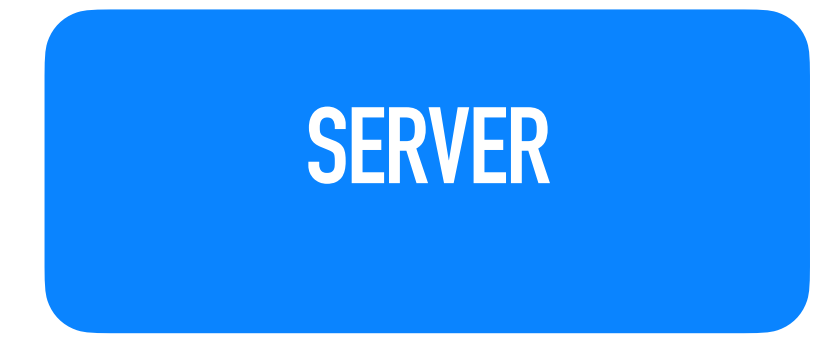
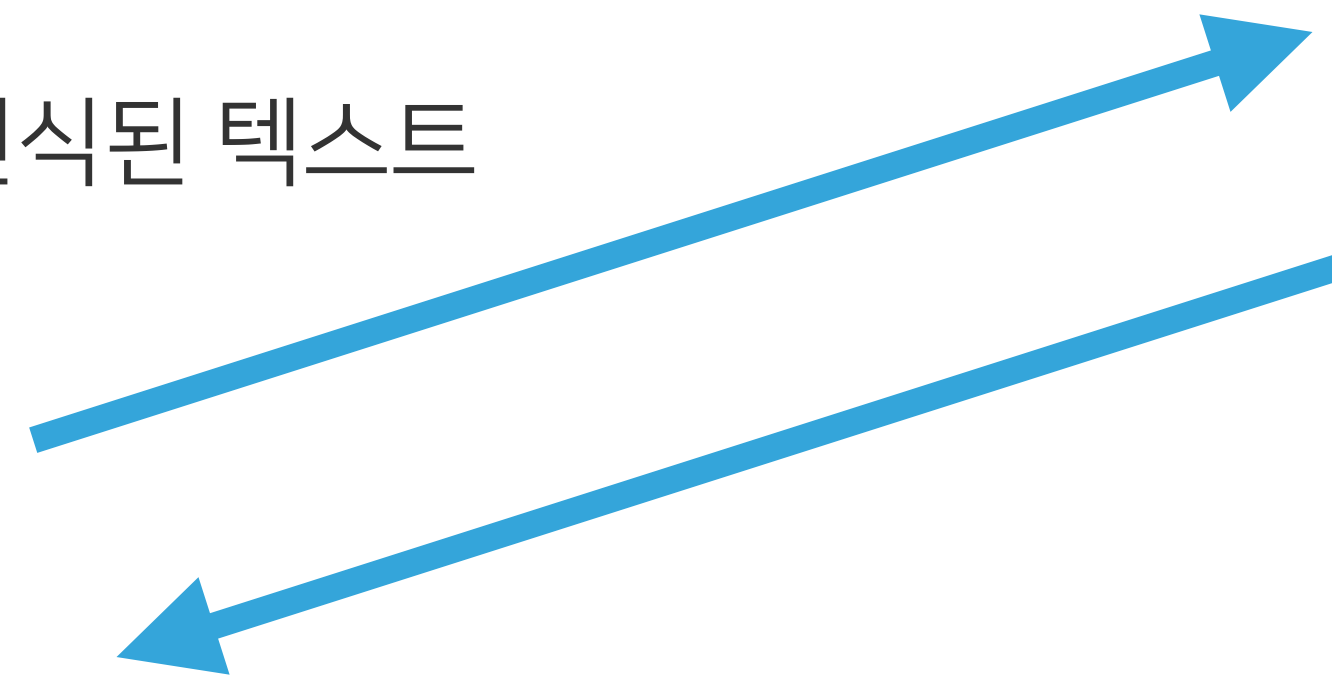
VA 연결



VA 동작

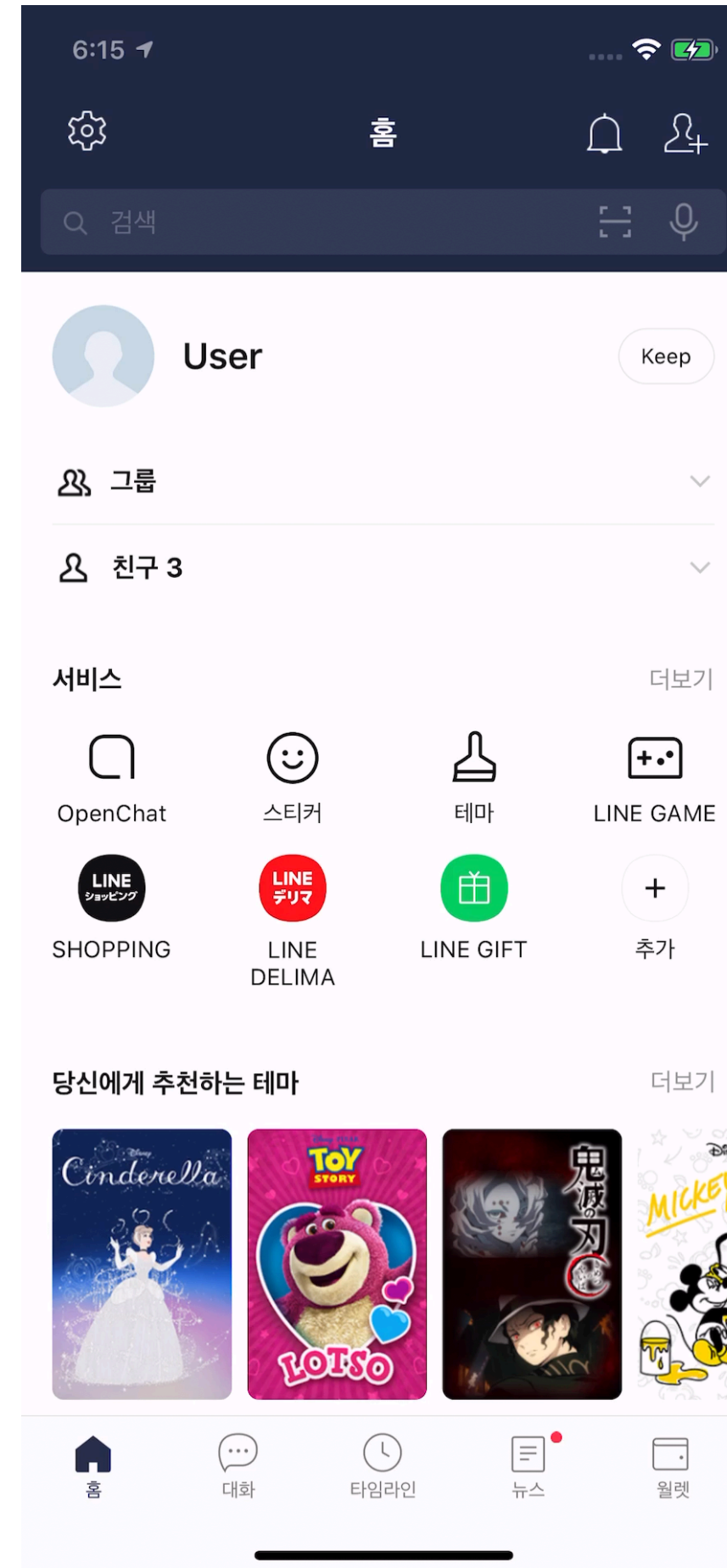


인식된 텍스트



검색 결과

도움말 URL

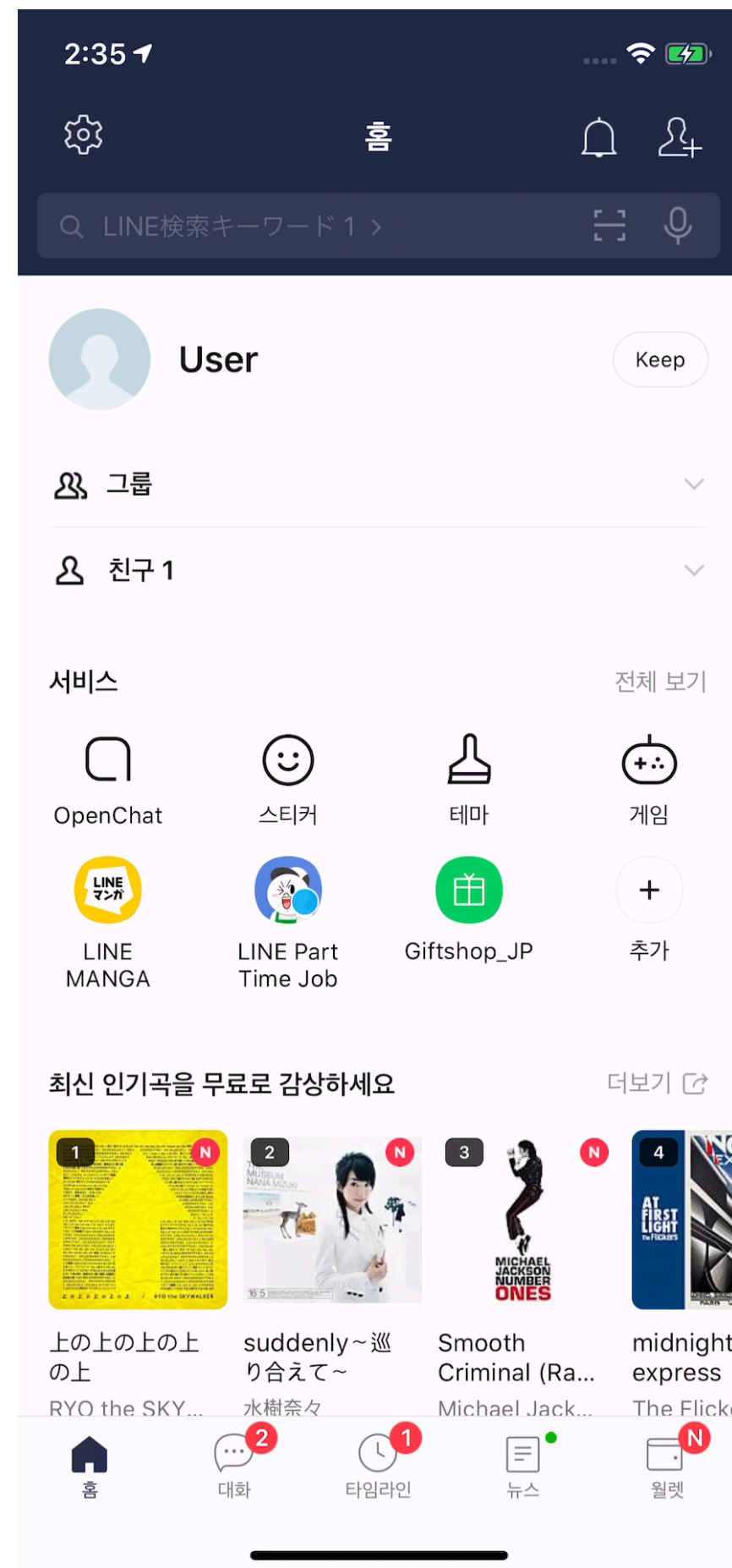


기능 별 결과 타입

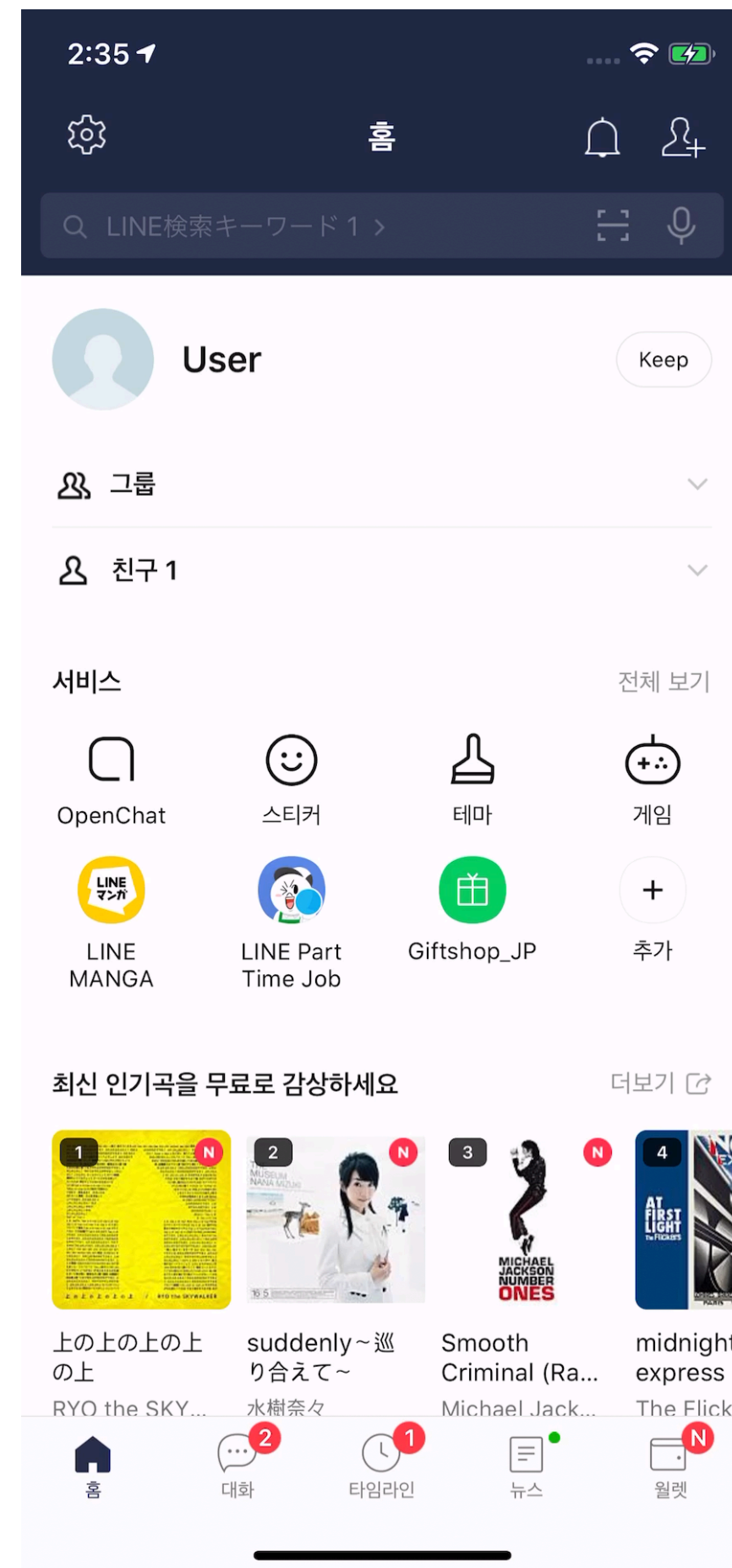
- 결과 타입
 - 웹 페이지 이동
 - 카드 결과 표시
 - 앱 호출 / 기능 실행

기능 별 결과 타입

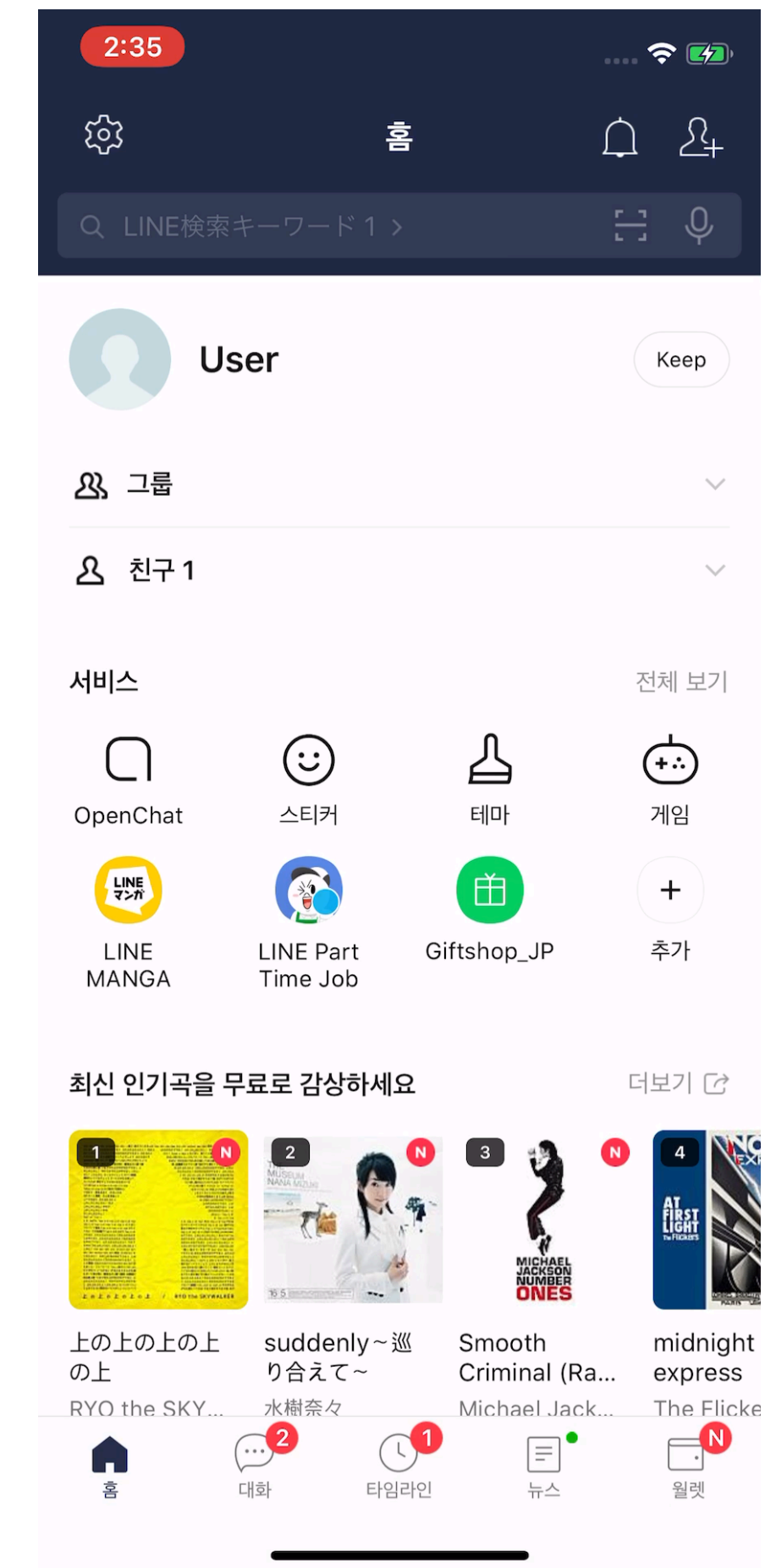
웹 페이지 이동



카드 결과 표시



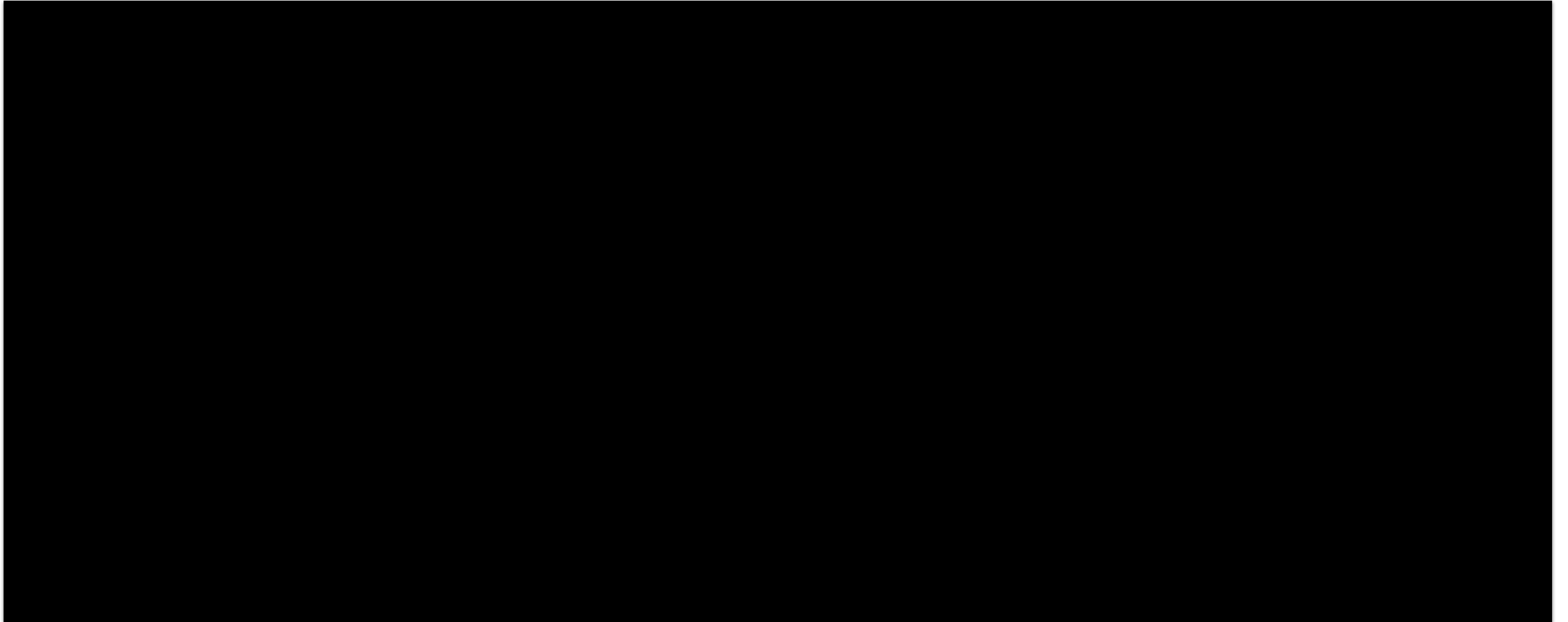
앱 호출 / 기능 실행



- **많은 기능들을 제공하는 서비스**
 - 은행 앱과 같이 상품과 메뉴가 많은 경우, 각 상품과 기능으로 이동
 - O2O 서비스 내의 추천 및 예약/주문
- **접근성이 필요한 서비스**
 - 음성으로 제어 가능한 서비스 제공
- **음성인식 개발 비용**
 - 음성인식을 사용하고 싶으나, 개발 비용 문제로 보류 중인 개발사

VA 연동 시연


VA 연동 시연



시연 영상

CLOVA 제휴 문의

dl_clova_partnership@navercorp.com



Q & A



Thank you