

# SAFETY GUARDIAN

## GROUP ASSIGNMENT OPTION 2

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### Team Members

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### Techniques, Methods and Special Features

#### 1. SQLiteOpenHelper

**i** SQLiteOpenHelper manages database creation and version management. We aim to create two database table, one is a blacklist table to store phone numbers which are inserted in blacklist by users, another is an interception list to store intercepted records including phone numbers, date and time. The methods we use are cursor, execSQL(), rawQuery(), getWritableDatabase(), getReadableDatabase().

#### 2. BroadcastReceiver

**i** BroadcastReceiver is used for receiving state of phone from Android system. In broadcastreceiver, we set a listener to retrieve the phone number when the phone is ringing and pass the number to phonehandleservice to go further judgement. We declare an implementation with the <receiver> tag in AndroidManifest.xml. BroadcastReceiver can still work when the application is closed. The main method we use is onreceive().

### 3. Service

- i** We use service to make a judgement between incoming phone number and phone number in blacklist & contact list. If the incoming phone number is in blacklist, reject directly and insert the number and time into database. If the incoming phone number is not in the contact list, show a warning message to inform the user it is a strange phone number. The methods we use in service are onStartCommand() and onDestroy().

### 4. AIDL

- i** AIDL (Android Interface Definition Language) is an IDL language used to generate code that enables two processes on an Android-powered device to talk using interprocess communication (IPC). Because the method to reject incoming calls is hidden by Android, we need to call the API hidden by Android through AIDL and reflection.

### 5. RecyclerView

- i** RecyclerView is a view group for displaying collections. It displays a collection of items in a list or a grid, enabling the user to scroll through the collection. We use recycler view to display contact list and intercept history, because It is efficient with large collections by reusing item views. To draw dividers between items, we use ItemDecoration. An ItemDecoration allows the application to add a special drawing and layout offset to specific item views from the adapter's data set.

### 6. Adapter

- i** Adapter acts as a bridge between an AdapterView and the underlying data for that view. The Adapter provides access to the data items. The Adapter is also responsible for making a View for each item in the data set. We use Adapter for displaying contact list, blacklist and intercept history.

## 7. Picasso

- i** Picasso is an image library for Android, which caters to image loading and processing. It simplifies the process of displaying images from external locations. The library handles every stage of the process, from the initial HTTP request to the caching of the image. In this app, we use Picasso to display the graphical warning message, of which the graph is download from the internet.

## 8. WindowManager

- i** WindowManager is an interface for Android. We use WindowManager to create a floating window to display a graphic warning message. Also, we use methods such as `setViewTouchListener()` and `onTouch()` to make the floating window removable as users drag the graph.

## Additional Features

### Contact List

- i** Once the user installs the application, his or her contact list will be get and displayed. Users can look up all the contacts through the application. Each item in the list contains phone number and name.

### Add Incoming Telephone Number to Blacklist

- i** When there is an incoming call that is not in the contact list, the app pops up a dialog asking whether to add this telephone number to the blacklist. Users can choose to add this phone number to blacklist and the incoming call will be hung up.

## Reject Incoming Telephone Number in Blacklist

- i** Once added to the blacklist, incoming calls from certain numbers will be blocked. Users can be protected from being disturbed by calls from certain numbers.

## Browse, Add and Delete Telephone Numbers in Blacklist

- i** Additionally, in the home page of the app, there is a button to turn to the blacklist page. In this page, users are allowed to browse, add and delete telephone numbers in the blacklist. If the telephone number is already in the blacklist, the app will display a message to remind that it is already in the list.

## Intercept History

- i** Also, there is a button in the homepage to turn to the page displaying the intercept history. On that page, the telephone numbers and time of the phone calls blocked are shown to the users.

## Image Warning

- i** If a number not in the contact list is calling, the app will pop up an image warning message with the telephone number. Furthermore, the image can be moved through touching.

## Contributions of Team Members

- i** Qiao Leiyang is responsible for blacklist function and database helper  
Zhang Mengshu is responsible for processing the incoming call and intercepted history  
Zhu Qingyu is responsible for the contact list, image warning message, processing welcome page and home page