<<interface>>
OnLoginSuccessListener

+ onLoginSuccess(userDID: String, userName: String)

LoginDialogFragment

db: FirebaseFirestore
android_device_id: String
preferences: SharedPreferences
usernameAndEmailList Pair<ArrayList<String>, ArrayList<String>>

+ LoginDialogFragment(db: FirebaseFirestore, preferences: SharedPreference
+ onCreateDialog(savedInstanceState: Bundle): Dialog

EditDialogFragment

- user: Player
- mListener: OnDismissListener

+ setOnDismissListener(listener: OnDismissListener)
+ onDismiss(dialog: DialogInterface)
+ EditDialogFragment(user: Player)
+ onCreateDialog(savedInstanceState: Bundle): Dialog

+ onCreateDialog(sa

ScanResultPopupFragment

- selectedPreferences: List<String>

+ onCreateDialog(savedInstanceState: Bundle): Dialog
+ ScanResultPopupFragment(fbw: FirebaseWrapper, scanFrag: Fragment,
    scannedCodeDID: String)
- sendResult()

FriendsRecyclerViewAdapter

- playerList: ArrayList<Player>
- clickListener: OnItemClickListener

+ setOnItemClickListener(listener: OnItemClickListener)
+ FriendsRecyclerViewAdapter(playerList: ArrayList<Player>)
+ onCreateViewHolder(parent: ViewGroup, viewType: int): PlayerViewHolder
+ onBindViewHolder(holder: PlayerViewHolder, position: int)
+ getItemCount(): int

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<<Interface>>
OnItemClickListener

OnItemClick(view: View, position: int)

PlayerViewHolder

+ playerName: TextView
+ qrCount: TextView
+ playersPoints: TextView
+ playerRank: TextView

+ PlayerViewHolder(itemView: View)

MainActivity

fbw: FirebaseWrapper
preferences: SharedPreferences

\# onCreate(savedInstanceState: Bundle)
\+ onCreateOptionsMenu(menu: Menu): boolean
\- transactFragment(fragment: Fragment)
\+ handleDropdownMenuWrapper(topBarMenu: Menu,
    dropdownNavWrapper: LinearLayout)
\+ getFirebaseWrapper(): FirebaseWrapper
\+ getDrawableResourceIdFromString(filename: String): int
\+ onLoginSuccess(userDID: String, userName: String)

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es, android_device_id: String)

DialogFragment

avedInstanceState: Bundle): Dialog

Fragment

\+ onCreate(savedInstanceState: Bundle)
\+ onCreateView(inflater: LayoutInflater, container: ViewGroup, savedIns

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CodesFragment

\- scannedCodes: List<ScannedCode>
\- fbw: FirebaseWrapper
\- scannedCodesAdapter: MyScannedCodeCardRecyclerViewAdapter

\+ CodesFragment(fbw: FirebaseWrapper)

FriendsFragment

\- fbw: FirebaseWrapper
\- db: FirebaseFirestore
\- users: ArrayList<Player>
\- userId: String
\- deviceID: String
\- friendsList: ArrayList<String>
\- onStartupPref: SharedPreferences
\- showFriendsButton: Button
\- showRanklistButton: Button

\+ FriendsFragment(fbw: FirebaseWrapper)
\- displayFriends(recyclerView: RecyclerView)
\- displayAllUsers(recyclerView: RecyclerView)
\- getAllUsers(listener: OnUsersRetrievedListener)
\- getFriends(listener: OnUsersRetrievedListener,
    friendsList: ArrayList<String>)
\- getFriendsList(listener: OnFriendsRetrievedListener)
\+ setClickListener(friendsAdapter: FriendsRecyclerViewAdapter,
    players: ArrayList<Player>)

<<interface>>
OnFriendsRetrievedListener

\+ onFriendsRetrieved(friends: ArrayList<String>)

<<interface>>
OnUsersRetrievedListener

\+ onUsersRetrieved(users: ArrayList<String>)

SettingsFragment

<<interface>> OnUsersRetrievedListener

+ onUsersRetrieved(users: ArrayList<String>, deviceToDoc: HashMap)

<<interface>> OnScoresRetrievedListener

+ onScoresRetrieved(topCodeForUser: HashMap)

<<interface>> OnRanklistRetrievedListener

+ onRanklistRetrieved(userRank: HashMap, topCodeForUser: HashMap)

FirebaseWrapper

+ db: FirebaseFirestore
- myDeviceID: String
- myUserDID: String
- myUserName: String
- scannedCodesDict: HashMap
- users: ArrayList<String>
- topCodeForUser: HashMap
- userRank: HashMap
- deviceToDoc: HashMap
- storage: FirebaseStorage

+ FirebaseWrapper(myUserDID: String, myUserName: String)
+ refreshScannedCodesForUser(userDID: String)
+ getMyUserDID(): String
+ getScannedCodesDict(): HashMap
+ deleteCode(scannedCode: ScannedCode)
+ getUsers() ArrayList<String>
+ getAllUsers(listener: OnUsersRetrievedListener)
+ getTopScoreForUsers(listener: OnScoresRetrievedListener)
+ createRanklist(listener: OnRanklistRetrievedListener)
+ getUserRank(userDeviceID: String,
       listener: OnRankRetrievedListener, rawVal: boolean)
+ deleteCode(scannedCodeDID: String)
+ deleteUser()
+ uploadImage(bytes: byte[], scannedCodeDID: String)
+ getStorage(): FirebaseStorage

Comment

userName: String
ash: String
content: String
ate: Date

getUserName(): String
getHash: String
getContent(): String
getDateString(): String
Comment(userName: String, codeDID: String,
     content: String, date: Date)

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...tanceState: Bundle): View

MyCommentCardRecyclerViewAdapter

- comments: List<Comment>

+ MyCommentCardRecyclerViewAdapter(items: List<Comment>)
+ onCreateViewHolder(parent: ViewGroup, viewType: int): ViewHolder
+ onBindViewHolder(holder: ViewHolder, position: int)
+ getItemCount(): int

OnClickCodeFragment

scannedCode: ScannedCode
fbw: FirebaseWrapper
comments: ArrayList<Comment>
commentsAdapter: MyCommentCardRecyclerViewAdapter
recyclerView: RecyclerView

+ OnClickCodeFragment(scannedCode: ScannedCode, fbw: FirebaseWrapper)
- fetchCommentsFromFirebase(view: View)
- fetchUserFromFirebase(view: View)

ViewHolder

commentHeader: TextView
commentContent: TextView

+ ViewHolder(binding: FragmentCodesContentBinding)
+ onClick(v: View)

ScanFragment

- mCodeScanner: CodeScanner
- fbw: FirebaseWrapper
- db: FirebaseFirestore
- geoFirestore: GeoFirestore
- mResult: Result
- scannerView: CodeScannerView
- resetButton: Button
- currentLocationGeopoint: GeoPoint
- flashButton: Button
- withinImpermissibleRadius: boolean
- requestPermissionLauncher: ActivityResultLauncher<String>

- self: MapsFr
- mMap: Goog
- mainActivity
- locationMan
- currentLocat
- mapModel:
- geoSearchIt
- textSearchIt
- makerCodeM
- geoQueryLis
- geoQueryAc
- mapsView: V
- geoSearchL
- scrollView: S
- latitudeText:
- longitudeTex
- callback: On

+ handleSeek
+ handleMark
+ handleGeoS
+ handleGeoS
+ handleGeoS
+ handleGeoS
+ handleGeoS
+ onLocationC
- moveCamer
- drawCodeM
- scatterQRLo
+ onCodeGeo
+ onCodeGeo
+ getMarkerD
+ onDestroyV

MyScannedCo

- scannedCodes: List<Scanned
- mListener: OnItemClickLister

+ setOnItemClickListener(lister
+ MyScannedCodeCardRecyc
+ onCreateViewHolder(parent:
+ onBindViewHolder(holder: V
+ getItemCount(): int

<<interface>>
OnRankRetrievedListener

onRankRetrieved(rank: int)

UniformSizeImageView

+ UniformSizeImageView(context: Context, attrs: AttributeSet)
+ onMeasure(widthMeasureSpec: int, heighMeasureSpec: int)

<<interface>>
GeoQueryListener

+ onCodeGeoQueried(code: ScannedCode)
+ onCodeGeoSearched(code: ScannedCode)

MapsCardPopup

- mainActivity: MainActivity
- cardHeader: TextView
- cardDistance: TextView
- cardImage: ImageView
- cardViewButton: Button
- code: ScannedCode

+ MapsCardPopup(code: ScannedCode, mainActivity: MainActivity)
+ onCreateView(inflater: LayoutInflater, container: ViewGroup,
    savedInstanceState: Bundle): View
+ onViewCreated(view: View, savedInstanceState: Bundle)
+ onStart()

MapsFragment

ragment
gleMap
: MainActivity
ager: LocationManager
tion: Location
MapModel
tem: MenuItem
tem: MenuItem
Map: HashMap
st: ArrayList<ScannedCode>
dapter: GeoSearchArrayAdapter
View
ayout: LinearLayout
ScrollView
 EditText
xt: EditText
MapReadyCallback

Bar()
terClickDialogue()
SearchCurrentLocationButton()
SearchMenuItem()
SearchSubmit()
SearchListView()
Chnaged(location: Location)
raToLocation(latitude: double, longitude: double, zoom: int)
arker(code: ScannedCode)
ocations()
Queried(code: ScannedCode)
Searched(code: ScannedCode)
istance(code: Scannedcode)
iew()

GeoSearchArrayAdapter

- mContext: Context
- mResource: int
- mainActivity: MainActivity

+ GeoSearchArrayAdapter(context: Context, resource: int,
    objects: ArrayList<ScannedCode>, mainActivity: MainActivity)
+ getView(position: int, convertView: View, parent: ViewGroup): View

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<<enumeration>>
GeoQueryType

SEARCH_QUERY

MAP_QUERY

MapModel

- db: FirebaseFirestore
- geoFirestore: GeoFirestore

+ MapModel()
+ setMapGeoQuery(latitude: double, longitude: double,
    radius: double, callback: GeoQueryListener)
+ searchGeoQuery(latitude: double, longitude: double,
    radius: double, callback: GeoQueryListener)
+ baseGeoQuery(currentLocation: GeoPoint, radius: double,
    callback: GeoQueryListener, queryType: GeoQueryType)

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deCardRecyclerViewAdapter

dCode>
ner

ner: OnItemClickListener)
lerViewAdapter(items: List<ScannedCode>)
 ViewGroup, viewType: int): ViewHolder
iewHolder, position: int)

ScannedCode

- hash: String
- hashVal: int
- date: Date
- hasLocation: boolean
- location: GeoPoint
- locationImage: String
- userDID: String
- points: int
- name: String
- mosterResourceName: String
- scannedCodeDID: String
- distance: double

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                              ├──────────────┤
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│          <<interface>>            │  + o
│  OnPlayerScoreRetrievedListener   │  └──────────────
├───────────────────────────────────┤
├───────────────────────────────────┤
│ + onScoresRetrieved(score: int)   │
└───────────────────────────────────┘
                    │
                    │         ┌──────────────
                    │         │
                    └──⊕──────├──────────────
                              │ - email: String
                              │ - playerName: S
                              │ - deviceID: Strin
                              │ - db: FirebaseFir
                              │ - rank: int
                              ├──────────────
                              │ + Player(playerN
                              │ + Player(playerN
                              │ + setRank(rank:
                              │ + getEmail(): Str
                              │ + getUserName(
                              │ + getDeviceID():
                              │ + getRank(): Stri
                              │ + getNumericalF
                              │ + getScore(lister
                              │ + getQRCount(li
                              └──────────────
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                              ├──────────────
                              │ - image: Bitmap
                              │ - qr: ScannedCo
                              ├──────────────
                              │ + getImage(): Bi
                              │ + setImage(bitm
                              │ + getQr(): Scann
                              │ + setQr(qr: Scan
                              └──────────────
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                              │
                              ├──────────────
                              │ - galleryList: Arra
                              │ - context: Contex
                              │ - player: Player
                              │ - galleryAdapterI
                              ├──────────────
                              │ + GalleryAdapte
                              │ + onCreateView
                              │ + onBindViewHo
                              │ + getItemCount(
                              │ + removeImage(
                              │ + getInstance():
                              └──────────────
```

```
                              ┌──────────────
                              │
                              ├──────────────
                              │ image: Image
                              ├──────────────
                              │ + ViewHolder
```

<<interface>>
OnQRCountQueryListener

onQRCount(count: int)
onError(errorMessage: String)

CaptureFragment

- scannedCodeDID: String
- binding: ActivityMainBinding
- imageCapture: ImageCapture
- videoCapture: VideoCapture<Recorder>
- recording: Recording
- cameraExecutor: ExecutorService
- cameraProviderFuture: ListenableFuture<ProcessCameraProvider>
- previewView: PreviewView
- fbw: FirebaseWrapper

+ CaptureFragment(fbw: FirebaseWrapper, scannedcodeDID: String)
- startCamera()
- takePhoto()
- allPermissionGranted()
+ onDestroy()

Player

tring
g
irestore

Name: String, email: String, deviceID: String)
Name: String, email: String, deviceID: String, rank: int)
 int)
ring
X(): String
 String
ing
Rank(): int
er: OnPlayerScoreRetrieved)
stener: OnQRCountQueryListener)

ProfileFragment

+ user: Player
- scannedCodes: List<ScannedCode>
- fbw: FirebaseWrapper
+ defaultQr: Bitmap
+ db: FirebaseFirestore
+ instance: ProfileFragment

+ ProfileFragment(user: Player, fbw: FirebaseWrapper)
+ getInstance(): ProfileFragment
+ setDefaultQr(qr: ScannedCode)

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Hon

+ HomeFragr

GalleryListItem

ode

tmap
apImage: Bitmap)
nedCode
annedCode)

0..*

GalleryBuilder

- fbw: FirebaseWrapper

+ GalleryBuilder(fbw: FirebaseWrapper)
+ populateGallery(player: Player, galleryRecyclerView: RecyclerView,
      context: Context)
+ updateImageList(user: Player): ArrayList<GalleryListItem>

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GalleryAdapter

ayList<GalleryListItem>
xt

Instance: GalleryAdapter

r(context: Context, galleryList: ArrayList<GalleryListItem>)
Holder(viewGroup: ViewGroup, i: int): ViewHolder
older(viewHolder: ViewHolder, i: int)
): int
(codeImage: ScannedCode)
 GalleryAdapter

1

ViewHolder

eView

r(binding: FragmentCodesContentBinding)

```
+ ScanFragment(fbw: FirebaseWrapper)
+ onResume()
+ onPause()
+ newIntent(preferences: ArrayList<String>): Intent
+ onActivityResult(requestCode: int, resultcode: int, data: Intent)
+ getCurLocation(): Location
+ onRequestPermissionsResult(requestCode: int, permissions: String[], grantResults: int[])
```

<<Interface>> OnItemClickListener
OnItemClick(view: View, position: int)

SearchResultFragment

```
+ db: FirebaseFirestore
- fbw: FirebaseWrapper
- query: String
- userId: String
```
```
+ SearchResultFragment(query: String, fbw: FirebaseWrapper)
- displayAllUsers(recyclerView: RecyclerView)
- getAllUsers(listener: OnUsersRetrievedListener)
+ setClickListener(friendsAdapter: FriendsRecyclerViewAdapter, players: ArrayList<Player>)
```

<<interface>> OnUsersRetrievedListener
+ onUsersRetrieved(users: ArrayList<String

...eFragment

```
...ment()
```

SameQrDialogFragment

```
-userIdList: ArrayList<String>
- fbw: FirebaseWrapper
- mRecyclerView: RecyclerView
- adapter: FriendsRecyclerViewAdapter
- playerArrayList: ArrayList<Player>
```
```
+ SameQrDialogFragment(userIdList: ArrayList<String>, fbw: FirebaseWrapper)
+ onCreateView(inflater: LayoutInflater, container: ViewGroup, savedInstanceState: Bundle): View
```

```
                                                    + ScannedCode(code: String, date: String, locationImage: String,
                                                          userDID: String, scannedCodeDID: String)
                                               0..*  + ScannedCode(code: String, date: String, location: GeoPoint,
                                                          locationImage: String, userDID: String, scannedCodeDID: String)
                                                    + ScannedCode(hash: String, hashVal: int, date: String,
                                                          location: GeoPoint, hasLocation: boolean, locationImage: String,
                                                          userDID: String, scannedCodeDID: String)
                                                    + getDate(): Date
                                                    + getDateString(): String
                                                    + getLocation(): GeoPoint
                                                    + getHasLocation(): boolean
                                                    + getLocationString(): String
                                                    + getUserDID(): String
                                                    + getHash(): String
                                                    + getHashVal(): int
                                                    + getLocationImage(): String
                                                    + getPoints(): int
                                                    + getName(): String
                                                    + getMonsterResourceName(): String
                                                    + getScannedCodeDID(): String
                                                    + getDistance(): double
                                                    + setDistance(distance: double)
```

ViewHolder

```
+ codeCardAscii: TextView
+ codeCardName: TextView
+ codeCardLocation: TextView
+ codeCardDate: TextView
+ codeCardPts: TextView

+ ViewHolder(binding: FragmentCodesContentBinding)
+ onClick(v: View)
```