## UI

LoginActivity
private AuthenticationInterface authenticationInterface

private boolean authenticate(String name, String password);

RegisterActivity

public void getVerificationCode(String primaryPhoneNumber); // Request server send an SMS message

VerificationActivity
private RegistrationInterface registrationInterface;

public boolean sendVerificationCode(String verificationCode); // Verify code, insert User to DB, set userId to User object in Information. If successed, return true.

GuestMainActivity

implements

GuestFragmentCallBackInterface

GuestMainActivity getGuestMainActivity(); void sendSpaceID(int spaceID);

containment

GuestEditProfileFragment
private ProfileInterface profileInterface;
private GuestFragmentCallBackInterface guestFragmentCallBackInterface;

public void updateProfile(String userState, String dataOfBirth, String gender, String emailAddress, int zipCode, String icon);
public void showProfile();//show the profile info that is already in db.

GuestMainEmptyLockFragment

private GuestFragmentCallBackInterface guestFragmentCallBackInterface;

public View onCreateView(LayoutInflater inflater, ViewGroup container, Bundle saveInstanceState);
public void onAttach(Activity activity);

GuestMainStep1RAFragment

private GuestFragmentCallBackInterface guestFragmentCallBackInterface;
private GuestLockInterface guestLockInterface;

public View onCreateView(LayoutInflater inflater, ViewGroup container, Bundle saveInstanceState);//send phone number to GuestMainActivity.
public void onAttach(Activity activity);
//use the guestLockInterface to call its loadHostIdFromDB(String primaryPhoneNumber) method to get the host id from database and assign the value to the static hostId in Information.

GuestMainStep2RAFragment

private GuestFragmentCallBackInterface guestFragmentCallBackInterface;
private GuestLockInterface guestLockInterface;
private List<Property> listProperties;
private GridView showProperties;//show a gird view of properties.

public View onCreateView(LayoutInflater inflater, ViewGroup container, Bundle saveInstanceState);
public void onAttach(Activity activity);
//use the method "public int getHostID();" in guestLockInterface to get the hostId from static variable.
//use the method "public List<Property> getHostPropertyList(int hostId); to get the list of properties and assign it to listProperties"
//after user select the property, we can get the property that user selected. Then, use "List<Integer> getHostLockedList(Property property);" method to get the specific lock. After this, use "public void setNewLockActivityLockId(int lockId);" to get the assign the lockID to static object newLockActivity in Information.
//use "public void loadHostIdFromDB(String primaryPhoneNumber);" to load host id from db to static variable. Then use "public int getHostID();" to get id from static variable to local variable.
//use "public void setNewLockActivityHostId(int hostId);
public int getGuestID();
public void setNewLockActivityGuestId(int guestId);

GuestLockFragment

private GuestFragmentCallBackInterface guestFragmentCallBackInterface;
private Lock lock;//the lock that the user clicked and wanted open or lock.

public View onCreateView(LayoutInflater inflater, ViewGroup container, Bundle saveInstanceState);
public void onAttach(Activity activity);
public List<Lock> getLockList();// get all of the available locks for the guest, which are permitted by the host and confirmed by this guest.
public boolean openLock(Lock lock);//open the lock
public boolean closeLock(Lock lock);//close the lock

GuestAddEventActivity
private GuestEventInterface guestEventInterface;

public void setNewLockActivityAccessStartTime(String accessStartTime);
public void setNewLockActivityAccessEndTime(String accessEndTime);
public void setNewLockActivityRequestAccessTimestamp(String requestAccessTimestamp);
public void setNewLockActivityRequestStatus(boolean requestStatus);
public void setNewLockActivityAlert(int alert);
public void insertNewLockActivity(); // Insert new lockActivity to DB, set lockActivityId to LockActivity object in Information.

containment

GuestMainHistoryFragment

private HistoryInterface historyInterface;
private ListView historyList;

public List<LockActivity> getHistoryLockActivity();

HostMainActivity

implements

HostFragmentCallBackInterface

HosttMainActivity getHostMainActivity();
void sendSpaceID(int spaceID);

containment

HostEditProfileFragment
private ProfileInterface profileInterface;
private HostFragmentCallBackInterface hostFragmentCallBackInterface;

public void updateProfile(String userState, String dataOfBirth, String gender, String emailAddress, int zipCode, String icon);
public void showProfile();//show the profile info that is already in db.

HostHistoryFragment

private HostFragmentCallBackInterface hostFragmentCallBackInterface;
private HistoryInterface historyInterface;
private ListView listViewHistory;

private List<LockActivity> getHistoryLockActivity();

HostEventFragment

private HostFragmentCallBackInterface hostFragmentCallBackInterface;
private HostEventInterface hostEventInterface;
private ListView listViewEvent;

private List<LockActivity> getFutureLockActivity()
private void acceptEventRequest(LockActivity lockActivity);

HostLockFragment

private HostFragmentCallBackInterface hostFragmentCallBackInterface;
private HostLockInterface hostLockInterface;
private ListView listViewLock;

private List<Lock> getLockList();

HostSpaceFragment

private HostFragmentCallBackInterface hostFragmentCallBackInterface;
private HostSpaceInterface hostSpaceInterface;
private ListView listViewSpace;

private List<Property> getPropertyList();

HostSpaceSettingsActivity

private HostFragmentCallBackInterface hostFragmentCallBackInterface;
private HostSpaceInterface hostSpaceInterface;
private boolean isNew;

private void insertProperty(Property property);
private void updateProperty(Property property);
private void deleteProperty(Property property);

HostSpaceLockActivity

private HostFragmentCallBackInterface hostFragmentCallBackInterface;
private HostSpaceInterface hostSpaceInterface;
private ListView listViewSpaceLock;
private Property property;

private List<Lock> getLockList(Property property);

HostLockSettingsActivity

private HostFragmentCallBackInterface hostFragmentCallBackInterface;
private HostSpaceInterface hostSpaceInterface;
private boolean isNew;
private Property property;

public void insertLock(Property property, Lock lock);
public void updateLock(Property property, Lock lock);
public void deleteLock(Property property, Lock lock);

## Interfaces

AuthenticationInterface

public boolean authenticate(String primaryPhoneNumber, String password); // If success, return true
public void loadUserIdFromDB(String primaryPhoneNumber);
public String getUserState();

RegistrationInterface

public void setBasicUserInfo(String name, String password, String country, String primaryPhoneNumber);
public void insertUser(); // Insert user to DB, set userId to User object in Information.

ProfileInterface

public void updateProfile(String userState, String dataOfBirth, String gender, String emailAddress, int zipCode, String icon);
public String getUserState();
public String getDateOfBirth();
public String getGender();
public String getEmailAddress();
public int getZipCode();
public String getIcon();

GuestEventInterface //Events

public List<LockActivity> getFutureLockActivity()
public void updateLockActivityLockActivity lockActivity);
public void loadHostIdFromDB(String primaryPhoneNumber);
public int getGuestId();
public int getHostId();
public List<Property> getHostPropertyList(int hostId);
public List<Integer> getHostLockedList(Property property);
public void setNewLockActivityHostId(int hostId);
public void setNewLockActivityGuestId(int guestId);
public void setNewLockActivityLockId(int lockId);
public void setNewLockActivityAccessStartTime(String accessStartTime);
public void setNewLockActivityAccessEndTime(String accessEndTime);
public void setNewLockActivityRequestAccessTimestamp(String requestAccessTimestamp);
public void setNewLockActivityRequestStatus(boolean requestStatus);
public void setNewLockActivityAlert(int alert);
public void insertNewLockActivity(); // Insert new lockActivity to DB, set lockActivityId to LockActivity object in Information.

GuestLockInterface

public List<Lock> getLockList();
public boolean openLock(Lock lock);
public boolean closeLock(Lock lock);

HistoryInterface

public List<LockActivity> getHistoryLockActivity();

HostEventInterface

public List<LockActivity> getFutureLockActivity()
public void updateLockActivity(LockActivity lockActivity);

HostLockInterface

public List<Lock> getLockList();

HostSpaceInterface

public List<Property> getPropertyList();
public void insertProperty(Property property);
public void updateProperty(Property property);
public void deleteProperty(Property property);
public List<Lock> getLockList(Property property);
public void insertLock(Property property, Lock lock);
public void updateLock(Property property, Lock lock);
public void deleteLock(Property property, Lock lock);

implements

## Business Logic

EntityAdapter

private static Information information = new Information();

public EntityAdapter();

... methods implementing interfaces ...

containment

## Entity

Information

private User user;
private List<Lock> guestLock;
private Map<Properties, List<Lock>> hostIPropLockMap;
private Map<Lock, List<LockActivity>> lockLockActivityMap;;
private Lock newLock;
private LockActivity newLockActivity;
private int hostId;

getters and setters;

containment

User
private int userId;
private String name;
private String country;
private String primaryPhoneNumber;
private String isMobileVerified;
private String password;
private String userState;
private String dataOfBirth;
private String gender;
private String emailAddress;
private int zipCode;
private String icon;

getters and setters;

Property
private int propertyId;
private int userId;
private String description;
private String address;
private int zipCode;
private String city;
private String state;
private String country;
private String ownership;

getters and setters

Lock
private int lockId;
private int propertyId;
private String description;
private boolean isLocked;
private double lockPower;
private double lockStartAngle;
private double lockEndAngle;
private String rotationDirection;
private double rotationEndPoints;

LockActivity
private int lockActicityId;
private int hostId;
private int guestId;
private int lockId;
private String accessStartTime;
private String accessEndTime;
private String requestAccessTimestamp;
private boolean requestStatus;
private int alert;

getters and setters

## DB

smartlock

## Tables

USER

PROPERTIES

LOCKS

LOCK_ACTICITY

GUEST_LOCK

## local

## remote

Tomcat

HttpConnection

private static Object httpPost(String url, Object object)

Servlet Package

[User|Property|Lock|LockActivity][Select|Insert|Update|Delete]Servlet

protected void doGet(HttpServletRequest request, HttpServletResponse response)
protected void doPost(HttpServletRequest request, HttpServletResponse response)

DbAdapter
public void createUser(User user);
public void updateUser(UserUser user);
public User readUser();
public int getUserId();;
public void createProperty(Property property);
public void updateProperty(Property property);
public Property readProperty();;
public void deleteProperty(Property property);
public void createLock(Lock lock));
public void updateLock(Lock lock);
public Lock readLock();
public void deleteLock(Lock lock);
public void createLockActivity(LockActicity lockActivity);
public void updateLockActivity(LockActivity lockActivity);
public LockActivity readGuestLockActivity (LockActivity lockActivity);
public LockActivity readHostLockActicity (LockActivity lockActivity);
public void deleteLockActivity(LockActivity lockActivity);

containment

User
private int userId;
private String name;
private String country;
private String primaryPhoneNumber;
private String isMobileVerified;
private String password;
private String userState;
private String dataOfBirth;
private String gender;
private String emailAddress;
private int zipCode;
private String icon;

getters and setters;

Property
private int propertyId;
private int userId;
private String description;
private String address;
private int zipCode;
private String city;
private String state;
private String country;
private String ownship;

getters and setters

Lock
private int lockId;
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getters and setters;

LockActivity
private int lockActicityId;
private int hostId;
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private String accessStartTime;
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private String requestAccessTimestamp;
private boolean requestStatus;
private int alert;

getters and setters

Entities Classes (Server-Side)