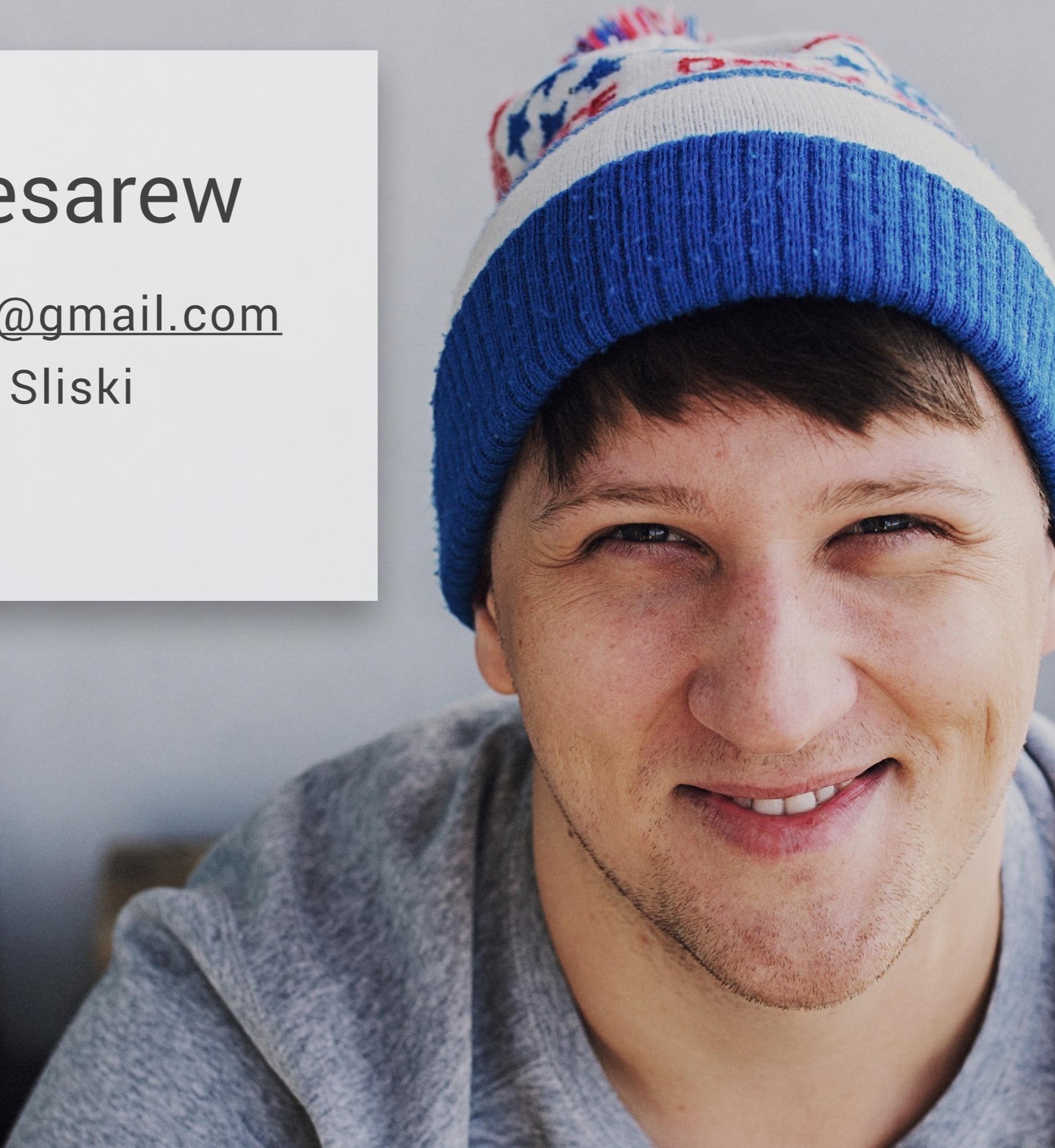


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on GitHub as Sliski
in



ROBUST UNIT TESTING IN ANDROID

TIPS & TRICKS

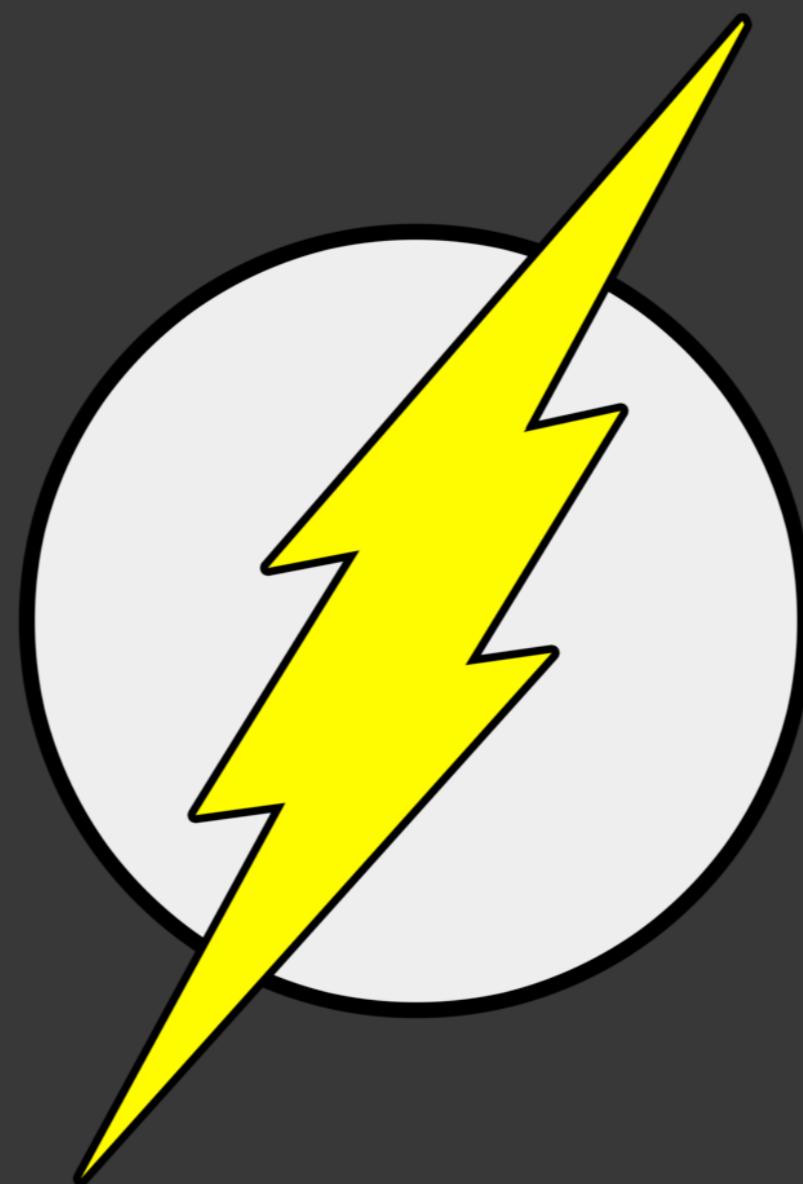
UNIT TESTING IS LIKE
INSURANCE POLICIES...

A LOT OF EFFORT FOR
SOMETHING YOU'LL NEVER USE.

UNIT TESTING IS LIKE
INSURANCE POLICIES...

THEY COVER WHAT YOU
INVEST IN ADVANCE.

WHAT POWERS DO WE NEED?



WHAT POWERS DO WE NEED?

```
public class AndroidDeveloperTest {  
  
    Developer mAndroidDeveloper;  
  
    @Before  
    public void setUp() throws Exception {  
        Skill skill = Skill.Builder  
            .withTestingSkill(true)  
            .build();  
        mAndroidDeveloper = AndroidDeveloper.create(skill);  
    }  
  
    @Test  
    public void androidDev_ShouldUnitTesting() throws Exception {  
        assertTrue(  
            "What? Android developer is not testing? Eghh...",  
            mAndroidDeveloper.isUnitTesting()  
        );  
    }  
}
```

WHAT POWERS DO WE NEED?

```
public class AndroidDeveloperTest
```

```
    extends Developer
```

```
    Before
```

```
    public void setupAndroidDeveloper() {
```

```
        Skill skill = mock(Skill.class);
        when(skill.isTestingSkill())
            .thenReturn(true);
```

```
)
```

```
}
```

WHAT POWERS DO WE NEED?

```
@RunWith(RobolectricTestRunner.class)
public class

Developer

Skill skill =
    .thenReturn(
        Application context = Robolectric.application;
        mAndroidDeveloper = AndroidDeveloper.create(context, skill);

    )
}
```

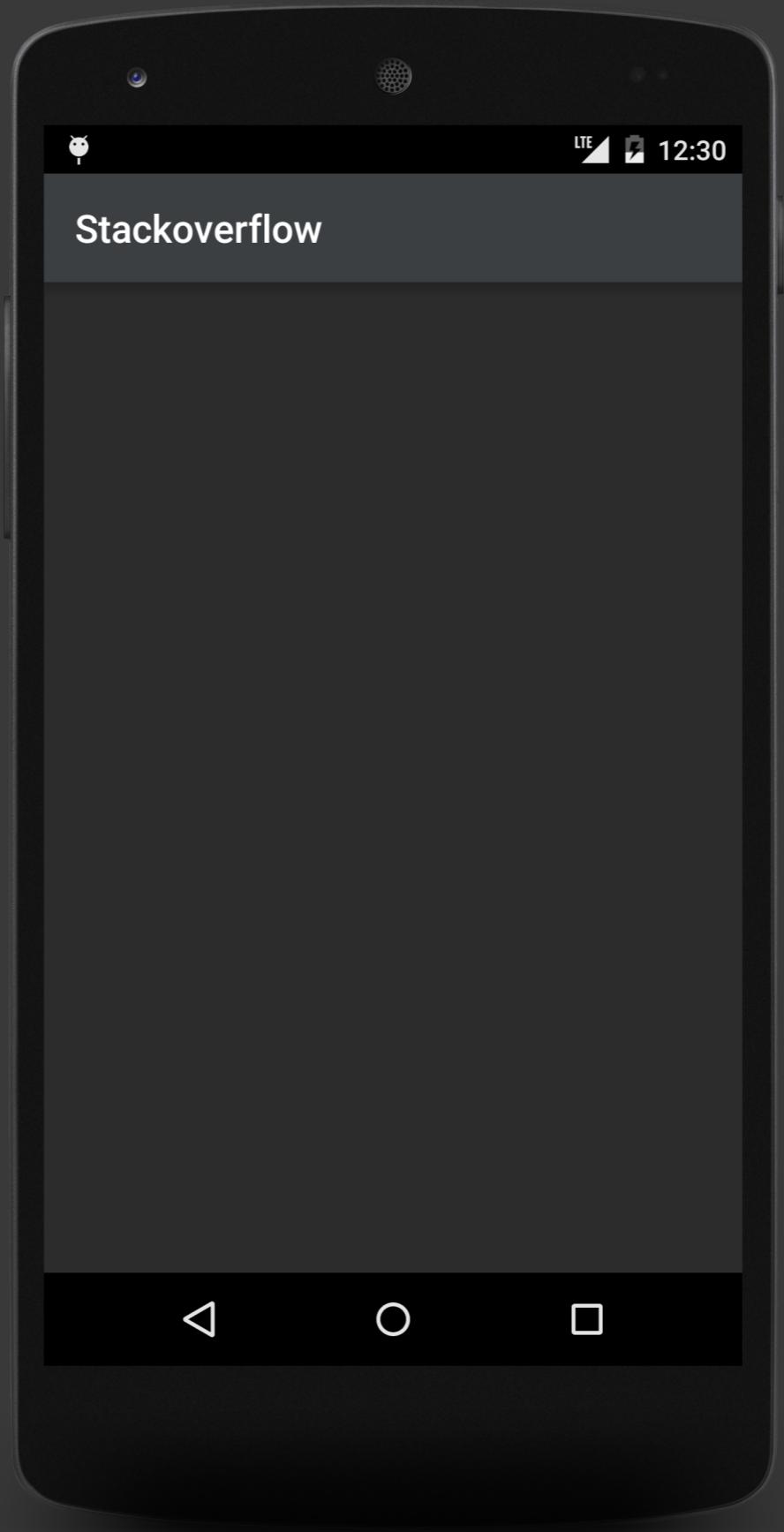
WHAT POWERS DO WE NEED?

```
@Singleton  
@Component(modules = AppModule.class)  
public interface AppComponent {  
    void inject(Skill skill);  
}  
  
@Module  
public class AppModule {  
    @Provides  
    public Skill provideSkill() {  
        return Skill.Builder  
            .withTestingSkill(true)  
            .build();  
    }  
}
```

ANDROID GRADLE PLUGIN BRINGS SUPPORT FOR JUNIT!



**REMEMBER! HEROES DO NOT
TEST BOILERPLATE.**



```
public class MainActivity : ActionBarActivity(), MainActivityView {

    public var presenter: MainActivityPresenter? = null
        [Inject] set

    override fun onCreate(savedInstanceState: Bundle?) {
        super<ActionBarActivity>.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)
        App.mGraph.inject(this)
        presenter?.setView(this)
        presenter?.addFragment(savedInstanceState)
    }

    override fun addLoginFragment() {
        addFragment(LoginFragment())
    }

    override fun addUserInfoFragment() {
        addFragment(UserInfoFragment())
    }

    private fun addFragment(fragment: Fragment) {
        addFragment(R.id.container, fragment)
    }
}
```

```
public class MainActivity : ActionBarActivity(), MainActivityView {

    public var presenter: MainActivityPresenter? = null
        [Inject] set

    override fun

        setContentView(R.layout.
        App.

            presenter?.addFragment(savedInstanceState)
    }

    override fun addLoginFragment() {
        addFragment(LoginFragment())
    }

    override fun addUserInfoFragment() {
        addFragment(UserInfoFragment())
    }

    private fun addFragment(fragment: Fragment) {
        addFragment(R.id.container, fragment)
    }
}
```

```
public trait MainActivityPresenter {
    public fun addFragment(savedInstanceState: Bundle?)
    public fun setView(view: MainActivityView)
    public fun getView(): MainActivityView?
}

public class MainActivityPresenterImpl : MainActivityPresenter {

    private var mainActivityView: MainActivityView? = null
    var preferencesManager: PreferencesManager? = null

    override fun addFragment(savedInstanceState: Bundle?) {
        if (savedInstanceState == null) {
            val userId = preferencesManager?.userId()?.getOr(0L)
            if (userId == 0L) {
                mainActivityView?.addLoginFragment()
            } else {
                mainActivityView?.addUserInfoFragment()
            }
        }
    }

    override fun setView(view: MainActivityView) {
        mainActivityView = view
    }

    override fun getView(): MainActivityView? {
        return mainActivityView
    }
}
```

```
public class MainActivityTest {  
  
    Fragment fragment;  
  
    @Before  
    public void setUp() throws Exception {  
        MainActivity mainActivity = Robolectric.buildActivity(MainActivity.class)  
            .create()  
            .start()  
            .visible()  
            .get();  
        fragment = mainActivity  
            .getSupportFragmentManager()  
            .findFragmentById(R.id.container);  
    }  
  
    @Test  
    @Config(application = App.class)  
    public void addFragment_ShouldAddUserIdFragment() throws Exception {  
        assertTrue(fragment instanceof LoginFragment);  
    }  
  
    @Test  
    @Config(application = TestApp.class)  
    public void addFragment_ShouldAddUserInfoFragment() throws Exception {  
        assertTrue(fragment instanceof UserInfoFragment);  
    }  
}
```

```
public class MainActivityPresenterImplTest {

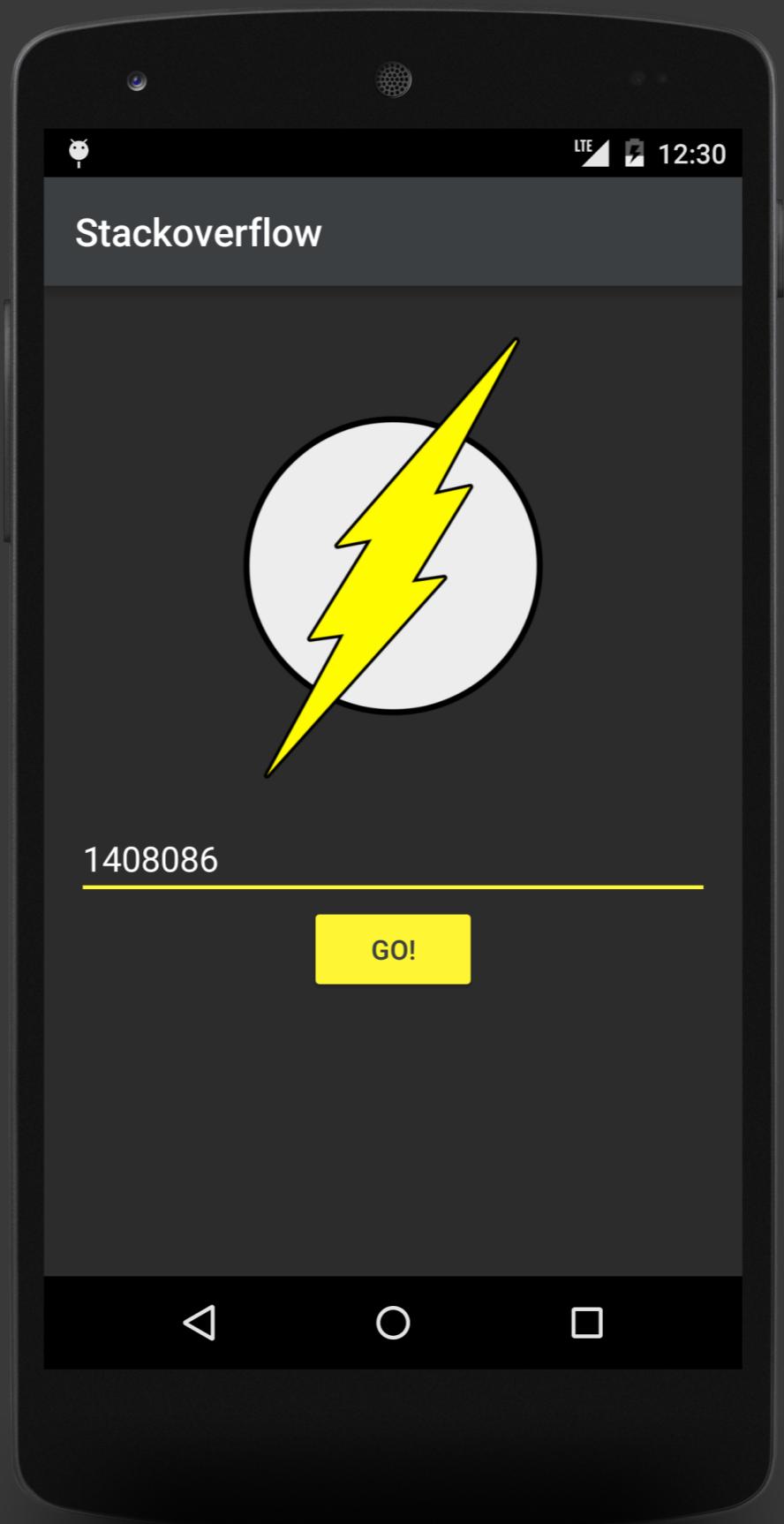
    private MainActivityPresenterImpl presenter;

    @Before
    public void setUp() throws Exception {
        presenter = new MainActivityPresenterImpl();
        presenter.setView(mock(MainActivityView.class));
        presenter.setPreferencesManager(getPreferencesManager());
    }

    @Test
    public void addFragment_ShouldNotAddFragment() throws Exception {
        presenter.addFragment(mock(Bundle.class));
        MainActivityView mainActivityView = presenter.getView();
        verify(mainActivityView, never()).addLoginFragment();
        verify(mainActivityView, never()).addUserInfoFragment();
    }

    @Test
    public void addFragment_ShouldAddLoginFragment() throws Exception {
        presenter.getPreferencesManager().userId().put(0L).commit();
        presenter.addFragment(null);
        verify(presenter.getView()).addLoginFragment();
    }

    @Test
    public void addFragment_ShouldAddUserInfoFragment() throws Exception {
        presenter.getPreferencesManager().userId().put(1408086L).commit();
        presenter.addFragment(null);
        verify(presenter.getView()).addUserInfoFragment();
    }
}
```



```
public class LoginFragment : Fragment(), LoginFragmentView, View.OnClickListener {

    public var presenter: LoginFragmentPresenter? = null
        [Inject] set

    override fun onCreate(savedInstanceState: Bundle?) {
        super<Fragment>.onCreate(savedInstanceState)
        App.mGraph.inject(this)
        presenter?.setView(this)
    }

    override fun onCreateView(inflater: LayoutInflater, container: ViewGroup?, savedInstanceState: Bundle?): View {
        return inflater.inflate(R.layout.user_id_fragment, container, false)
    }

    override fun onActivityCreated(savedInstanceState: Bundle?) {
        super<Fragment>.onActivityCreated(savedInstanceState)
        findViewById<View>(R.id.go_button).setOnClickListener(this)
    }

    override fun showBadFormatInfo() {
        showToastShort(R.string.bad_format_info)
    }

    override fun replaceWithUserInfoFragment() {
        replaceWith(UserInfoFragment())
    }

    override fun onClick(v: View) {
        val userId = findViewById<EditText>(R.id.user_id_editText).getText().toString()
        presenter?.login(userId)
    }
}
```

```
public class LoginFragment : Fragment(), LoginFragmentView, View.OnClickListener {

    public var presenter: LoginFragmentPresenter? = null
        [Inject] set

    override fun

        App.

    }

    override fun
    savedInstanceState: Bundle?): View {

    }

    override fun

    }

    override fun showBadFormatInfo() {
        showToastShort(R.string.bad_format_info)
    }

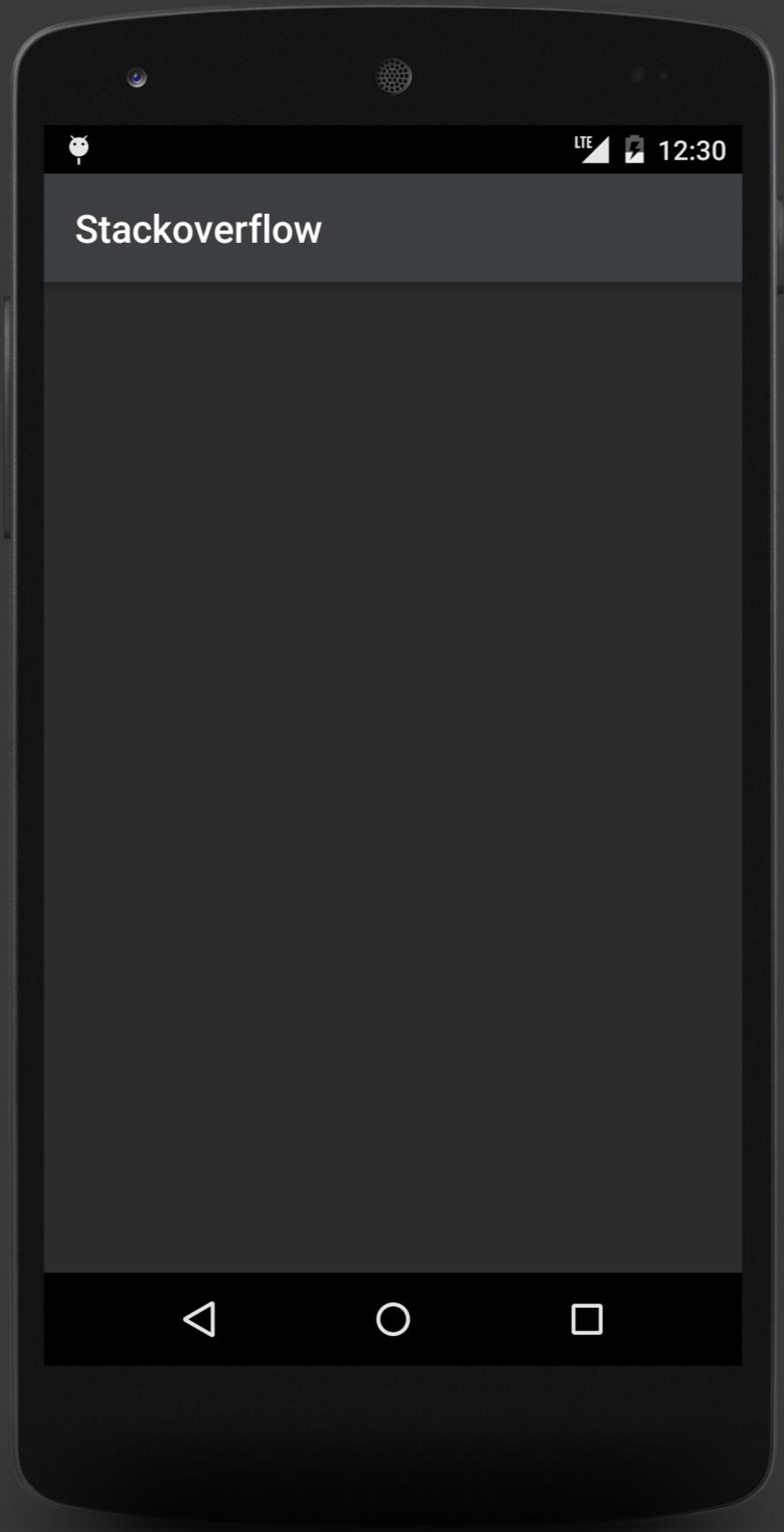
    override fun replaceWithUserInfoFragment() {
        replaceWith(UserInfoFragment())
    }

    override fun onClick(v: View) {
        val userId = findView<EditText>(R.id.user_id_editText).getText().toString()
        presenter?.login(userId)
    }
}
```

```
public trait LoginFragmentPresenter {  
    fun login(userId: String)  
    public fun setView(view: LoginFragmentView)  
    public fun getView(): LoginFragmentView?  
}  
  
public class LoginFragmentPresenterImpl : LoginFragmentPresenter {  
  
    private var loginFragmentView: LoginFragmentView? = null  
    var preferencesManager: PreferencesManager? = null  
  
    override public fun login(userId: String) {  
        try {  
            val userIdToLong = userId.toLong()  
            preferencesManager  
                ?.userId()  
                ?.put(userIdToLong)  
                ?.commit()  
            loginFragmentView?.replaceWithUserInfoFragment()  
        } catch(e: NumberFormatException) {  
            loginFragmentView?.showBadFormatInfo()  
        }  
    }  
  
    override fun setView(view: LoginFragmentView) {  
        loginFragmentView = view  
    }  
  
    override fun getView(): LoginFragmentView? {  
        return loginFragmentView;  
    }  
}
```

```
public class LoginFragmentTest {  
  
    private LoginFragmentView userIdFragment;  
  
    @Before  
    public void setUp() throws Exception {  
        userIdFragment = new LoginFragment();  
        FragmentTestUtil.startFragment(((LoginFragment) userIdFragment),  
MainActivity.class);  
    }  
  
    @Test  
    public void login_ShouldReplaceFragmentWithUserInfoFragment() throws Exception {  
        userIdFragment.setId("2");  
        userIdFragment.onClickGoButton();  
        Fragment fragment = ((LoginFragment) userIdFragment)  
            .getActivity()  
            .getSupportFragmentManager()  
            .findFragmentById(R.id.container);  
        assertTrue(fragment instanceof UserInfoFragment);  
    }  
}
```

```
public class LoginFragmentPresenterImplTest {  
  
    private LoginFragmentPresenterImpl presenter;  
  
    @Before  
    public void setUp() throws Exception {  
        presenter = new LoginFragmentPresenterImpl();  
        presenter.setView(mock(LoginFragmentView.class));  
        presenter.setPreferencesManager(getPreferencesManager());  
    }  
  
    @Test  
    public void login_ShouldShowBadFormatInfo() throws Exception {  
        presenter.login("");  
        verify(presenter.getView()).showBadFormatInfo();  
    }  
  
    @Test  
    public void login_ShouldReplaceFragmentAndSaveIdToPrefs() throws Exception {  
        presenter.login("1408086");  
        verify(presenter.getView()).replaceWithUserInfoFragment();  
  
        assertEquals(  
            Long.valueOf(1408086L),  
            presenter.getPreferencesManager().userId().getOr(0L)  
        );  
    }  
}
```



```
public class UserInfoFragment : Fragment(), UserInfoFragmentView {

    public var presenter: UserInfoFragmentPresenter? = null
        [Inject] set

    override fun onCreate(savedInstanceState: Bundle?) {
        super<Fragment>.onCreate(savedInstanceState)
        App.mGraph.inject(this)
        presenter?.setView(this)
    }

    override fun onCreateView(inflater: LayoutInflater, container: ViewGroup?, savedInstanceState: Bundle?): View {
        return inflater.inflate(R.layout.user_info_fragment, container, false)
    }

    override fun onActivityCreated(savedInstanceState: Bundle?) {
        super<Fragment>.onActivityCreated(savedInstanceState)
        presenter!!.addFragments(savedInstanceState, isTablet())
    }

    override fun addPostListFragment() {
        addChildFragment(R.id.list_container, PostListFragment())
    }

    override fun addPostDetailsFragment() {
        addChildFragment(R.id.preview_container, PostDetailsFragment())
    }
}
```

```
public class UserInfoFragment : Fragment(), UserInfoFragmentView {  
  
    public var presenter: UserInfoFragmentPresenter? = null  
        [Inject] set  
  
    override fun  
  
        App.  
  
    }  
  
    override fun  
savedInstanceState: Bundle?): View {  
  
    }  
  
    override fun onActivityCreated(savedInstanceState: Bundle?) {  
        super<Fragment>.onActivityCreated(savedInstanceState)  
        presenter!!.addFragments(savedInstanceState, isTablet())  
    }  
  
    override fun addPostListFragment() {  
        addChildFragment(R.id.list_container, PostListFragment())  
    }  
  
    override fun addPostDetailsFragment() {  
        addChildFragment(R.id.preview_container, PostDetailsFragment())  
    }  
}
```

```
public trait UserInfoFragmentPresenter {  
    public fun addFragments(savedInstanceState: Bundle?, isTablet: Boolean)  
    public fun setView(view: UserInfoFragmentView)  
    public fun getView(): UserInfoFragmentView?  
}  
  
public class UserInfoFragmentPresenterImpl : UserInfoFragmentPresenter {  
  
    private var userInfoFragmentView: UserInfoFragmentView? = null  
  
    override fun addFragments(savedInstanceState: Bundle?, isTablet: Boolean) {  
        if (savedInstanceState == null) {  
            userInfoFragmentView?.addPostListFragment()  
            if (isTablet) {  
                userInfoFragmentView?.addPostDetailsFragment()  
            }  
        }  
    }  
  
    override fun setView(view: UserInfoFragmentView) {  
        userInfoFragmentView = view  
    }  
  
    override fun getView(): UserInfoFragmentView? {  
        return userInfoFragmentView  
    }  
}
```

```
public class UserInfoFragmentTest {  
  
    private int childFragmentManager;  
  
    @Before  
    public void setUp() throws Exception {  
        UserInfoFragment userInfoFragment = new UserInfoFragment();  
        FragmentTestUtil.startFragment(userInfoFragment);  
        childFragmentManager = userInfoFragment  
            .getChildFragmentManager()  
            .getFragments()  
            .size();  
    }  
  
    @Test  
    public void fragment_ShouldContainsOneChild() throws Exception {  
        assertEquals(1, childFragmentManager);  
    }  
  
    @Test  
    @Config(qualifiers = "layout-large")  
    public void fragment_ShouldContainsTwoChildren() throws Exception {  
        assertEquals(2, childFragmentManager);  
    }  
}
```

```
public class UserInfoFragmentPresenterImplTest {

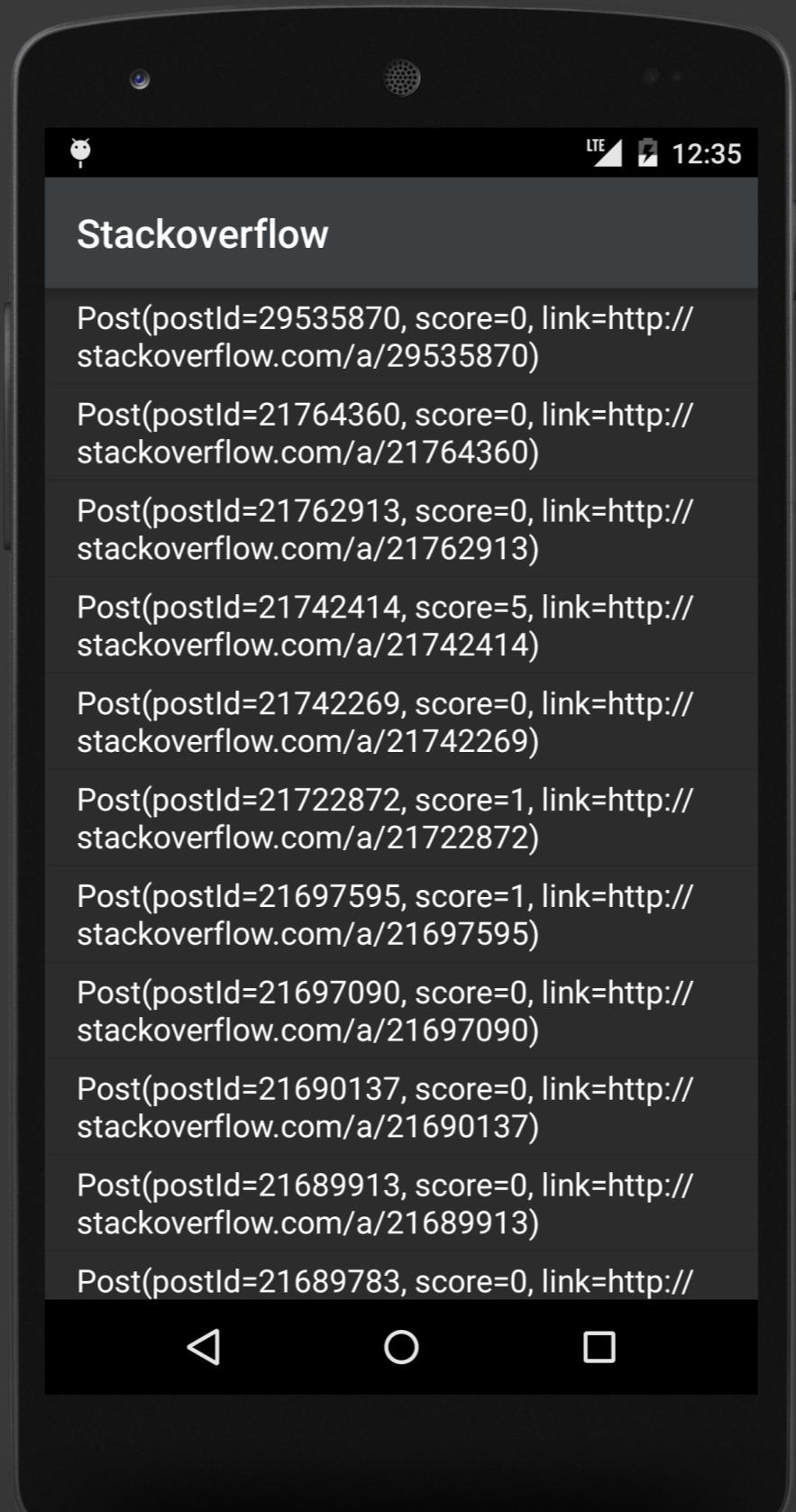
    private UserInfoFragmentPresenterImpl presenter;

    @Before
    public void setUp() throws Exception {
        presenter = new UserInfoFragmentPresenterImpl();
        presenter.setView(mock(UserInfoFragmentView.class));
    }

    @Test
    public void addFragments_ShouldNotAddFragments() throws Exception {
        presenter.addFragments(mock(Bundle.class), true);
        verify(presenter.getView(), never()).addPostListFragment();
        verify(presenter.getView(), never()).addPostDetailsFragment();
    }

    @Test
    public void addFragments_ShouldAddPostDetailsFragment() throws Exception {
        presenter.addFragments(null, true);
        verify(presenter.getView()).addPostDetailsFragment();
    }

    @Test
    public void addFragments_ShouldNotAddPostDetailsFragment() throws Exception {
        presenter.addFragments(null, false);
        verify(presenter.getView(), never()).addPostDetailsFragment();
    }
}
```



```
public class PostListFragment : ListFragment(), PostListFragmentView,  
    AdapterView.OnItemClickListener {  
  
    public var presenter: PostListFragmentPresenter? = null  
        [Inject] set  
  
    override public fun onCreate(savedInstanceState: Bundle?) {  
        super<ListFragment>.onCreate(savedInstanceState)  
        App.mGraph.inject(this)  
        presenter?.setView(this)  
    }  
  
    override public fun onActivityCreated(savedInstanceState: Bundle?) {  
        super<ListFragment>.onActivityCreated(savedInstanceState)  
        getListView().setOnItemClickListener(this)  
        presenter?.getPosts()  
    }  
  
    override fun onPause() {  
        super<ListFragment>.onPause()  
        presenter?.setView(null)  
    }  
  
    override fun onItemClick(pv: AdapterView<*>, v: View, p: Int, id: Long) {  
        presenter?.onItemClick(p, isTablet())  
    }  
  
    override fun setAdapter(posts: ArrayList<Post>?) {  
        val layoutId = android.R.layout.simple_list_item_1  
        setListAdapter(ArrayAdapter(getActivity(), layoutId, posts))  
    }  
  
    override fun addToBackStack(post: Post) {  
        addToBackStack(R.id.list_container, PostDetailsFragment.getInstance(post))  
    }  
}
```

```
public class PostListFragment : ListFragment(), PostListFragmentView,  
    AdapterView.OnItemClickListener {  
  
    public var presenter: PostListFragmentPresenter? = null  
        [Inject] set  
  
    override public fun  
  
        App.  
    }  
  
    override public fun  
  
        getListView().setOnItemClickListener(  
            presenter?.getPosts()  
    }  
  
    override fun  
  
    }  
  
    override fun onItemClick(pv: AdapterView<*>, v: View, p: Int, id: Long) {  
        presenter?.onItemClick(p, isTablet())  
    }  
  
    override fun setAdapter(posts: ArrayList<Post>?) {  
        val layoutId = android.R.layout.simple_list_item_1  
        setListAdapter(ArrayAdapter(getActivity(), layoutId, posts))  
    }  
  
    override fun addToBackStack(post: Post) {  
        addToBackStack(R.id.list_container, PostDetailsFragment.getInstance(post))  
    }  
}
```

```
public trait PostListFragmentPresenter {
    public fun getPosts()
    public fun onItemClick(position: Int, isTablet: Boolean)
    public fun setView(view: PostListFragmentView?)
    public fun getView(): PostListFragmentView?
}

public class PostListFragmentPresenterImpl() : PostListFragmentPresenter {

    private var postListFragmentView : PostListFragmentView? = null
    var client: Client? = null
    var preferencesManager: PreferencesManager? = null
    var postList: ArrayList<Post>? = null
    var eventBus: EventBus? = null

    override fun getPosts() {
        if (postList != null) {
            postListFragmentView?.setAdapter(postList)
        } else {
            eventBus?.register(this)
            val userId = preferencesManager?.userId()?.getOr(0L);
            client?.getPosts(userId as Long);
        }
    }

    override fun onItemClick(position: Int, isTablet: Boolean) {
        val post = postList?.get(position) as Post
        if (isTablet) {
            eventBus?.post(OnPostClickedEvent(post))
        } else {
            postListFragmentView?.addToBackStack(post)
        }
    }

    public fun onEvent(event: GetPostsResponseEvent) {
        postList = event.posts
        postListFragmentView?.setAdapter(ArrayList(event.posts))
    }
}
```

```
public class PostListFragmentPresenterImplTest {

    private PostListFragmentPresenterImpl presenter;

    @Before
    public void setUp() throws Exception {
        presenter = new PostListFragmentPresenterImpl();
        presenter.setPostListFragmentView(mock(PostListFragmentView.class));
        presenter.setClient(mock(Client.class));
        presenter.setEventBus(mock(EventBus.class));
    }

    @Test
    public void getPosts_ShouldLoadPostsFromCache() throws Exception {
        ArrayList<Post> arrayList = new ArrayList<>();
        presenter.setPostList(arrayList);
        presenter.getPosts();
        verify(presenter.getView()).setAdapter(arrayList);
    }

    @Test
    public void getPosts_ShouldLoadPostFromServer() throws Exception {
        PreferencesManager preferencesManager = getPreferencesManager(1408086L);
        presenter.setPreferencesManager(preferencesManager);
        presenter.setPostList(null);
        presenter.getPosts();
        verify(presenter.getClient()).getPosts(1408086L);
    }
}
```

```
public class PostListFragmentPresenterImplTest {

    private PostListFragmentPresenterImpl presenter;

    @Before
    public void setUp() throws Exception {
        presenter = new PostListFragmentPresenterImpl();
        presenter.setView(mock(PostListFragmentView.class));
        presenter.setClient(mock(Client.class));
        presenter.setEventBus(mock(EventBus.class));
    }

    @Test
    public void onItemClick_ShouldPostOnPostClickedEvent() throws Exception {
        ArrayList<Post> posts = new ArrayList<>();
        posts.add(new Post(1, 0, ""));
        presenter.setPostList(posts);
        presenter.onItemClick(0, true);
        verify(presenter.getEventBus()).post(Mockito.any(OnPostClickedEvent.class));
    }

    @Test
    public void onItemClick_ShouldAddToBackStack() throws Exception {
        ArrayList<Post> posts = new ArrayList<>();
        Post post = new Post(1, 0, "");
        posts.add(post);
        presenter.setPostList(posts);
        presenter.onItemClick(0, false);
        verify(presenter.getView()).addToBackStack(post);
    }
}
```



[http://stackoverflow.com/a/
13733914](http://stackoverflow.com/a/13733914)

```
public class PostDetailsFragmentTest {

    @Test
    public void fragment_ShouldDisplayInfoAboutPost() throws Exception {
        PostDetailsFragment postDetailsFragment =
PostDetailsFragment.Factory.getInstance(new Post(1, 100, "www.stack.com/aa"));
        FragmentTestUtil.startFragment(postDetailsFragment);
        TextView score = ((TextView)
postDetailsFragment.getView().findViewById(R.id.score));
        TextView link = ((TextView) postDetailsFragment.getView().findViewById(R.id.link));
        assertEquals(
            "100",
            score.getText().toString()
        );
        assertEquals(
            "www.stack.com/aa",
            link.getText().toString()
        );
    }

    @Test
    public void fragment_ShouldNotDisplayInfoAboutPost() throws Exception {
        PostDetailsFragment postDetailsFragment = new PostDetailsFragment();
        FragmentTestUtil.startFragment(postDetailsFragment);
        TextView score = ((TextView)
postDetailsFragment.getView().findViewById(R.id.score));
        TextView link = ((TextView) postDetailsFragment.getView().findViewById(R.id.link));
        assertEquals(
            "",
            score.getText().toString()
        );
        assertEquals(
            "",
            link.getText().toString()
        );
    }
}
```



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QUESTIONS