Mobile Application Development

Produced by

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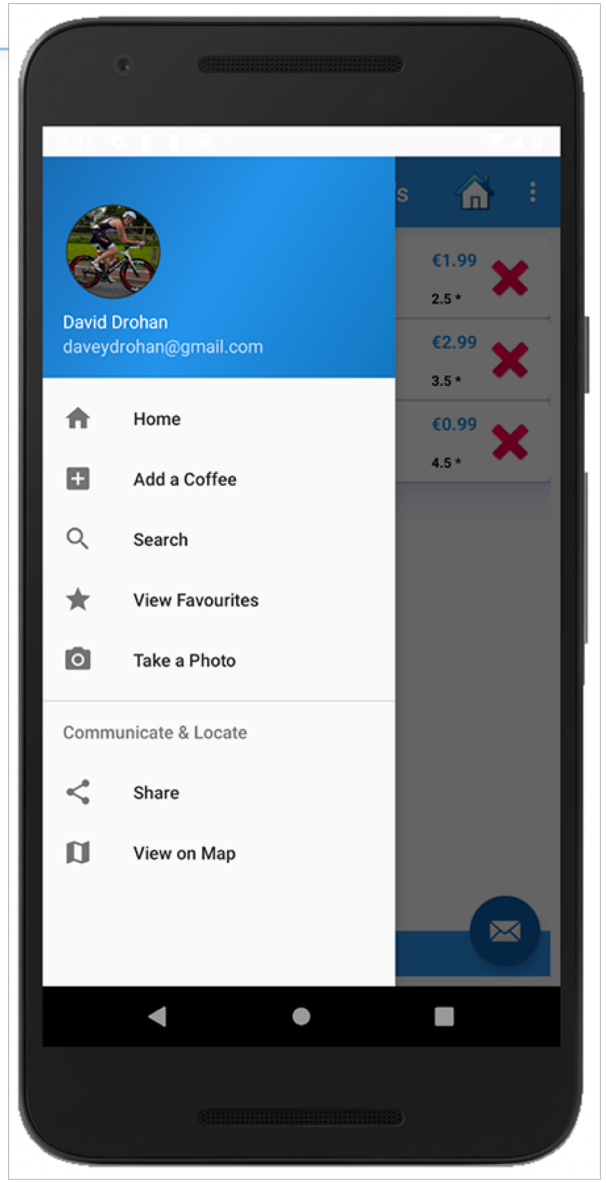
User Interface Design & Development – Part 3

Goals of this Section

- Be able to create and use a **`NavigationDrawer`** to implement more effective navigation within an app (CoffeeMate 4.0+)
- Investigate replacing our **`ListView`** and **`ArrayAdapter`** to use a **`RecyclerView`** & **`RecyclerAdapter`**

Case Study

- *CoffeeMate* – an Android App to keep track of
  your Coffees, their details, and which ones you like the best (your favourites)
- App Features with Google+ Sign-In
  - List all your Coffees
  - View specific Coffee details
  - Filter Coffees by Name and Type
  - Delete a Coffee
  - List all your Favourite Coffees
  - View Coffees on a Map

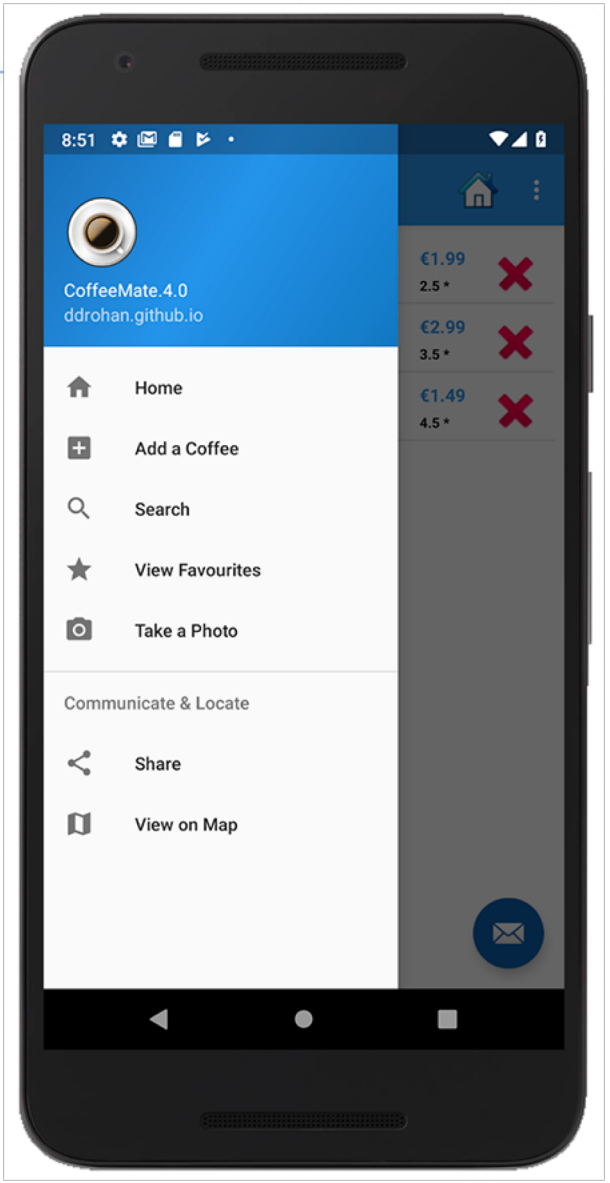


CoffeeMate 4.0+

Using
The
Navigation Drawer

Navigation Drawer Overview

- https://developer.android.com/training/implementing-navigation/nav-drawer.html
- The navigation drawer is a panel that displays the app's main navigation options on the left edge of the screen. It is hidden most of the time, but is revealed when the user swipes a finger from the left edge of the screen or, while at the top level of the app, the user touches the app icon in the action bar.



Navigation Drawer Overview

- Android Studio does a lot of the heavy lifting for you, but generally the following steps are necessary to add a Navigation Drawer to your app
  - *Create drawer layout*
  - *Bind to navigation drawer layout*
  - *Handle navigation drawer click and*
  - *Update content based on user selection*

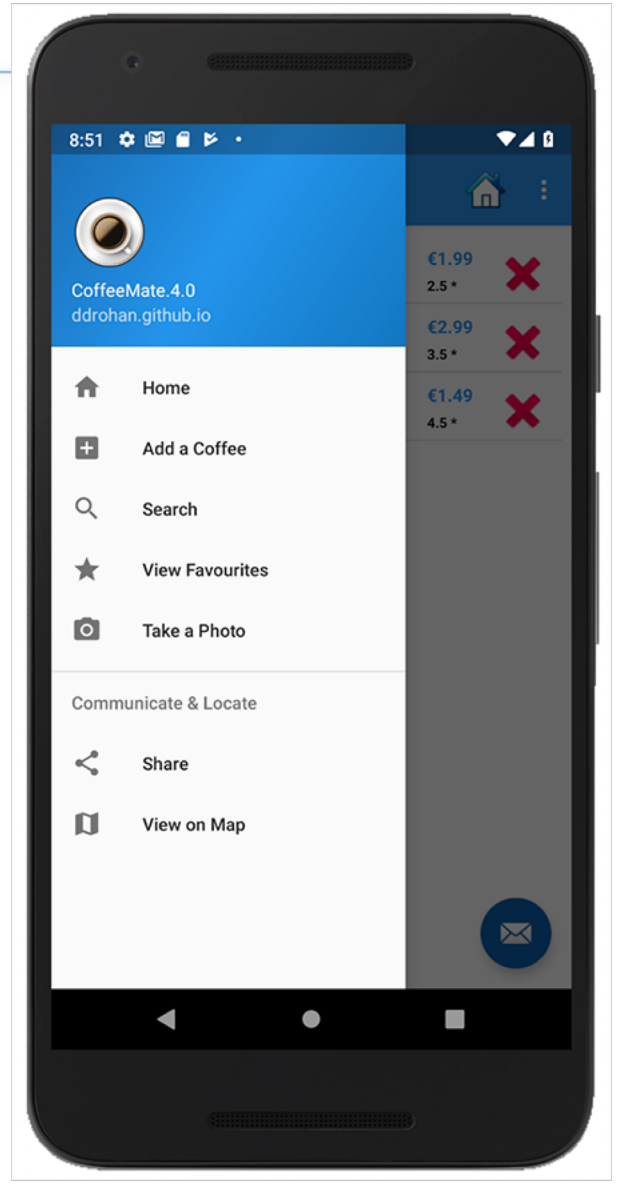
Overview - *Create Drawer Layout*

- For creating a navigation drawer, first we need to declare the drawer layout in your main activity where you want to show the navigation drawer.
- You add **`android.support.v4.widget.DrawerLayout`** as the root view of your activity layout.
- As already mentioned, Android Studio does a lot of this for you so it's more about understanding how it all pieces together to allow you to modify as necessary.
- We'll use **`CoffeeMate`** as the example to illustrate…

Overview - *Create Drawer Layout* *

home.xml

```
1  <?xml version="1.0" encoding="utf-8"?>
2  <android.support.v4.widget.DrawerLayout
3      xmlns:android="http://schemas.android.com/apk/res/android"
4      xmlns:app="http://schemas.android.com/apk/res-auto"
5      xmlns:tools="http://schemas.android.com/tools"
6      android:id="@+id/drawer_layout"
7      android:layout_width="match_parent"
8      android:layout_height="match_parent"
9      android:windowSoftInputMode="adjustPan|adjustResize"
10     tools:openDrawer="start">
11
12     <include
13         layout="@layout/app_bar_home"
14         android:layout_width="match_parent"
15         android:layout_height="match_parent" />
16
17     <android.support.design.widget.NavigationView
18         android:id="@+id/nav_view"
19         android:layout_width="wrap_content"
20         android:layout_height="match_parent"
21         android:layout_gravity="start"
22         android:fitsSystemWindows="true"
23         app:headerLayout="@layout/nav_header_home"
24         app:menu="@menu/home_drawer" />
25 </android.support.v4.widget.DrawerLayout>
```



Overview - *Create Drawer Layout* *

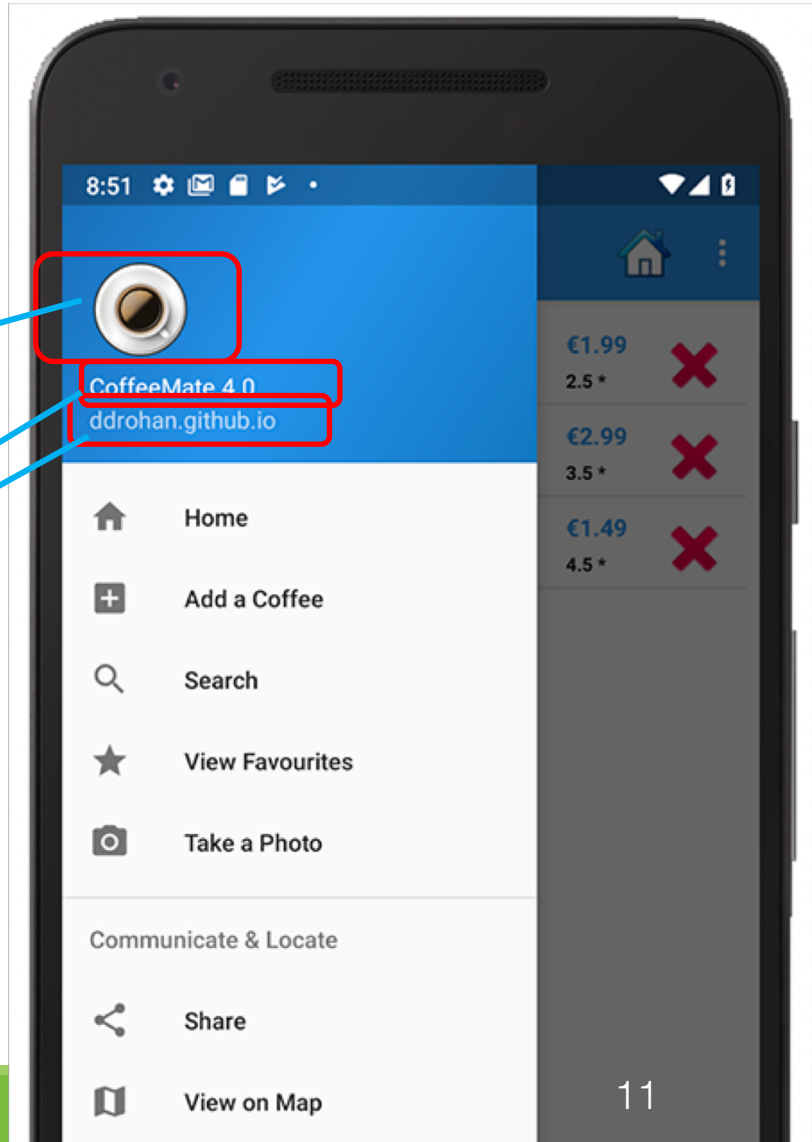
home.xml

```
1  <?xml version="1.0" encoding="utf-8"?>
2  <android.support.v4.widget.DrawerLayout
3      xmlns:android="http://schemas.android.com/apk/res/android"
4      xmlns:app="http://schemas.android.com/apk/res-auto"
5      xmlns:tools="http://schemas.android.com/tools"
6      android:id="@+id/drawer_layout"
7      android:layout_width="match_parent"
8      android:layout_height="match_parent"
9      android:windowSoftInputMode="adjustPan|adjustResize"
10     tools:openDrawer="start">
11
12     <include
13         layout="@layout/app_bar_home"
14         android:layout_width="match_parent"
15         android:layout_height="match_parent" />
16
17     <android.support.design.widget.NavigationView
18         android:id="@+id/nav_view"
19         android:layout_width="wrap_content"
20         android:layout_height="match_parent"
21         android:layout_gravity="start"
22         android:fitsSystemWindows="true"
23         app:headerLayout="@layout/nav_header_home"
24         app:menu="@menu/home_drawer" />
25 </android.support.v4.widget.DrawerLayout>
```

- *home.xml* contains the Navigation Header (*nav_header_home*) AND the Navigation Drawer Menu (*home_drawer*) inside a **`NavigationView`**.
- *home includes app_bar_home* which will display our content
- Also, note the 'ids' of the widgets (for later on)

Overview – *nav_header_home* *

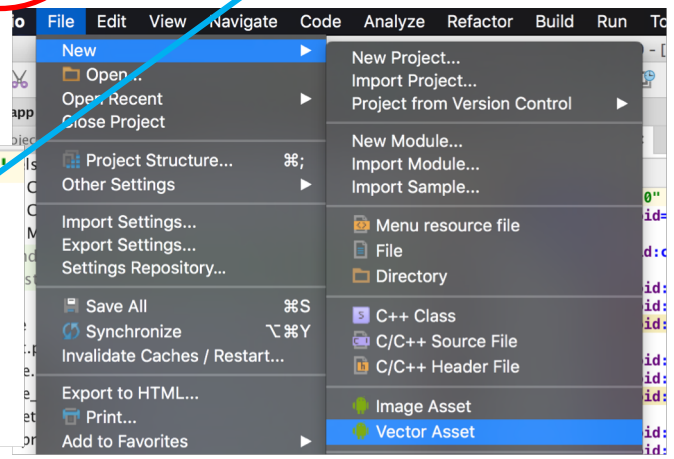
```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="160dp"
    android:background="@drawable/side_nav_bar"
    android:gravity="bottom"
    android:orientation="vertical"
    android:paddingBottom="6dp"
    android:paddingLeft="6dp"
    android:paddingRight="6dp"
    android:paddingTop="6dp"
    android:theme="@style/ThemeOverlay.AppCompat.Dark">

    <!-- https://github.com/vinc3m1/RoundedImageView -->
    <com.makeramen.roundedimageview.RoundedImageView...>
    <TextView
        android:id="@+id/googlename"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:paddingTop="16dp"
        android:text="CoffeeMate"
        android:textAppearance="@style/TextAppearance.AppCompat.Body1" />

    <TextView...>

</LinearLayout>
```

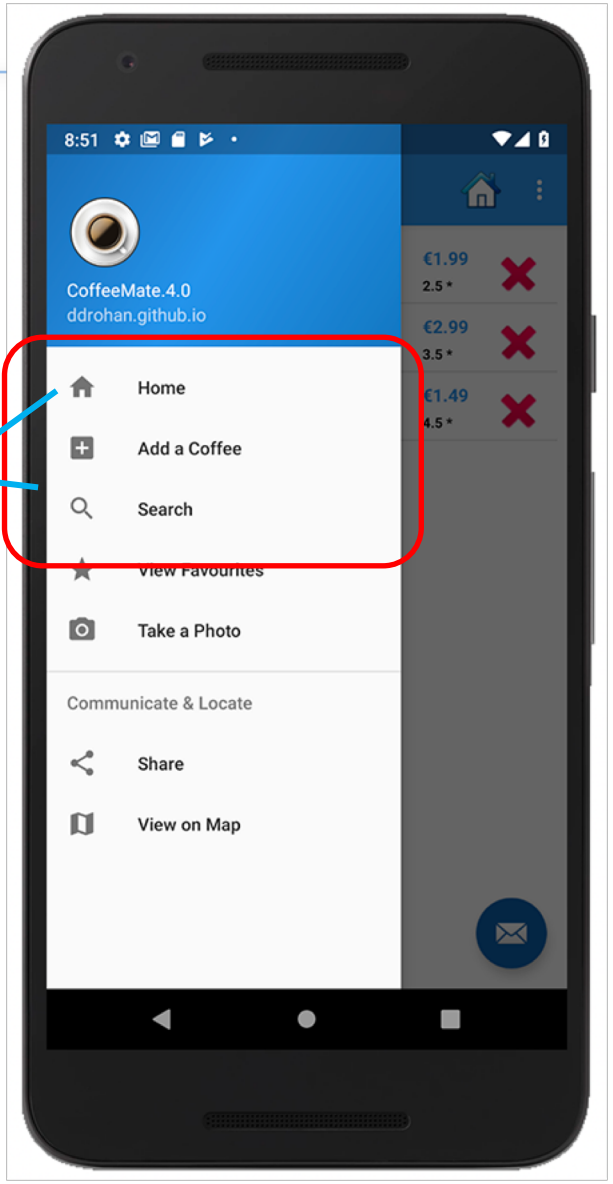


Overview – *home_drawer **

```
<menu xmlns:android="http://schemas.android.com/apk/res/andr

    <group android:checkableBehavior="single">
        <item
            android:id="@+id/nav_home"
            android:icon="@drawable/ic_menu_home"
            android:title="Home" />
        <item
            android:id="@+id/nav_add"
            android:icon="@drawable/ic_menu_addcoffee"
            android:title="Add a Coffee" />
        <item
            android:id="@+id/nav_search"
            android:icon="@drawable/ic_menu_search"
            android:title="Search" />
        <item
```

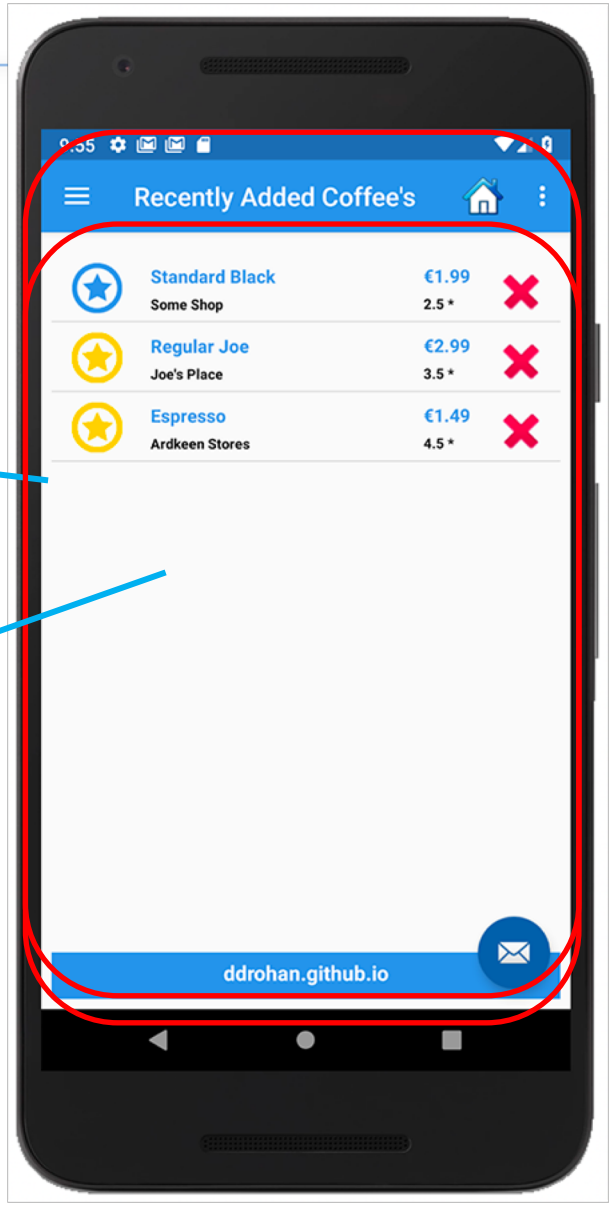
```
<vector xmlns:android="http://schemas.android.com/apk/res/android"
        android:width="24dp"
        android:height="24dp"
        android:viewportWidth="24.0"
        android:viewportHeight="24.0">
    <path
        android:fillColor="#FF000000"
        android:pathData="M10,20v-6h4v6h5v-8h3L12,3 2,12h3v8z"/>
</vector>
```





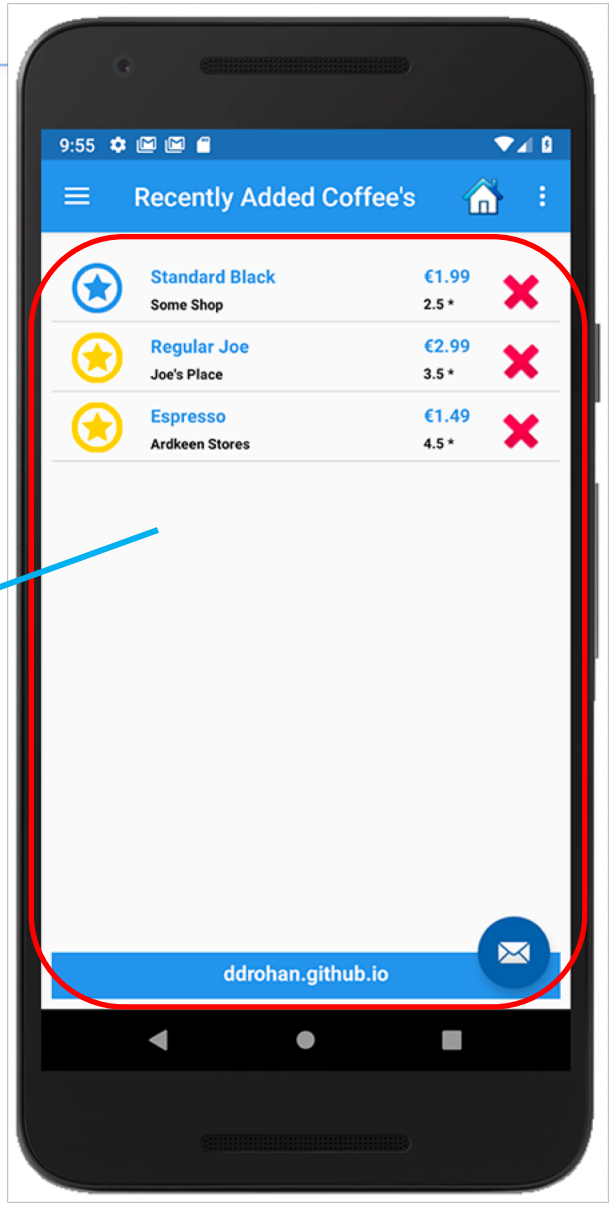
Overview – *app_bar_home* *

```
<?xml version="1.0" encoding="utf-8"?>
<android.support.design.widget.CoordinatorLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:fitsSystemWindows="true"
    tools:context=".activities.Home">

    <android.support.design.widget.AppBarLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:theme="@style/AppTheme.AppBarOverlay">

        <android.support.v7.widget.Toolbar...>

    </android.support.design.widget.AppBarLayout>

    <include layout="@layout/content_home" />

    <android.support.design.widget.FloatingActionButton...>
</android.support.design.widget.CoordinatorLayout>
```



Overview – *content_home **

```
<?xml version="1.0" encoding="utf-8"?>
<android.support.constraint.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/homeLayout"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    app:layout_behavior="@string/appbar_scrolling_view_behavior"
    tools:context=".activities.Home"
    tools:showIn="@layout/app_bar_home">

    <FrameLayout
        android:id="@+id/homeFrame"
        android:layout_width="0dp"
        android:layout_height="0dp"
        android:layout_marginBottom="8dp"
        android:layout_marginEnd="8dp"
        android:layout_marginStart="8dp"
        android:layout_marginTop="8dp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

</android.support.constraint.ConstraintLayout>
```



Overview – *Bind to the Drawer Layout etc.*

- Once you have the necessary layouts and menu in place, you then need to bind to the **Drawer** and **Navigation View** to allow you to handle the user navigation and switching content based on user selection.
- In your **`onCreate()`** you'll have something like the following

```
DrawerLayout drawer = (DrawerLayout) findViewById(R.id.drawer_layout);
ActionBarDrawerToggle toggle = new ActionBarDrawerToggle(
        this, drawer, toolbar, "Open navigation drawer", "Close navigation drawer");
drawer.addDrawerListener(toggle);
toggle.syncState();

NavigationView navigationView = (NavigationView) findViewById(R.id.nav_view);
navigationView.setNavigationItemSelectedListener(this);
```

We also setup GooglePhoto and Email for the Drawer here (later labs)

Overview – *Bind to the Drawer Layout etc.*

- You'll probably want to display some kind of initial landing page once the app starts so in our example, we load up the list of user coffees (maintained in our **`CoffeeFragment`**).
- Again, in your *onCreate()* you'll have something like the following

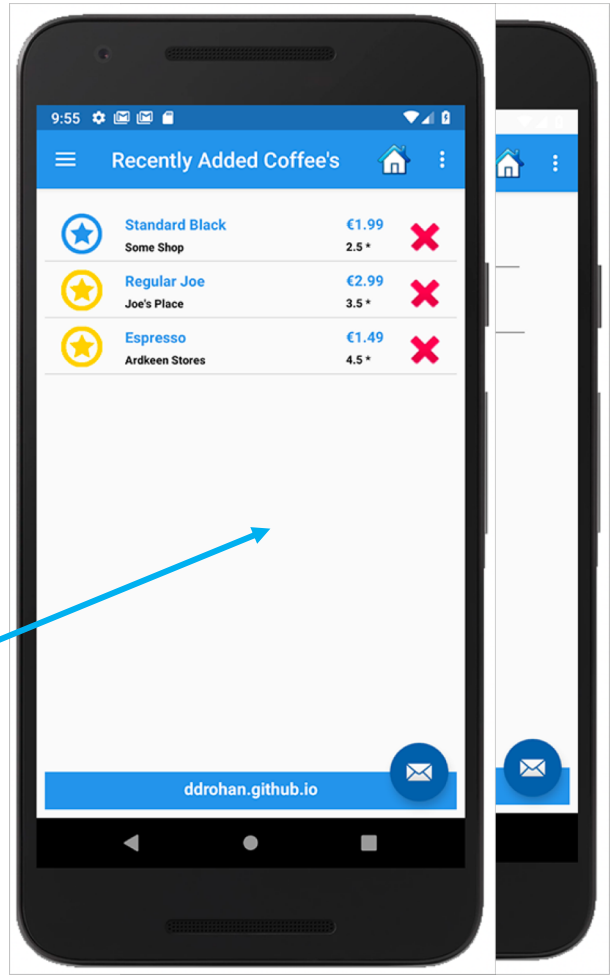
```
FragmentTransaction ft = getFragmentManager().beginTransaction();

CoffeeFragment fragment = CoffeeFragment.newInstance();
ft.replace(R.id.homeFrame, fragment);
ft.commit();
```

- This creates a new instance of a CoffeeFragment and replaces the fragment in our FrameLayout with this instance.

Overview – *Handle Drawer Click & Update Content* *

- To handle users menu selection we implement the following

```
public boolean onNavigationItemSelected(MenuItem item) {
    // Handle navigation view item clicks here.

    // http://stackoverflow.com/questions/32944798/switch

    int id = item.getItemId();
    Fragment fragment;
    ft = getSupportFragmentManager().beginTransaction();

    if (id == R.id.nav_home) {
        this.setTitle(R.string.recentlyViewedLbl);
        fragment = CoffeeFragment.newInstance();
        ((CoffeeFragment)fragment).favourites = false;
        ft.replace(R.id.homeFrame, fragment);
        ft.addToBackStack(null);
        ft.commit();

    } else if (id == R.id.nav_add) {
        this.setTitle(R.string.addACoffeeLbl);
        fragment = AddFragment.newInstance();
        ft.replace(R.id.homeFrame, fragment);
        ft.addToBackStack(null);
        ft.commit();
```



CoffeeMate 4.0+

Using a RecyclerView and RecyclerAdapter

Introduction – Using RecyclerView & RecyclerAdapter

- The **`RecyclerView`** class supports the display of a collection of data.
- It is a modernized version of **`ListView`** and **`GridView`**
- Enforces a programming style that results in good performance.
- Comes with default animations for removing and adding elements.
- Can use different layout managers for positioning items.
- Uses a **`ViewHolder`** to store references to the views for one entry in the **`RecyclerView`**.

Introduction – Using RecyclerView & RecyclerAdapter

- A **`ViewHolder`** class is a static inner class in your adapter which holds references to the relevant views. With these references your code can avoid the time-consuming **`findViewById()`** method to update the widgets with new data.
- As we know, An *adapter* manages the data model and adapts it to the individual entries in the widget, in our case, extending **`RecyclerView.Adapter`** and is assigned to the recycler view via the **`RecyclerView.setAdapter`**

Introduction – Using RecyclerView & RecyclerAdapter

- **`onCreateViewHolder`** prepares the layout of the items by inflating the correct layout for the individual data elements and returns an object of type **`ViewHolder`** per visual entry in the recycler view. This instance is used to access the views in the inflated layout and is only called when a new view must be created.
- Every visible entry in a recycler view is filled with the correct data model item by the adapter. Once a data item becomes visible, the adapter assigns this data to the individual widgets via **`onBindViewHolder`**.

CoffeeMate 4.0+ - Dependencies

```
dependencies {
    implementation fileTree(dir: 'libs', include: ['*.jar'])
    implementation 'com.android.support:appcompat-v7:28.0.0'
    implementation 'com.android.support:support-v4:28.0.0'
    implementation 'com.android.support:design:28.0.0'
    implementation 'com.android.support.constraint:constraint-layout:1.1.3'
    testImplementation 'junit:junit:4.12'
    androidTestImplementation 'com.android.support.test:runner:1.0.2'
    androidTestImplementation 'com.android.support.test.espresso:espresso-core:3.0.2'

    implementation 'com.makeramen:roundedimageview:2.2.1'

    implementation "com.android.support:recyclerview-v7:28.0.0"
    implementation "com.android.support:cardview-v7:28.0.0"
}
```

CoffeeMate 4.0+ - `coffeecard.xml`

```
<?xml version="1.0" encoding="utf-8"?>
<android.support.v7.widget.CardView
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:id="@+id/coffeecardview"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:clickable="true"
    android:elevation="30dp">

    <RelativeLayout
        android:id="@+id/cardviewlayout"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:background="@drawable/background_activated">

        <ImageView...>
        <ImageView...>
        <TextView...>
        <TextView...>
        <TextView...>
        <TextView...>
    </RelativeLayout>

</android.support.v7.widget.CardView>
```

- Very similar to our existing `coffeerow`

CoffeeMate 4.0+ - `CoffeeViewHolder`

```
public class CoffeeViewHolder extends RecyclerView.ViewHolder {
    public View view;
    public  Coffee coffee;
    public View.OnClickListener deleteListener;
    public View.OnClickListener clickListener;

    public CoffeeViewHolder(View v, View.OnClickListener delete,
                            View.OnClickListener click) {
        super(v);
        view = v;
        deleteListener = delete;
        clickListener = click;
    }

    public void updateControls(Coffee coffee) {...}
}
```

- Very similar to our existing `CoffeeItem`

CoffeeMate 4.0+ - CoffeeRecyclerAdapter

```
public class CoffeeRecyclerAdapter extends
                    RecyclerView.Adapter<CoffeeViewHolder>
{
    public Context context;
    public View.OnClickListener deleteListener, clickListener;
    public List<Coffee> coffeeList;
    public CoffeeViewHolder coffeeViewHolder;
    public View coffeeCardView;

    public CoffeeRecyclerAdapter(Context context,
                                 View.OnClickListener deleteListener,
                                 View.OnClickListener clickListener,
                                 List<Coffee> coffeeList)
    {...}

    @NonNull
    @Override
    public CoffeeViewHolder onCreateViewHolder(@NonNull ViewGroup viewGroup, int viewType) {
        LayoutInflater inflater = LayoutInflater.from(viewGroup.getContext());
        coffeeCardView = inflater.inflate(R.layout.coffeecard, viewGroup, false);

        coffeeViewHolder = new CoffeeViewHolder(coffeeCardView, this.deleteListener,clickListener);
        return coffeeViewHolder;
    }

    @Override
    public void onBindViewHolder(@NonNull CoffeeViewHolder coffeeViewHolder, int i) {
        Coffee coffee = coffeeList.get(i);
        coffeeViewHolder.updateControls(coffee);
    }

    @Override
    public int getItemCount() { return coffeeList.size(); }

    public void add(int position, Coffee item) {...}
    public void remove(int position) {...}
}
```

CoffeeMate 4.0+ - CoffeeFragment

```
@Override
public void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);

    clickListener = new View.OnClickListener() {
        @Override
        public void onClick(View view) {
            Bundle activityInfo = new Bundle(); // Creates a new Bundle object
            activityInfo.putString("coffeeId", (String) view.getTag());

            Fragment fragment = EditFragment.newInstance(activityInfo);
            getActivity().setTitle("Edit a Coffee");

            getActivity().getSupportFragmentManager().beginTransaction()
                    .replace(R.id.homeFrame, fragment)
                    .addToBackStack(null)
                    .commit();
        }
    };
    recyclerAdapter = new CoffeeRecyclerAdapter(activity, this,clickListener,
                                                activity.app.coffeeList);
    coffeeFilter = new CoffeeFilter(activity.app.coffeeList,"all",recyclerAdapter);
}
```

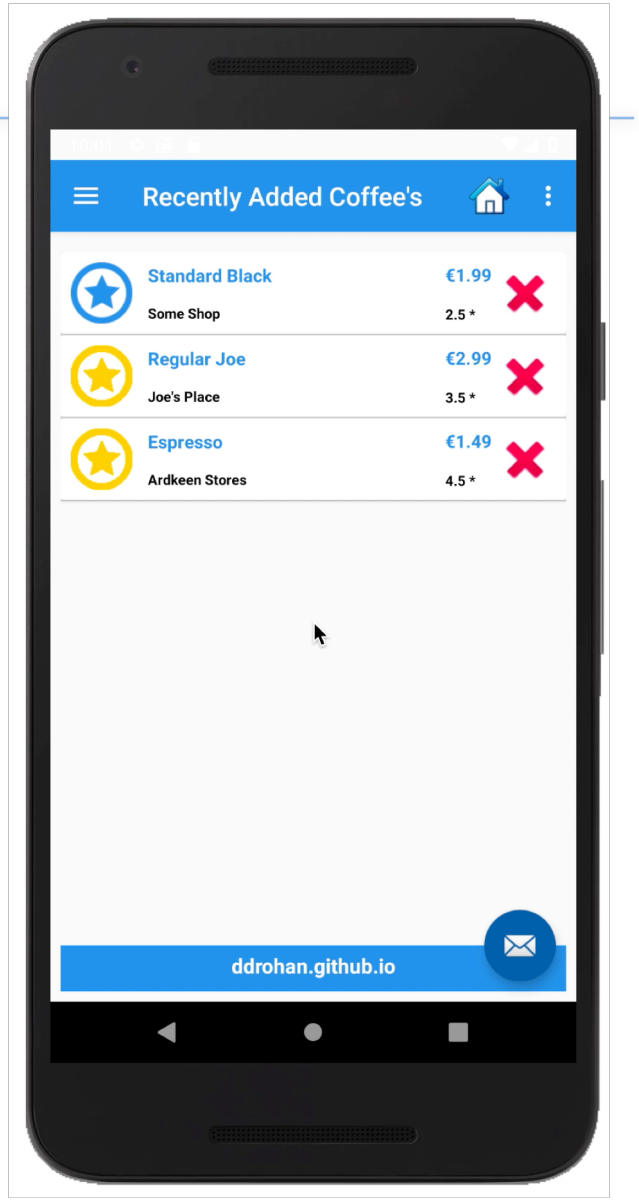
CoffeeMate 4.0+ - `CoffeeFragment`

```
@Override
public View onCreateView(LayoutInflater inflater, ViewGroup parent,
                         Bundle savedInstanceState) {

    // Inflate the layout for this fragment
    View v = inflater.inflate(R.layout.fragment_rhome, parent, false);

    if (favourites) {
        coffeeFilter.setFilter("favourites"); // Set the filter text field from 'all' to 'favourit
        coffeeFilter.filter(null); // Filter the data, but don't use any prefix
        recyclerAdapter.notifyDataSetChanged(); // Update the adapter
    }

    recyclerView = v.findViewById(R.id.homeRecycler);
    setRecyclerView(v);

    return v;
}
```

CoffeeMate 4.0+ - CoffeeFragment

```
public void setRecyclerView(View view)
{
    recyclerView.setLayoutManager(new LinearLayoutManager(activity));
    recyclerView.setAdapter (recyclerAdapter);
    recyclerView.addItemDecoration(new DividerItemDecoration(getActivity(),
            LinearLayoutManager.VERTICAL));
    recyclerView.setHasFixedSize(true);

    ItemTouchHelper.SimpleCallback simpleItemTouchCallback =
            new ItemTouchHelper.SimpleCallback(0, ItemTouchHelper.LEFT |
                                                  ItemTouchHelper.RIGHT) {
                @Override
                public boolean onMove(RecyclerView recyclerView,
                                      RecyclerView.ViewHolder viewHolder,
                                      RecyclerView.ViewHolder
                        target) {
                    return false;
                }
                @Override
                public void onSwiped(RecyclerView.ViewHolder viewHolder, int swipeDir) {
                    activity.app.coffeeList.remove(viewHolder.getAdapterPosition());
                    recyclerAdapter.notifyItemRemoved(viewHolder.getAdapterPosition());
                }
            };
    ItemTouchHelper itemTouchHelper = new ItemTouchHelper(simpleItemTouchCallback);
    itemTouchHelper.attachToRecyclerView(recyclerView);
}
```

Swipe-to-Delete feature



Summary

- We made use of a **`NavigationDrawer`** to implement more effective navigation within our app (CoffeeMate 4.0+)
- We had a brief look at implementing a **`RecyclerView`** and **`RecyclerAdapter`** to replace our List.

References

- http://www.vogella.com/tutorials/AndroidRecyclerView/article.html

Questions?


Thanks!