9.2: App settings

Contents:

This chapter describes app settings that let users indicate their preferences for how an app or service should behave.

Determining appropriate setting controls

Apps often include settings that allow users to modify app features and behaviors. For example, some apps allow users to specify whether notifications are enabled, or how often the app syncs data with the cloud.

The controls that belong in the app's settings should capture user preferences that affect most users or provide critical support to a minority of users. For example, notification settings affect all users, while a currency setting for a foreign market provides critical support for the users in that market.

Most settings are accessed infrequently, because once users change a setting, they rarely need to go back and change it again. If users need to access a control or preference frequently, consider moving the control or preference to the app bar options menu, or to a side navigation menu such as a navigation drawer.

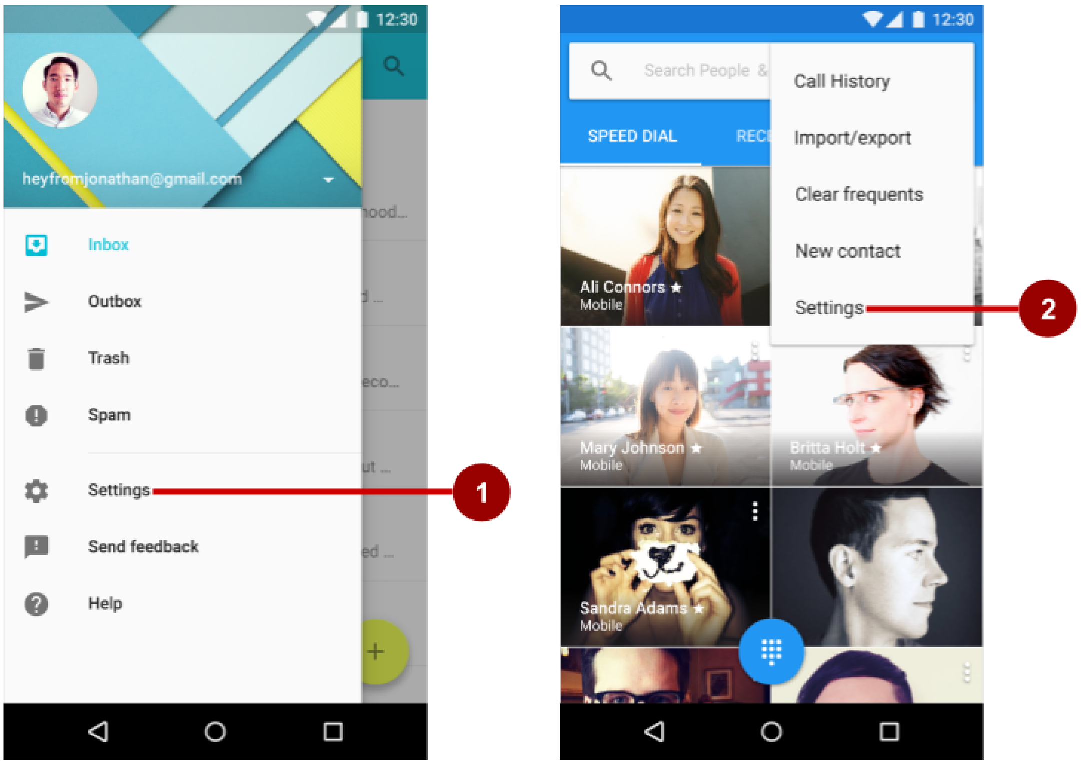
For your setting controls, set defaults that are familiar to users and make the app experience better. The initial default value for a setting should do the following:

- Represent the value most users would choose. For example, in the Contacts app, **All contacts** is the default for "Contacts to display".
- Use less battery power. For example, in the Android Settings app, Bluetooth is off until the user turns it on.
- Pose the least risk to security and data loss. For example, in the Gmail app, the default action is to archive rather than delete messages.
- Interrupt only when important. For example, the default setting for when calls and notifications arrive is to interrupt only when important.

> **Tip**: If the setting contains information about the app, such as a version number or licensing information, move the setting to a separately accessed **Help** screen.

Providing navigation to settings

Users should be able to navigate to app settings by tapping **Settings**, which should be located in side navigation, such as a navigation drawer, as shown on the left side of the figure below, or in the options menu in the app bar, as shown on the right side of the figure below.



In the figure above:

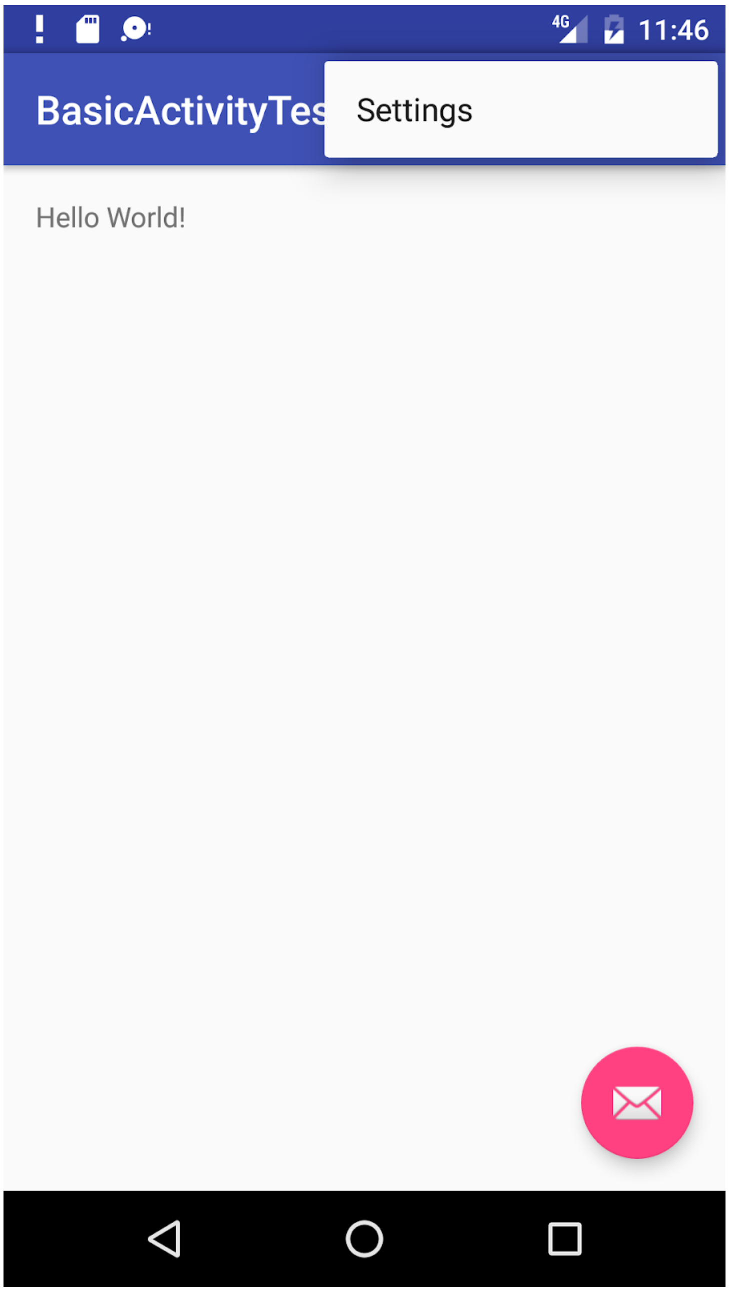
1. Settings in side navigation (a navigation drawer)
2. Settings in the options menu of the app bar

Follow these design guidelines for navigating to settings:

- If your app offers side navigation such as a navigation drawer, include **Settings** below all other items (except **Help** and **Send Feedback**).
- If your app doesn't offer side navigation, place **Settings** in the app bar menu's options menu below all other items (except **Help** and **Send Feedback**).

Note: Use the word **Settings** in the app's navigation to access the settings. Do not use synonyms such as "Options" or "Preferences."

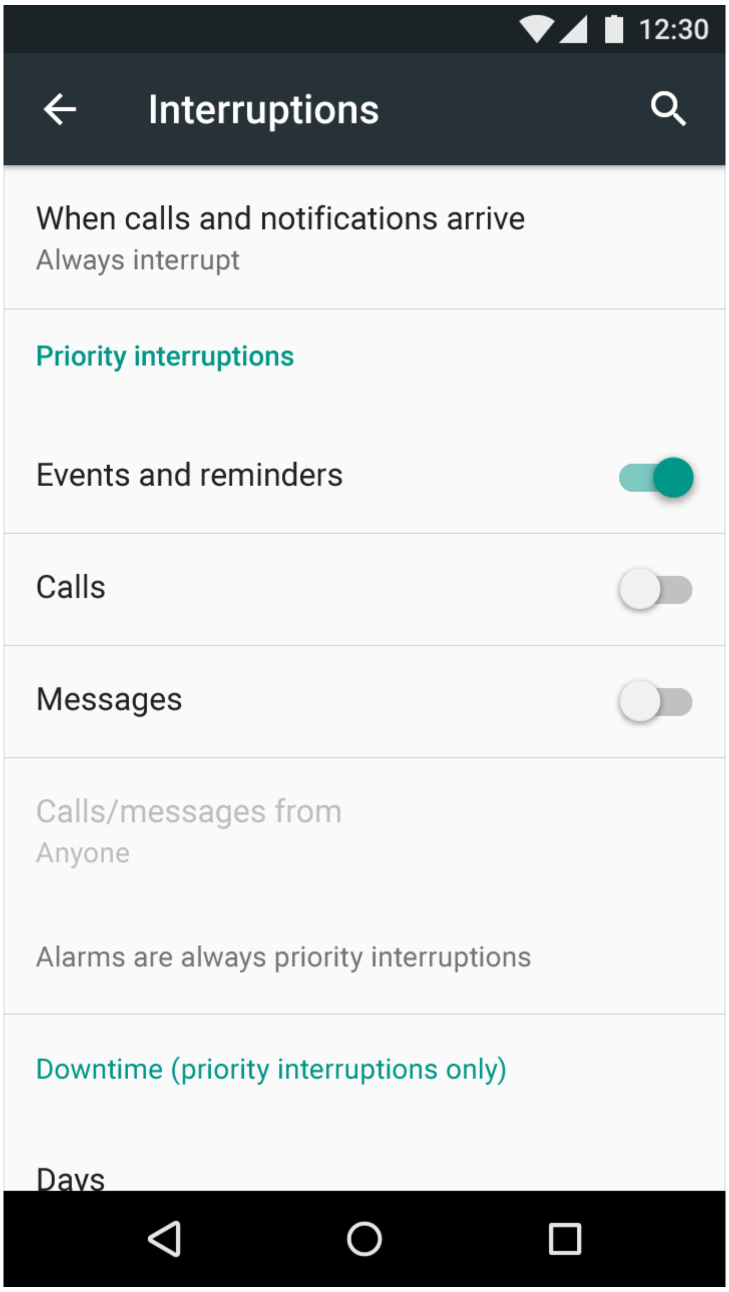
Tip: Android Studio provides a shortcut for setting up an options menu with **Settings**. If you start an Android Studio project for a phone or tablet using the Basic Activity template, the new app includes **Settings** as shown below:



The settings UI

Settings should be well-organized, predictable, and contain a manageable number of options. A user should be able to quickly understand all available settings and their current values. Follow these design guidelines:

- **7 or fewer settings**: Arrange them according to priority with the most important ones at the top.
- **7-15 settings**: Group related settings under section dividers. For example, in the figure below, "Priority interruptions" and "Downtime (priority interruptions only)" are section dividers.


12:30

Interruptions

When calls and notifications arrive
Always interrupt

Priority interruptions

Events and reminders ✓

Calls

Messages

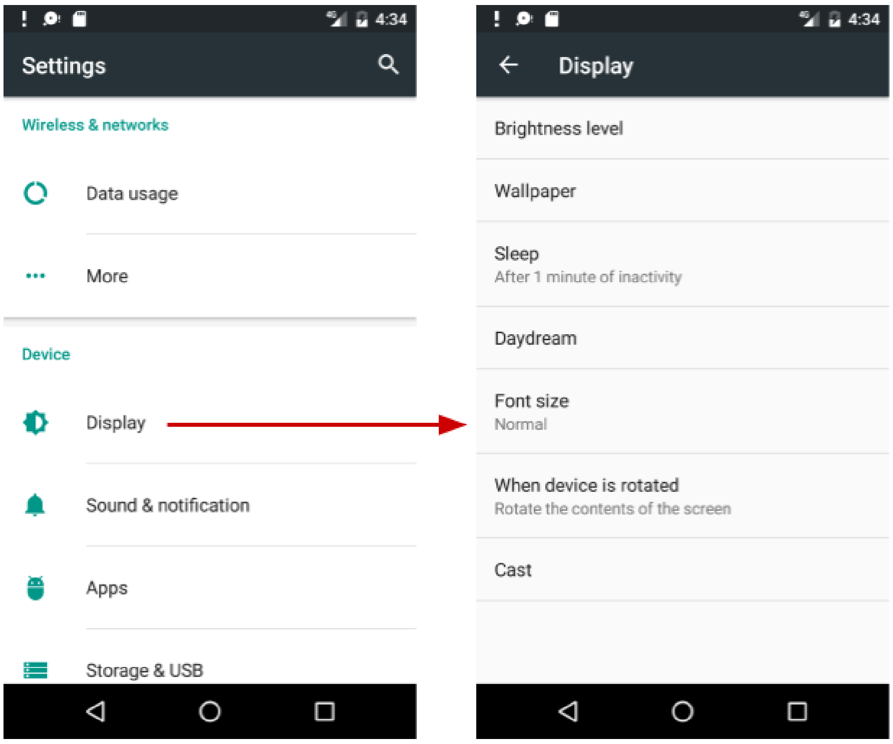
Calls/messages from
Anyone

Alarms are always priority interruptions

Downtime (priority interruptions only)

Days

- **16 or more settings**: Group related settings into separate screens. Use headings, such as **Display** on the main Settings screen (as shown on the left side of the figure below) to enable users to navigate to the display settings (shown on the right side of the figure below):



Building the settings

Build an app's settings using various subclasses of the `Preference` class rather than using `View` elements. `Preference` provides the `View` to be displayed for each setting, and associates with it a `SharedPreferences` interface to store and retrieve the preference data.

Each `Preference` appears as an item in a list. Direct subclasses provide containers for layouts involving multiple settings. For example:

- `PreferenceGroup`: Represents a group of settings (`Preference` objects).
- `PreferenceCategory`: Provides a disabled title above a group as a section divider.
- `PreferenceScreen`: Represents a top-level `Preference` that is the root of a `Preference` hierarchy. Use a `PreferenceScreen` in a layout at the top of each screen of settings.

For example, to provide dividers with headings between groups of settings (as shown in the previous figure for 7-15 settings), place each group of `Preference` objects inside a `PreferenceCategory`. To use separate screens for groups, place each group of `Preference` objects inside a `PreferenceScreen`.

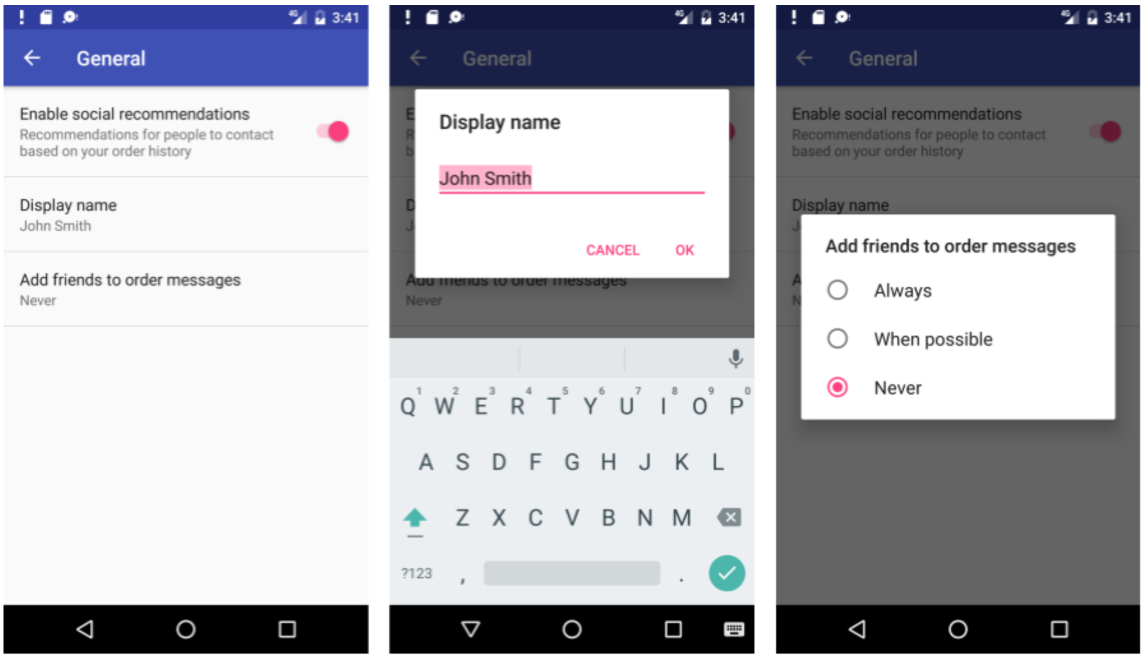
Other `Preference` subclasses for settings provide the appropriate UI for users to change the setting. For example:

- `CheckBoxPreference`: Creates a list item that shows a checkbox for a setting that is either enabled or disabled. The saved value is a `boolean` (`true` if it's checked).
- `ListPreference`: Creates an item that opens a dialog with a list of radio buttons.
- `SwitchPreference`: Creates a two-state option that can be toggled (such as on/off or true/false).
- `EditTextPreference`: Creates an item that opens a dialog with an `EditText` element. The saved value is a `String`.
- `RingtonePreference`: Lets the user choose a ringtone from those available on the device.

Define your list of settings in XML, which provides an easy-to-read structure that's simple to update. Each `Preference` subclass can be declared with an XML element that matches the class name, such as `<CheckBoxPreference>`.

XML attributes for settings

The following example from the Settings Activity template defines a screen with three settings as shown in the figure below: a `SwitchPreference` toggle switch (at the top of the screen on the left side), an `EditTextPreference` text entry field (center), and a `ListPreference` list of radio buttons (right):


General

Enable social recommendations
Recommendations for people to contact based on your order history

Display name
John Smith

Add friends to order messages
Never

Display name
John Smith

Add friends to order messages
Always
When possible
[✓ Never]

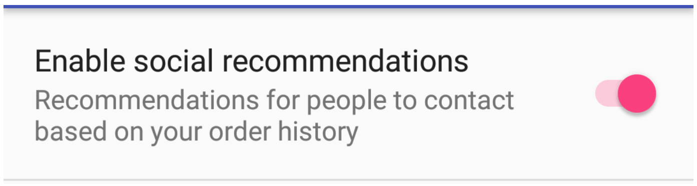
The root of the settings hierarchy is a `PreferenceScreen` layout:

```
<PreferenceScreen xmlns:android="http://schemas.android.com/apk/res/android">

    <android.support.v7.preference.SwitchPreferenceCompat
        android:defaultValue="true"
        android:key="example_switch"
        android:summary="@string/switch_summary"
        android:title="@string/switch_title" />

</PreferenceScreen>
```

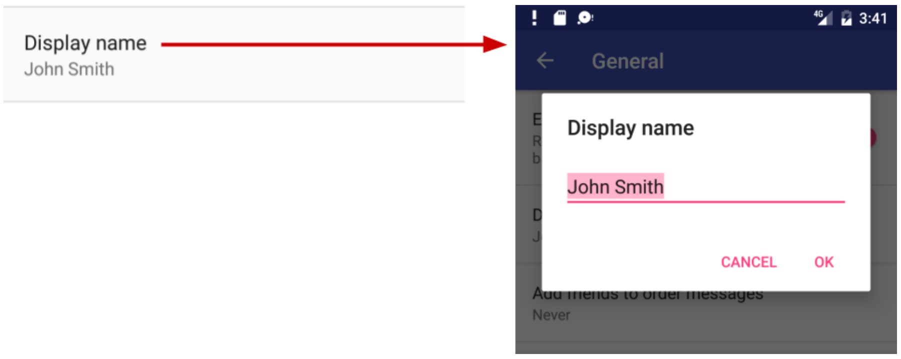
Inside the above layout is a `SwitchPreference` that shows a toggle switch to disable or enable an option.


Enable social recommendations
Recommendations for people to contact based on your order history

The setting has the following attributes:

- `android:defaultValue`: The option is enabled (set to `true`) by default.
- `android:key`: The key to use for storing the setting value. Each setting (`Preference`) has a corresponding key-value pair that the system uses to save the setting in a default `SharedPreferences` file for your app's settings.
- `android:summary`: The text summary appears underneath the setting. For some settings, the summary should change to show whether the option is enabled or disabled.
- `android:title`: The title of the setting. For a `SwitchPreference`, the title appears to the left of the toggle switch.

An `EditTextPreference` shows a text field for the user to enter text.

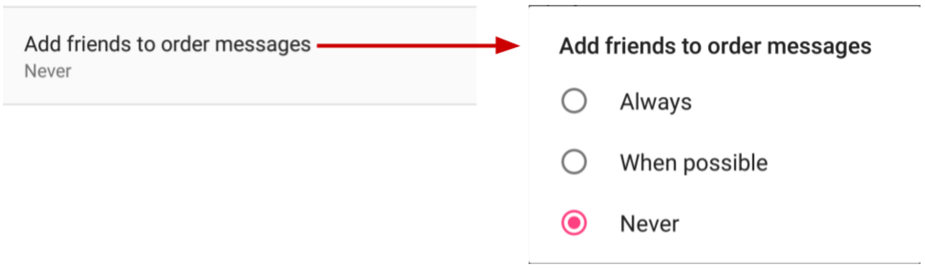


- Use `EditText` attributes such as `android:capitalize` and `android:maxLines` to define the text field's appearance and input control.
- The default setting is the `pref_default_display_name` string resource.

Example:

```
<EditTextPreference
    android:capitalize="words"
    android:defaultValue="@string/pref_default_display_name"
    android:inputType="textCapWords"
    android:key="example_text"
    android:maxLines="1"
    android:selectAllOnFocus="true"
    android:singleLine="true"
    android:title="@string/pref_title_display_name" />
```

A `ListPreference` shows a dialog with radio buttons for the user to make one choice.



- The default value is set to `-1` for no choice.
- The text for the radio buttons (**Always**, **When possible**, and **Never**) are defined in the `pref_example_list_titles` array and specified by the `android:entries` attribute.
- The values for the radio button choices are defined in the `pref_example_list_values` array and specified by the `android:entryValues` attribute.
- The radio buttons are displayed in a dialog, which usually have positive (**OK** or **Accept**) and negative (**Cancel**) buttons. However, a settings dialog doesn't need these buttons, because the user can touch outside the dialog to dismiss it. To hide these buttons, set the `android:positiveButtonText` and `android:negativeButtonText` attributes to `"@null"`.

Example:

```
<ListPreference
        android:defaultValue="-1"
        android:entries="@array/pref_example_list_titles"
        android:entryValues="@array/pref_example_list_values"
        android:key="example_list"
        android:negativeButtonText="@null"
        android:positiveButtonText="@null"
        android:title="@string/pref_list_title" />
```

Save the XML file in the `res/xml` directory. Although you can name the file anything you want, it is traditionally named `preferences.xml`.

If you are using the support v7 appcompat library and extending the Settings `Activity` with `AppCompatActivity` and the `Fragment` with `PreferenceFragmentCompat`, as shown in the next section, change the setting's XML attribute to use the support v7 appcompat library version. For example, for a `SwitchPreference` setting, change `<SwitchPreference` in the code to:

```
<android.support.v7.preference.SwitchPreferenceCompat
```

Displaying the settings

Use a specialized `Activity` or `Fragment` subclass to display a list of settings.

- For an app that supports Android 3.0 and newer versions, the best practice for settings is to use a Settings `Activity` and a `Fragment` for each preference XML file. Add a Settings `Activity` class that extends `Activity` and hosts a fragment that extends `PreferenceFragment`.
- To remain compatible with the v7 appcompat library, extend the Settings `Activity` with `AppCompatActivity`, and extend the `Fragment` with `PreferenceFragmentCompat`.
- If your app must support versions of Android older than 3.0 (API level 10 and lower), build a special settings `Activity` as an extension of the `PreferenceActivity` class.

A `Fragment` like `PreferenceFragment` provides a more flexible architecture for your app, compared to using an `Activity` alone. A `Fragment` is like a modular section of an `Activity`—it has its own lifecycle and receives its own input events, and you can add or remove a `Fragment` while the `Activity` is running. Use `PreferenceFragment` to control the display of your settings instead of `PreferenceActivity` whenever possible.

However, to create a two-pane layout for large screens when you have multiple groups of settings, you can use an `Activity` that extends `PreferenceActivity` and also use `PreferenceFragment` to display each list of settings. You will see this pattern with the Settings Activity template as described later in this chapter in "Using the Settings Activity template".

The following examples show you how to remain compatible with the v7 appcompat library by extending the Settings `Activity` with `AppCompatActivity`, and extending the `Fragment` with `PreferenceFragmentCompat`. To use this library and the `PreferenceFragmentCompat` version of `PreferenceFragment`, you must also add the `android.support:preference-v7` library to the `build.gradle (Module: app)` file's `dependencies` section:

```
implementation 'com.android.support:preference-v7:26.1.0'
```

You also need to add the following `preferenceTheme` declaration to the `AppTheme` in the `styles.xml` file:

```
<style name="AppTheme" parent="Theme.AppCompat.Light.DarkActionBar">
   <!-- Other items -->
   <item name="preferenceTheme">@style/PreferenceThemeOverlay</item>
</style>
```

Using a PreferenceFragment

The following shows how to use a `PreferenceFragment` to display a list of settings, and how to add a `PreferenceFragment` to an `Activity` for settings. To remain compatible with the v7 appcompat library, extend the Settings `Activity` with `AppCompatActivity`, and extend the `Fragment` with `PreferenceFragmentCompat` for each preferences XML file.

In the `Fragment`, replace the automatically generated `onCreate()` method with the `onCreatePreferences()` method to load a preferences file with `setPreferencesFromResource()`:

```
public static class SettingsFragment extends PreferenceFragment {
    @Override
    public void onCreatePreferences(Bundle savedInstanceState,
                                            String rootKey) {
        setPreferencesFromResource(R.xml.preferences, rootKey);
    }
}
```

As shown in the code above, you associate an XML layout of settings with the `Fragment` during the `onCreatePreferences()` callback by calling `setPreferencesFromResource()` with two arguments:

- `R.xml.` and the name of the XML file (`preferences`).
- the `rootKey` to identify the preference root in `PreferenceScreen`.

You can then create an `Activity` for settings (named `SettingsActivity`) that extends `AppCompatActivity`, and add the settings `Fragment` to it:

```
public class SettingsActivity extends AppCompatActivity {
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        // Display the fragment as the main content.
        getSupportFragmentManager().beginTransaction()
               .replace(android.R.id.content, new SettingsFragment())
               .commit();
    }
}
```

The above code is the typical pattern used to add a `Fragment` to an `Activity` so that the `Fragment` appears as the main content of the `Activity`. You use:

- `getFragmentManager()` if the class extends `Activity` and the `Fragment` extends `PreferenceFragment`.
- `getSupportFragmentManager()` if the class extends `AppCompatActivity` and the `Fragment` extends `PreferenceFragmentCompat`.

To set Up navigation for the `SettingsActivity`, be sure to declare the `SettingsActivity` parent to be `MainActivity` in the `AndroidManifest.xml` file.

Calling the settings Activity

If you implement the options menu with the **Settings** item, use the following `Intent` to call the Settings `Activity` from with the `onOptionsItemSelected()` method when the user taps **Settings** (using `action_settings` for the **Settings** menu resource id):

```
@Override
public boolean onOptionsItemSelected(MenuItem item) {
   int id = item.getItemId();
   // ... Handle other options menu items.
   if (id == R.id.action_settings) {
      Intent intent = new Intent(this, SettingsActivity.class);
      startActivity(intent);
      return true;
      }
   return super.onOptionsItemSelected(item);
}
```

If you implement a navigation drawer with the **Settings** item, use the following `Intent` to call the Settings `Activity` from with the `onNavigationItemSelected()` method when the user taps **Settings** (using `action_settings` for the **Settings** menu resource id):

```
@Override
public boolean onNavigationItemSelected(MenuItem item) {
   int id = item.getItemId();
   if (id == R.id.action_settings) {
      Intent intent = new Intent(this, SettingsActivity.class);
      startActivity(intent);
   } else if ...
   // ... Handle other navigation drawer items.
   return true;
}
```

Setting the default values for settings

When the user changes a setting, the system saves the changes to a `SharedPreferences` file. As you learned in another practical, shared preferences allow you to read and write small amounts of primitive data as key/value pairs to a file on the device storage.

The app must initialize the `SharedPreferences` file with default values for each setting when the user first opens the app. Follow these steps:

1. Be sure to specify a default value for each setting in your XML file using the `android:defaultValue` attribute:

   ```
   <SwitchPreference
            android:defaultValue="true"
   ```

2. From the `onCreate()` method in `MainActivity`—and in any other `Activity` through which the user may enter your app for the first time—call `setDefaultValues()`:

   ```
   PreferenceManager.setDefaultValues(this,
                                   R.xml.preferences, false);
   ```

   Step 2 ensures that the app is properly initialized with default settings. The `setDefaultValues()` method takes three arguments:

3. The app `context`, such as `this`.
4. The resource ID (`preferences`) for the settings layout XML file which includes the default values set by Step 1 above.
5. A `boolean` indicating whether the default values should be set more than once. When `false`, the system sets the default values only if this method has never been called in the past (or the `KEY_HAS_SET_DEFAULT_VALUES` in the default value `SharedPreferences` file is `false`). As long as you set this third argument to `false`, you can safely call this method every time `MainActivity` starts without overriding the user's saved settings values. However, if you set it to `true`, the method will override any previous values with the defaults.

Reading the settings values

Each `Preference` you add has a corresponding key/value pair that the system uses to save the setting in a default `SharedPreferences` file for your app's settings. When the user changes a setting, the system updates the corresponding value in the `SharedPreferences` file for you. The only time you should directly interact with the associated `SharedPreferences` file is when you need to read the value in order to determine your app's behavior based on the user's setting.

All of an app's preferences are saved by default to a file that is accessible from anywhere within the app by calling the static method `PreferenceManager.getDefaultSharedPreferences()`. This method takes the `context` and returns the `SharedPreferences` object containing all the key/value pairs that are associated with the Preference objects.

For example, the following code snippet shows how you can read one of the preference values from the `MainActivity` `onCreate()` method:

```
SharedPreferences sharedPref =
              PreferenceManager.getDefaultSharedPreferences(this);
Boolean switchPref = sharedPref
             .getBoolean("example_switch", false);
```

The above code snippet uses `PreferenceManager.getDefaultSharedPreferences(this)` to get the settings as a `SharedPreferences` object (`sharedPref`).

It then uses `getBoolean()` to get the `boolean` value of the preference that uses the key `"example_switch"`. If there is no value for the key, the `getBoolean()` method sets the value to `false`.

Listening for a setting change

There are several reasons why you might want to set up a listener for a specific setting:

- If a change to the value of a setting also requires changing the summary of the setting, you can listen for the change, and then change the summary with the new setting value.
- If the setting requires several more options, you may want to listen for the change and immediately respond by displaying the options.
- If the setting makes another setting obsolete or inappropriate, you may want to listen for the change and immediately respond by disabling the other setting.

To listen to a setting, use the `Preference.OnPreferenceChangeListener` interface, which includes the `onPreferenceChange()` method that returns the new value of the setting.

In the following example, the listener retrieves the new value after the setting is changed, and changes the summary of the setting (which appears below the setting in the UI) to show the new value. Follow these steps:

1. Use a shared preferences file, as described in another practical, to store the value of the preference (setting). Declare the following variables in the `SettingsFragment` class definition:

   ```
   public class SettingsFragment extends PreferenceFragment {
      private SharedPreferences mPreferences;
      private String sharedPrefFile =
                              "com.example.android.settingstest";
   }
   ```

2. Add the following to the `onCreate()` method of `SettingsFragment` to get the preference defined by the key `example_switch`, and to set the initial text (the string resource `option_on`) for the summary:

   ```
   @Override
   public void onCreate(Bundle savedInstanceState) {
      // ... Rest of onCreate code.
      mPreferences = this.getActivity()
              .getSharedPreferences(sharedPrefFile, MODE_PRIVATE);
      Preference preference =
              this.findPreference("example_switch");
      preference.setSummary(mPreferences.getString("summary",
              getString(R.string.option_on)));
   }
   ```

3. Add the following code to `onCreate()` after the code in the previous step:

```
preference.setOnPreferenceChangeListener(new
                     Preference.OnPreferenceChangeListener() {
   @Override
   public boolean onPreferenceChange(Preference preference,
                           Object newValue) {
      if ((Boolean) newValue == true) {
         preference.setSummary(R.string.option_on);
         SharedPreferences.Editor preferencesEditor =
                                      mPreferences.edit();
         preferencesEditor.putString("summary",
                       getString(R.string.option_on)).apply();
      } else {
         preference.setSummary(R.string.option_off);
         SharedPreferences.Editor preferencesEditor =
                                      mPreferences.edit();
         preferencesEditor.putString("summary",
                       getString(R.string.option_off)).apply();
      }
      return true;
   }
});
```

The code listens to a change in the switch setting using `onPreferenceChange()`, and returns `true`. It then determines the new `boolean` value (`newValue`) for the setting after the change (`true` or `false`).

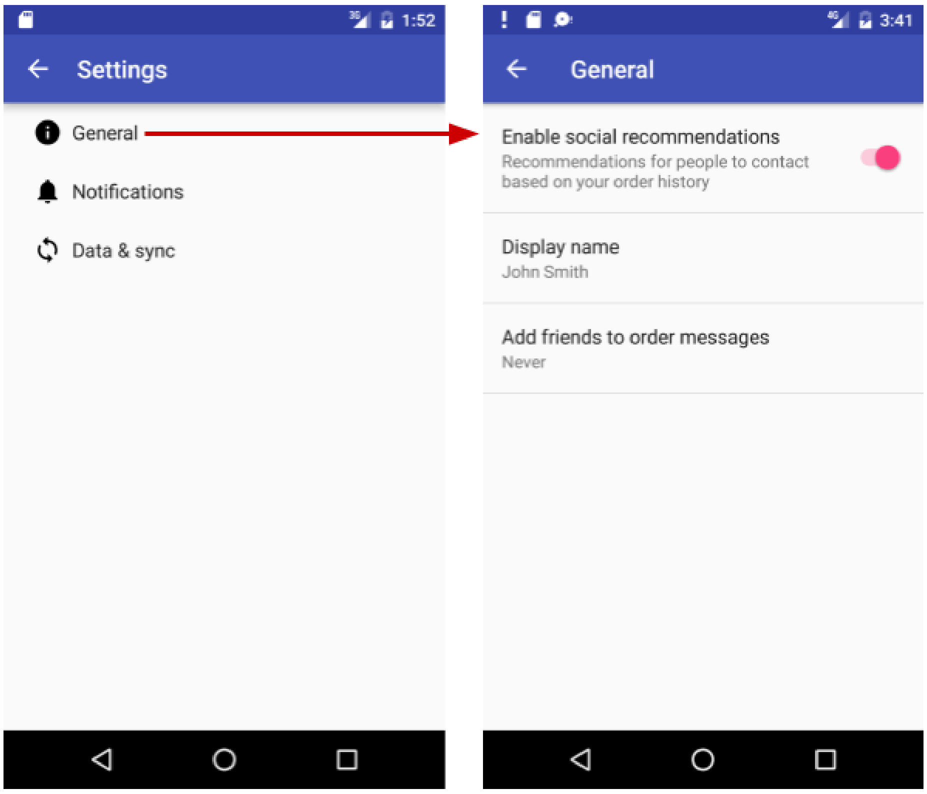
If `true`, the code edits the `SharedPreferences` file (as described in a previous practical) using `SharedPreferences.Editor`, putting the new value (`string.option.on`) as a string in the summary using `putString()` and applies the change using `apply()`. If `false`, the code does the same thing with the new value (`string.option.off`) as a string in the summary.

Using the Settings Activity template

If you need to build several screens of settings and you want to take advantage of tablet-sized screens as well as maintain compatibility with older versions of Android for tablets, Android Studio provides a shortcut: the Settings Activity template.

The Settings Activity template is populated with settings you can customize for an app, and provides a different layout for phones and tablets:

- *Phones*: A main Settings screen with a header link for each group of settings, such as General for general settings, as shown below.



Settings

General

Notifications

Data & sync

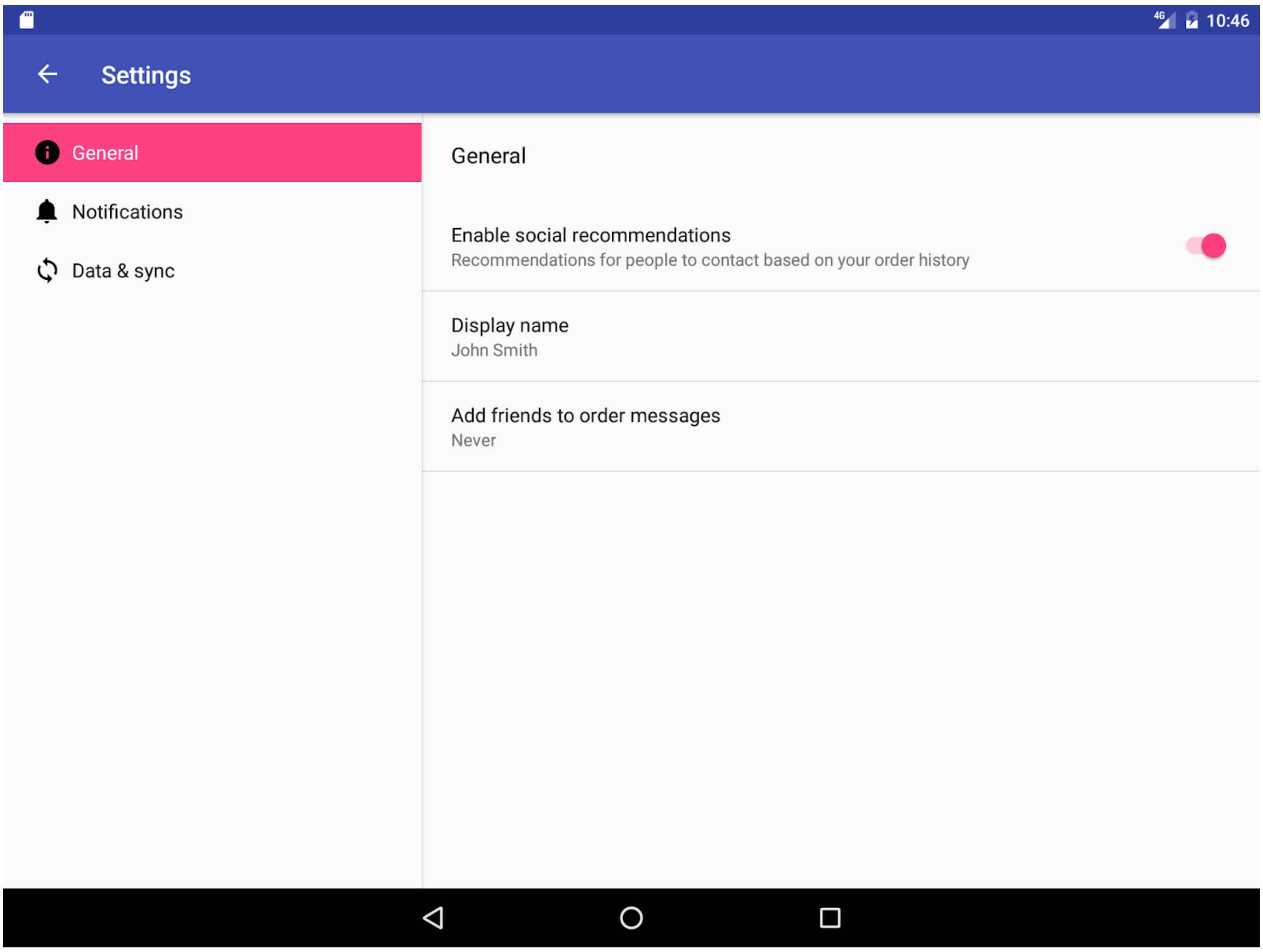
General

Enable social recommendations
Recommendations for people to contact based on your order history

Display name
John Smith

Add friends to order messages
Never

- *Tablets*: A master/detail screen layout with a header link for each group on the left (master) side, and the group of settings on the right (detail) side, as shown in the figure below.



Settings

General

Notifications

Data & sync

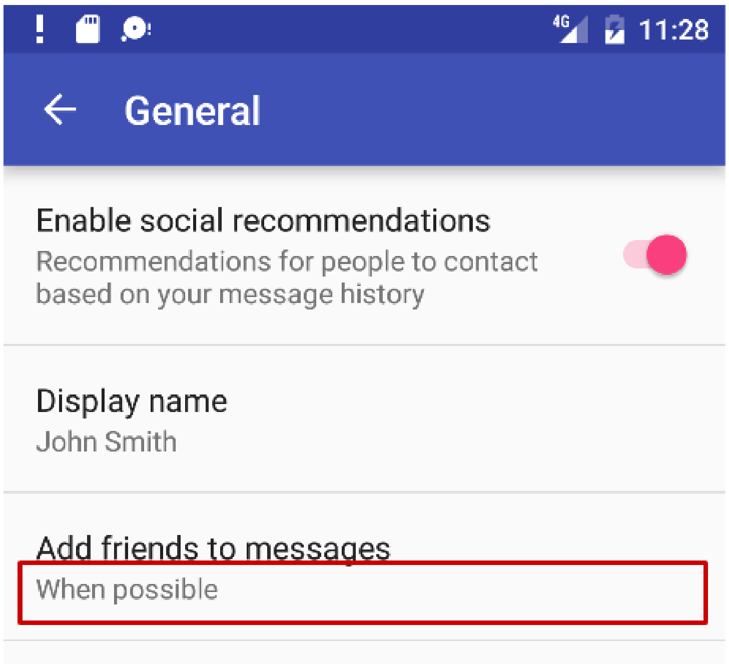
General

Enable social recommendations
Recommendations for people to contact based on your order history

Display name
John Smith

Add friends to order messages
Never

The Settings Activity template also provides the function of listening to a settings change, and changing the summary to reflect the settings change. For example, if you change the "Add friends to messages" setting (the choices are **Always**, **When possible**, or **Never**), the choice you make appears in the summary underneath the setting:


General

Enable social recommendations
Recommendations for people to contact based on your message history

Display name
John Smith

Add friends to messages
When possible

In general, you need not change the Settings Activity template code in order to customize `SettingsActivity` for the settings you want in your app. You can customize the settings titles, summaries, possible values, and default values without changing the template code, and even add more settings to the groups that are provided. To customize the settings, edit the string and string array resources in the strings.xml file and the layout attributes for each setting in the files in the `res > xml` folder in the **Project** > **Android** pane.

You use the Settings Activity template code as-is. To make it work for your app, add code to `MainActivity` to set the default settings values, and to *read* and *use* the settings values, as shown later in this chapter.

Including the Settings Activity template in your project

To include the Settings Activity template in your app project in Android Studio, follow these steps:

1. Select **app** at the top of the **Project** > **Android** pane, and choose **New** > **Activity** > **Settings Activity**.
2. In the dialog that appears, accept the Activity Name (**SettingsActivity** is the suggested name) and the Title (**Settings**).
3. Click the three dots at the end of the **Hierarchical Parent** field and choose the parent `Activity` (usually **MainActivity**), so that the **Up** app bar button in `SettingsActivity` returns the user to `MainActivity`. Choosing the parent `Activity` automatically updates the `AndroidManifest.xml` file to support **Up** navigation.

The Settings Activity template creates XML files in the **res** > **xml** folder of the **Project** > **Android**pane, which you can add to or customize for the settings you want:

- `pref_data_sync.xml`: `PreferenceScreen` layout for "Data & sync" settings.
- `pref_general.xml`: `PreferenceScreen` layout for "General" settings.
- `pref_headers.xml`: Layout of headers for the Settings main screen.
- `pref_notification.xml`: `PreferenceScreen` layout for "Notifications" settings.

The above XML layouts use various subclasses of the `Preference` class rather than `View`, and direct subclasses provide containers for layouts involving multiple settings. For example, `PreferenceScreen` represents a top-level `Preference` that is the root of a `Preference` hierarchy. The above files use `PreferenceScreen` at the top of each screen of settings. Other `Preference` subclasses for settings provide the appropriate UI for users to change the setting. For example:

- `CheckBoxPreference`: A checkbox for a setting that is either enabled or disabled.
- `ListPreference`: A dialog with a list of radio buttons.
- `SwitchPreference`: A two-state option that can be toggled (such as on/off or true/false).
- `EditTextPreference`: A dialog with an `EditText`.
- `RingtonePreference`: A dialog with ringtones on the device.

The Settings Activity template also provides the following:

- String resources in the `strings.xml` file in the `res > values` folder of the **Project > Android**pane, which you can customize for the settings you want.

  All strings used in the Settings `Activity`, such as the titles for settings, string arrays for lists, and descriptions for settings, are defined as string resources at the end of this file. They are marked by comments such as `<!-- Strings related to Settings -->` and `<!-- Example General settings -->`.

Tip: You can edit these strings to customize the settings you need for your app.

- `SettingsActivity` in the `java > com.example.android.` *projectname* folder, which you can use as is. This is the `Activity` that displays the settings. `SettingsActivity` extends `AppCompatPreferenceActivity` for maintaining compatibility with older versions of Android.
- `AppCompatPreferenceActivity` in the `java > com.example.android.` *projectname* folder, which you use as is. This `Activity` is a helper class that `SettingsActivity` uses to maintain backwards compatibility with previous versions of Android.

Using preference headers

The Settings Activity template shows preference headers on the main screen that separate the settings into categories (**General**, **Notifications**, and **Data & sync**). The user taps a heading to access the settings under that heading. On larger tablet displays (see previous figure), the headers appear in the left pane and the settings for each header appears in the right pane.

To implement the headers, the template provides the `pref_headers.xml` file:

```
<preference-headers xmlns:android="http://schemas.android.com/apk/res/android">
   <header
       android:fragment="com.example.android.droidcafe.SettingsActivity$GeneralPreferenceFragment"
      android:icon="@drawable/ic_info_black_24dp"
      android:title="@string/pref_header_general" />

   <header
      android:fragment="com.example.android.droidcafe.SettingsActivity$NotificationPreferenceFragment"
      android:icon="@drawable/ic_notifications_black_24dp"
      android:title="@string/pref_header_notifications" />

   <header
      android:fragment="com.example.android.droidcafe.SettingsActivity$DataSyncPreferenceFragment"
      android:icon="@drawable/ic_sync_black_24dp"


      android:title="@string/pref_header_data_sync" />
</preference-headers>
```

The XML headers file lists each preferences category and declares the fragment that contains the corresponding preferences.

To display the headers, the template uses the following `onBuildHeaders()` method:

```
@Override
@TargetApi(Build.VERSION_CODES.HONEYCOMB)
public void onBuildHeaders(List<Header> target) {
        loadHeadersFromResource(R.xml.pref_headers, target);
}
```

The above code snippet uses the `loadHeadersFromResource()` method of the `PreferenceActivity` class to load the headers from the XML resource (`pref_headers.xml`). The `TargetApi` annotation tells Android Studio's Lint code scanning tool that the class or method is targeting a particular API level regardless of what is specified as the min SDK level in manifest. Lint would otherwise produce errors and warnings when using new functionality that is not available in the target API level.

Using PreferenceActivity with a Fragment

The Settings Activity template provides an `Activity` (`SettingsActivity`) that extends `PreferenceActivity` to create a two-pane layout to support large screens, and *also* includes a `Fragment` for each group of settings. This is a useful pattern if you have multiple groups of settings and need to support tablet-sized screens as well as phones.

The following shows how to use an `Activity` that extends `PreferenceActivity` to host a `Fragment` (`PreferenceFragment`) that displays a group of settings. The `Activity` can host more than one `Fragment`, such as `GeneralPreferenceFragment` and `NotificationPreferenceFragment`, and each `Fragment` definition uses `addPreferencesFromResource` to load the settings from the XML preferences file:

```
public class SettingsActivity extends AppCompatPreferenceActivity {
   // ... SettingsActivity code

   public static class GeneralPreferenceFragment extends
                                             PreferenceFragment {
       @Override
       public void onCreate(Bundle savedInstanceState) {
            super.onCreate(savedInstanceState);
            addPreferencesFromResource(R.xml.pref_general);
            // ... onCreate code
   }
   public static class NotificationPreferenceFragment extends
                                             PreferenceFragment {
       // ... Similar code as in above fragment
}
```