9.2 App settings

Contents

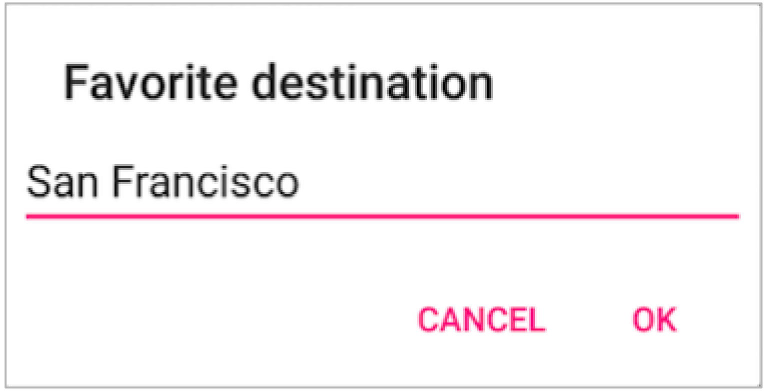
Settings

What are app settings?

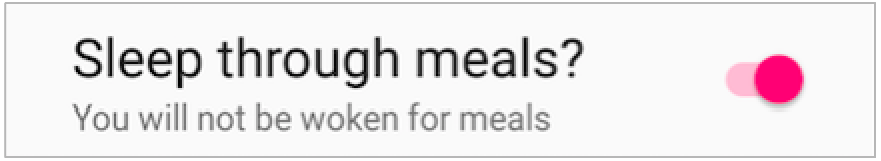
- Users can set features and behaviors of app

  Examples:
  - Home location, defaults units of measurement
  - Notification behavior for specific app
- For values that change infrequently and are relevant to most users
- If values change often, use options menu or nav drawer

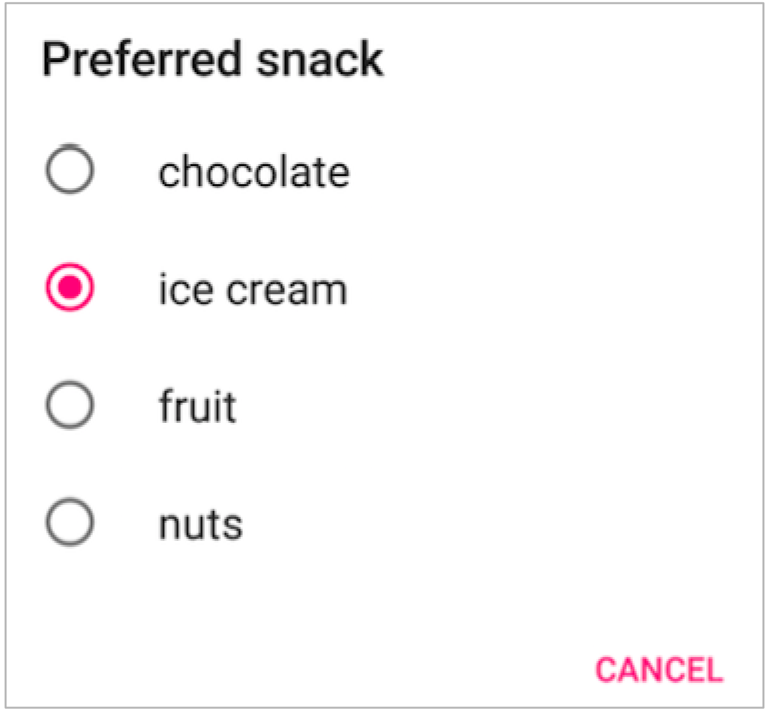
Example settings


Favorite destination

San Francisco


Sleep through meals?

You will not be woken for meals


Preferred snack

○ chocolate

● ice cream

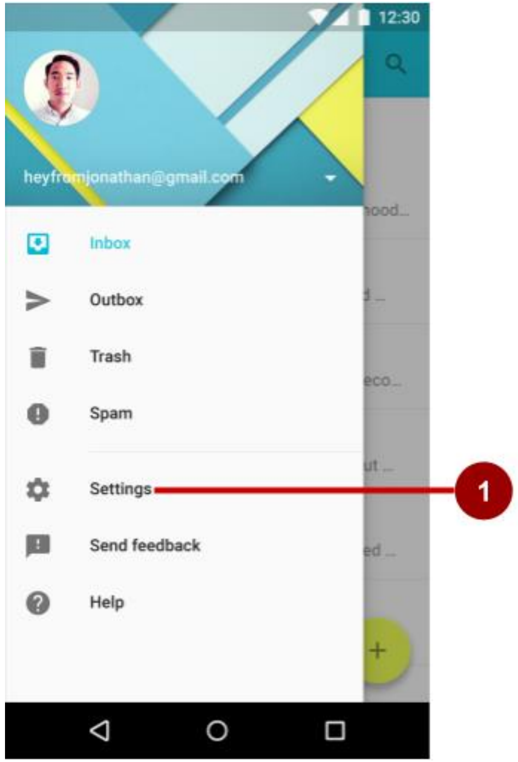
○ fruit

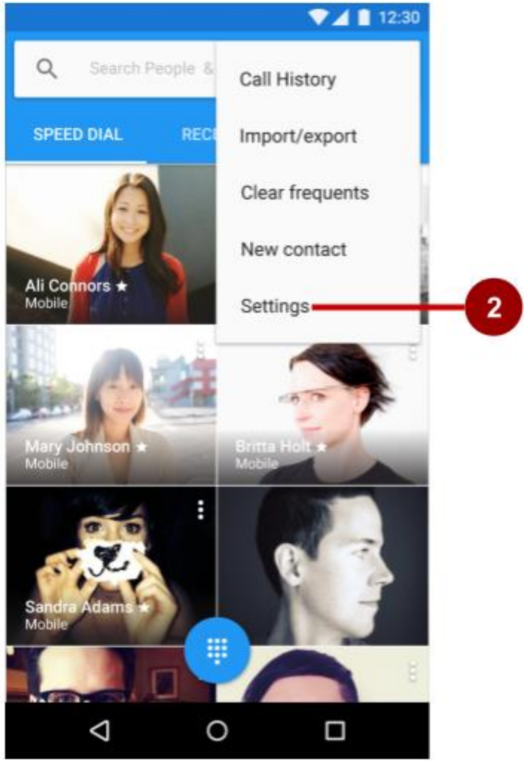
○ nuts

Accessing settings

Users access settings through:

1. Navigation drawer
2. Options menu

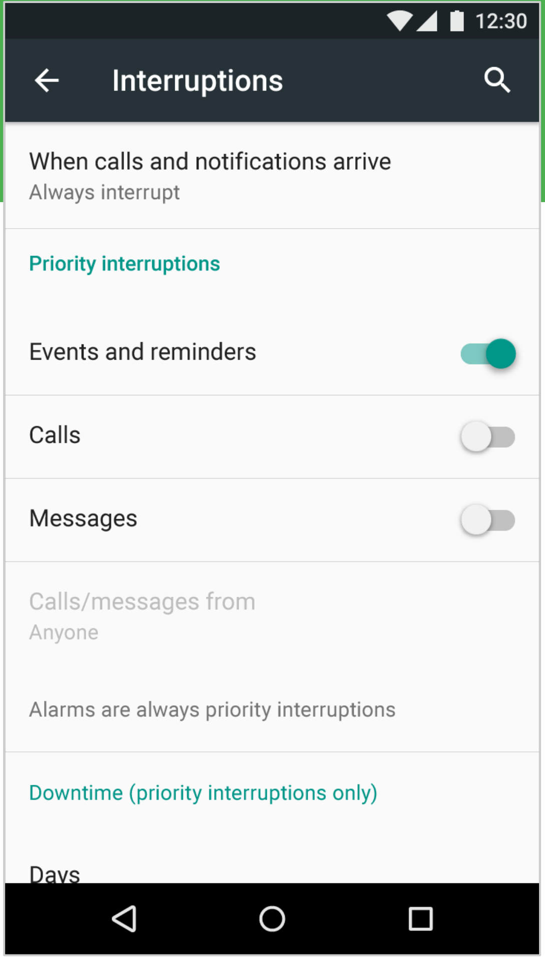




Setting screens

Organize your settings

- Predictable, manageable number of options
- 7 or less: arrange according to priority with most important at top
- 7-15 settings: group related settings under section dividers


12:30

Interruptions

When calls and notifications arrive
Always interrupt

Priority interruptions

Events and reminders — on

Calls — off

Messages — off

Calls/messages from
Anyone

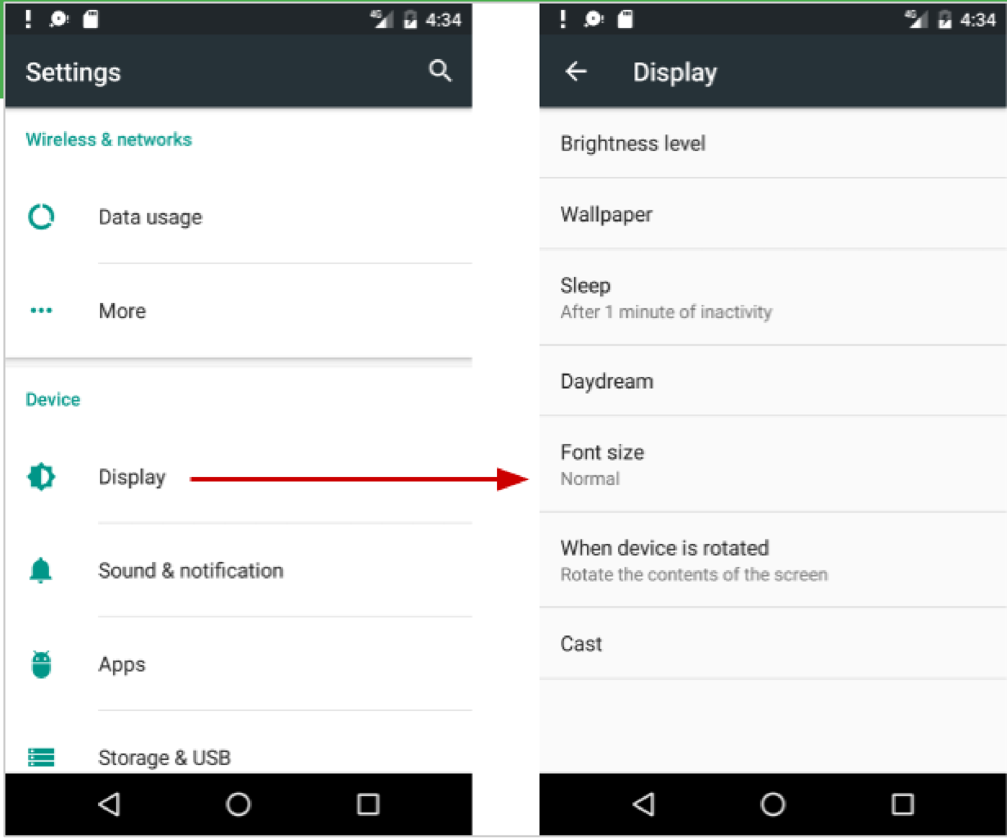
Alarms are always priority interruptions

Downtime (priority interruptions only)

Days

16+ Settings

- Group into screens opened from main Settings screen



4:34

Settings

Wireless & networks

Data usage

More

Device

Display

Sound & notification

Apps

Storage & USB

4:34

Display

Brightness level

Wallpaper

Sleep
After 1 minute of inactivity

Daydream

Font size
Normal

When device is rotated
Rotate the contents of the screen

Cast

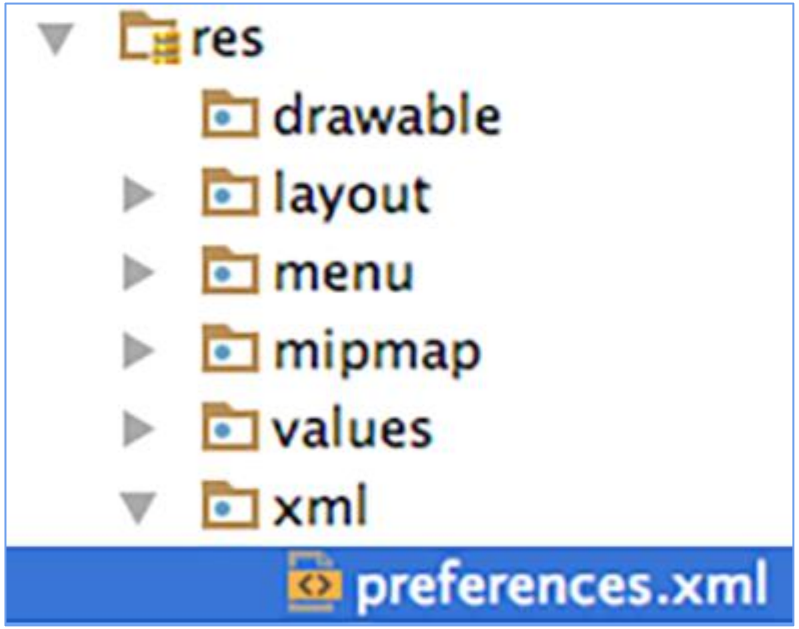
View versus Preference

- Use Preference objects instead of View objects in your Settings screens
- Design and edit Preference objects in the layout editor just like you do for View objects

Define Settings in a Preference Screen

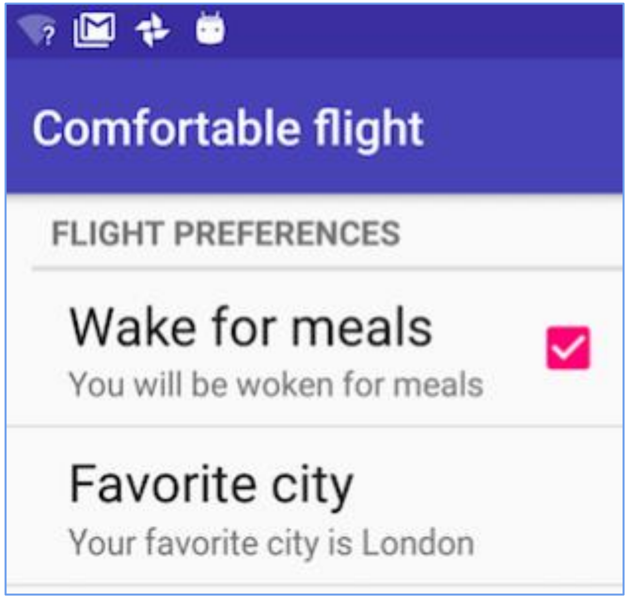
- Define settings in a preferences screen
- It is like a layout
- define in:

  res > xml > preferences.xml



Preference Screen example

```
<PreferenceScreen>
  <PreferenceCategory
    android:title="Flight Preferences">
    <CheckBoxPreference
       android:title="Wake for meals"
       ... />
    <EditTextPreference
       android:title="Favorite city"
       .../>
  </PreferenceCategory>
</PreferenceScreen>
```


Comfortable flight

FLIGHT PREFERENCES

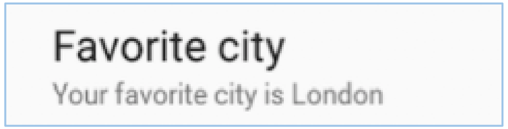
Wake for meals ✓
You will be woken for meals

Favorite city
Your favorite city is London

Every Preference must have a key

- Every preference must have a key
- Android uses the key to save the setting value

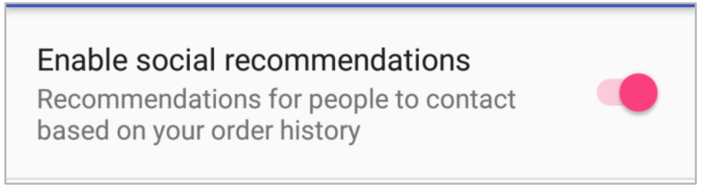
```
<EditTextPreference
    android:title="Favorite city"
    android:key="fav_city"
    … />
```


Favorite city
Your favorite city is London

SwitchPreference

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


   <SwitchPreference
       android:defaultValue="true"
       android:title="@string/pref_title_social"
       android:key="switch"
       android:summary="@string/pref_sum_social" />
</PreferenceScreen>
```



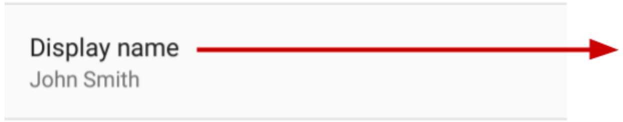
Enable social recommendations

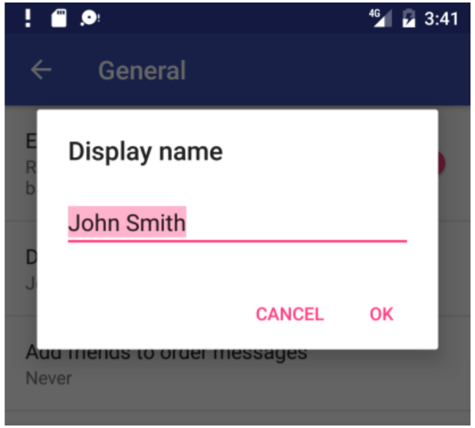
Recommendations for people to contact based on your order history

SwitchPreference attributes

- `android:defaultValue`—true by default
- `android:summary`—text underneath setting, for some settings, should change to reflect value
- `android:title`—title/name
- `android:key`—key for storing value in SharedPreferences

EditTextPreference

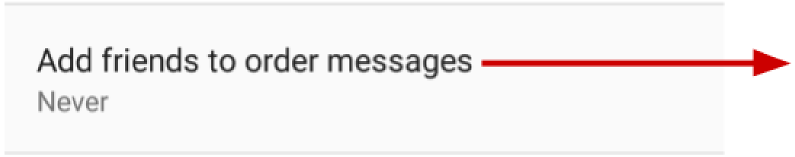

Display name
John Smith

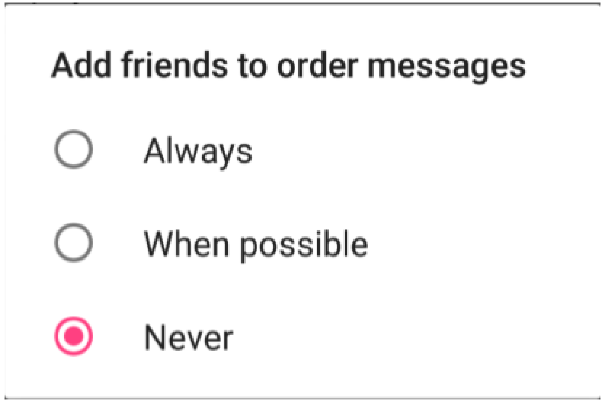


Display name
John Smith

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

ListPreference


Add friends to order messages
Never


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

```
<ListPreference
  android:defaultValue="-1"
  android:key="add_friends_key"
  android:entries="@array/pref_example_list_titles"
  android:entryValues="@array/pref_example_list_values"
  android:title="@string/pref_title_add_friends_to_messages" />
```

ListPreference

- Default value of -1 for no choice
- `android:entries`—Array of labels for radio buttons
- android:entryValues —Array of values radio button

Preference class

- Preference class provides View for each kind of setting
- associates View with SharedPreferences interface to store/retrieve the preference data
- Uses key in the Preference to store the setting value

Preference subclasses

- CheckBoxPreference—list item that shows a checkbox
- ListPreference—opens a dialog with a list of radio buttons
- SwitchPreference—two-state toggleable option
- EditTextPreference—that opens a dialog with an EditText
- RingtonePreference—lets user to choose a ringtone

Classes for grouping

- PreferenceScreen
  - root of a Preference layout hierarchy
  - at the top of each screen of settings
- PreferenceGroup
  - for a group of settings (Preference objects).
- PreferenceCategory
  - title above a group as a section divider

Implement settings

Settings UI uses fragments

- Use an Activity with a Fragment to display the Settings screen
- Use specialized Activity and Fragment subclasses that handle the work of saving settings

Activities and fragments for settings

- Android 3.0 and newer:
  - AppCompatActivity with PreferenceFragmentCompat
  - OR use Activity with PreferenceFragment
- Android older than 3.0 (API level 10 and lower):
  - build a special settings activity as an extension of the PreferenceActivity class (use the template!)

Lesson focusses on this!

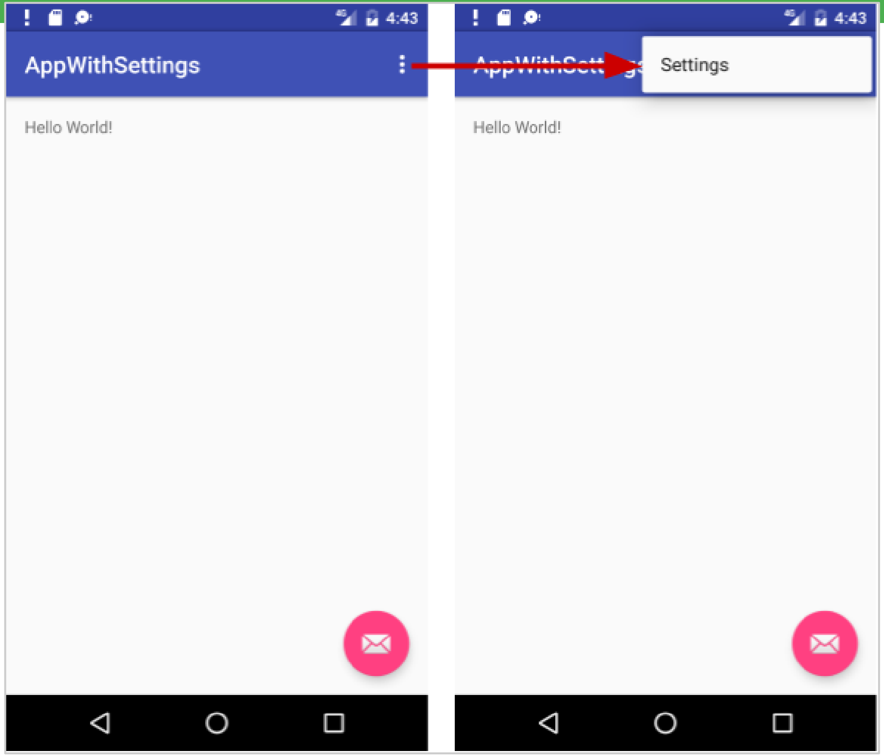
Steps to implement Settings

For AppCompatActivity with PreferenceFragmentCompat:

- Create the preferences screen
- Create an Activity for the settings
- Create a Fragment for the settings
- Add the preferenceTheme to the AppTheme
- Add code to invoke Settings UI

Basic Activity template

- Basic Activity template
  Includes options menu
- **Settings** menu item provided for options menu



Create a Settings Activity subclass

- Extends AppCompatActivity
- in onCreate() display the settings Fragment:

```
getSupportFragmentManager()
    .beginTransaction()
    .replace(android.R.id.content,
                   new MySettingsFragment())
    .commit();
```

Settings Activity example

```java
public class MySettingsActivity extends AppCompatActivity {

   @Override
   protected void onCreate(Bundle savedInstanceState) {
       super.onCreate(savedInstanceState);
       getSupportFragmentManager().beginTransaction()
           .replace(android.R.id.content, new MySettingsFragment())
           .commit();
   }
}
```

This is the whole class!

Create a Settings Fragment subclass

- Extends PreferenceFragmentCompat
- Implement methods:
    - onCreatePreferences() displays the settings
    - setOnPreferenceChangeListener() handles any changes that need to happen when the user changes a preference (optional)

PreferenceFragment

```
public class MySettingsFragment
    extends PreferenceFragmentCompat { …}
```

- Blank fragments include onCreateView() by default
- Replace onCreateView() with onCreatePreferences() because this fragment displays a preferences screen

Settings Fragment example

```
public class MySettingsFragment extends PreferenceFragmentCompat {

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

Add PreferenceTheme to app's theme

If using PreferenceFragmentCompat, set preferenceTheme in styles.xml:

```
<style name="AppTheme" parent="...">
   ...
   <item name="preferenceTheme">
       @style/PreferenceThemeOverlay
   </item>
  …
</style>
```

Invoke Settings UI

Send the Intent to start the Settings Activity:

- From Options menu, update onOptionItemsSelected()
- From Navigation drawer, update onItemClick() on the OnItemClickListener given to setOnItemClickListener

Default Settings

Default settings

- Set default to value most users would choose
  - All contacts
- Use less battery power
  - Bluetooth is off until the user turns it on
- Least risk to security and data loss
  - Archive rather than delete messages
- Interrupt only when important
  - When calls and notifications arrive

Set default values

- Use android:defaultValue in Preference view in xml:

```
<EditTextPreference
     android:defaultValue="London"
   … />
```

- In onCreate() of MainActivity, save default values.

Save default values in shared preferences

In onCreate() of MainActivity

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

- App context, such as `this`
- Resource ID of XML resource file with settings
- `false` only calls method the first time the app starts

Save and retrieve settings

Saving setting values

- No need to write code to save settings!
- If you use specialized Preference Activity and Fragment, Android automatically saves setting values in shared preferences

Get settings from shared preferences

- In your code, get settings from default shared preferences
- Use key as specified in preference view in xml

```
SharedPreferences sharedPref =
   PreferenceManager.getDefaultSharedPreferences(this);

String destinationPref =
    sharedPref.getString("fav_city", "Jamaica");
```

Get settings values from shared preferences

- In preference definition in xml:

```
<EditTextPreference
   android:defaultValue="London"
   android:key="fav_city" />
```

- In code, get fav_city setting:

```
String destinationPref =
    sharedPref.getString("fav_city", "Jamaica");
```

default setting value

is different than

default value returned by pref.getString() if key is not found in shared prefs

Respond to changes in settings

Listening to changes

- Display related follow-up settings
- Disable or enable related settings
- Change the summary to reflect current choice
- Act on the setting

  For example, if the setting changes the screen background, then change the background

Listen for changes to settings

- Define setOnPreferenceChangeListener()
- in onCreatePreferences() in the Settings Fragment

onCreatePreferences() example

```
@Override
public void onCreatePreferences(Bundle savedInstanceState,
                                String rootKey) {
   setPreferencesFromResource(R.xml.preferences, rootKey);
   ListPreference colorPref =
               (ListPreference) findPreference("color_pref");
   colorPref.setOnPreferenceChangeListener(
     // see next slide
     // ...);
}
```

onPreferenceChangeListener() example

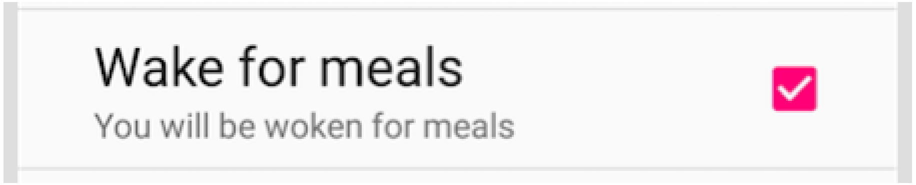
Example: change background color when setting changes

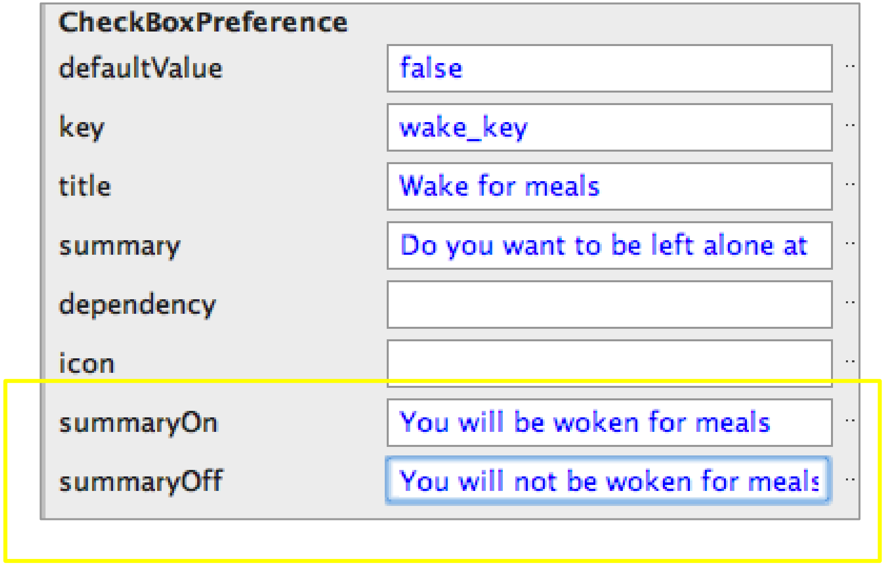
```
colorPref.setOnPreferenceChangeListener(
    new Preference.OnPreferenceChangeListener(){
        @Override
        public boolean onPreferenceChange(
           Preference preference, Object newValue){
               setMyBackgroundColor(newValue);
               return true;
        }
});
```

Summaries for settings

Summaries for true/false values

Set attributes to define conditional summaries for preferences that have true/false values


Wake for meals
You will be woken for meals

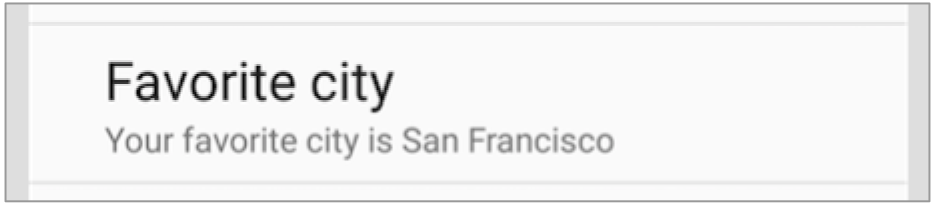

CheckBoxPreference

defaultValue	false
key	wake_key
title	Wake for meals
summary	Do you want to be left alone at
dependency	
icon	
summaryOn	You will be woken for meals
summaryOff	You will not be woken for meals

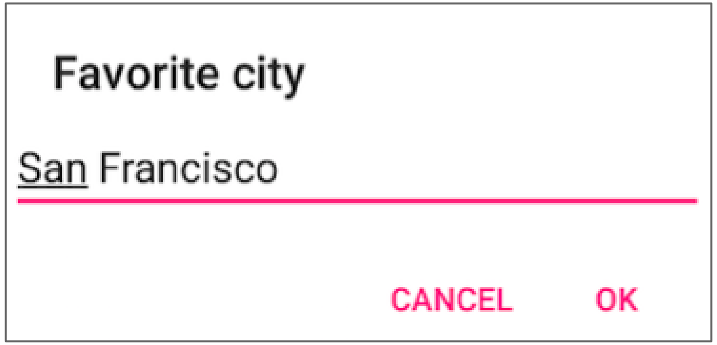
Summaries for other settings

For settings that have values other than true/false, update the summary when the setting value changes

- Set the summary in onPreferenceChangeListener()


Favorite city

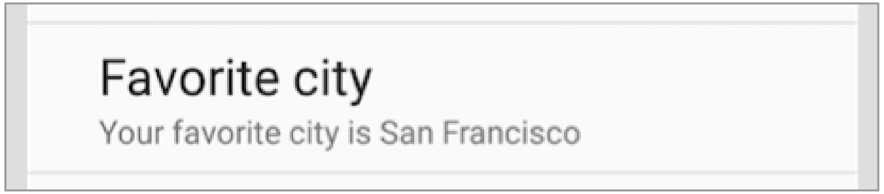
Your favorite city is San Francisco


Favorite city

San Francisco

Set summary example

```
EditTextPreference cityPref = (EditTextPreference)
                              findPreference("fav_city");
cityPref.setOnPreferenceChangeListener(
  new Preference.OnPreferenceChangeListener(){
    @Override
    public boolean onPreferenceChange(Preference pref, Object value){
      String city = value.toString();
      pref.setSummary("Your favorite city is " + city);
      return true;
    }
  });
```



Favorite city

Your favorite city is San Francisco

Activity Template

More complex?

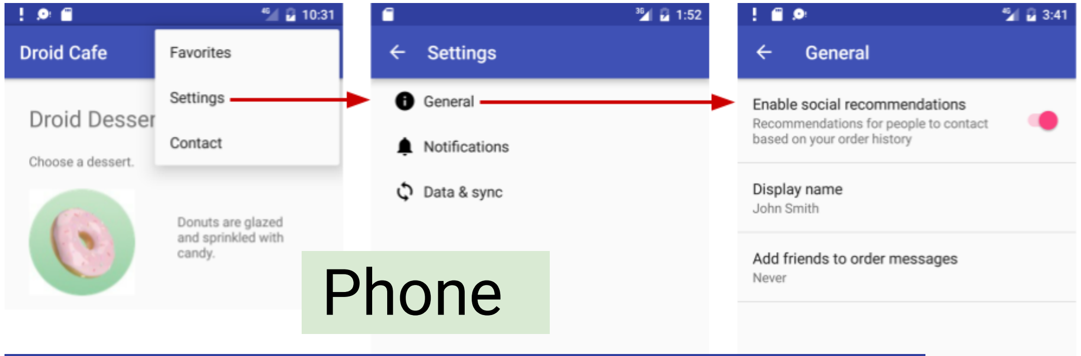
For anything more complex

?

use the Settings Activity template!

Settings Activity template

- Complex Settings
- Backwards compatibility
- Customize pre-populated settings
- Adaptive layout for phones and tablets



Droid Cafe

Favorites

Settings

Contact

Droid Desser

Choose a dessert.

Donuts are glazed and sprinkled with candy.

Settings

General

Notifications

Data & sync

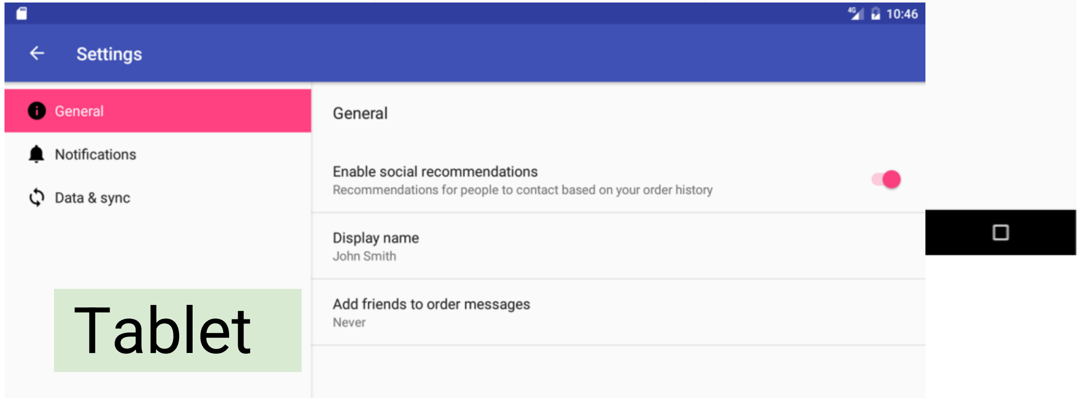
General

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

Display name
John Smith

Add friends to order messages
Never

Phone



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

Tablet

Learn more

Learn more

- Android Studio User Guide
- Settings (coding)
- Preference class
- PreferenceFragment
- Fragment
- SharedPreferences
- Saving Key-Value Sets
- Settings (design)

What's Next?

- Concept Chapter: 9.2 App settings
- Practical: 9.2 App settings