AND180

Toolbar and App Bar

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Microsoft

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Objectives

- Add a **`Toolbar`** to an Activity
- Populate **`Toolbar`** Actions from an XML menu file
- Use a **`Toolbar`** as an Activity's app bar
- Set a navigation icon on an app bar

Add a Toolbar to an Activity

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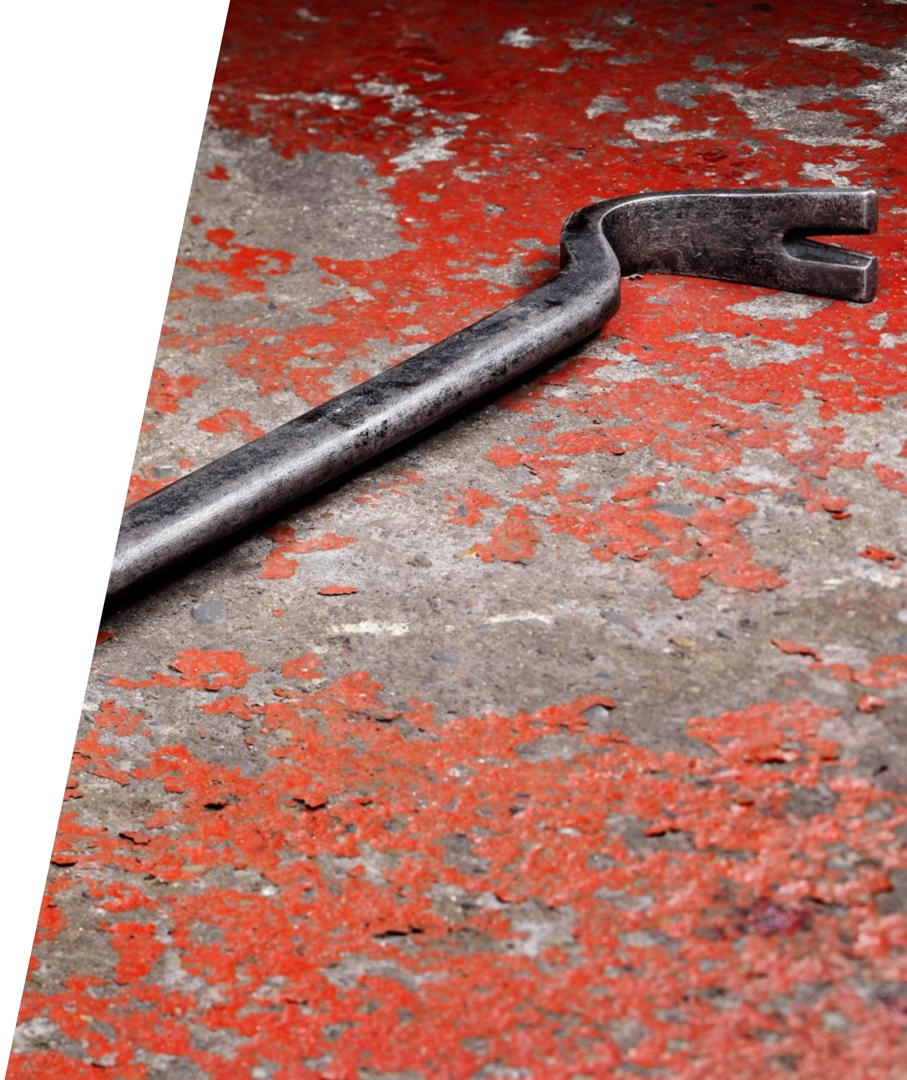
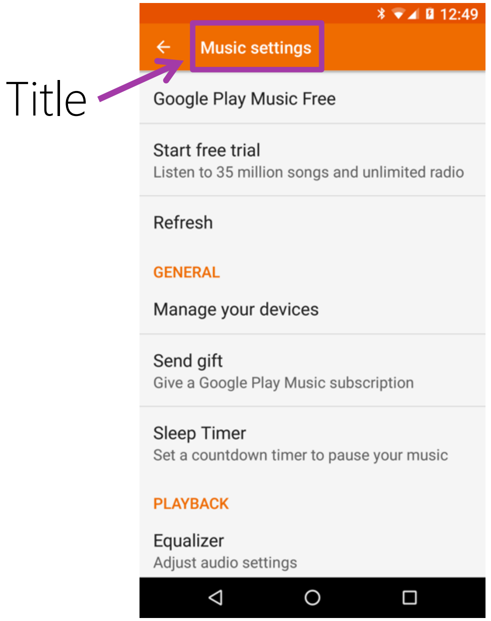
Tasks

1. Add a **`Toolbar`** to your UI
2. Set text and logo



Motivation

- Activities often contain a title and/or logo for branding and to indicate the user's current location within the app



Google Play Music Free

Start free trial
Listen to 35 million songs and unlimited radio

Refresh

GENERAL

Manage your devices

Send gift
Give a Google Play Music subscription

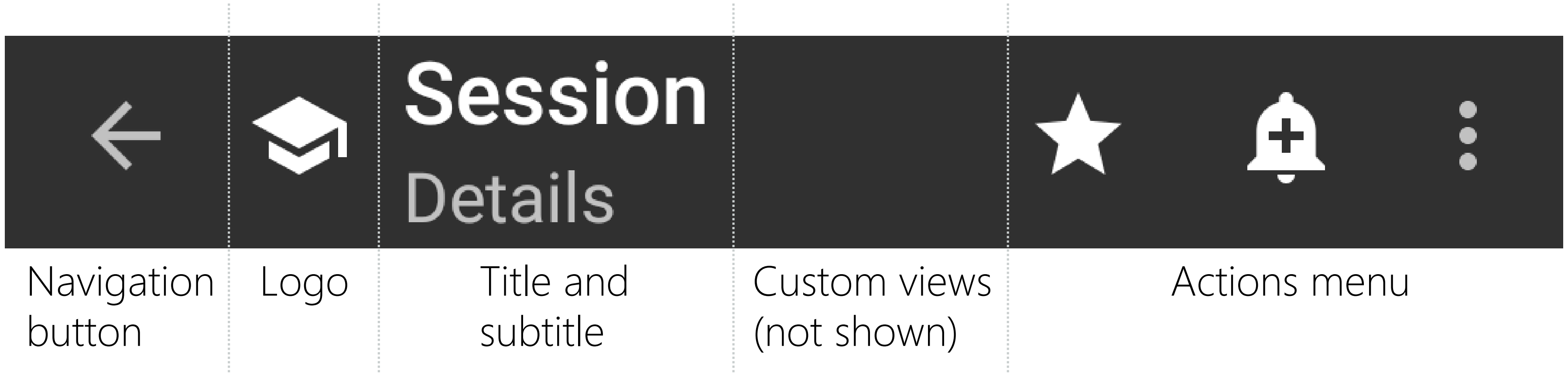
Sleep Timer
Set a countdown timer to pause your music

PLAYBACK

Equalizer
Adjust audio settings

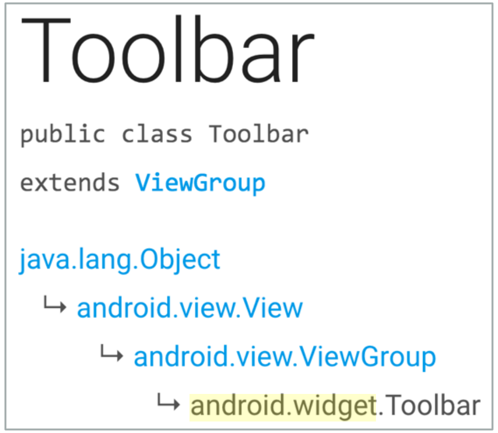
What is Toolbar?

❖ `Toolbar` is a horizontal menu that you position anywhere in your UI – it has several standard elements that you can use or ignore as needed



Packaging

- `Toolbar` is available in two places

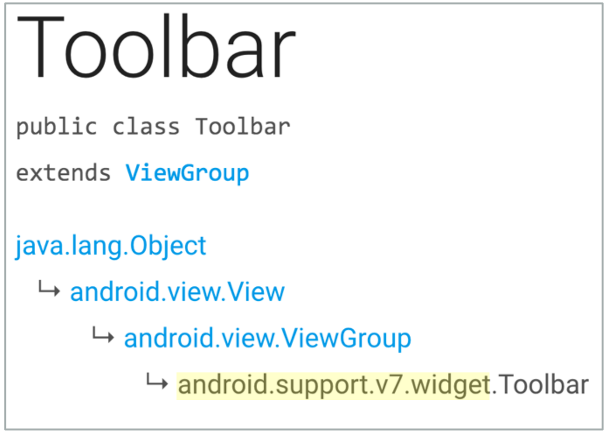


Toolbar

```
public class Toolbar
extends ViewGroup
```

java.lang.Object
  ↳ android.view.View
    ↳ android.view.ViewGroup
      ↳ android.widget.Toolbar

Standard in Android API level 21 and higher



Toolbar

```
public class Toolbar
extends ViewGroup
```

java.lang.Object
  ↳ android.view.View
    ↳ android.view.ViewGroup
      ↳ android.support.v7.widget.Toolbar

v7 Support Library for use on older Android versions

We will use the Support Library version for maximum compatibility

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Theme dependency

- Apps using the Support **`Toolbar`** must select one of the AppCompat themes

`AndroidManifest.xml`

```
<application
   ...
   android:theme="@style/Theme.AppCompat">
</application>
```

Needed when using the Support **`Toolbar`**

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How to create a Toolbar

- It is typical to use XML to add a **`Toolbar`** to your layout

```
<LinearLayout ...>

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

</LinearLayout>
```

Include the package name since we are using the **`Toolbar`** from the Support library

No Android namespace

❖ The Support **`Toolbar`** defines several XML attributes – since they come from a library rather than standard Android, they are **not** in the Android namespace

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

   <android.support.v7.widget.Toolbar android:title="Session" ... />

...
```

`Toolbar`'s **`title`** attribute will not be found, this setting will be ignored at runtime

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App namespace

- Support Toolbar attributes are in your app's namespace – use the special symbol **`res-auto`** to define an XML prefix to reach them

The prefix **app** is used by convention

Replaced with your app's package name

```
<LinearLayout xmlns:app="http://schemas.android.com/apk/res-auto" ...>

   <android.support.v7.widget.Toolbar app:title="Session" ... />

...
```

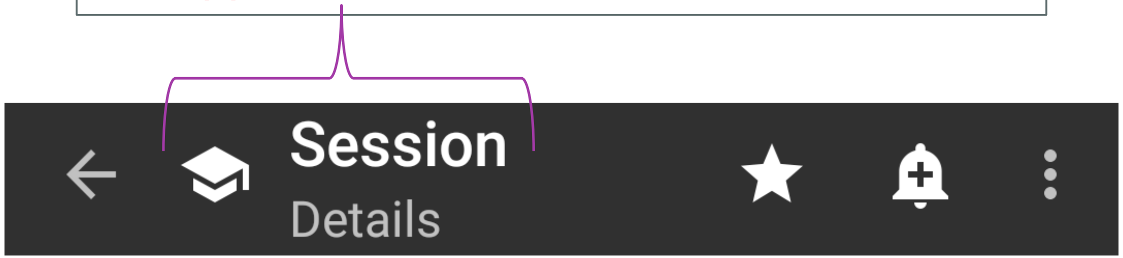
✓

This will correctly locate **`Toolbar`**'s **`title`** attribute

How to set logo and text

❖ It is typical to use XML attributes to set the **`Toolbar`**'s logo and text

```
<android.support.v7.widget.Toolbar
   app:logo="@drawable/hat"
   app:title="Session"
   app:subtitle="Details" ... />
```



Individual Exercise

Add a Toolbar to an Activity

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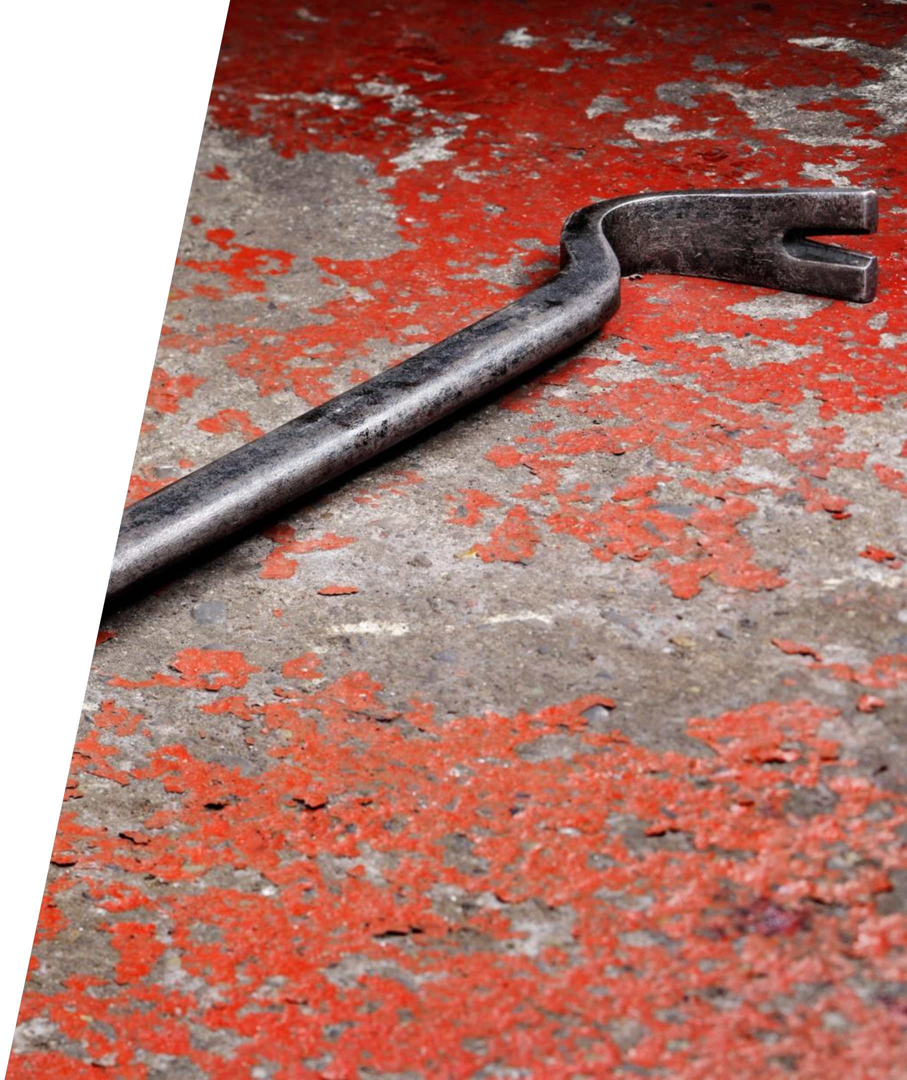
Summary

1. Add a **`Toolbar`** to your UI
2. Set text and logo



Populate Toolbar Actions from an XML menu file

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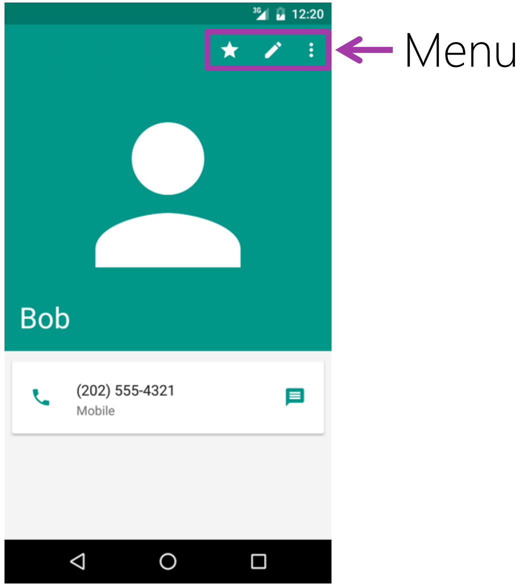
Tasks

1. Define an XML menu file
2. Inflate the XML menu file into a `Toolbar`'s actions menu
3. Create hierarchical menus
4. Create checkable menu items

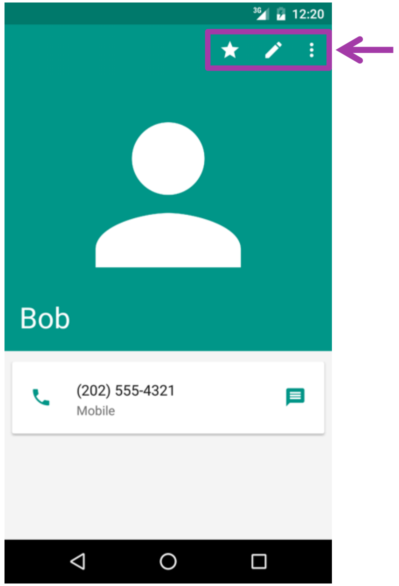
Motivation

- Many Activities give the user a menu for easy access to common commands



What are Actions?

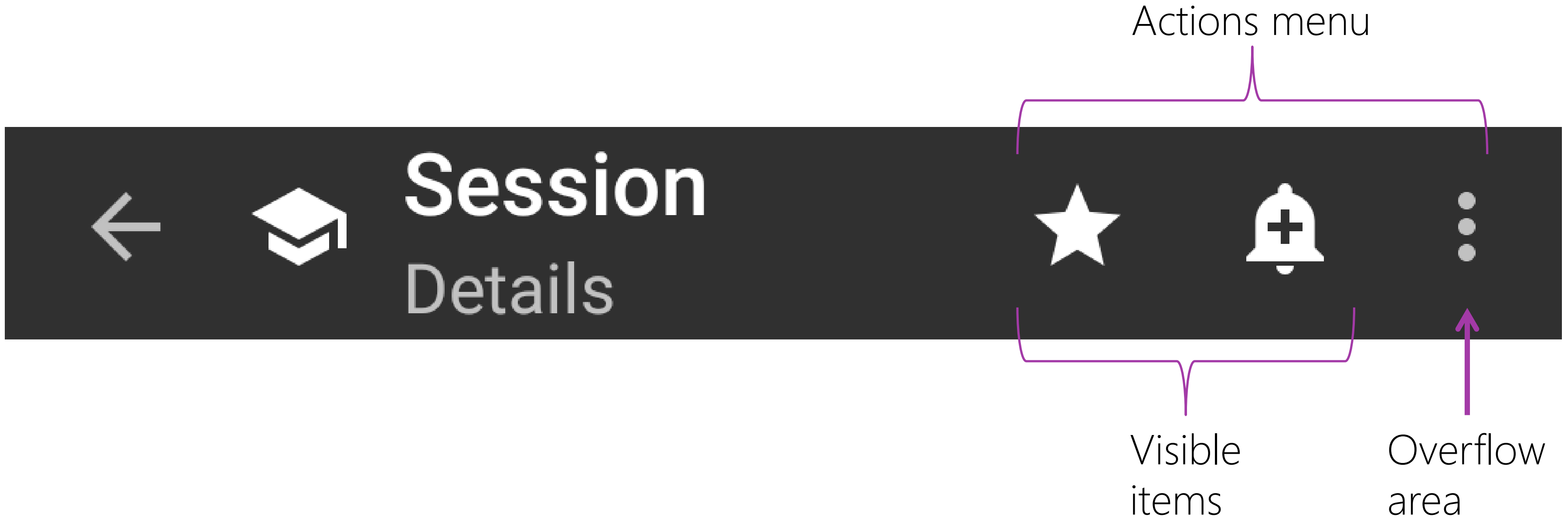
- *Actions* are the most-useful commands a user will need on a page – Android uses the acronym FIT (Frequent, Important, or Typical) to describe what qualifies as an action



Actions for a contact include *Add to Favorites* and *Edit*

Toolbar's actions menu

❖ `Toolbar` has an actions menu built in



What is a Menu Item?

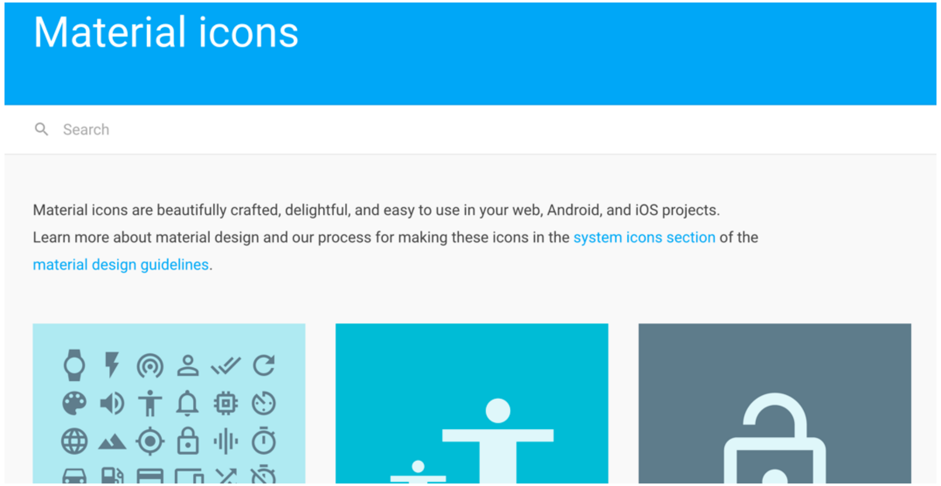
- **`IMenuItem`** represents an entry on an Android menu

```
public interface IMenuItem : IJavaObject, IDisposable
{  ...
   IMenuItem SetTitle (int title);

   IMenuItem SetIcon (Drawable icon);

   void SetShowAsAction (ShowAsAction actionEnum);

   ISubMenu SubMenu { get; }

   IMenuItem SetChecked(bool value);
}
```

Text	`SetTitle`
Image	`SetIcon`
Positioning	`SetShowAsAction`
Hierarchy	`SubMenu`
Checked state	`SetChecked`

Icons

- Google provides many graphics appropriate for use as action icons at https://design.google.com/icons/



Material icons

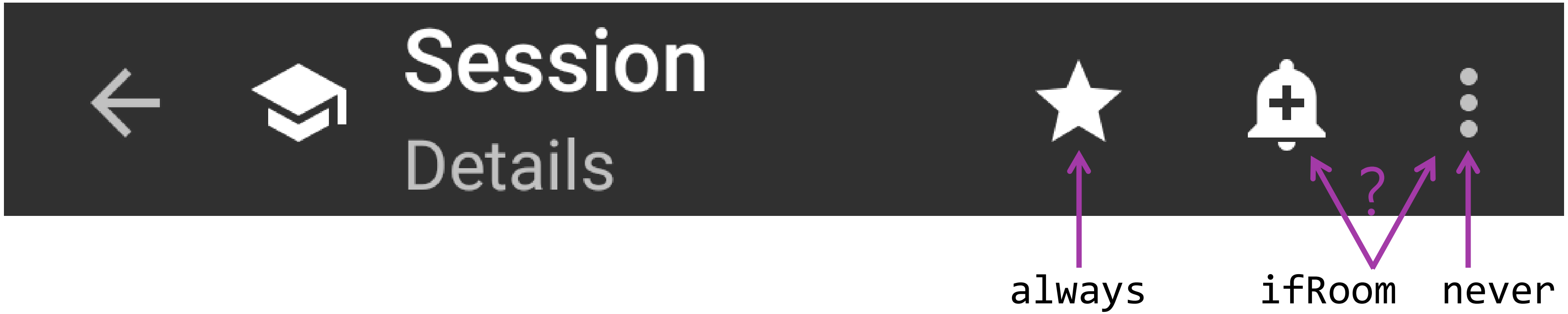
Search

Material icons are beautifully crafted, delightful, and easy to use in your web, Android, and iOS projects. Learn more about material design and our process for making these icons in the system icons section of the material design guidelines.

If you create your own icons, you should provide multiple sizes so they look good on all devices, see: https://developer.android.com/guide/practices/ui_guidelines/icon_design_action_bar.html

Menu item location

- The **`showAsAction`** property determines whether menu items are placed directly on the toolbar or in the overflow area



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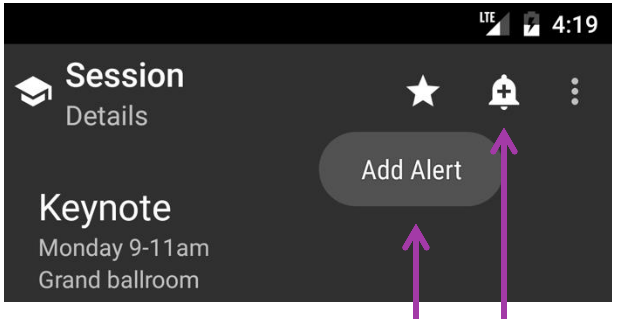
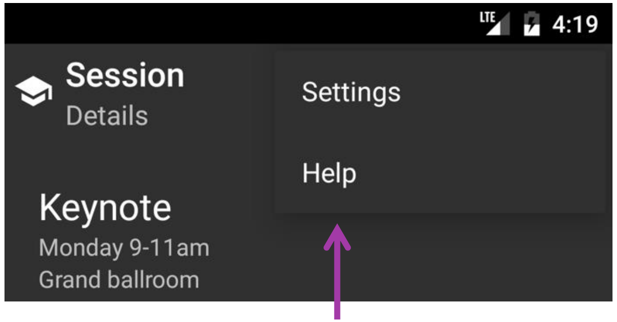
Menu item display

- Menu items are displayed differently depending on location



Title used as item's tooltip

Icon used when item is visible



Only the title is used in the overflow area

Ways to create menus

❖ You can create menu items either in code or XML

C#

Rare, but useful if menu content needs to be dynamic

XML

Concise and follows the standard Android paradigm to define UI in markup

Create menu items in code

❖ Use **Toolbar**'s **Menu** property and its **Add** method to create and add new menu items

Text →

Image →

Positioning →

```
var toolbar = FindViewById<Toolbar>(Resource.Id.toolbar);

IMenuItem item = toolbar.Menu.Add(Resource.String.add_alert);

item.SetIcon(Resource.Drawable.ic_add_alert_white_24dp);

item.SetShowAsAction(ShowAsAction.IfRoom);
```

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Create menu items in XML

- To create a menu in XML, first define a menu file and then use code to inflate it

Resources/menu/actions.xml ← File placed in the menu folder

Define the menu items →

```
<?xml version="1.0" encoding="utf-8"?>
<menu ...>
   ...
</menu>
```

Inflate →

```
var toolbar = FindViewById<Toolbar>(Resource.Id.toolbar);
toolbar.InflateMenu(Resource.Menu.actions);
```

Menu file structure

- A menu resource file defines a menu using XML
  (See https://developer.android.com/guide/topics/resources/menu-resource.html)

Must start with **menu** element

Can contain single **item**s

Can contain item **group**s

```
<?xml version="1.0" encoding="utf-8"?>
<menu ...>

   <item ... />
   <item ... />

   <group>
      <item ... />
      <item ... />
   </group>

</menu>
```

What is the <menu> element?

❖ The **menu** element is the root of a menu file – it defines any needed namespace prefixes but has no other attributes

```
<?xml version="1.0" encoding="utf-8"?>
<menu xmlns:android="http://schemas.android.com/apk/res/android"
      xmlns:app="http://schemas.android.com/apk/res-auto">
   ...
</menu>
```

The res-auto prefix is needed when using the support Toolbar

The standard Android prefix is always needed

What is the <item> element?

- The **`item`** element defines a menu entry in XML

Add an **`id`** to any item you will need to identify from code

```
<item
    android:id          ="@+id/addToFavorites"
    android:title       ="Add To Favorites"
    android:icon        ="@drawable/ic_grade_white_24dp"
    app:showAsAction="always"
    ...
/>
```

Text → android:title
Image → android:icon
Positioning → app:showAsAction

Use the **`res-auto`** prefix for **`showAsAction`** when this item is inside a Support Toolbar

Menu item click event

❖ **`Toolbar`** has a **`MenuItemClick`** event – use the item id to determine which menu entry was clicked

```
var toolbar = FindViewById<Toolbar>(Resource.Id.toolbar);
toolbar.MenuItemClick += OnClick;
```

Detect which item was clicked

```
void OnClick(object sender, Toolbar.MenuItemClickEventArgs e)
{
   switch (e.Item.ItemId)
   {
      case Resource.Id.addAlert:       ... break;
      case Resource.Id.addToFavorites: ... break;
   }
}
```

Individual Exercise

Populate Toolbar Actions from an XML menu file

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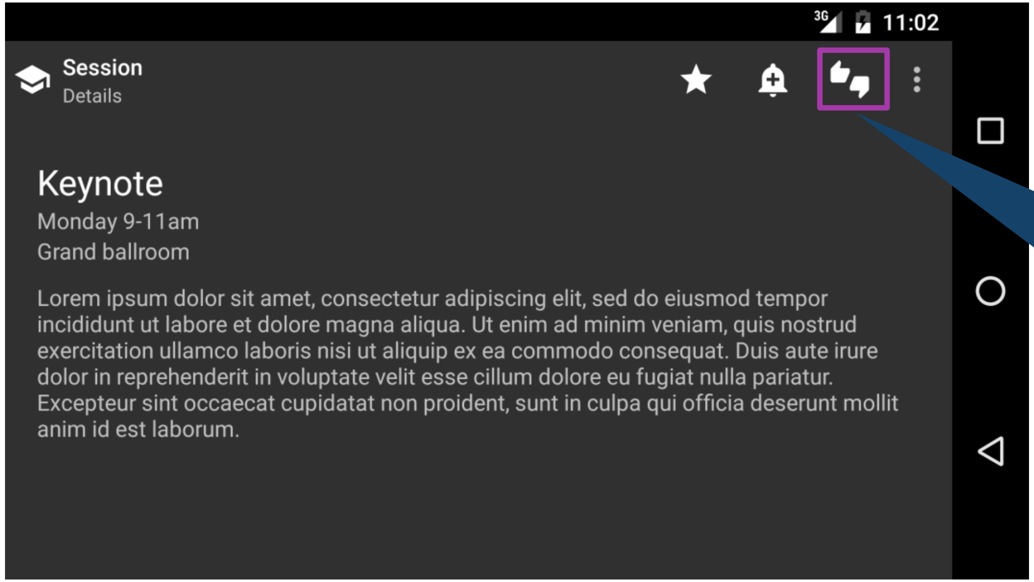
Motivation [hierarchy]

❖ Menus can be hierarchical – a top-level entry may lead to a sub-menu



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Monday 9-11am

Grand ballroom

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You might want this item to open a rating sub-menu

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What is a sub-menu?

- A sub-menu is a **`menu`** contained within a **`item`**

Each **`item`** can optionally contain one **`menu`**

```
<menu>

   <item>
      <menu>
         <item ... />
         <item ... />
         <item ... />
      </menu>
   </item>

   <item ... />
   <item ... />
</menu>
```

Submenu behavior

- An **`item`**'s sub-menu is hidden until the user selects the **`item`**

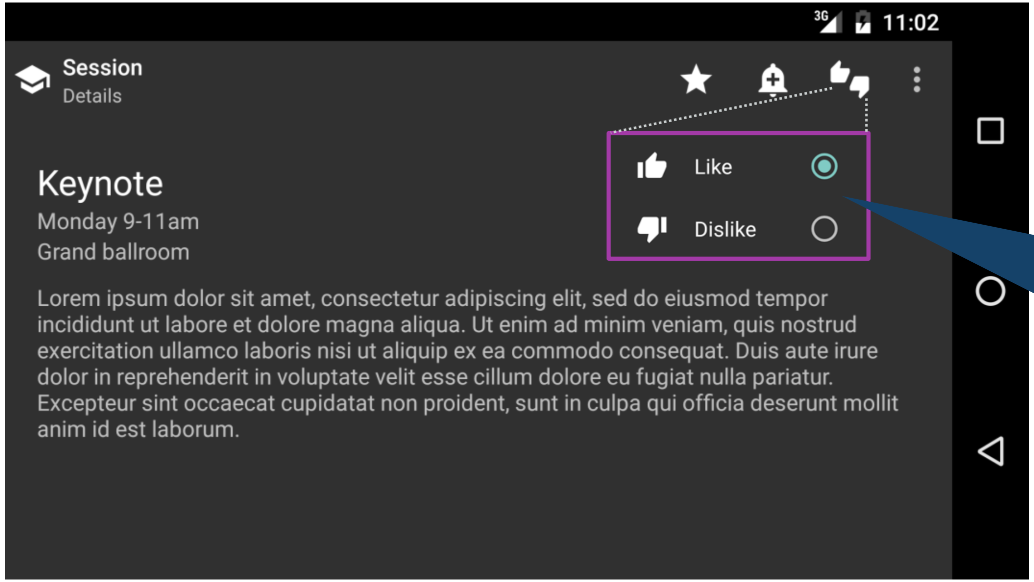
When the user selects this item...

...this menu appears

```
<item android:id="@+id/rating" ...>
   <menu>
      <item android:id="@+id/like"     ... />
      <item android:id="@+id/dislike" ... />
   </menu>
</item>
```

Motivation [checkable]

- Menu items that let you select one option from several choices need to support "checkable" behavior



Keynote
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These menu items need to function as radio buttons

What is the <group> element?

- The **group** element is a container for a collection of **items**

A group containing two items

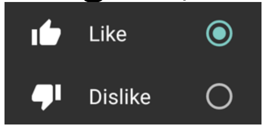
```
<group>

   <item
      android:id    ="@+id/like"
      android:icon  ="@drawable/ic_thumb_up_white_24dp"
      android:title="Like" />

   <item
      android:id    ="@+id/dislike"
      android:icon  ="@drawable/ic_thumb_down_white_24dp"
      android:title="Dislike" />

</group>
```

Checkable <group>

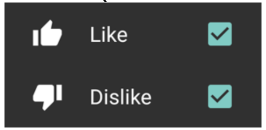
- The **group** element provides checkable behavior for the items it holds

```
<group android:checkableBehavior="single">

   <item
      android:id    ="@+id/like"
      android:icon ="@drawable/ic_thumb_up_white_24dp"
      android:title="Like" />

   <item
      android:id    ="@+id/dislike"
      android:icon ="@drawable/ic_thumb_down_white_24dp"
      android:title="Dislike" />

</group>
```

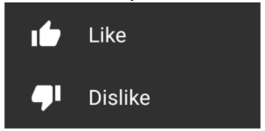
`single` (radio buttons)



`all` (check boxes)



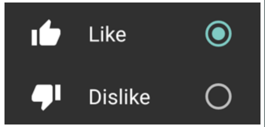
`none` (the default)



How to handle clicks for "single"

- You need to programmatically set **`single`** checkable items to the checked state; however, others in the group will be unset automatically

```
void OnClick(object sender, Toolbar.MenuItemClickEventArgs e)
{
   switch (e.Item.ItemId)
   {
      case Resource.Id.like    : e.Item.SetChecked(true); ... break;
      case Resource.Id.dislike: e.Item.SetChecked(true); ... break;
   }
}
```

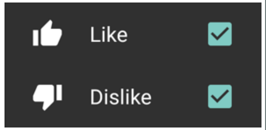


Show item state as checked

How to handle clicks for "all"

- You need to programmatically toggle the checkable state for items in an `all`-checkable group, others in the group are **not** unset automatically

```
void OnClick(object sender, Toolbar.MenuItemClickEventArgs e)
{
   switch (e.Item.ItemId)
   {
      case Resource.Id.like:    e.Item.SetChecked(!e.Item.IsChecked); ... break;
      case Resource.Id.dislike: e.Item.SetChecked(!e.Item.IsChecked); ... break;
   }
}
```



Toggle the checked state of each item when clicked

Individual Exercise

Add a checkable submenu

Summary

1. Define an XML menu file
2. Inflate the XML menu file into a `Toolbar`'s actions menu
3. Create hierarchical menus
4. Create checkable menu items

Use a Toolbar as an Activity's app bar

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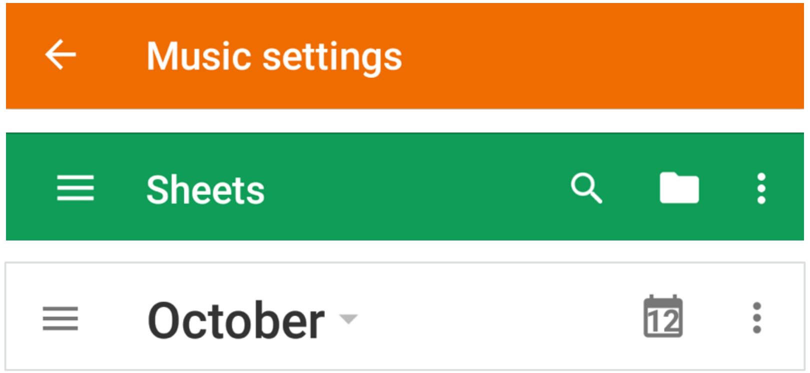
Tasks

1. Set a **`Toolbar`** as your Activity's app bar
2. Inflate the **`Toolbar`** menu items
3. Respond to item click

Motivation

❖ To make your UI comfortable and familiar, you should use the standard Android structure for your Activity's navigation, title, and commands

Android users have seen this menu style in many apps



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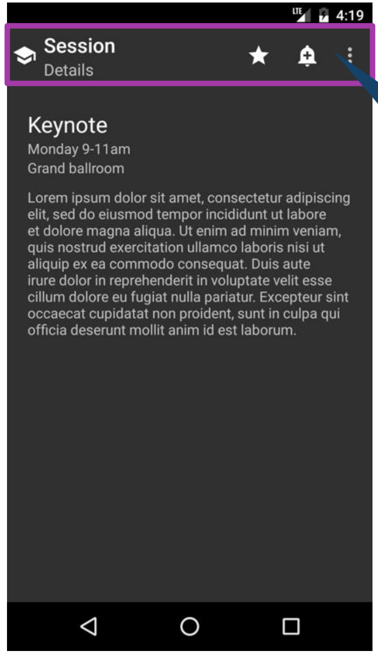
What is an app bar?

- An *app bar* is a dedicated area in your UI that hosts navigation, identity, and action items



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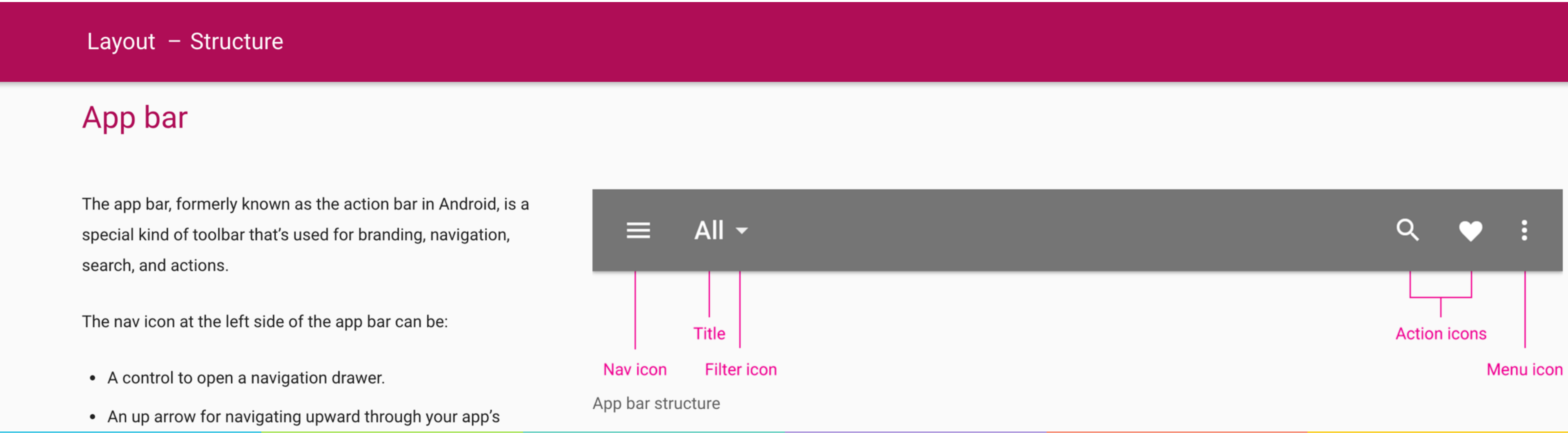
Positioned at its standard location at the top of an Activity

Elements like title, actions etc. are at standard locations inside

App bar structure

- Google has guidance on how to arrange and style the elements in your app bar

Source: https://material.google.com/layout/structure.html#structure-app-bar



Layout – Structure

App bar

The app bar, formerly known as the action bar in Android, is a special kind of toolbar that's used for branding, navigation, search, and actions.

The nav icon at the left side of the app bar can be:

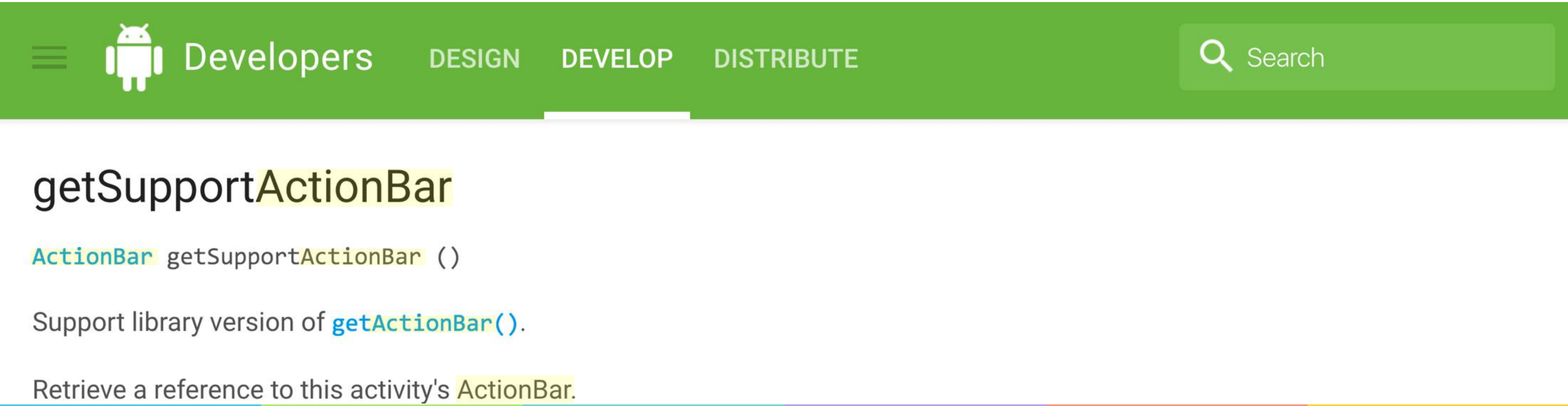
- A control to open a navigation drawer.
- An up arrow for navigating upward through your app's

App bar structure

App bar history

- *App bar* was initially called *action bar* and implemented by a class named **`ActionBar`**

Source: https://developer.android.com/reference/android/support/v7/app/AppCompatActivity.html



getSupportActionBar

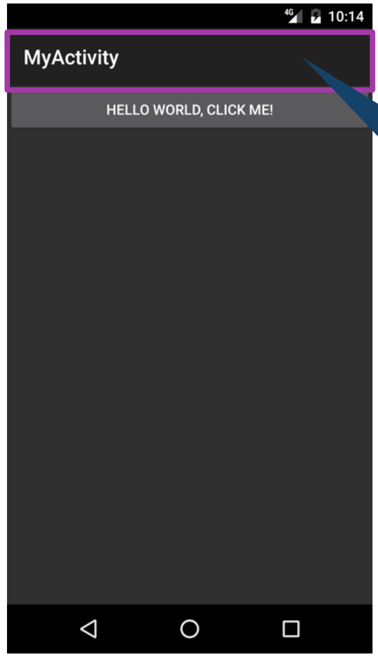
`ActionBar getSupportActionBar ()`

Support library version of `getActionBar()`.

Retrieve a reference to this activity's ActionBar.

Default ActionBar

- By default, most app themes add an **`ActionBar`** to each Activity

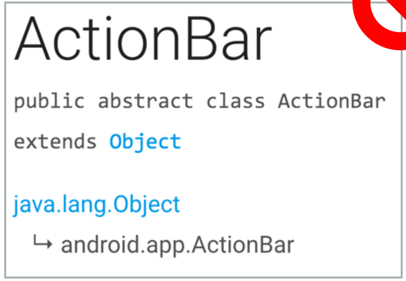


This shows the starter project generated by the Android app template

The template uses a theme that installs an **`ActionBar`** as the Activity's app bar

App bar implementation options

- You can use **`ActionBar`** or one of the **`Toolbar`**s to implement your app bar; Android recommends you use the Support **`Toolbar`**

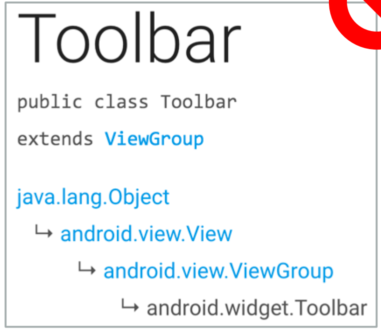


ActionBar

```
public abstract class ActionBar
extends Object
```

java.lang.Object
  ↳ android.app.ActionBar

Features vary based on Android version; difficult to get a uniform experience

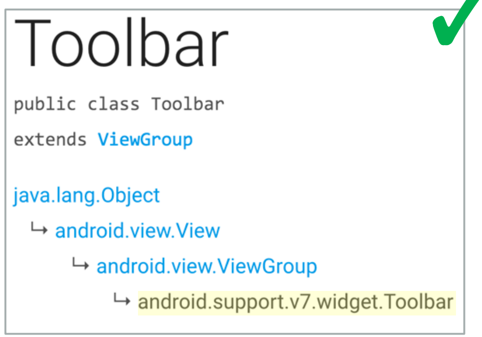


Toolbar

```
public class Toolbar
extends ViewGroup
```

java.lang.Object
  ↳ android.view.View
    ↳ android.view.ViewGroup
      ↳ android.widget.Toolbar

Only available in API level 21 and higher



Toolbar

```
public class Toolbar
extends ViewGroup
```

java.lang.Object
  ↳ android.view.View
    ↳ android.view.ViewGroup
      ↳ android.support.v7.widget.Toolbar

Kept up to date with new features; usable with API level 9 and higher

Activity host

❖ You use an Activity base class to host a Support **`Toolbar`** as your app bar; Android recommends you use the Support **`AppCompatActivity`**

Toolbar members only available in API level 21 and higher

```
public class Activity : ...
{  ...
   void SetSupportActionBar(Toolbar toolbar);
   ActionBar SupportActionBar { get; }
}
```

From the v7 support library; works with API level 9 and higher

```
public class AppCompatActivity : ...
{  ...
   void SetSupportActionBar(Toolbar toolbar);
   ActionBar SupportActionBar { get; }
}
```

Toolbar wrapper

- For compatibility with older APIs that used **`ActionBar`**, the **`AppCompatActivity`** class wraps your **`Toolbar`** in an **`ActionBar`**

```
public class AppCompatActivity : ...
{  ...
   void SetSupportActionBar(Toolbar toolbar);
   ActionBar SupportActionBar { get; }
}
```

The getter returns an **`ActionBar`** wrapper around your **`Toolbar`**

The setter method takes a **`Toolbar`**

Activity integration

- When you use a **`Toolbar`** as your app bar, you use Activity and **`ActionBar`** methods to work with it, not **`Toolbar`** methods

	Inflate	Set navigation icon	Item click
Standalone Toolbar	Toolbar's inflate method	XML attribute	Toolbar event
Toolbar as app bar	Override Activity method	ActionBar methods	Override Activity method

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Implement an app bar [steps]

- Several steps required to install a `Toolbar` as your Activity's app bar

1. Inherit from `AppCompatActivity`
2. Use `AppCompat.NoActionBar` theme
3. Create and position a `Toolbar`
4. Set the `Toolbar` as your app bar
5. Populate your Toolbar
6. Respond to item click

Implement an app bar [step 1]

- Every Activity that uses a Support **`Toolbar`** as its app bar must inherit from **`AppCompatActivity`**

```
public class MainActivity : Android.Support.V7.App.AppCompatActivity
{
    ...
}
```

You will need some members you inherit from this base

1 Inherit from **`AppCompatActivity`**

Implement an app bar [step 2]

- **`AppCompatActivity`** includes an action bar by default with most themes, use one of the **`NoActionBar`** themes to remove it

`AndroidManifest.xml`

```
<application
    ...
    android:theme="@style/Theme.AppCompat.NoActionBar">
</application>
```

Disable default action bar

2 Use **`AppCompat.NoActionBar`** theme

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Implement an app bar [step 3]

- You will typically use XML to create and position your **`Toolbar`**

Position the **`Toolbar`** at the top of your UI

```
<LinearLayout ...>

   <android.support.v7.widget.Toolbar
      android:id="@+id/toolbar"
      android:layout_width="match_parent"
      android:layout_height="wrap_content" />
   ...
</LinearLayout>
```

3 Create and position a **`Toolbar`**

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Implement an app bar [step 4]

- During Activity creation, call **`SetSupportActionBar`** to install your **`Toolbar`** as your Activity's app bar

```
public class MainActivity : Android.Support.V7.App.AppCompatActivity
{  ...
   protected override void OnCreate(Bundle savedInstanceState)
   {  ...
      var toolbar = FindViewById<Android.Support.V7.Widget.Toolbar>(Resource.Id.toolbar);
      base.SetSupportActionBar(toolbar);
   }
}
```

Set **`Toolbar`** as your app bar

4 Set the **`Toolbar`** as your app bar

Implement an app bar [step 5]

- Override **OnCreateOptionsMenu** to populate your **Toolbar**'s actions

```
public class MainActivity : Android.Support.V7.App.AppCompatActivity
{  ...
   public override bool OnCreateOptionsMenu(Android.Views.IMenu menu)
   {
      base.MenuInflater.Inflate(Resource.Menu.actions, menu);
      return true;
   }
}
```

Use inherited inflator

Populate actions using a standard XML menu file

5 Populate your Toolbar

Implement an app bar [step 6]

❖ Override **`OnOptionsItemSelected`** to respond to app bar item click

```
public class MainActivity : Android.Support.V7.App.AppCompatActivity
{  ...
   public override bool OnOptionsItemSelected(Android.Views.IMenuItem item)
   {
      switch (item.ItemId)
      {
         ...
      }
   }
}
```

Identifies which item the user selected

Individual Exercise

Use a Toolbar as an Activity's app bar

Summary

1. Set a **`Toolbar`** as your Activity's app bar
2. Inflate the **`Toolbar`** menu items
3. Respond to item click

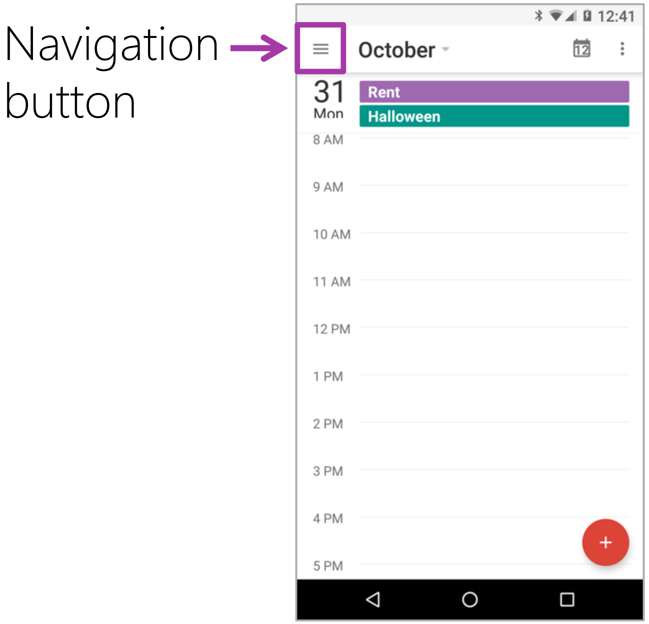
Set a navigation icon on an app bar

Tasks

1. Enable the app bar navigation button
2. Set the navigation icon
3. Respond when the navigation button is clicked

Motivation

- Some navigation patterns use a button in the top-left corner of the Activity's UI



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ActionBar support for app bar navigation

- The **ActionBar** class supplies the methods you use to set up navigation in your app bar

Enable the navigation button

```
public class ActionBar : ...
{  ...
   void SetDisplayHomeAsUpEnabled(bool showHomeAsUp);
   void SetHomeAsUpIndicator(int resId);
}
```

Select the icon you want to display on the button

The methods were originally for Up navigation and the API names remain even though they are now used for several navigation styles

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Add navigation [steps]

- Several steps required to add navigation to your app bar

1. Enable navigation
2. Set the icon
3. Respond to item click

Add navigation [step 1]

- Use **`SetDisplayHomeAsUpEnabled`** to turn on the navigation button within your app bar

```
public class MainActivity : Android.Support.V7.App.AppCompatActivity
{  ...
   protected override void OnCreate(Bundle savedInstanceState)
   {  ...
      SupportActionBar.SetDisplayHomeAsUpEnabled(true);
      ...
   }
}
```

Show the navigation button

1 Enable navigation

Add navigation [step 2]

❖ Use **`SetHomeAsUpIndicator`** to specify a navigation icon

```
public class MainActivity : Android.Support.V7.App.AppCompatActivity
{  ...
   protected override void OnCreate(Bundle savedInstanceState)
   {  ...
      SupportActionBar.SetHomeAsUpIndicator(Resource.Drawable.ic_menu_white_24dp);
      ...
   }
}
```

Choose your navigation icon

2 Set the icon

Add navigation [step 3]

- Navigation button clicks are reported via **`OnOptionsItemSelected`**

```
public class MainActivity : Android.Support.V7.App.AppCompatActivity
{  ...
   public override bool OnOptionsItemSelected(Android.Views.IMenuItem item)
   {
      if (item.ItemId == Android.Resource.Id.Home)
      {
      }
   }
}
```

The navigation button is identified by the special Android Id "**Home**"

3 Respond to item click

Individual Exercise

Set a navigation icon on an app bar

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Summary

1. Enable the app bar navigation button
2. Set the navigation icon
3. Respond when the navigation button is clicked

Thank You!

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