Dealing with Images in Android

Dr. Christelle Scharff
Pace University

Principle

- Android provides support for multiple screen sizes and densities
- Each image needs to be created in several sizes to correspond to different densities and provide a consistent experience for users
- The densities are:

- *ldpi* (low) ~120dpi
- *mdpi* (medium) ~160dpi
- *hdpi* (high) ~240dpi
- *xhdpi* (extra-high) ~320dpi
- *xxhdpi* (extra-extra-high) ~480dpi
- *xxxhdpi* (extra-extra-extra-high) ~640dpi

- `xhdpi`: 2.0
- `hdpi`: 1.5
- `mdpi`: 1.0 (baseline)
- `ldpi`: 0.75

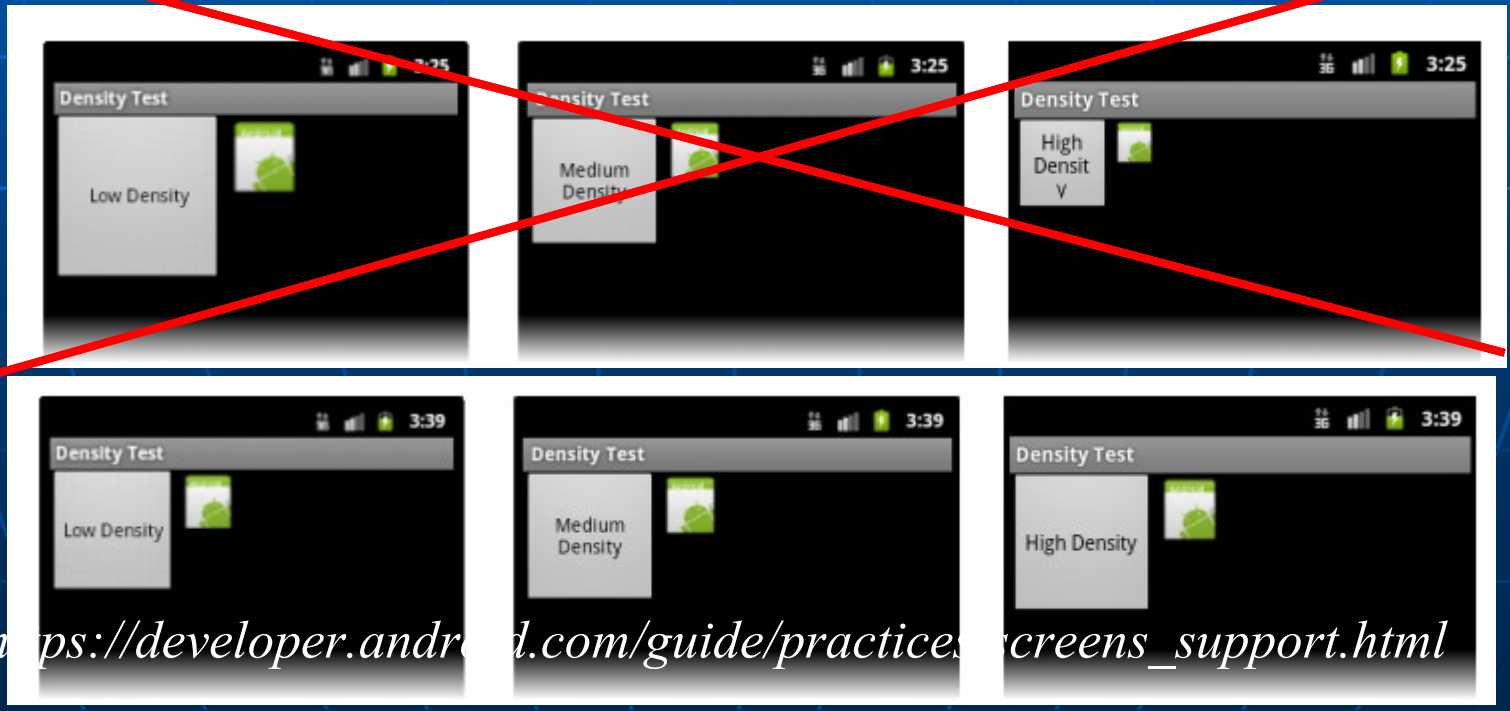
- xhdpi: 640x960 px
- hdpi: 480x800 px
- mdpi: 320x480 px
- ldpi: 240x320 px

1 image -> 6 images

https://developer.android.com/guide/practices/screens_support.html

Density Independence

- With this mechanism Android permits to achieve density independence
- "Android preserves the physical size (from the user's point of view) of user interface elements when displayed on screens with different densities"

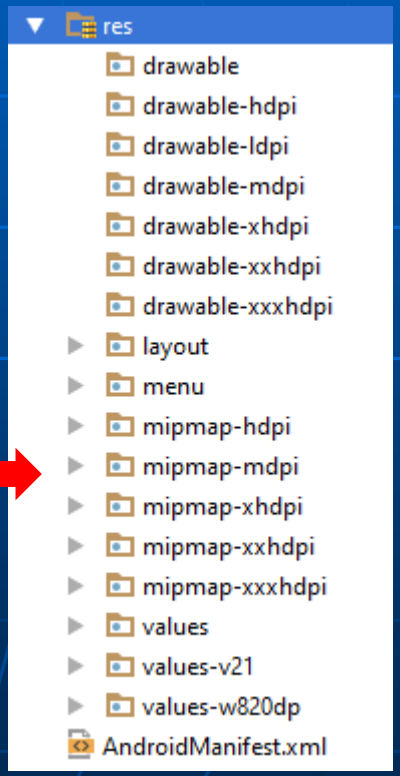


https://developer.android.com/guide/practices/screens_support.html

Icons

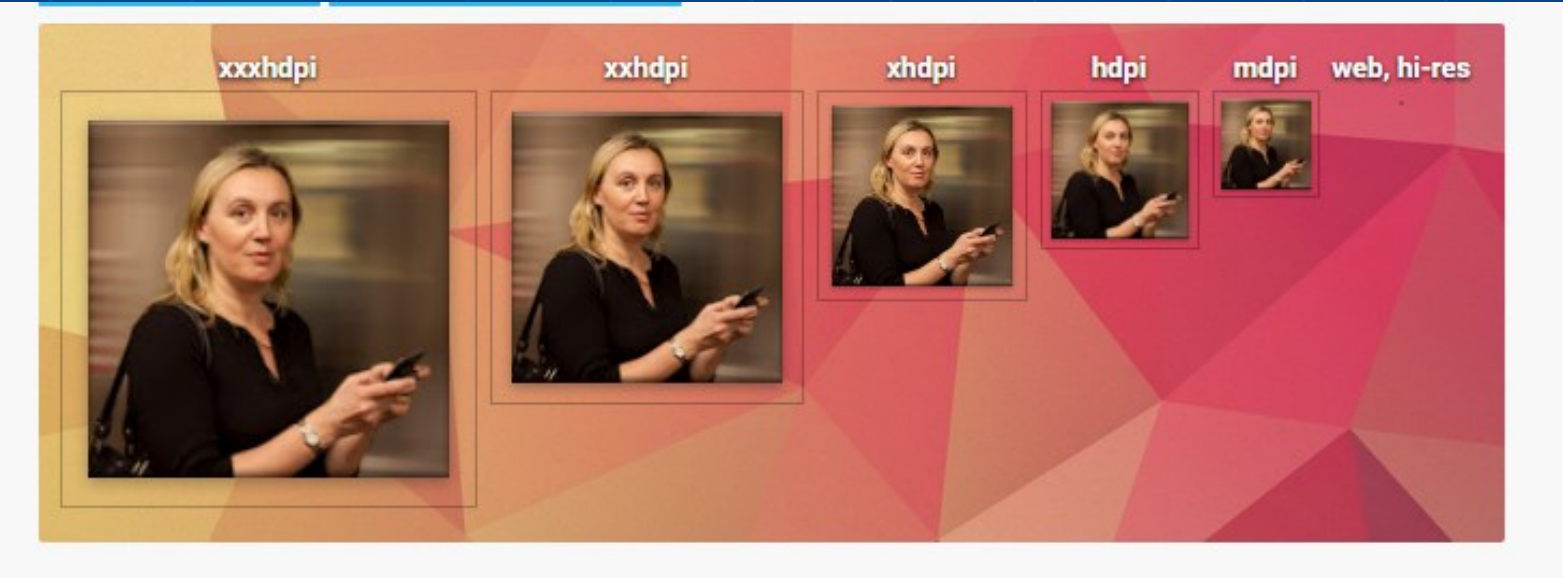
- Icons are available in the *drawable* directory
- Icons are available in different sizes too

1. Right click on res, new **Image Asset**
2. On **Asset type** choose **Action Bar and Tab Icons**
3. Choose the **image path**
4. Give your image a name in Resource name
5. Next->Finish



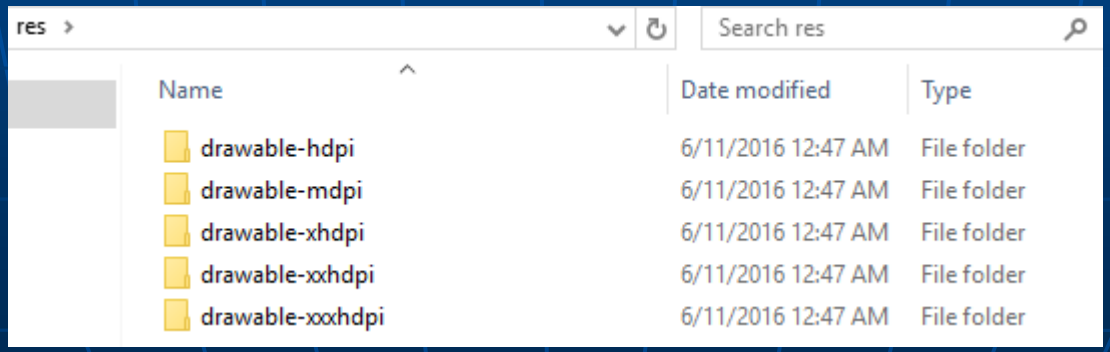
Android Asset Studio

- If you need to generate image, use this external tool and move the images of the zip file in the correct directory in Android Studio (you need to be in Project mode to use drag and drop files)
- Android Asset Studio permits to generate assets of different sizes:
  - *http://romannurik.github.io/AndroidAssetStudio by Roman Nurik, Google*



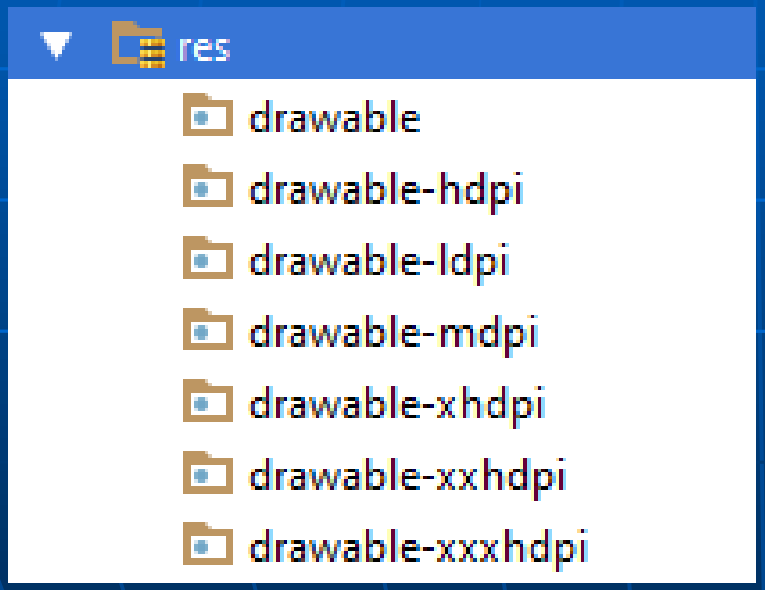
Android Asset Studio

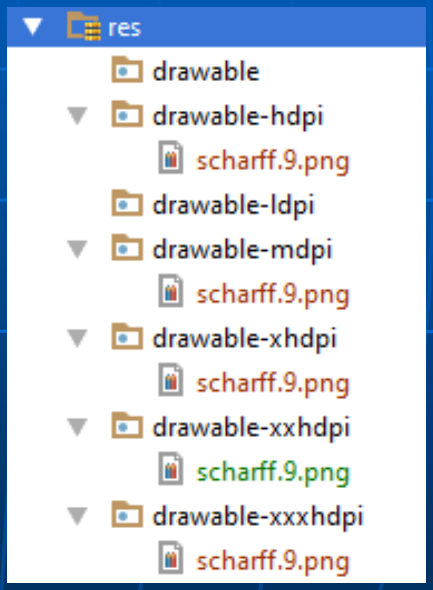
- Android Asset Studio generates a zip file that can be unzipped and the content should be copied in the *drawable* or *mipmap* directories
- "It creates 9 Patch images that are stretchable and repeatable and reduced to their smallest size. The image won't stretch and loose proportions in different screen sizes."



Drawable Directories

- Create the directories or move the files to the corresponding directories

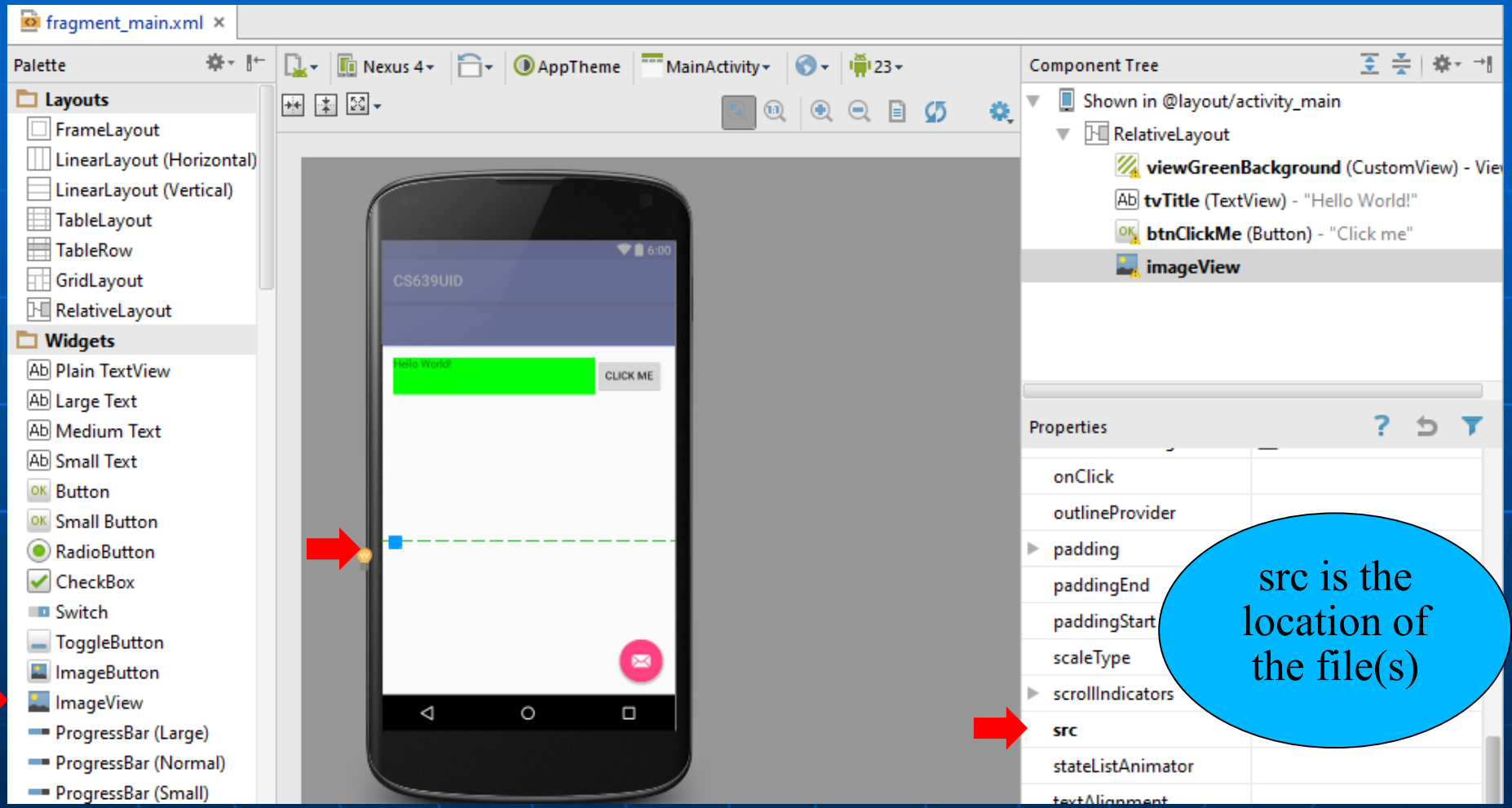




Draw 9-patch Tool

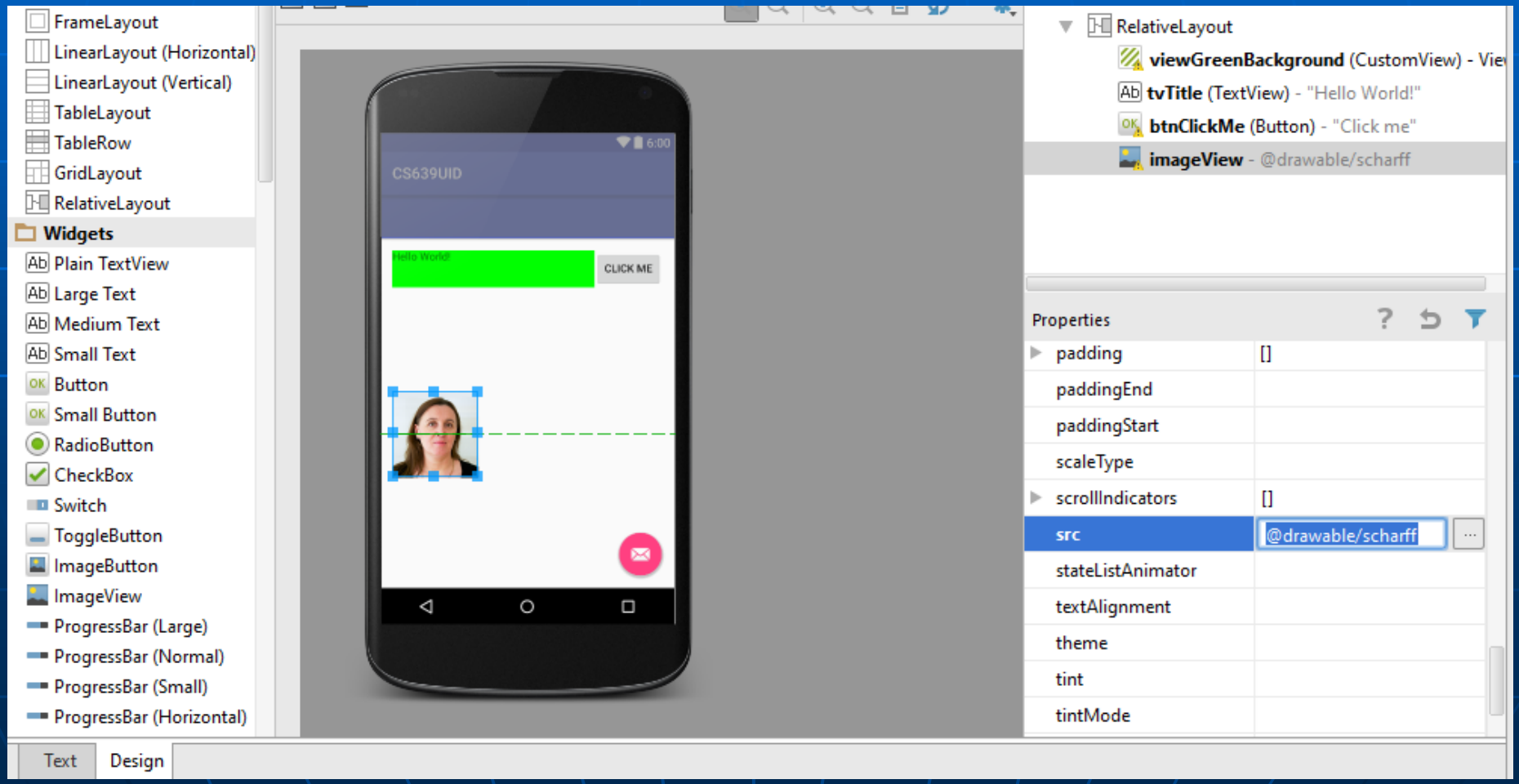
- Another way to resize images is to use the tool provided by Google and available directly in Android Studio
- https://developer.android.com/studio/write/draw9patch.html
- The Draw 9-patch tool is available in the tools directory of the SDK (e.g., AppData\Local\Android\sdk\tools on Windows)
- "The Draw 9-patch tool is a WYSIWYG editor that allows you to create bitmap images that automatically resize to accommodate the contents of the view and the size of the screen. Selected parts of the image are scaled horizontally or vertically based indicators drawn within the image."

XML and Images



XML and Images

- Click on src to add the source of the image



Drawable Resources

- Bitmap file
- Nine-Patch File
- State List
  - An XML file that references different bitmap graphics for different states (for example, to use a different image when a button is pressed)
- Shape Drawable
  - An XML file that defines a geometric shape, including colors and gradients.
- More resources https://developer.android.com/guide/topics/resources/drawable-resource

Lab

- Generate Android image assets and add them to Android Studio