APP Design (Day 4)

- Review
- Drawing on Canvas
- Taking Photos
- Saving Results
- Start on your Project!

MIT APP INVENTOR

Review

Problem Solving Approach

1) Problem Selection
2) Understand the problem
3) Define the problem
4) Ideate (...think of a solution)
5) Prototype
6) Test!

Review

- TinyWebDB
  - Stores values on the internet
  - Identify values using a “tag”
  - Anyone can retrieve values if they know the tag
  - Can be used to share data across phones

Store values on the internet

Retrieve values using the tag

Problem Selection

- Need some way to mark out which seeds are planted where

Understand the Problem

- Gardeners plant many different types of seeds in a single plot
- Plants have different nutrients and water requirement
- Easy to forget where each seed is planted

Define the Problem

- Need a way...
  - to take a photo of the plot
  - mark out the location of each seed type

Ideate

- Create an app that...
  - Takes photos
  - Allows drawing on the photo
  - Support different colors
  - Support saving to file

Prototype

- When prototyping, don’t try to do everything at once
- Add features in gradually

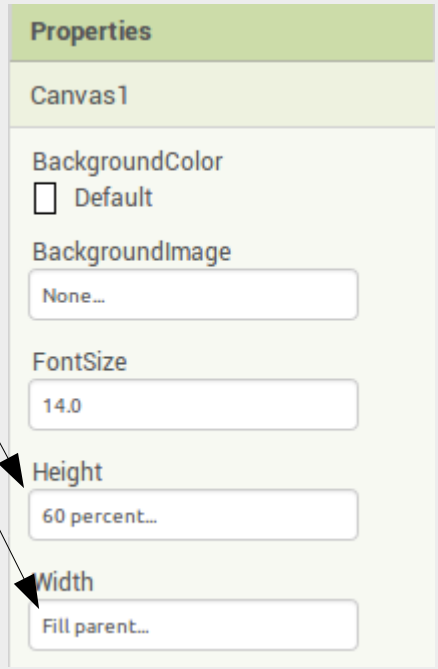
Today’s Project

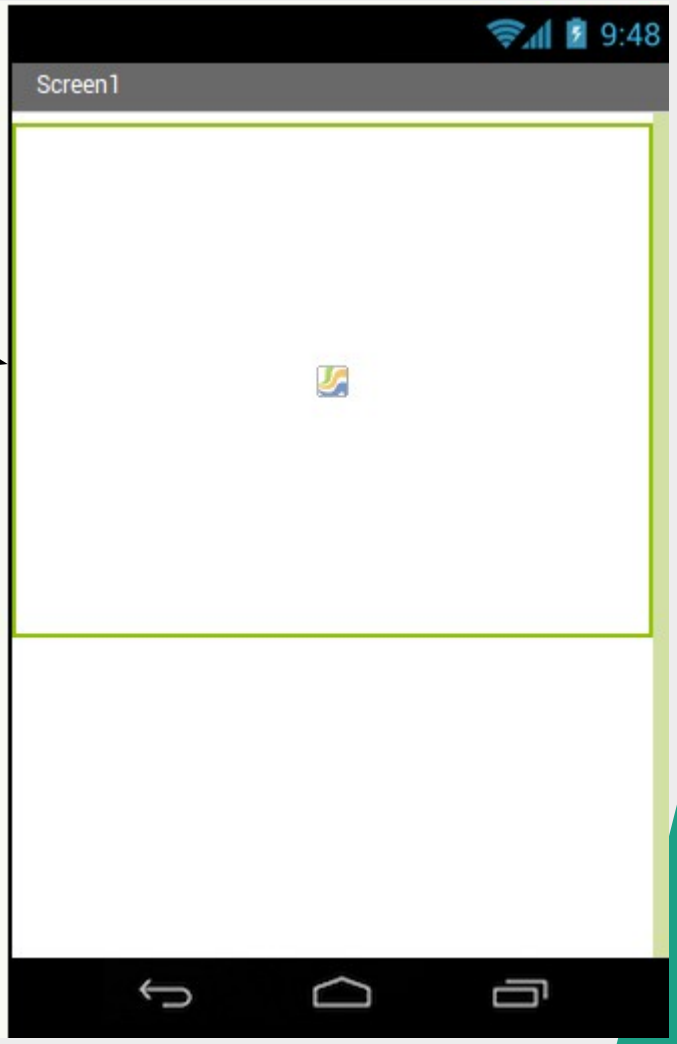
- Photo + Drawing App
  - Take photo, draw on photo, save to file
- Steps
  1) Draw on canvas
  2) Add drawing options
  3) Take photo and add to canvas
  4) Save to file

1) Draw to Canvas

Add in...

- Canvas
- Set width and height to a reasonable value (up to you)

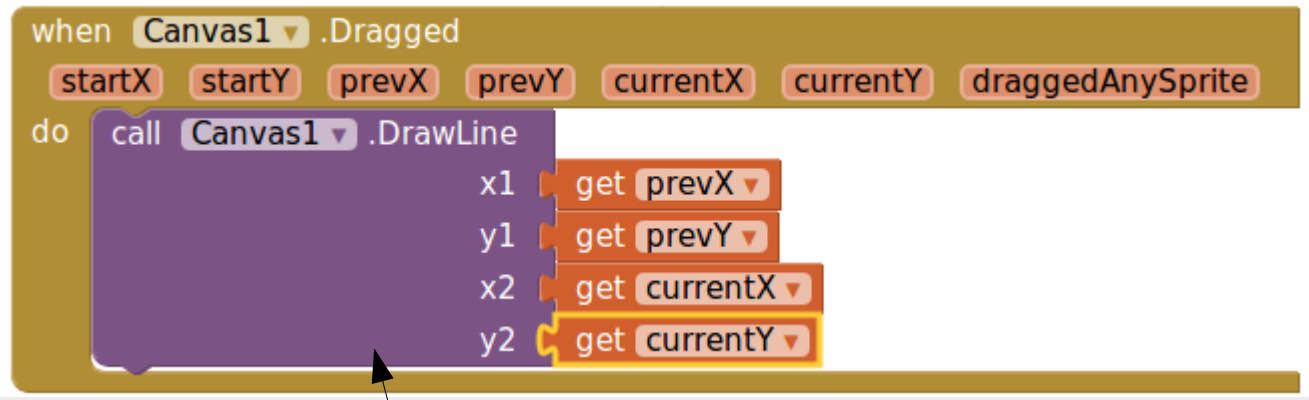




1) Draw to Canvas

When the “dragged” event occurs...

Dragged
User touch and drag finger across canvas



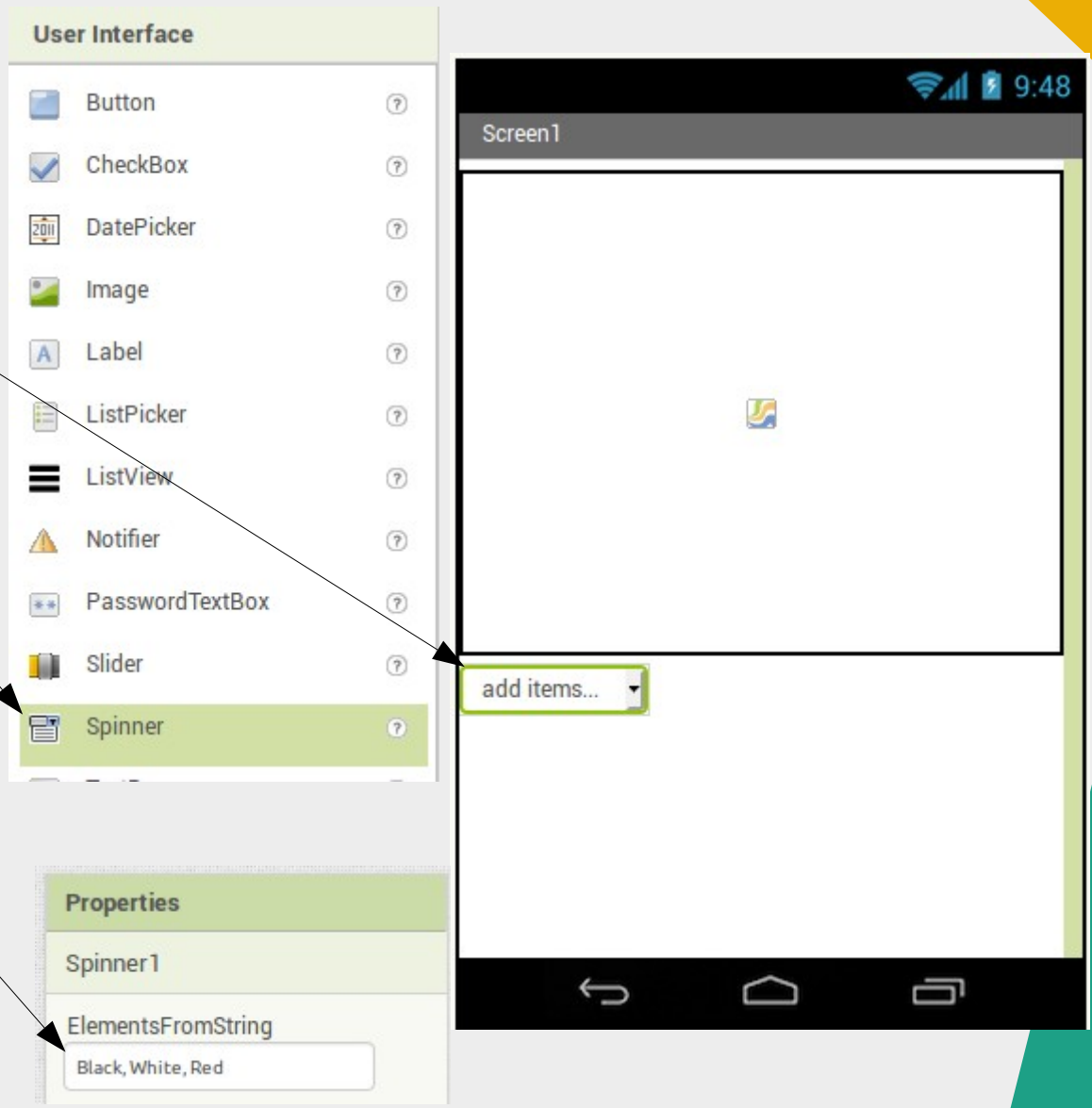
...draw a line from the previous x / y coordinates, to the current x / y coordinates

Test it out on your phone!

2) Add Drawing Options

Color options

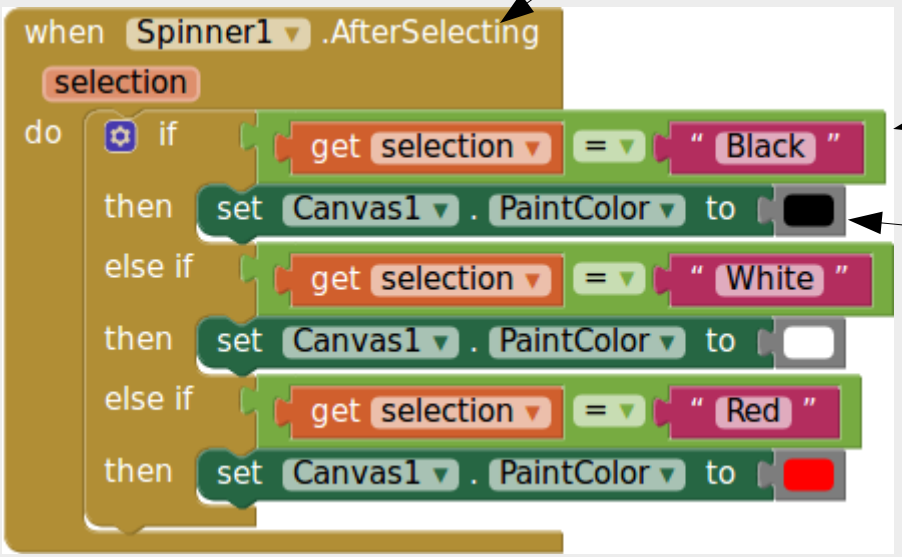
- Add Spinner



- Set some options (Feel free to add in more)

2) Add Drawing Options

The “AfterSelecting” event is triggered after you have made a selection on the spinner



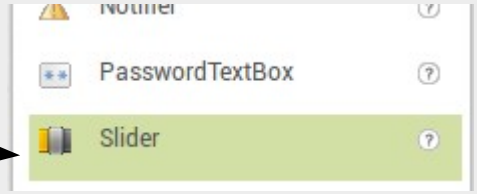
Check which is the selected color...

...and set the canvas paint color accordingly

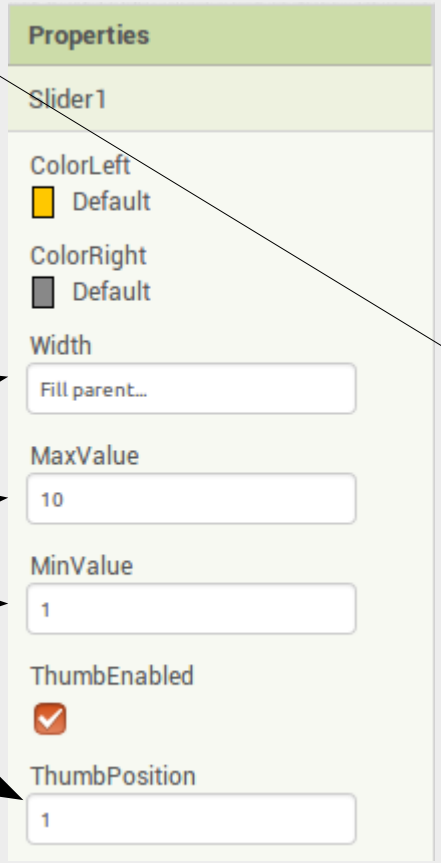
2) Add Drawing Options

Line width option

- Add Slider

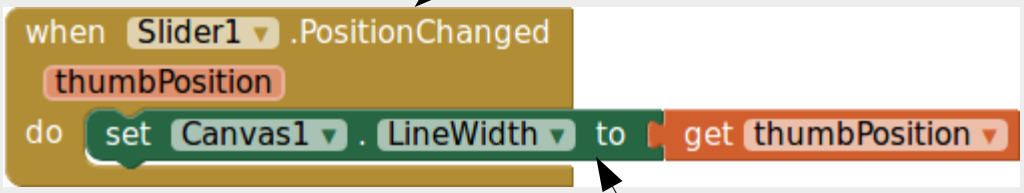


- Set...
  - Width
  - MaxValue
  - MinValue
  - Optional: Starting ThumbPosition



2) Add Drawing Options

The “PositionChange” event is triggered when you change the slider

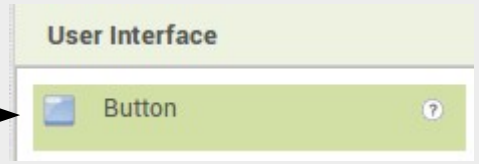


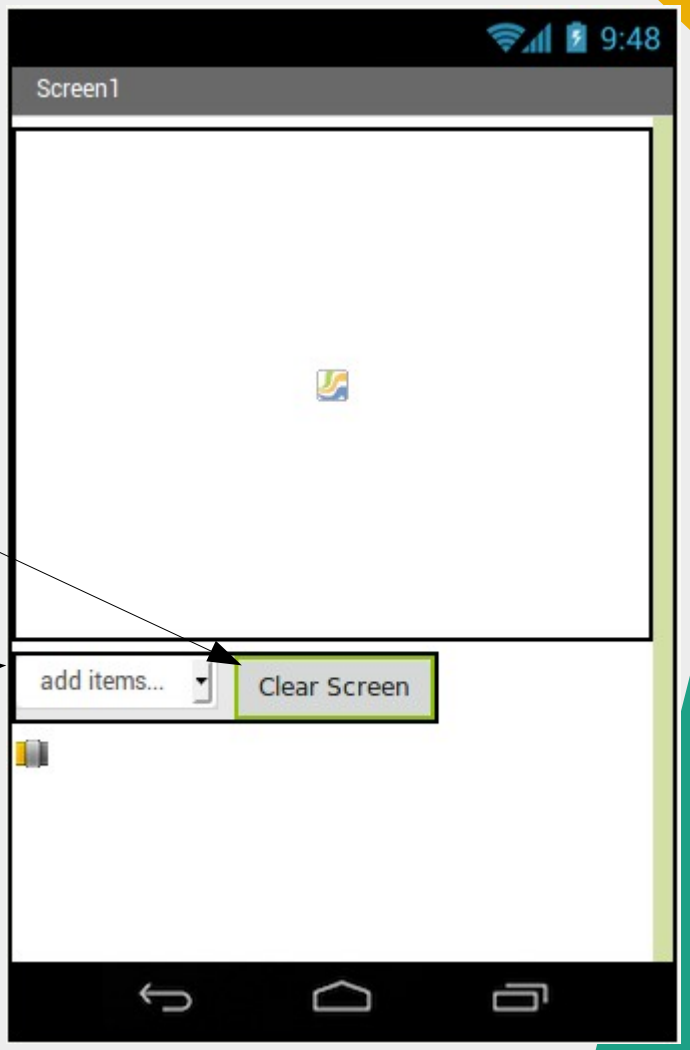
Set the canvas line width based on the slider position

2) Add Drawing Options

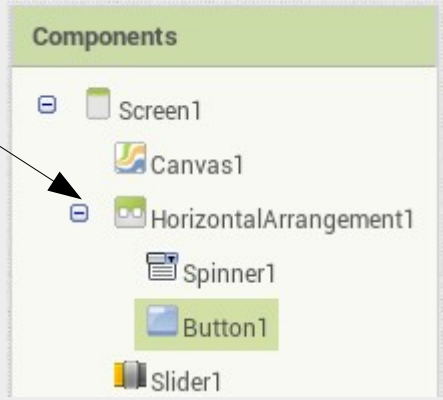
Clear Screen Button

- Add Button
  - Change the text to "Clear Screen"



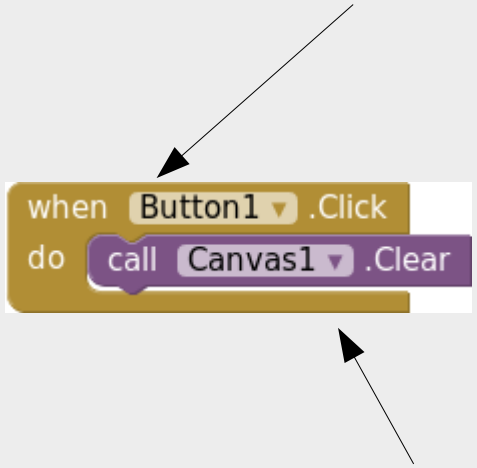


- Optional:
  - I'm using a HorizontalArrangement to make the layout neater
  - The Spinner and Button are both placed inside the HorizontalArrangement



2) Add Drawing Options

When the button is clicked...



...clear the canvas

That’s it for adding drawing options!

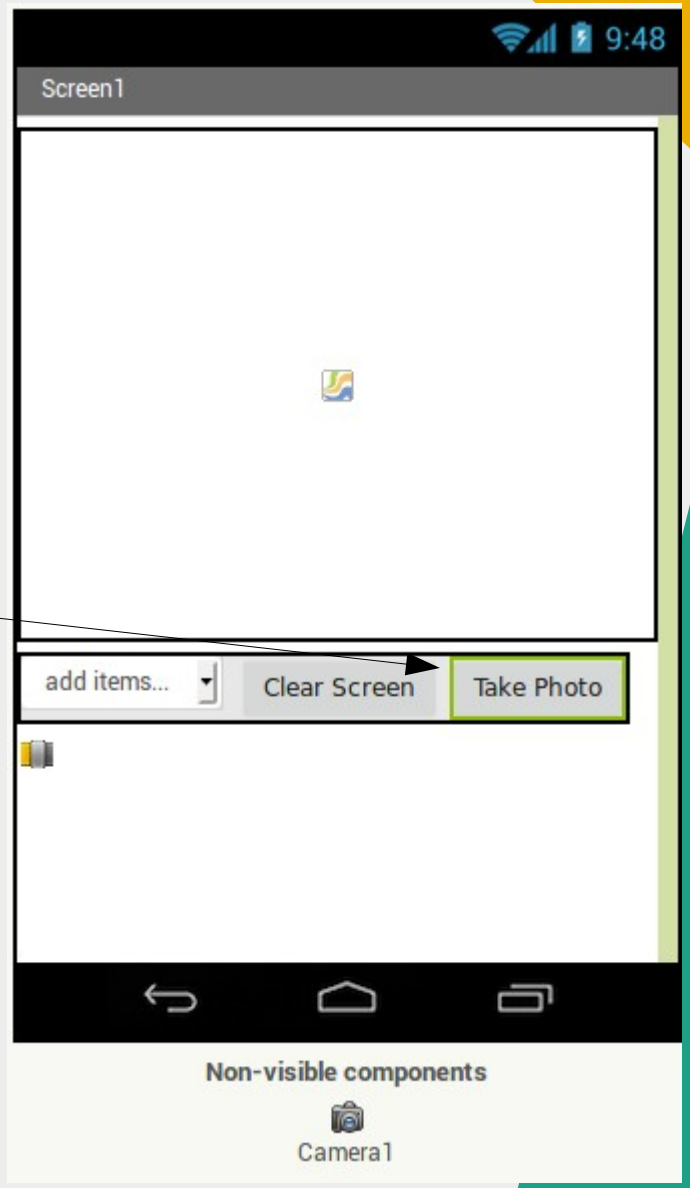
Test it out on your phone before moving on to the next step.

3) Take Photo and Add to Canvas

Add...

- Camera Component
  - This is a non-visible component and will not appear on screen

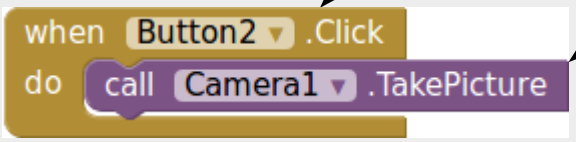
- Button
  - Set the text to “Take Photo”



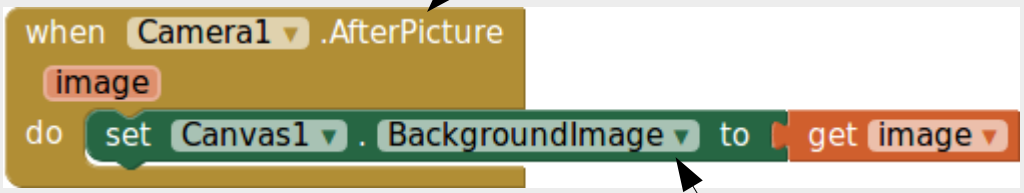
3) Take Photo and Add to Canvas

When the button is clicked...

...take a photo



When the photo taking is completed...



...set the canvas background image to the photo

3) Take Photo and Add to Canvas

Caveats...

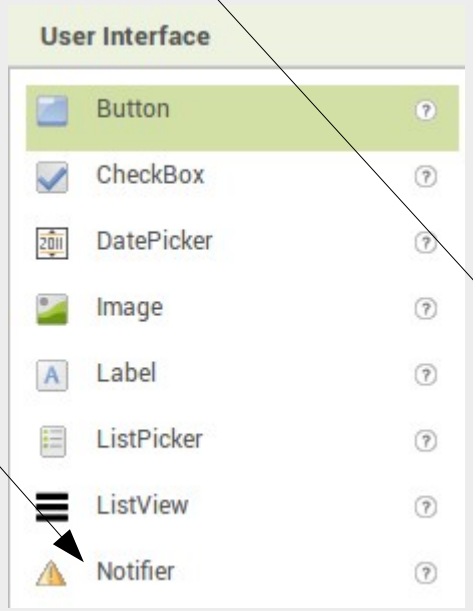
- Images may be rotated
  - Most phones take photos only in landscape mode, but adds a tag to the photo indicating the correct orientation.
  - App Inventor does not read this tag, and will get the image orientation wrong
  - Workaround this by always taking photo in landscape mode
- Image may be stretched
  - App Inventor will stretch the image to fit the canvas
  - Workaround this by changing your canvas size to suit the image

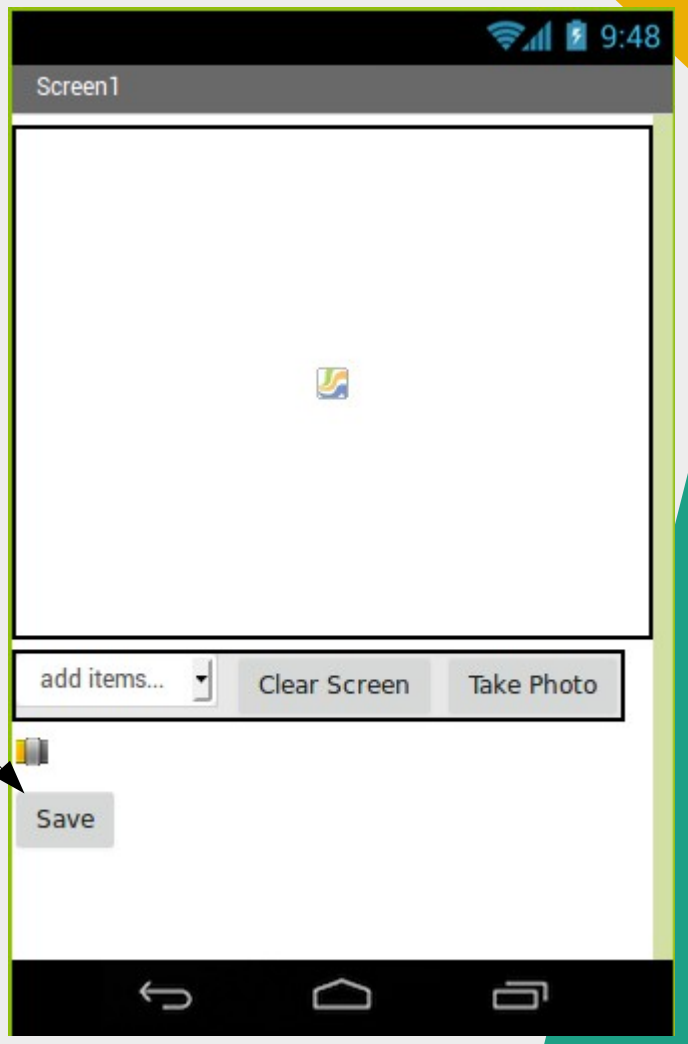
4) Save to File

Add...

- Button
  - Set the text to “Save”

- Optional:
  - Add a notifier component
  - You can use this to display the saved filename
  - Don’t need this if you don’t care about the filename





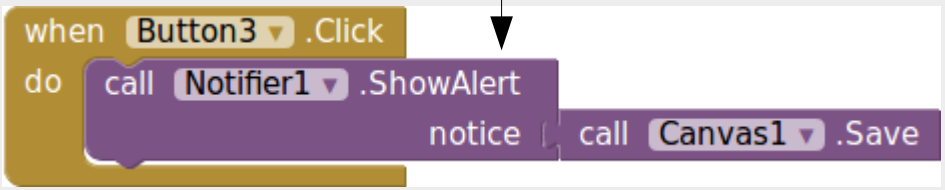
4) Save to File

When the button is clicked...

...save the canvas image to a file

Save Canvas
This function will return the filename used. If you don't need to know the filename, you can use "evaluate but ignore result" to run it.

Alternative:
Use the notifier component to display the filename on screen



Install App to Phone

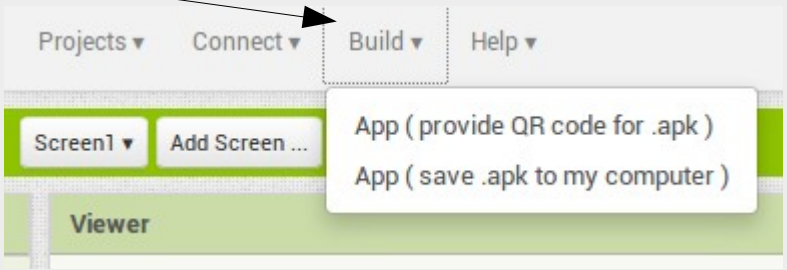
- So far, we have been using AI Companion
  - Good for development (changes updates immediately)...
  - ...but need to connect each time before using the app

Install App to Phone

- Installing on the phone...
  - Don’t require AI Companion
  - Can launch directly from phone without connecting to computer
  - Can send apk to other users.

Choose either QR code or save to computer.

Save to computer if you want to send your app to others



Polishing Up

- The app works, but is really rough and simple. Can you add in...
  - A way to draw text on the image
  - Display saved images in the app
  - Rotate photos to the correct orientation
- Bonus Challenge
  - Small gaps appears when drawing thick lines. Figure out why they happen and how to eliminate the gaps