



The Chartered Institute for IT
Enabling the information society

BCSWomen Android programming (with AppInventor) Family fun day



Overview of the day

- **Intros**
- Hello Android!
- Installing AppInventor
- Overview of AppInventor
- Making your first app
- What's special about mobile?
- Changing an app
- Getting your app on your phone
- Getting into groups
- Ideas for apps
- Planning your own app
- Q&A
- Coding your app
- Showing it all off
- Next steps

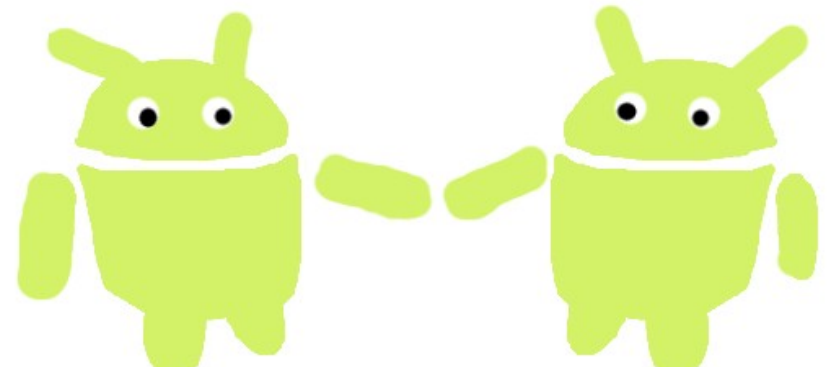
The boring bit

- Introductions
- Fire exits
- Toilets
- Blah blah blah



About the day

- This is a hands-on intro to programming phones
- It'll be a mix of talk, play, programming and thinking
- If you have a question, go ahead and ask it, any time.
 - There are lots of us, and we're here to help
- I'll try not to talk for more than 10 minutes at a time
 - If anything isn't clear let me know



A bit about what you've got here

Hands up if

... you have brought a windows laptop

... you have brought a mac

... you have brought a linux laptop

... you have brought something else

... you've got an android device

We'll be working in small groups (so if you haven't got anything, don't panic, we can share)



A bit about what you've done before

Hands up if

... You like computer games

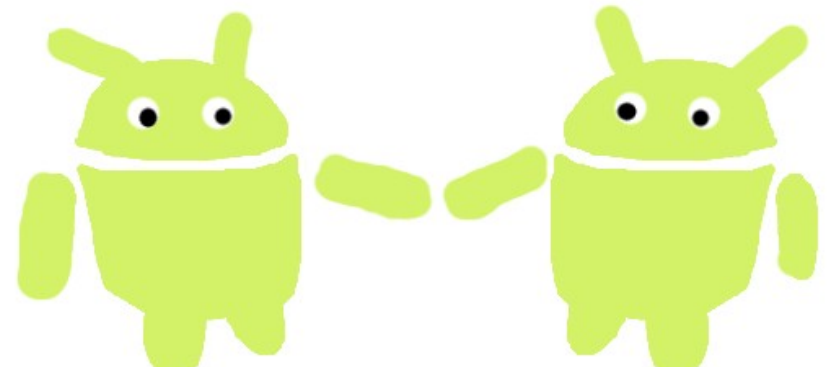
... You like using computers for drawing and art

... You have used Word

... You have written a webpage

... You have programmed using Scratch

... You have programmed using Java or something like that

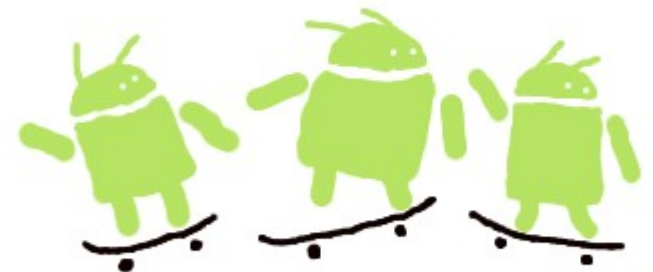


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Hello Android!

- Mobile operating system
 - Phones
 - Tablets
 - Things like that
- Open
 - Anyone can write programs for it
- You don't need an android to write android programs



Do you have an android?

- You do if you have a phone made by Google, HTC, Sony, Dell, Intel, Motorola, Qualcomm, Texas Instruments, Samsung Electronics, LG Electronics, T-Mobile, Sprint Nextel, Nvidia, or Wind River Systems...
- This is the Open Handset Alliance



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Installing AppInventor 0

- We should all be connected to the wifi but let's not all try and download things at the same time
- In the appinventor_workshop folder you've just copied, there's a folder called installation_files
 - This has inside it folders for windows, mac and linux



Installing AppInventor 1

- AppInventor needs Java, but you might well already have this installed...
- Go to this page
- <http://www.java.com/en/download/testjava.jsp>
- If it says Java 1.6 or Java 6 ... great!
 - Otherwise you will find Java in the install folder, install it now



Installing AppInventor 2

- Go to the folder for your computer (windows, mac, or linux)
 - There are instructions for installing AppInventor in that folder
- There's also an installer
 - .exe for windows
 - .dmg for mac
 - .tar.gz & .deb for linux
- Use these installers as they are up to date and will save downloading tons of stuff



Installing AppInventor 3

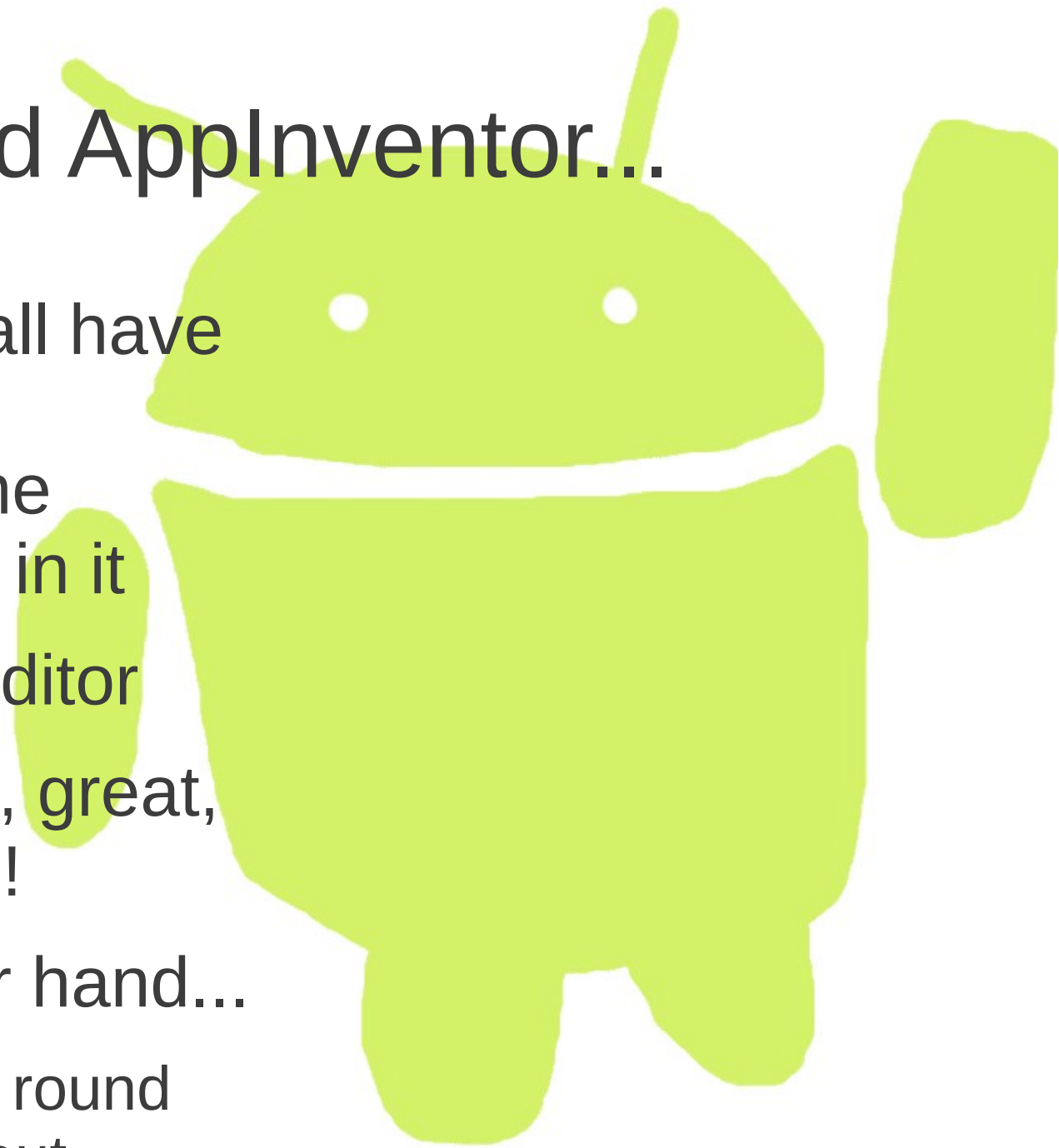
- Test your AppInventor installation by visiting <http://appinventor.mit.edu> using a web browser
- Towards the right of the screen you will see a button marked “Open Blocks Editor”
- Click on this now...

Welcome to the App Inventor beta release. Be sure to check the list of [known issues](#) and [release notes](#). [Try the App Inventor Community \(Beta\)](#) handee20001@gmail.com | [Sign out](#)



Installed AppInventor...

- You should now all have a window in your browser with some AppInventor stuff in it
- And the Blocks Editor
- If you've got both, great, we're ready to go!
- If not, put up your hand...
 - ...and we'll come round and try to sort it out.



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AppInventor

- Provides an easy and quick way to build apps
 - Can build apps for yourself
 - Can share apps with friends
- Lets you use
 - Screen, Phone, Camera, SMS, GPS, Accelerometer...
- You can (now) publish your apps to Google Play
 - But I haven't tried this yet!





AppInventor has 2 parts

Main window

- Has a menu of things you can choose to include in your app
- Lets you lay out things on the screen
- Lets you set the colour or position

Blocks editor

- Lets you program what goes on behind the things on the screen
- Has options for connecting to phones and tablets

Main Window

The screenshot shows the MIT App Inventor interface. At the top, there is a navigation bar with 'MIT App Inventor BETA' on the left and 'My Projects', 'Design', 'Learn', and '(Debugging)' in the center. On the right, there is a welcome message and a 'Sign out' link. Below the navigation bar is a toolbar with buttons for 'Save', 'Save As', 'Checkpoint', 'Add Screen', and 'Remove Screen'. On the far right of the toolbar are 'Open the Blocks Editor' and 'Package for Phone'. The main workspace is divided into four panels: 'Palette', 'Viewer', 'Components', and 'Properties'. The 'Palette' panel on the left contains various UI components like Button, Canvas, CheckBox, Clock, Image, Label, ListPicker, PasswordTextBox, TextBox, and TinyDB. The 'Viewer' panel in the center shows a preview of 'Screen1' with a status bar at the top displaying '5:09 PM'. The 'Components' panel on the right shows a list of components currently on the screen, including 'Screen1'. The 'Properties' panel on the far right shows settings for the selected component, such as 'AlignHorizontal' (Left), 'AlignVertical' (Top), 'BackgroundColor', 'BackgroundImage', 'CloseScreenAnimation', 'Icon', 'OpenScreenAnimation', 'ScreenOrientation', 'Scrollable', 'Title', 'VersionCode', and 'VersionName' (1.0). Handwritten purple annotations include: a large arrow pointing from the 'Basic' section of the Palette to the 'Viewer' panel with the text 'On this side are things you can put in your app'; text in the 'Viewer' panel stating 'This is the Screen'; text in the 'Components' panel stating 'This is where you will see the things you've put on the screen'; and text in the 'Properties' panel stating 'This will show options for the stuff here'.

Blocks Editor

meow - Screen1

Quit-In My Blocks Advanced

My Definitions

- Button1
- Screen1
- Sound1

when Button1.Click

when Button1.GotFocus

when Button1.LongClick

when Button1.LostFocus

Button1.BackgroundColor

set Button1.BackgroundColor to

Button1.Enabled

set Button1.Enabled to

Button1.Height

set Button1.Height to

Button1.Image

set Button1.Image to

Button1.Text

set Button1.Text to

Button1.TextColor

set Button1.TextColor to

when Button1.Click

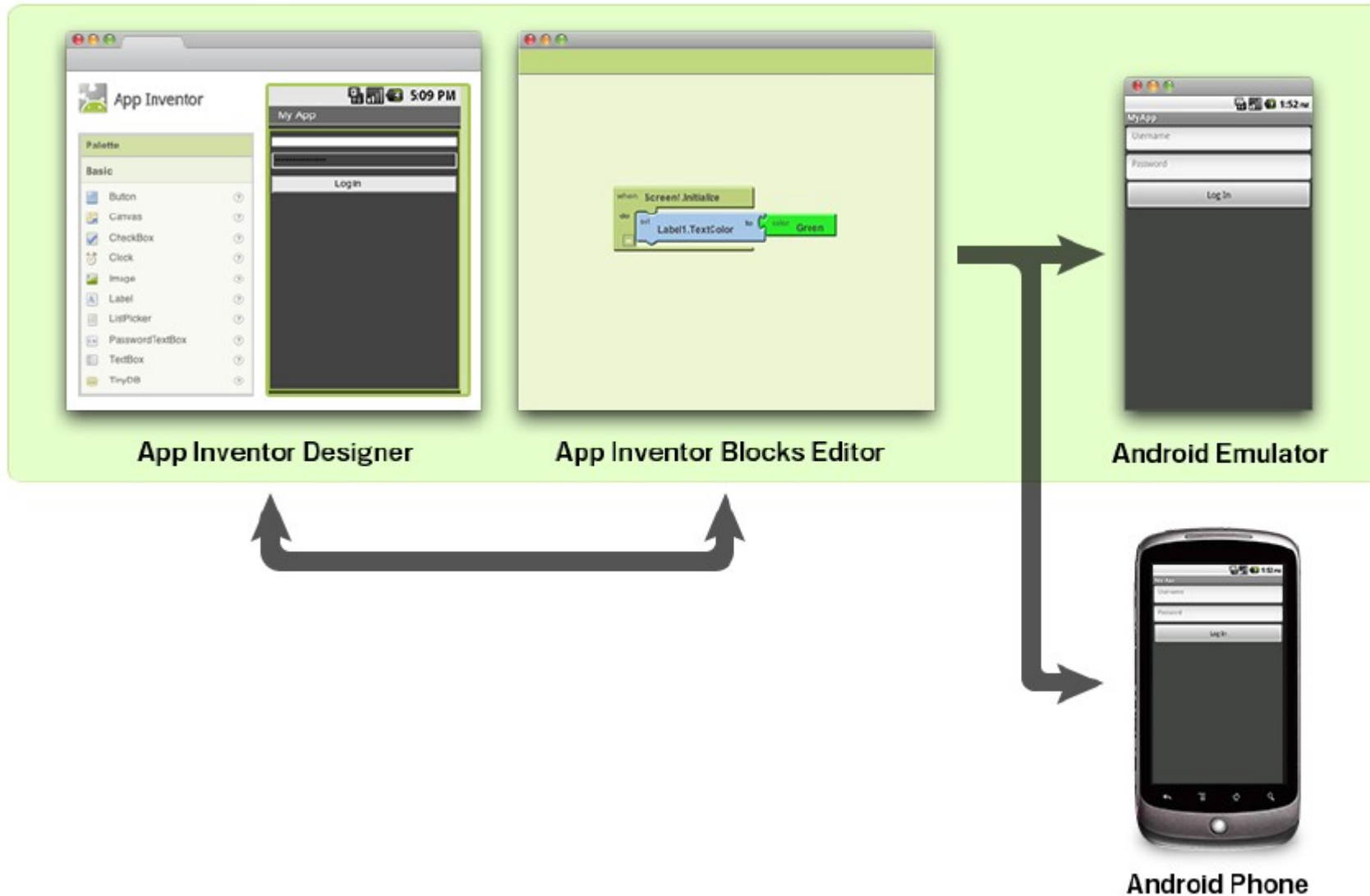
do

Click on a button

things you can do with a button will appear to the left

You can then drag things over to the main part of the blocks editor, and put them together like a jigsaw

How it fits together

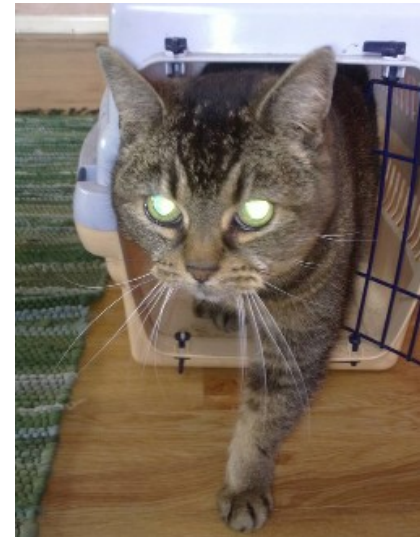


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Making your first app

- We're all going to make the same first app



- There are detailed instructions in the handout
- And all the photos & sounds you need are in the folder 1st_activity

Running your first app

- On the Blocks Editor, click New Emulator
- This will start up an emulator
 - Like an android phone, but running on your laptop rather than on its own
- You can then connect to the emulator, and your app should appear on it



Overview of the day

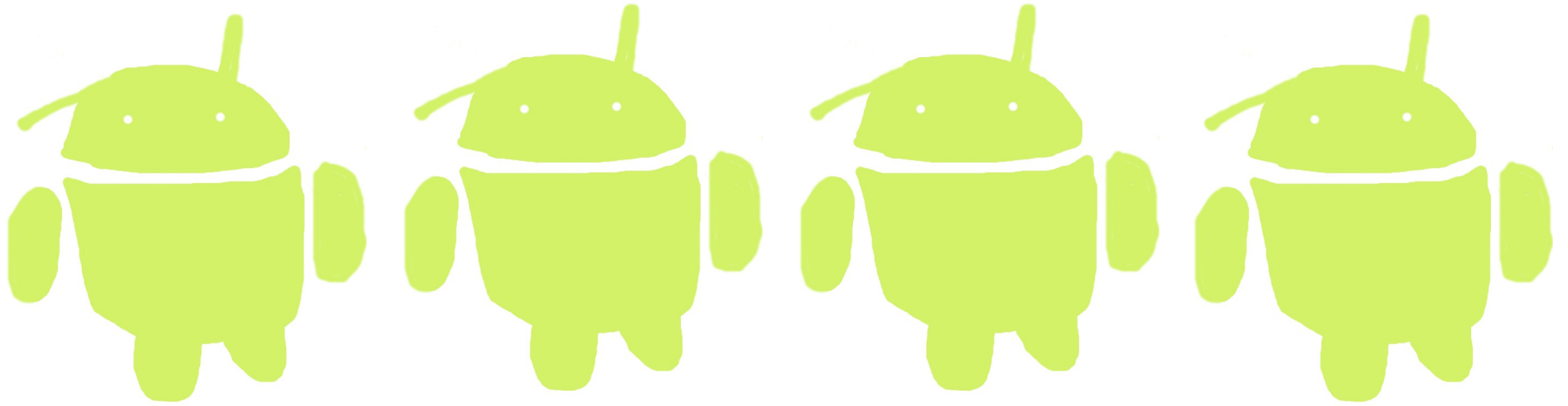
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What's special about mobile?

- Emulator is OK if you want to see buttons clicking and sounds going *Meow!*
- But the fun thing about mobile is that it's **mobile**

- A mobile phone is a computer with all sorts of other stuff attached



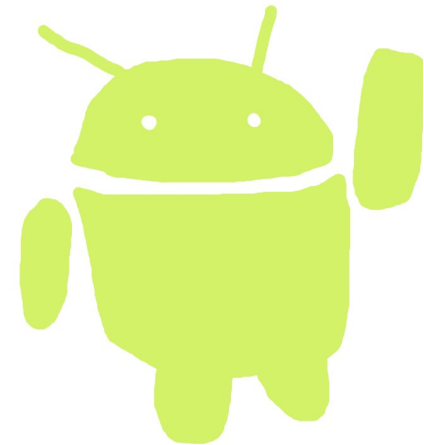


What does a phone have that a normal computer doesn't?



Some special things about mobile ...

- Small screens and big fingers
 - Also, no mouse pointer...
- Moves around a lot
- (Probably) contains a camera
- Has other sensors like GPS, compass,
- Has wireless
- (Probably) can vibrate...
- ALSO IT IS A PHONE



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Changing an app

- Let's make our “Meow” app different, and let's make it more mobile
- Change the photo so it's BenDragon ---->>>>>>>>>
 - You'll find him in 2nd_activity, along with a woof sound
- Change the app so it's more mobile: vibrating, and shaking



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- Next steps

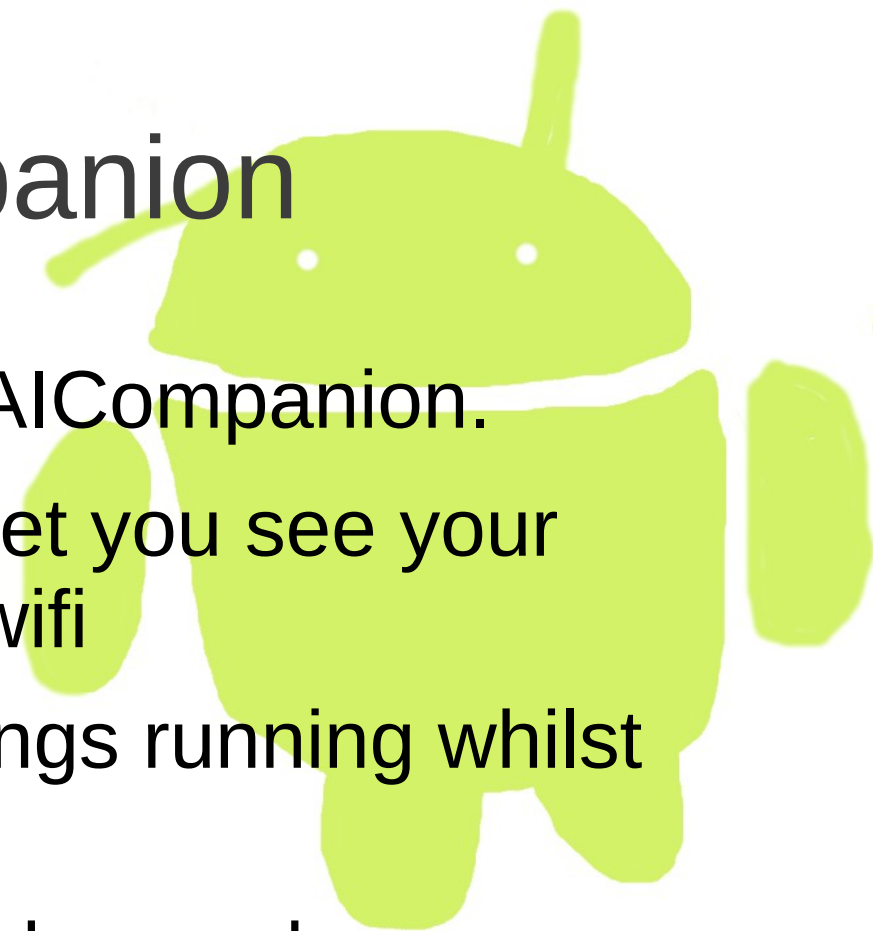
Getting the app on your phone

- There are two main ways to get the app on your phone
 - MIT AICompanion
 - Wifi – Package for phone
- You can also use USB connect; this can be quicker and is useful if you're doing lots of AppInventor work, but it's more complex so we won't cover it here.



MIT AICompanion

- In Google Play look for MIT AICompanion.
 - it's a small app which will let you see your apps on the phone using wifi
 - This is great for seeing things running whilst you are building them
 - But it won't still be on the phone when you walk away
- You do this by starting the app on your phone (or tablet), then selecting “Connect to device” and “Wifi” from the top right of the blocks editor.





Package for phone

- Go to the main AppInventor Window (not the blocks editor)
- Select “Package for phone”.
 - The easiest way to handle this is to do “Show Barcode”.
 - After waiting a bit, a barcode will appear on the screen.
- If you've not got a barcode reader installed on your phone or tablet, install one now...
 - Google Play search for QR code

Which technique to use?

- If you use the MIT AICompanion app...
 - You see your app update on the phone as you change it in AppInventor
 - BUT the app isn't installed on your phone, so when you stop AppInventor, it stops on the phone too.
- If you package for phone and the barcode, it takes longer
 - But the app is actually installed on the phone.



Recap!

- So!
- It's been a busy morning. You've...
 - Installed AppInventor
 - Made an app by following instructions
 - Edited that app
 - Seen it working on an emulator
 - Seen it working on a phone (probably)



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The rest of the day...

- We're going to get into little groups
- We'd like each group to have 1 computer, and 3-6 people
- (Some of you have been working in groups already)
- In these groups, you're going to come up with an idea for an app
- And then we're going to help you try and build it



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AppInventor ideas

- There are lots of different things we can do with AppInventor
- I'm going to talk you through some ideas –
 - If you want to take any of these further that's fine
 - Really I just want to show you what can be done
- You can find details of some of these in the handout if you want to look again...



Drawing dots

This involves...

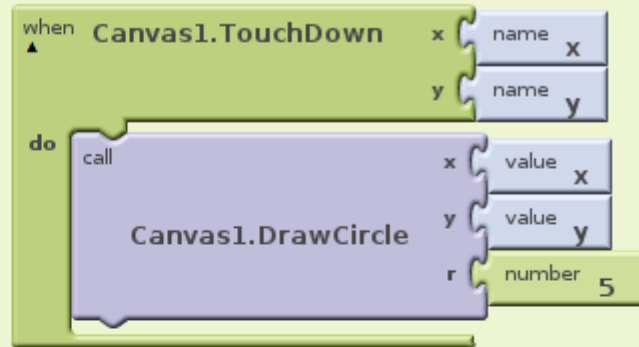
Renaming blocks

Putting things on a canvas

Layout of screen elements

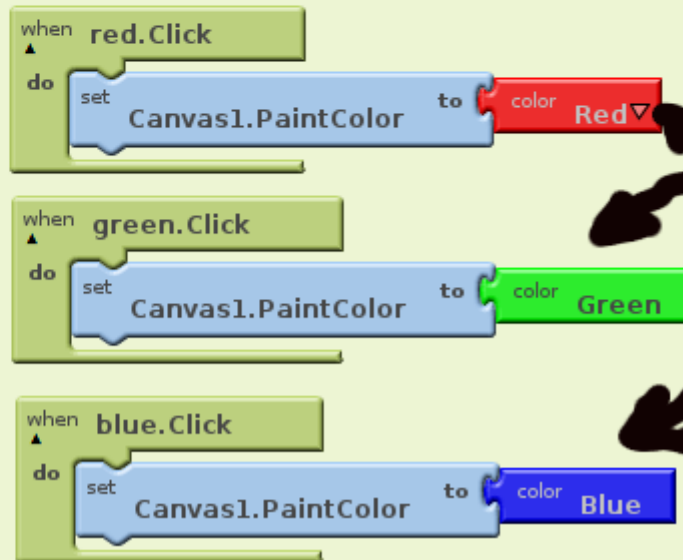
Drawing dots

Canvases have quite a few drawing options

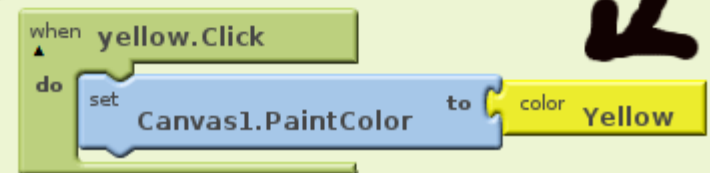


Here we use circle. To draw a circle you need centre and radius (x,y,r).

There are four buttons in this app, and I have renamed them red, green, blue and yellow so it doesn't get confusing



To change the colour of a drawing, you have to change the PaintColor that will appear on the canvas. You could think of the PaintColor as like picking up a new pen



Moustache man (or woman!)

This involves...

Using the camera

Dragging things around

Using an ImageSprite

Moustache man (or woman!)

There's a button, which takes a picture when it's clicked



The TakePicture command is on the camera block

After the pic has been taken make the image appear in ImageSprite1



We use an ImageSprite here as it makes it easier to have things move around.

There's another ImageSprite, which in this app contains a white transparent moustache



When you drag things you get lots of options, but we are only using currentX and currentY

Counting

This involves...

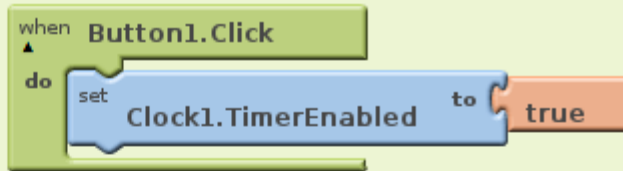
Using a clock

Having a variable

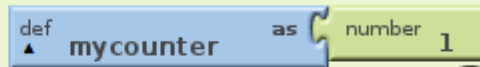
Doing sums

Counting

We start the timer when a button is clicked



We want the count to start at one, so we need to define a place to keep the count. This is called a variable



When the clock ticks ...



We make Label1 show the counter

And then we update the counter by adding one - this means next time we show it it will have gone up.

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Planning is important

- What will your app do?
- What will your app need?
- Sounds
- Pictures
- Anything else?



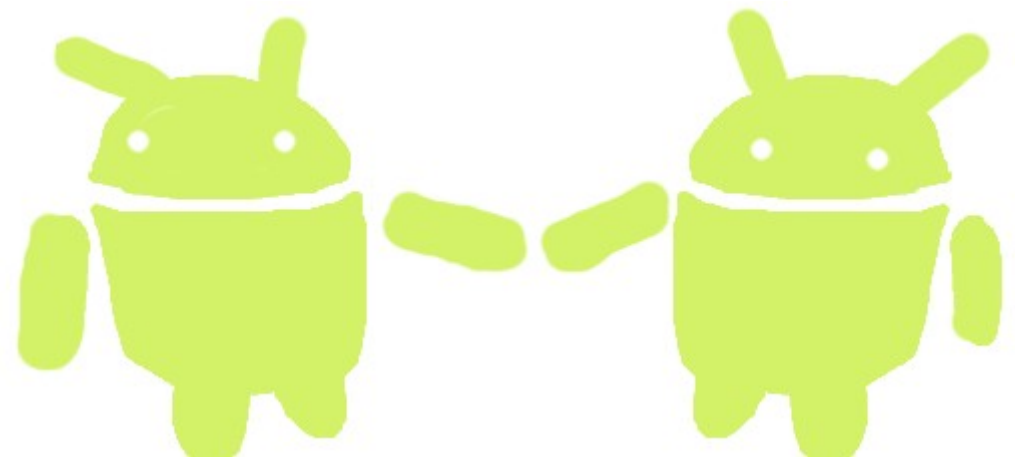
Animal noises, and bangs!

- There are some noises, photographs and sounds in the “resources” folder
 - Animal noises...
 - Drum sounds...
- But you have your own imagination and the entire internet to call on
 - so do not feel you have to make a farmyard app or a drum machine



Planning your app

- Draw what you want your app to look like
- Work out what you want to happen
 - Will it do something when you shake it?
 - Will it do something when you press a button?
- Work out what it needs
 - Colours? Pictures? Sounds?



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Questions and answers

- Now you've all hopefully come up with an idea for an app, I want to know what it is...
 - Some ideas might be too hard to do in an afternoon
 - We don't mind you starting it and carrying on at home, but we don't want anyone to get stuck...
- SO What are you doing to do?



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Time to make your app!

- We're here to help, if you need a hand, just stick up a hand.



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Showing it all off


- Let's all see what you've managed to build
- We'd like to take some short videos of apps
 - It doesn't matter if they're not finished
 - We might run this day again and it'll be good for future attendees to see what you got up to
 - But if you don't want to be videoed, just say



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Sharing code



MIT App Inventor BETA

My Projects Design Learn (Debugging)

Welcome to the App Inventor beta release. Be sure to check the list of [known issues](#) and [release notes](#). [Try the App Inventor Community Gallery \(Beta\)](#)

handee20001@gmail.com | [Sign out](#)

New Delete Download All Projects More Actions ▾

Projects

	Name ▲	Date Created
<input type="checkbox"/>	cameraplay	
<input type="checkbox"/>	counting	
<input checked="" type="checkbox"/>	draw	2013 Jan 19 19:35:52
<input type="checkbox"/>	funplay	2012 May 31 16:44:08
<input type="checkbox"/>	meow	2013 Jan 18 16:27:11
<input type="checkbox"/>	meow2	2013 Jan 19 18:13:18
<input type="checkbox"/>	virtual_bendragon	2013 Jan 22 14:41:18

Download Source
Upload Source
Download Keystore
Upload Keystore
Delete Keystore



Other things to try

- Scratch

<http://scratch.mit.edu/>

Great for playing around, uses blocks like AppInventor

- Greenfoot

<http://www.greenfoot.org/>

Good for older learners (14+?), teaches real Java

- Both of these have a really active community



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AND WE'RE DONE!

Please fill in a questionnaire – it'll help us make this workshop better for next time!



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a) give us credit (BCSWomen & Hannah Dee) and

b) release any versions you develop yourself, using a similar license (so if you make something cool with this, you've got to give it away too). More information here:

<http://creativecommons.org/licenses/by-sa/3.0/>

The current version will be kept at

<http://www.hannahdee.eu/appinventor> along with all other materials. If you've any suggestions for improvements, let me know on hmd@hannahdee.eu and I'll incorporate them in future versions