

Coding for Kids: Notes from the Front Line

Oxford Geek Night, May 2012

A bit about me



- ✦ Software developer
- ✦ Currently specialise in iOS app development
- ✦ Started coding in the 1980s, a golden age for programming



```
10 PRINT "Robocop is cool!!"  
20 GOTO 10
```

My predictions, aged 15

In the future, we will have...

- ✦ Computers you can hold in your hand
- ✦ TVs thin enough to hang on the wall
- ✦ Lessons in computer programming at school

Two out of three ain't bad



Which **one** of the following is the most important feature to be considered when designing a new user interface?

- A) Availability of a help facility
- B) The yearly pay of the people who will be using the system
- C) The age of the people who will be using the system
- D) The age of the people designing the system

(1 mark)

Which **one** of the following is a well known social networking website?

A) E-book

B) Face-to-face

C) Facebook

D) Netbook

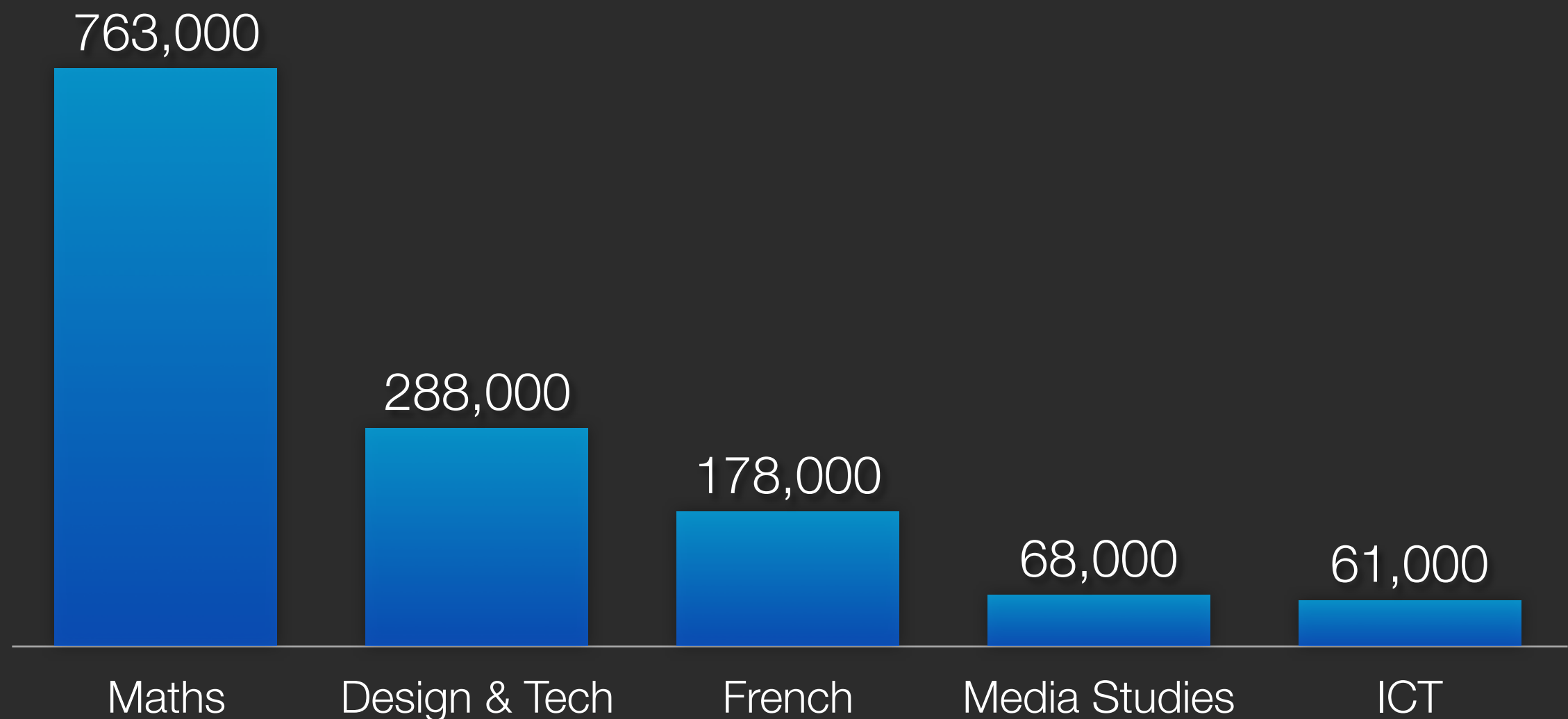
(1 mark)

The rock band Purple Spiders has a large fan club run by the band's manager. A database is used to store details of the members of the fan club.

Discuss the implications of the responsibilities placed on the band's manager by the Data Protection Act.

(5 marks)

Number of students sitting GCSEs in 2010



Source: Guardian Datablog (<http://gu.com/p/2j7pj>)

"I was flabbergasted to learn that today computer science isn't even taught as standard in UK schools. Your IT curriculum focuses on teaching how to use software, but gives no insight into how it's made."

Eric Schmidt, Executive chairman, Google

August 2011

Meanwhile...

- ✧ Young Rewired State
- ✧ Code Dojo
- ✧ Raspberry Pi
- ✧ Scratch
- ✧ Codecademy
- ✧ etc...

Dear Headmaster,

I'm a geek...

The audience

- ✦ 10-15 students
- ✦ Ages 14 - 18
- ✦ All had chosen to attend

Using Lua

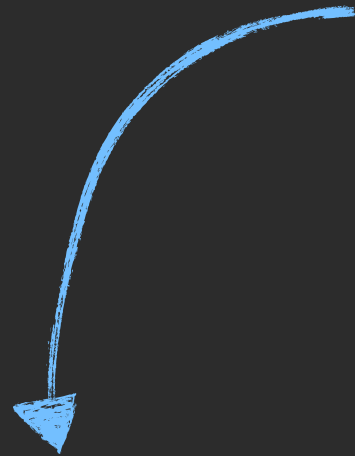
- ✦ Simple scripting language
- ✦ Easy to learn
- ✦ Windows, Mac OS X, Linux
- ✦ Popular language for game development



Introducing variables

variable

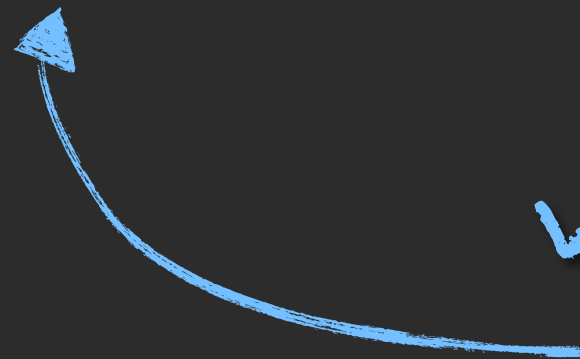
name



```
message = "Hello, World!"  
print(message)
```

variable

value



Example: **if...elseif...else**

```
mark = 65
```

```
if mark > 80 then
```

```
    grade = "A"
```

```
elseif mark > 60 then
```

```
    grade = "B"
```

```
else
```

```
    grade = "C"
```

```
end
```

```
print("Your grade: " .. grade)
```



Demo

Try Lua before [downloading](#) it. Enter your Lua program or choose one of the demo programs below.

[hello](#) · [globals](#) · [bisect](#) · [sieve](#) · [account](#)

```
mark = 65
if mark > 80 then
  grade = "A"
elseif mark > 60 then
  grade = "B"
else
  grade = "C"
end
```

Run

Clear

Restore

Restart

Output

```
Your grade: B
```



Your program ran successfully.

Grand plan

1. Master Lua
2. Move on to Corona
3. Write next Angry Birds
4. Become billionaires
5. Home in time for tea

They hated it :-)

`$syntax != "fun";`

What to do next?

- ✦ Switch to something **graphical** and **fun**
- ✦ Learn by doing, not by being taught
- ✦ Reward early efforts with a usable, working program

From Lua to Scratch

```
for i = 1, 10 do
  pos = pos + 10
  if pos > 200 then
    pos = 0
  end
end
```



SCRATCH



File Edit Share Help



Motion

Control

Looks

Sensing

Sound

Operators

Pen

Variables



Sprite1



x: 0

y: 0

direction: 90

Scripts

Costumes

Sounds

when  clickedwhen  space key pressed

when Sprite1 clicked

wait 1 secs

forever

repeat 10

broadcast broadcast  and waitwhen I receive forever if if if 

else

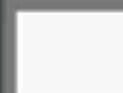


x: -608 y: 191

New sprite:



Sprite1



Stage

Session structure

- ✦ First 10 minutes: "Here's one I prepared earlier"
- ✦ Demoed a core technique
- ✦ Rest of the lesson (c. 80 minutes): they went back to their computers and used that technique in a Scratch program
- ✦ I was on hand to help when they needed it

Examples of core techniques

- ✦ Using variables to track game state (score, lives, etc)
- ✦ Making a sprite jump and fall under gravity
- ✦ Building simple UI widgets, e.g. an on/off button

They loved it! :-)

The first course

- ✦ 6 week course
- ✦ 3 weeks of Lua, 3 weeks of Scratch

The second course

- ✦ 9 weeks total
- ✦ Started with Scratch
- ✦ Moved on to [codecademy.com](https://www.codecademy.com) for the last 2 weeks

Lessons learned

- ✦ Make it fun! (Learning syntax rules is not fun for most people)
- ✦ Start slowly, assuming nothing
- ✦ Provide extension tasks for more able students
- ✦ Consider lunch times or Saturday mornings

Lessons learned

- ✦ Don't use iPads
- ✦ Avoid using slides
- ✦ Don't make it too hard - it isn't school, they're there for fun