SUPA COO (C++)
Lecture 1 – 15 Oct 2015

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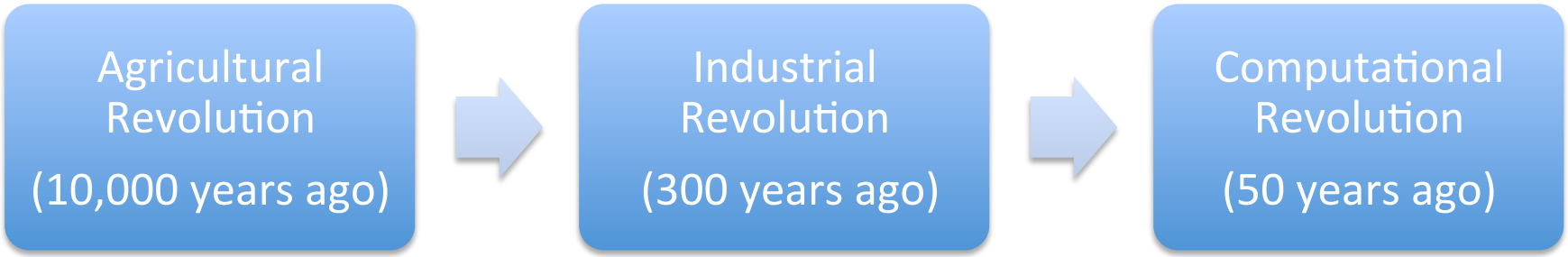
Thanks to to some usage of previous lecturer's materials
(S. Allwood-Spiers & W. H. Bell)

Why programming?

Lets humans be creative, analyse, design, while leaving repetitive calculations to computers.



New buzz word: “Big Data”

Particle physics and astronomy
Biology (genome)
Retailers, Facebook, … (clients preferences)
National security
Car manufacturers, etc

Plenty of jobs now available.
once you have programming skills.

Why C++?

Programming must be fast, while offering flexibility to solve a wide range of problems.

About 70% of a smart phone software

Works on any operating system

Object orientated programming

Keeps being improved:

C++(95), C++11, C++14

In science C++ under Linux is the standard.

What are the four lectures about?

Broad context,
simple problems you can solve,
so that you know what to search for,
when dividing a big problem into small problems
In the following computer lab.

Plenty of excellent C++ tutorials online,
and on SUPA lectures from previous tutor Sarah
(see on my.SUPA course resources right under description)

Google what you want to do and you find it!

What are the labs about?

The things I found most useful to me in my C++ usage with research, as problems and solutions.

You try them in the lab and them I provide the solutions as well.

This is just an introduction to C++!

Learning programming and C++
takes several years at least to master.

One learns by practice and experience.

The most powerful features of C++,
classes and objects (object oriented features),
will be touched on in the last lecture and lab.

Code design is key
to maintain code
and add easily new features later on!

Software-Carpentry.org
Best practices:
swcarpentry.github.io/slideshows/best-practices/index.html
Program design:
https://www.youtube.com/watch?v=F1tAUPVzYs4
Unix shell:
https://www.youtube.com/watch?v=sW04COJ0n5s
Lessons:
http://software-carpentry.org/lessons.html

They also have Bash, Python, Make, etc.

First lab exercises

Hello World in .h and .cxx
Read from a file, write to a file
Receive command line arguments
Overloading functions
Templating functions

See on my.SUPA the lab1 folder with instructions and input files, give the exercises a try before the lab on Tuesday.

First lab logistics

Where: University of Glasgow, Comp. lab 333
Time: 1.30 pm – 4.30 pm

Exceptionally the second lecture from Oct 21 will be moved right after the first lab the same lab 4.30 pm to 5.30 pm, as I am travelling.

If possible, bring your Laptop with Mac OS or Linux (not Windows). For the rest we will provide access to a Linux machine at Glasgow.

Make sure you know some basic Linux (cd, ls, mkdir, etc) and text editor (emacs, or vim).

C++ syntax and basic introduction

Done very nicely by Sarah,
so let's move to the resource file
SarahLecture1.pdf!