

C.Sc. 131: Systems Architecture

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CSc101/102 & CSc 103...

- Course taken by Single and Joint Majors:
 - CSc110 Java Programming
 - CSc 111,112,113 Same
 - CSc120 Programs & Data
 - CSc 121,122,123 Same
 - CSc130 Systems Architecture
 - CSc 131,132,133 131 and 133 Only
 - CSc140 Computational Fundamentals
 - CSc 141,142 142 Only
 - CSc150 Web Technologies
 - CSc 151,152, 153 None
 - CSc160 Software Engineering
 - CSc 161,162,163 None

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Aims of the Systems Course

- To introduce the features and components of computer systems.
- To provide you with an understanding of the relationship between applications software, systems software and hardware.
- To provide a basis for more detailed courses next year.

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131 Course Structure...

- Topic 1 : Introduction - 1 lecture
 - course structure
 - book details
 - assessment information
 - basic computer concepts
 - basic architecture and system software

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Course Structure...

- Topic 2 : Building a computer – 2, 3;
 - information representation
 - computer logic
 - components of a computer
- Topic 3 : Controlling the computer – 4,5,6,7;
 - assembling the components
 - microinstructions
 - machine languages
 - assembly language
 - translation (interpretation/compilation)
 - the Java approach

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Course Structure...

- Topic 4 : I/O Devices – 8,9;
 - I/O devices
 - Interrupts and device control techniques
- Topic 5 : Performance – 10;
 - Computer Performance

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Book Details...

Computer Science illuminated (Second Edition)

Nell Dale and John Lewis

<http://csilluminated.jbpub.com/>

Jones and Bartlett

£18.99

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Lecture Material

- The slides are available on the Department Intranet.
- <http://info.comp.lancs.ac.uk/>
- http://www.comp.lancs.ac.uk/computing/staff/kc/keiths_teaching.html
- You can take copies of these slides from any machine but note that the files are big.
- There are no printed notes - you should take your own.

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Assessment and Coursework

- Exam questions at the end of the first year.
 - 101 exam paper
 - 103 exam paper
- Written exercises.
- Tutorial discussion material.

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Topic 1 : Introduction

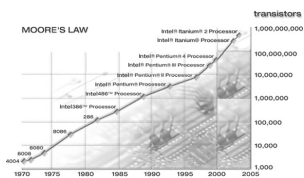
Basic Concepts

Reference : D & L: Chapter 1 + 159-161

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Concepts and Terminology

- Key concepts in computing
 - Program or Algorithm
 - Memory
 - Processor
 - I/O device



<http://www.intel.com/technology/mooreslaw/index.htm>

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Jack and Jill

- Jack and Jill are found lying dead on the floor. Around them are fragments of broken glass and a small pool of water.

What killed them ?

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A Program To Sort Numbers

```
while list isn't sorted into ascending order do ...
  start with the first element (box)
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Finished

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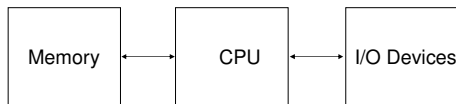
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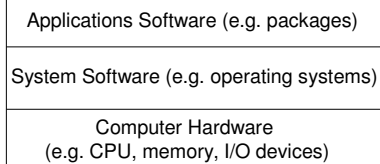
Basic Computer Architecture

- The components of a computer are connected together via one or more buses.



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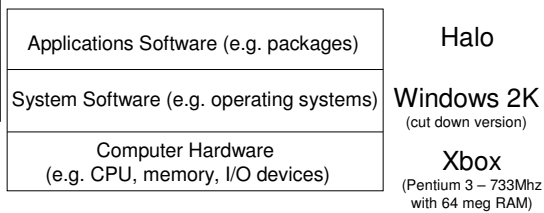
The Software-Hardware Hierarchy



Implications for performance...

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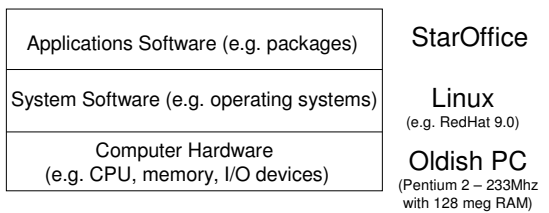
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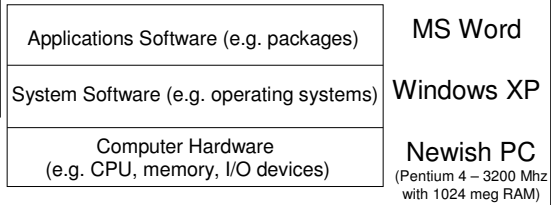
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Implications for performance...

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The Software-Hardware Hierarchy



Implications for performance...

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Summary

- Covered the course structure.
- Demonstrated the basic computer concepts of memory, programs, processors and i/o devices.

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Coming this afternoon...

- Topic 2 : How to Build a Stored Program Computer
- Reference : D & L: Ch 2. + Ch 3 pages 53-69

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