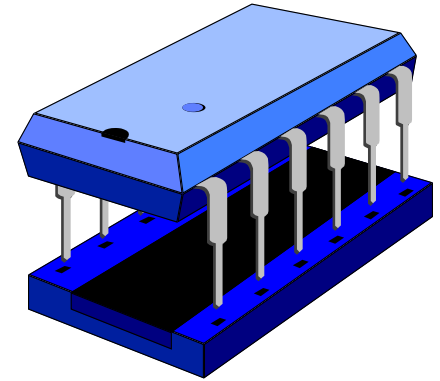


COMPUTER ARCHITECTURE



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Introduction

<https://eduassistpro.github.io/>

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Bernhard Kainz (with thanks to
Edwards)

N. Dulay and **E.**

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Course Aims

- To understand the elements and functional principles of a computer

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Learning Outcomes

- At the end of this course you should:
 - Know the basic the elements of a computer and understand how these elements link together
 - Know the difference <https://eduassistpro.github.io/>
 - Understand the basis of logic and representation
 - Comprehend the different levels of programs
 - Understand the structure of the Toy and Pentium processor
 - Be able to write assembler programs

What is a computer?

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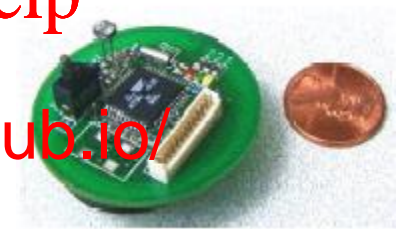
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Downsizing

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Matchbox
computer

Web Server

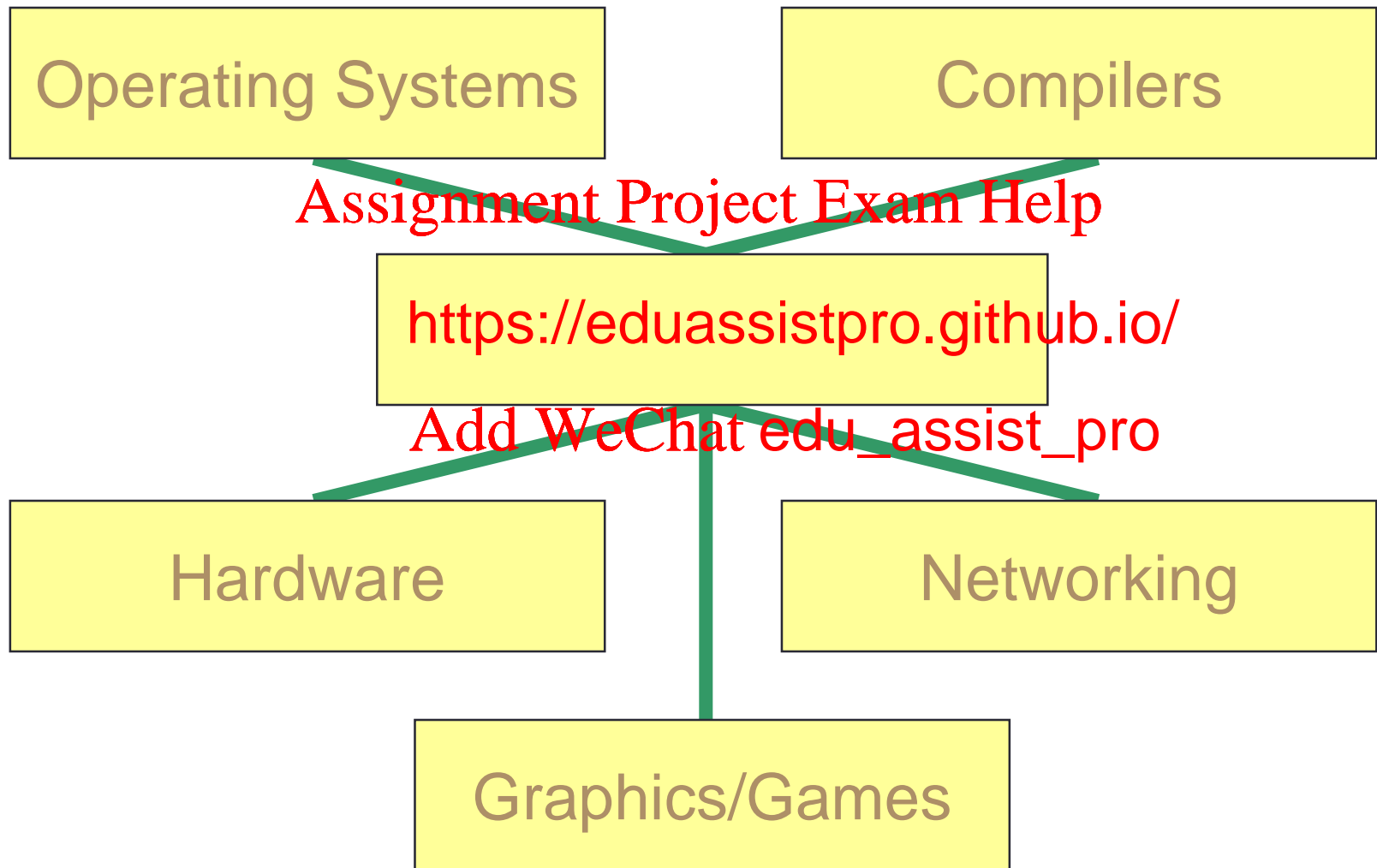
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Why ?



Computer Architects - What do they do?

- **Instruction Set Design**
- **CPU Design**
- **I/O Interface Design**
- **Bus design**
- **Motherboard design**
-
- **Emulation & testing** of the Architecture in Software
- **Implementation and testing** of the Architecture in Silicon
- **Performance Evaluation**
- Requirements with input from:
 - Higher Management,
 - Compiler writers,
 - System developers,
 - marketing,
 - and potential
- **Cost/profitability** analysis

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Computer Architecture - Who needs to know?

- **Students** of Computer Architecture!
- **Lecturers** of Computer Architecture !!
- Operating System
- Compiler Writers
- **Repair and Maintenance Technicians**
- **Third Party Vendors** e.g. Peripheral makers, Memory suppliers, Add-on card Suppliers (e.g. Co-processors, Graphics Accelerators)
- Sales and Marketing
- **Patent Office Workers**
- Reverse Engineers/Hackers

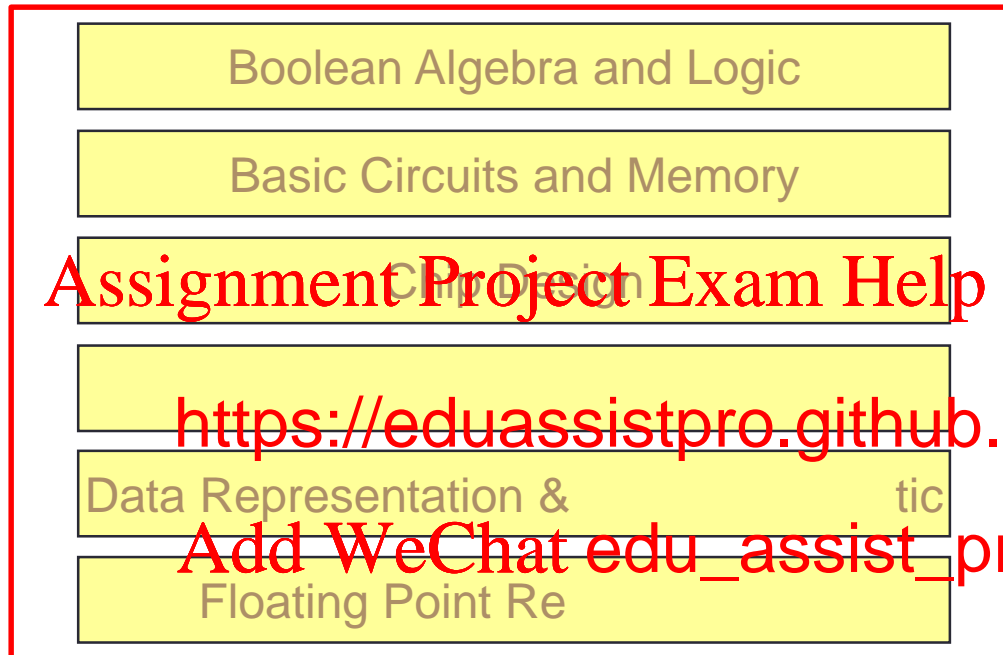
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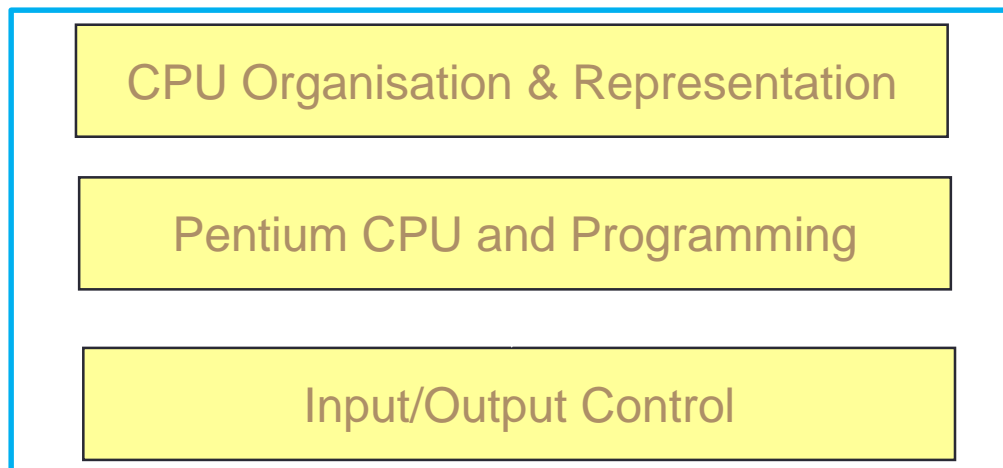
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Course Outline

Part 1



Part 2



Recommended Reading

Structured Computer Organisation (5th ed.)

- Andrew S. Tannenbaum, Prentice-Hall International
- Easy to read, also covers 2nd & 3rd year topics

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Computer Organisation (9th ed.)

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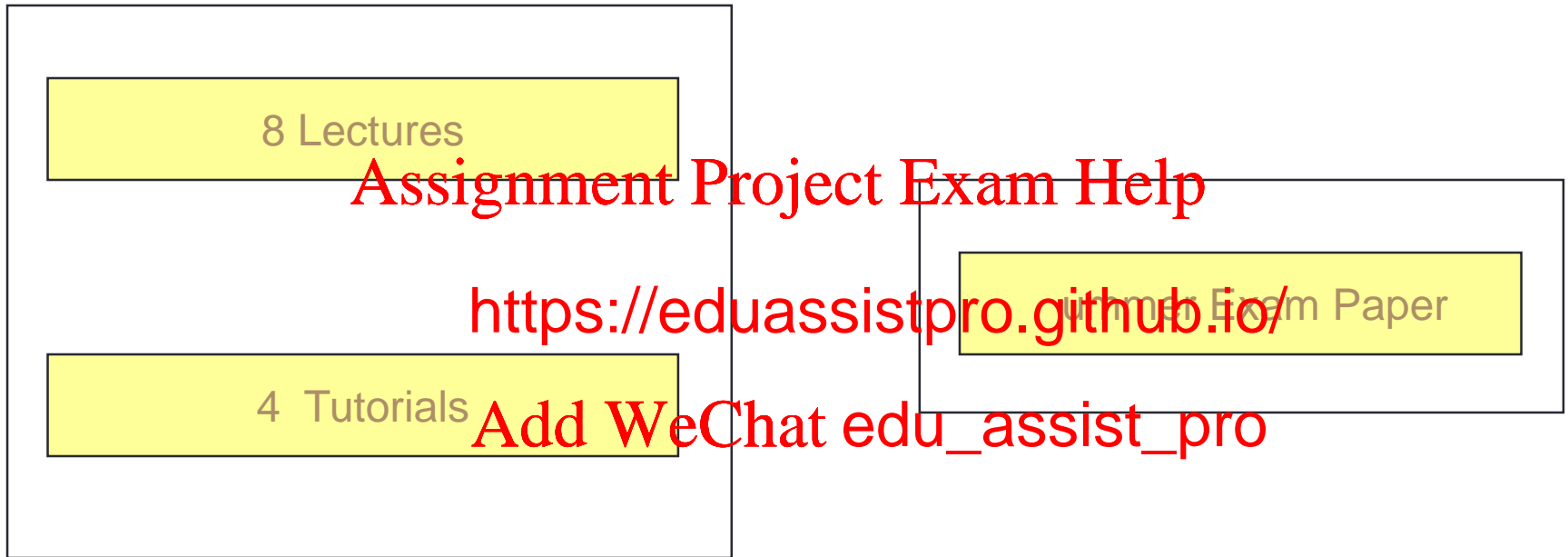
- William Stallings, Prentice-Hall International
- Detailed, academic, also covers 2nd and 3rd year topics

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Guide to Assembly Language Programming in Linux

- Sivarama Dandamudi, Springer
- Good introduction to Intel assembly programming

Workload (Architecture – Part 1)



- Lecture notes and Tutorials available from CATe
- Questions and discussions on Piazza
- Coursework on paper, 2 weeks time

Schedule

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