MGT 415H5 S
Electronic Commerce

Lu Lahodynskyj

Week#2 - Architecture

Copyright Lu Lahodynskyj. All Rights Reserved

Agenda

- Review of Last Week
- Who Are We?
- Groups
- Architecture
- Speaker
- Next Week

Copyright Lu Lakodynskyj. All Rights Reserved

Review of Last Week

Copyright Lu Lakodynskyj. All Rights Reserved

How many visited the site?

- www.resultsoriented.ca/MGT415H5
  - Outline
  - Class presentations
- Last week
  - Definition, etc.....

Copyright Lu Lakodynskyj. All Rights Reserved

Who Are We

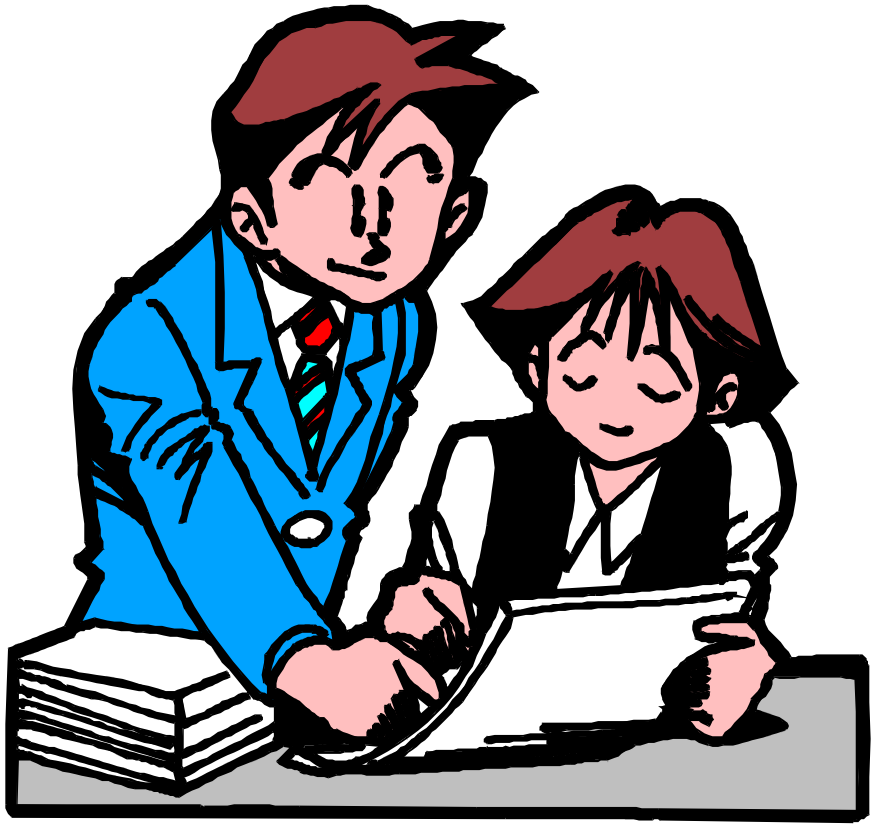
Copyright Lu Lakodynskyj. All Rights Reserved

Student Aims and Hopes

- 34 Responses
  - Done
    - Web-developers
    - House builders
    - Sales reps
    - Army reserves, Translations, Tutors, etc...
  - Goal
    - 13 – own business
    - Remainder – Awareness & Job

Copyright Lu Lakodynskyj. All Rights Reserved

Roll Call



- Answer your name
  - Confirm your group

Copyright Lu Lakodynskyj. All Rights Reserved

Group Assignments

- On our Web-page
  - Rubric
    - Details
  - Document Format
  - Presentation Format
  - Topics
    - Overview
- Remember
  - All communications between me and Focal

Copyright Lu Lakodynskyj. All Rights Reserved

Assignments

- Group 1 - UML
- Group 2 - XML
- Group 3 – Java
- Group 4 – MySQL
- Group 5 - HTML
- Group 6 – J2EE

Copyright Lu Lakodynskyj. All Rights Reserved

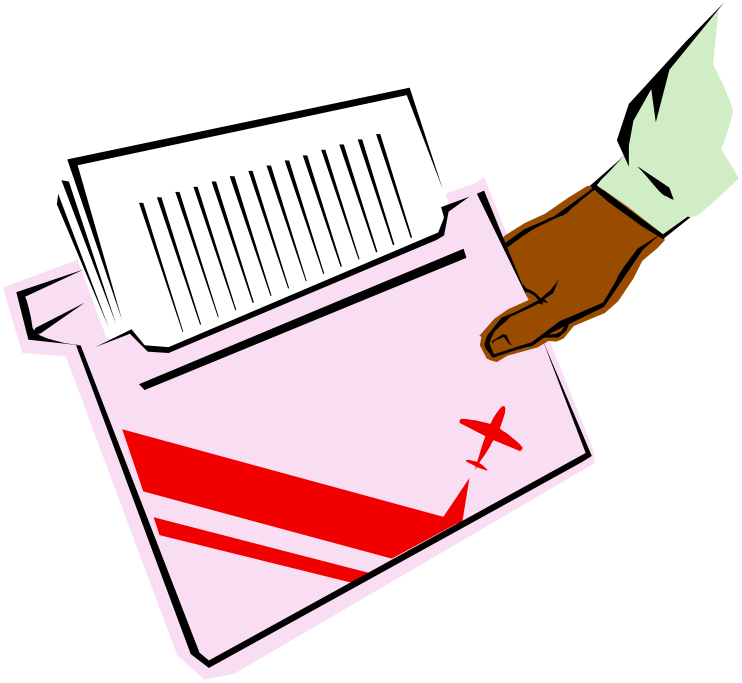
Assignments

- 2,000words (approx)
  - Describe the topic
    - What is the business enabler
    - How does it work
    - Who sets the Standards
  - Alternatives
    - Pro/Con
  - Bibliography

- Presentation
  - 5-10 slides
  - Convey the above to your classmates
    - 1st slide = Topic, Group#, Your Names

Copyright Lu Lakodynskyj. All Rights Reserved

Dates

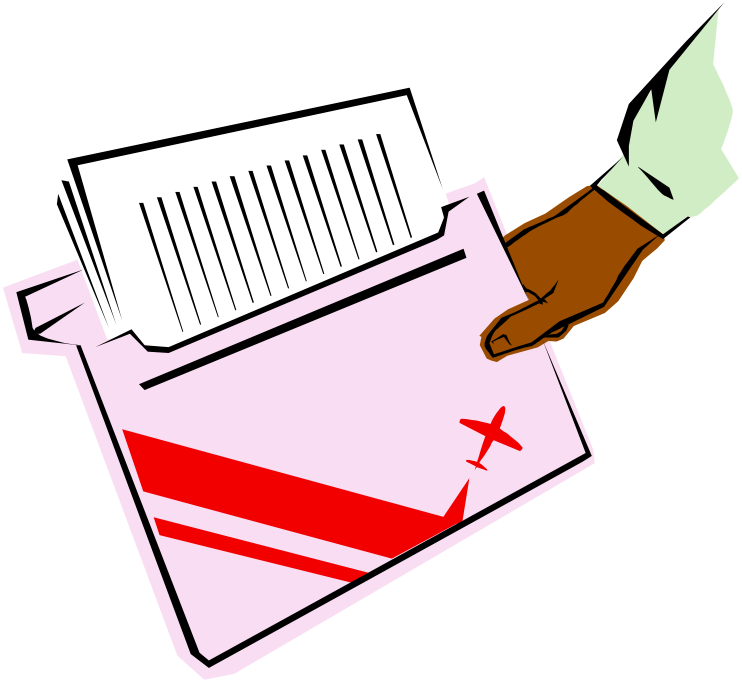


- Week#3 (Jan21)
  - Confirm the alternatives to be included
- Week#6 (Feb11)
  - Assignment Due
    - Word
    - PPT
- Week#8 (Feb25)
  - Present your topic

Copyright Lu Lakodynskyj. All Rights Reserved

Handing in the Assignment

- www.turnitin.com



Copyright Lu Lakodynskyj. All Rights Reserved

Architecture

Copyright Lu Lakodynskyj. All Rights Reserved

Bits&Bytes

- Computers are based on a "Bit"
  - A switch
    - Can be set to ON (1) or OFF (0)
- Bits are grouped in 8's, into a "Byte"
  - Eg: 00010011
    - Hard to write out all those 1's and 0's, so used hexadecimal notation, counting in base of 16
      - So a Binary 00010011 translates as 010F in Hex

Copyright Lu Lakodynskyj. All Rights Reserved

Bits&Bytes – Numerical Implication

- Decimals
  - Binary does not convert to decimal
    - Rounding
- Magic numbers
  - eg: Size
    - 256 (or 255) = 16*16 bytes
      - Number of colours
      - Length of cell in Excel
    - 1024*768 = (64*16) and (48*16)
      - Screen resolution

Copyright Lu Lakodynskyj. All Rights Reserved

Bits&Bytes – Logic Implication

- Working with Bits that can only be
  - 1= On = Yes
  - 0 = Off = No
- Questions have to be specific
  - eg:
    - "Is 12 > 10?"
      - Can be answered by a computer
    - "Do you like this music?"
      - Cannot be answered by a computer

Copyright Lu Lakodynskyj. All Rights Reserved

Bits&Bytes – Logic Implication

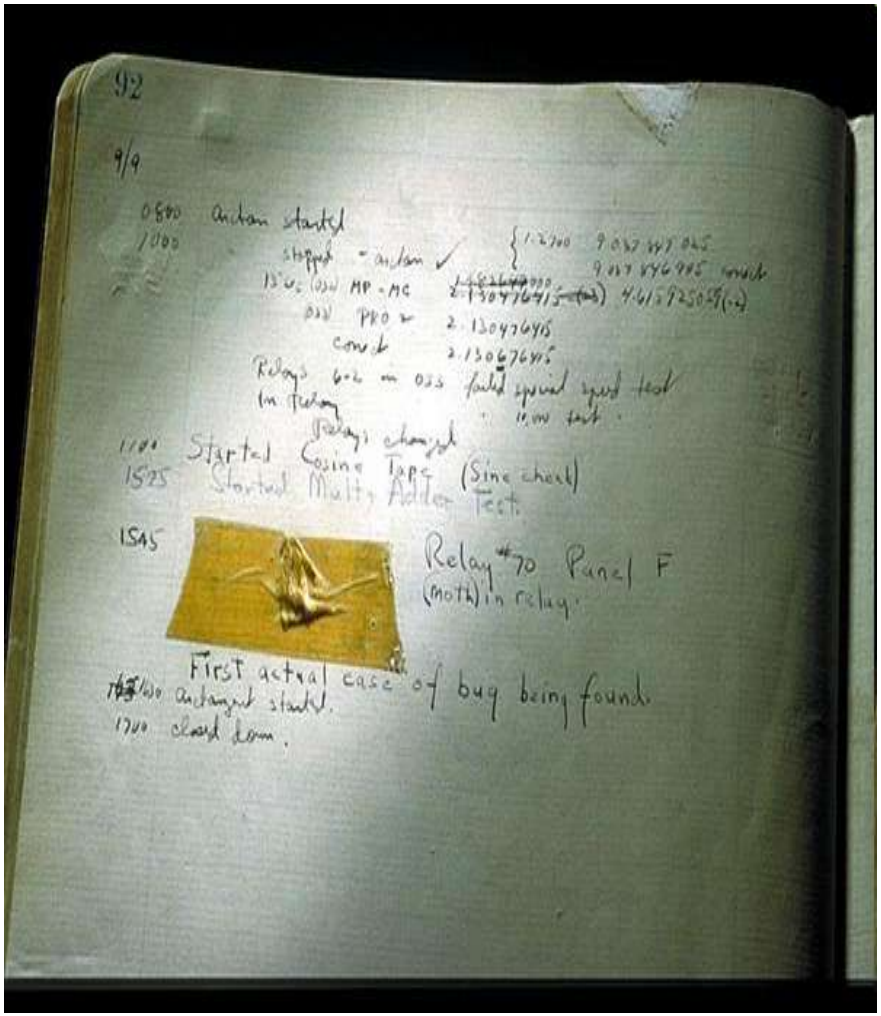
- Answers will be specific too
  - eg: "Is 12>10?" = "True"
    - Will not state "Just a bit"
      - You have to program

```
ANSWER = "  "
DIFF = 12 - 10
SELECT (DIFF)
  IF DIFF >3 THEN ANSWER = "Much greater"
  IF DIFF =3 THEN ANSWER = "Bigger"
  IF DIFF =2 THEN ANSWER = "Just a bit"
  IF DIFF =1 THEN ANSWER = "Slightly"
  IF DIFF =0 THEN ANSWER = "The same"
  OTHERWISE ANSWER = "Less"
```

- Many lines of code, for even a simple question and answer
  - Complex programs are huge: Thousands, even millions, lines of code

Copyright Lu Lakodynskyj. All Rights Reserved

Bits&Bytes – "First Bug"



- From the Smithsonian Museum
  - "American engineers have been calling small flaws in machines "bugs" for over a century. Thomas Edison talked about bugs in electrical circuits in the 1870s. When the first computers were built during the early 1940s, people working on them found bugs in both the hardware of the machines and in the programs that ran them.
  - In 1947, engineers working on the Mark II computer at Harvard University found a moth stuck in one of the components. They taped the insect in their logbook and labeled it "first actual case of bug being found."

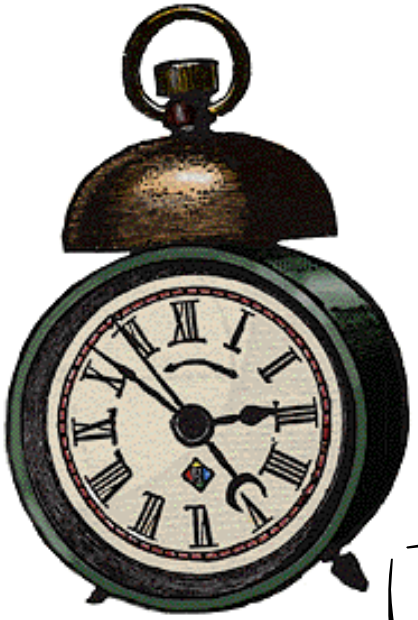
Copyright Lu Lakodynskyj. All Rights Reserved

Bits&Bytes – Logic Implication

- Rule of thumb: One bug for every 10 lines of code.
  - Recovery strategies
    - Testing
    - Formal Methods
    - Code generators
  - Problem
    - Most errors introduced during analysis.
      - The above strategies address only coding issues
    - Need formal methods can catch this
      - Rarely used outside of safety-critical systems
    - Need to Simplify
      - Software is “fatter” each release

Copyright Lu Lakodynskyj. All Rights Reserved

Bits&Bytes – Quality Implication



- Time-to-Market
  - Code will be "buggy"
    - Welcome to world of
      - Microsoft
      - Packages
      - Releases (α,β)
        - Patches
      - User groups

Copyright Lu Lakodynskyj. All Rights Reserved

Bits&Bytes – Speed Implications

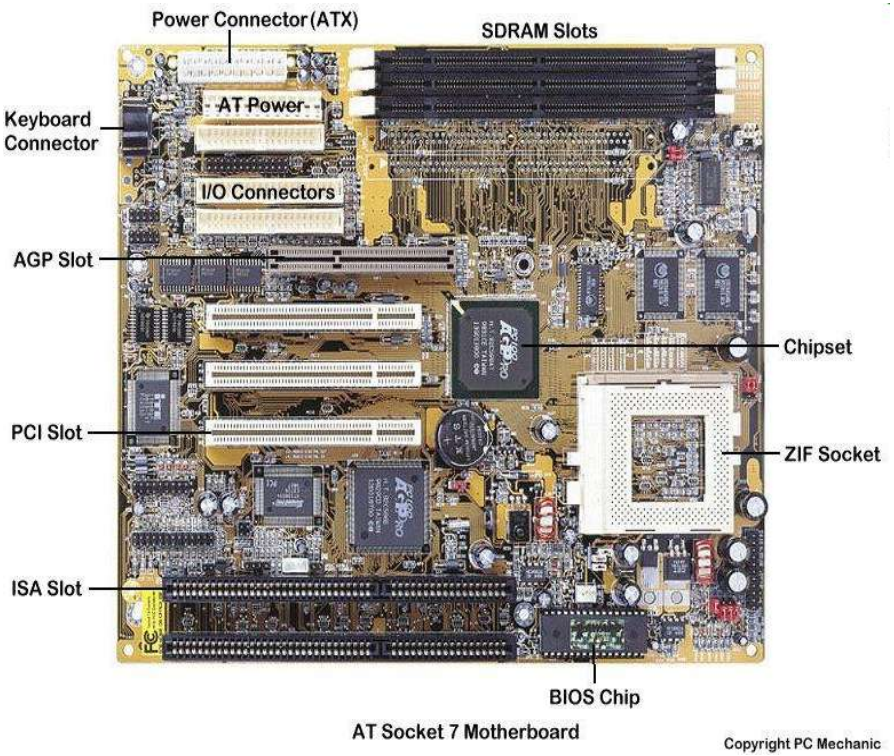
- Everything has to be digitized - broken down into Bits & Bytes
  - Takes a one byte per letter so text is fast.
    - Typical "dumb terminal" had 80 chars per line, and 20 lines on a screen
      - Screen contained 160 bytes.
  - Today's graphics take many more bytes, as you need to represent, colour and brightness as well as position in the picture.
    - Screens today use dots, or pixels. The minimum seems to be 256 colours in 1024*768 pixels.
      - Screen contains 49K bytes as a minimum
      - 300 times more data
      - And this is before you add in any multi-media

Copyright Lu Lakodynskyj. All Rights Reserved

Architecture Levels

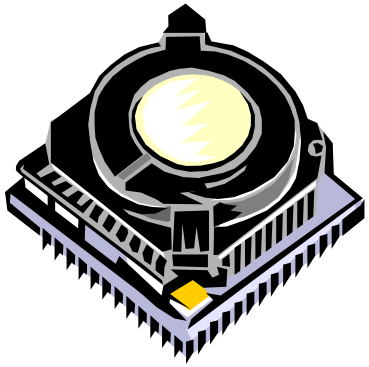
Copyright Lu Lakodynskyj. All Rights Reserved

Connecting the Bits & Bytes



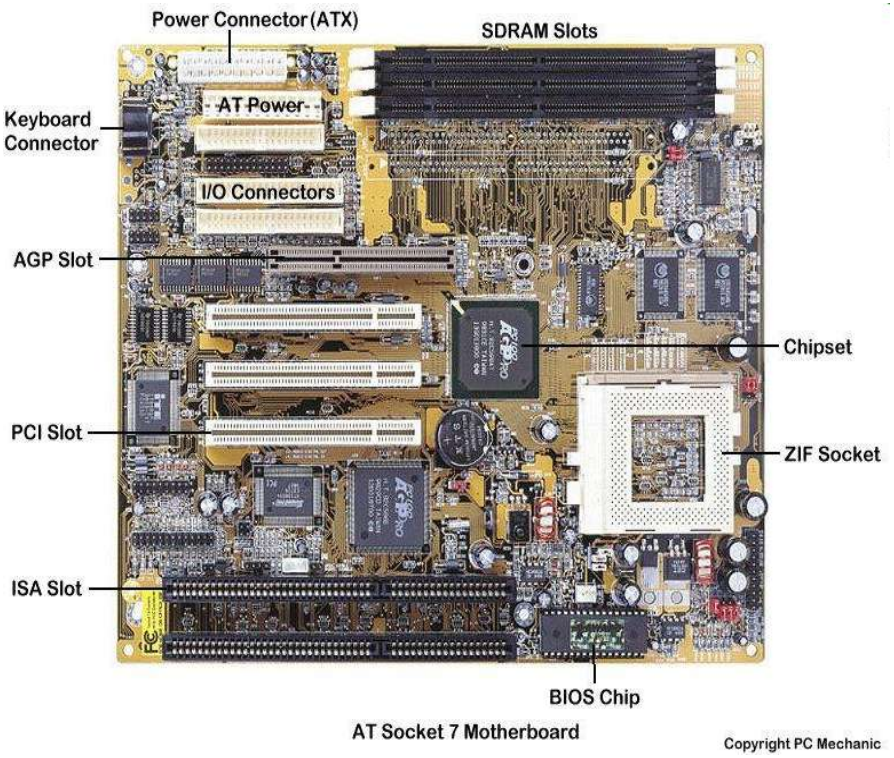
AT Socket 7 Motherboard

Copyright PC Mechanic



Copyright Lu Lakodynskyj. All Rights Reserved

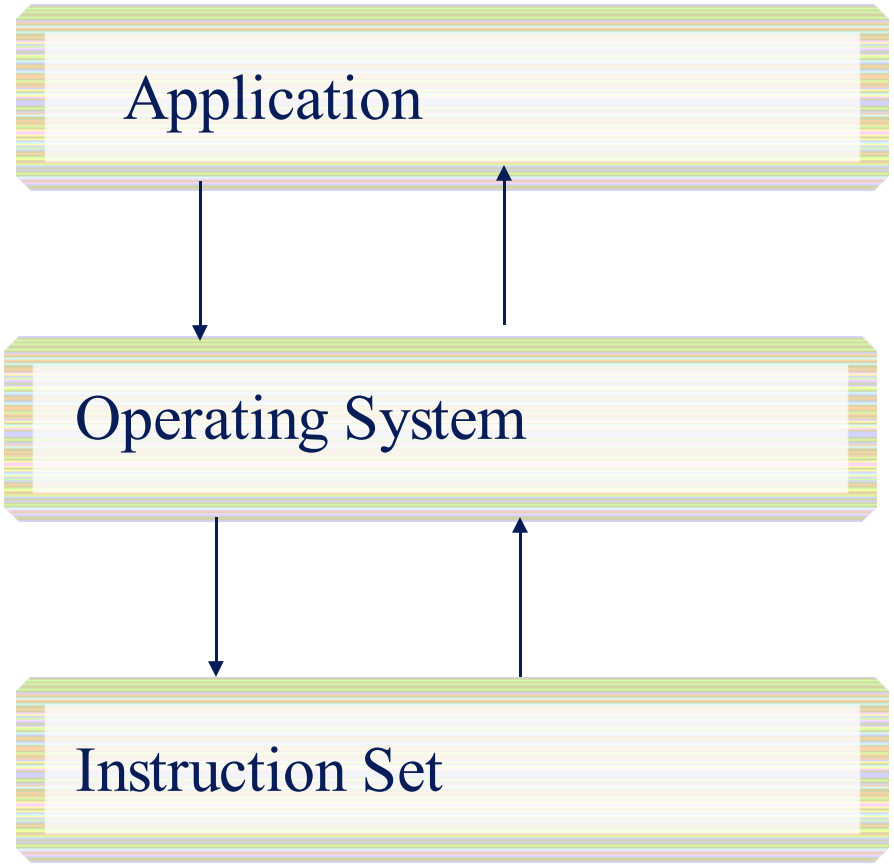
Connecting the Bits & Bytes - Implications



- Speed of the computer depends upon more than just the CPU
  - RAM
  - Graphics
  - BUS
- RISC
  - Faster

Copyright Lu Lakodynskyj. All Rights Reserved

Chips & OS - Implications



- Desktops
  - Intel
  - Windows
- If you had to design an application
  - Windows?
  - Mac?
  - Other?

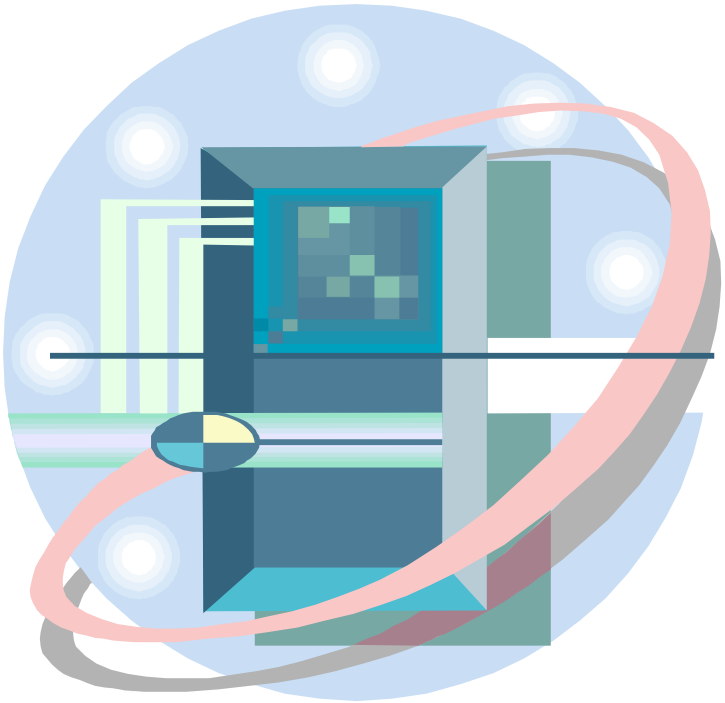
Copyright Lu Lakodynskyj. All Rights Reserved

Chips & OS – Which Operating System?

- Cost
  - Time
- Bugs

Copyright Lu Lakodynskyj. All Rights Reserved

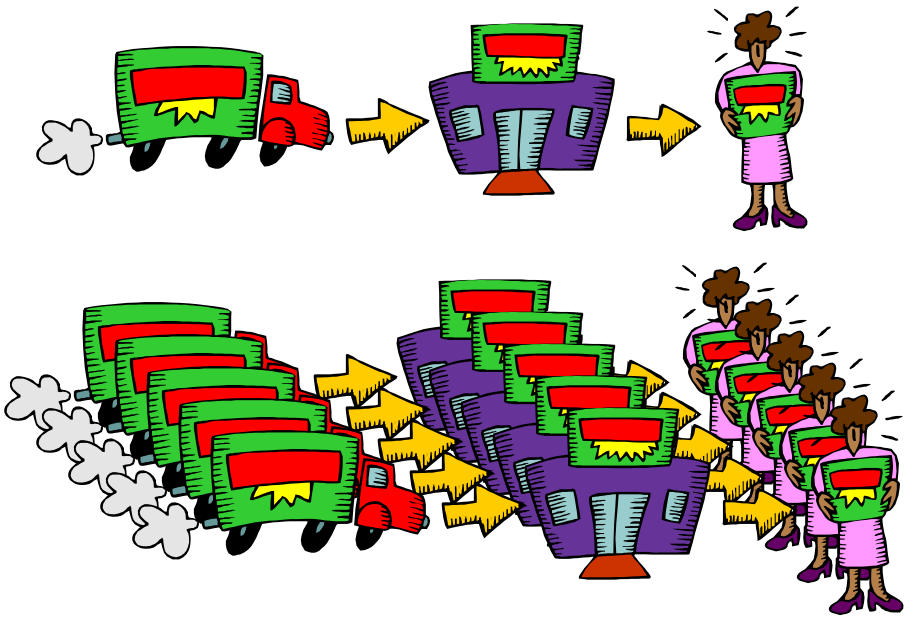
Chips & OS – Server



- "A rose by any other name"

Copyright Lu Lakodynskyj. All Rights Reserved

Connecting the Bits & Bytes - Uses



- Processing
  - Sequential
  - Parallel

Copyright Lu Lakodynskyj. All Rights Reserved

SuperComputer (Top500.org) – Fastest

- #1
- Site: Earth Simulator
  - Japan
  - Year = 2002
- Computer: Earth Simulator
  - #of Processors = 5120
  - Built by NEC
- Speed Measures
  - 35,860

Copyright Lu Lakodynskyj. All Rights Reserved

SuperComputer (Top500.org) – Noteworthy

- #3
- Site: Virginia Tech
  - USA
  - Year = 2003
- Computer: 1100 Dual 2.0 GHz Apple G5 / Mellanox Infiniband 4X/Cisco GigE
  - #of Processors = 2,200
  - Built by Virginia Tech
- Speed Measures
  - 10,280

Copyright Lu Lakodynskyj. All Rights Reserved

SuperComputer (Top500.org) – Canada

- #29
- Site: IBM
  - Canada
  - Year = 2003
- Computer: pSeries 690 Turbo 1.3GHz
  - #of Processors = 864
  - Built by IBM
- Speed Measures
  - 2,310

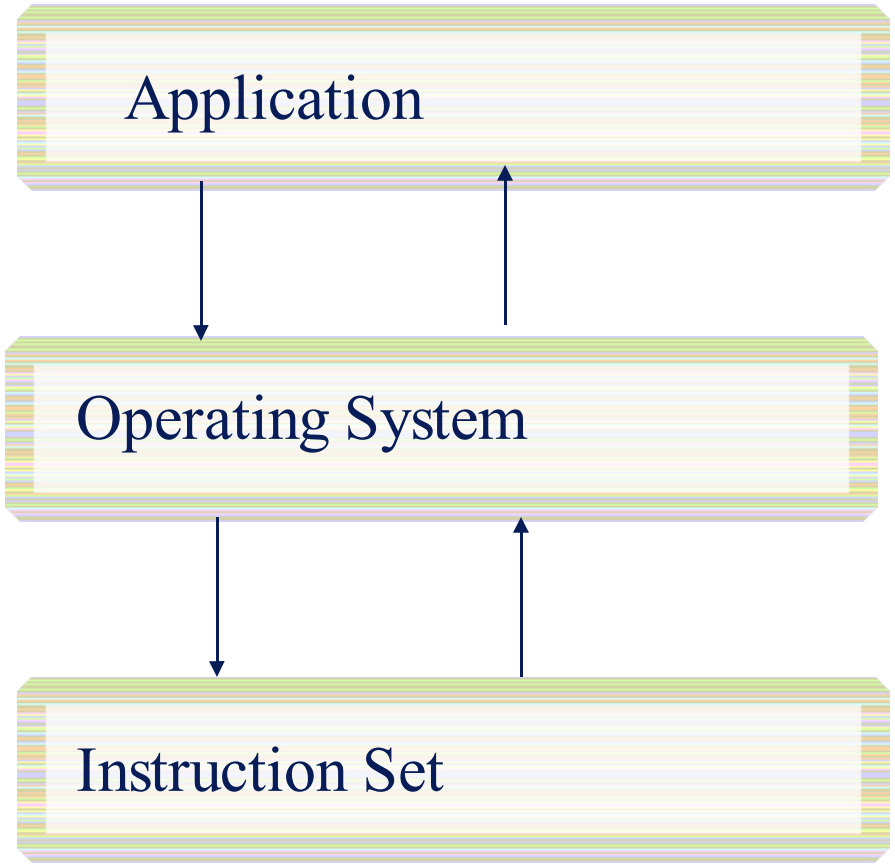
Copyright Lu Lakodynskyj. All Rights Reserved

SuperComputer (Top500.org) – #500

- #500
- Site: MTU Aero Engines
  - Germany
  - Year = 2003
- PowerEdge 2650 Cluster P4 Xeon 2.4 GHz - Myrinet
  - #of Processors = 128
  - Built by Dell
- Speed Measures
  - 403.4

Copyright Lu Lakodynskyj. All Rights Reserved

Chips & OS – Server Implications



- Servers
  - Linux/Unix
  - Windows
  - Other

Copyright Lu Lakodynskyj. All Rights Reserved

Chips & OS – Alternatives

- Open-Source
  - Applications
    - Sun's OpenOffice
  - Operating Systems
    - Linux
  - Firmware
    - Even at the chip level
- Another approach is Java
  - Assignment

Copyright Lu Lakodynskyj. All Rights Reserved

Sounds Chaotic?

- There are actually Committees that set standards
  - Examples:
    - ISO
    - IEEE

Copyright Lu Lakodynskyj. All Rights Reserved

Business ?

- Buy?
- Lease?
- Outsource?

Copyright Lu Lakodynskyj. All Rights Reserved

Architecture – New Paradigm

- Software Vendors
- Open Source

Copyright Lu Lakodynskyj. All Rights Reserved

Speaker

David Bruce

Copyright Lu Lakodynskyj. All Rights Reserved

Linux

- Delayed due to the weather conditions.
  - Rescheduled
    - See Week#03

Copyright Lu Lakodynskyj. All Rights Reserved

Thank You

Copyright Lu Lakodynskyj. All Rights Reserved

Next Week

- We will cover Networks
  - How computers are connected

Copyright Lu Lakodynskyj. All Rights Reserved