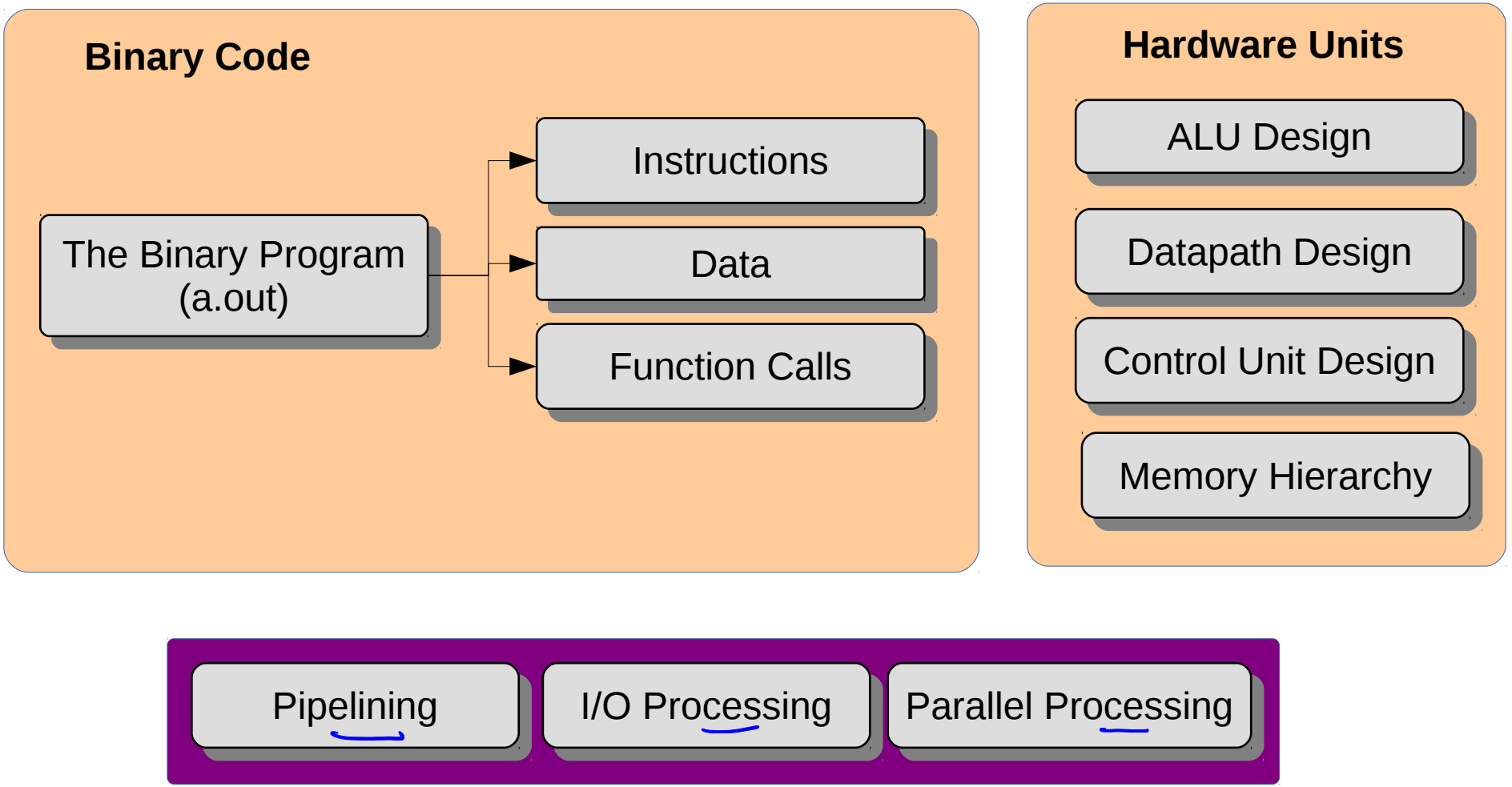
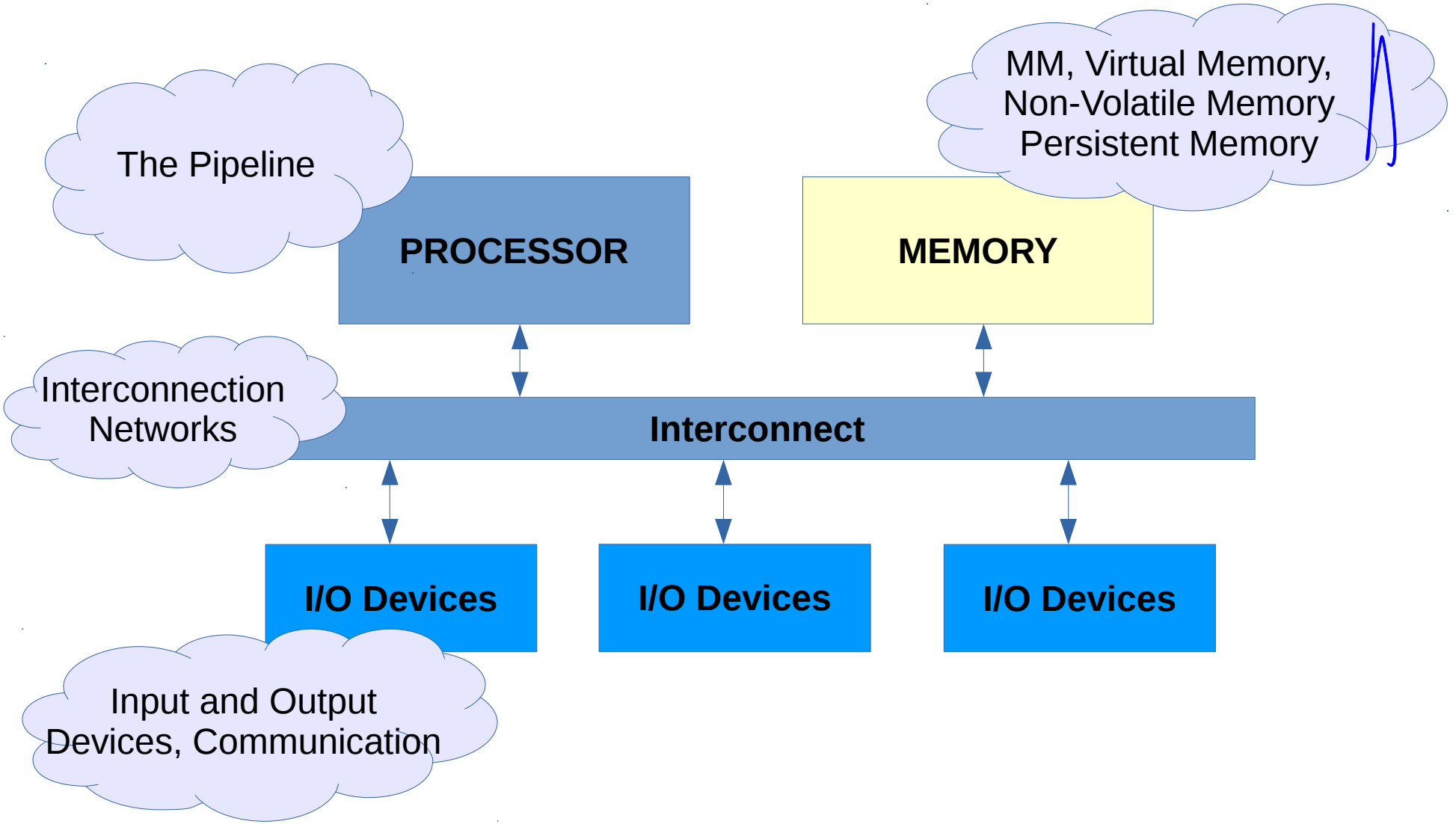
CO262 – System Programming

http://bt.nitk.ac.in/courses.html

Computer Organization and Architecture – II

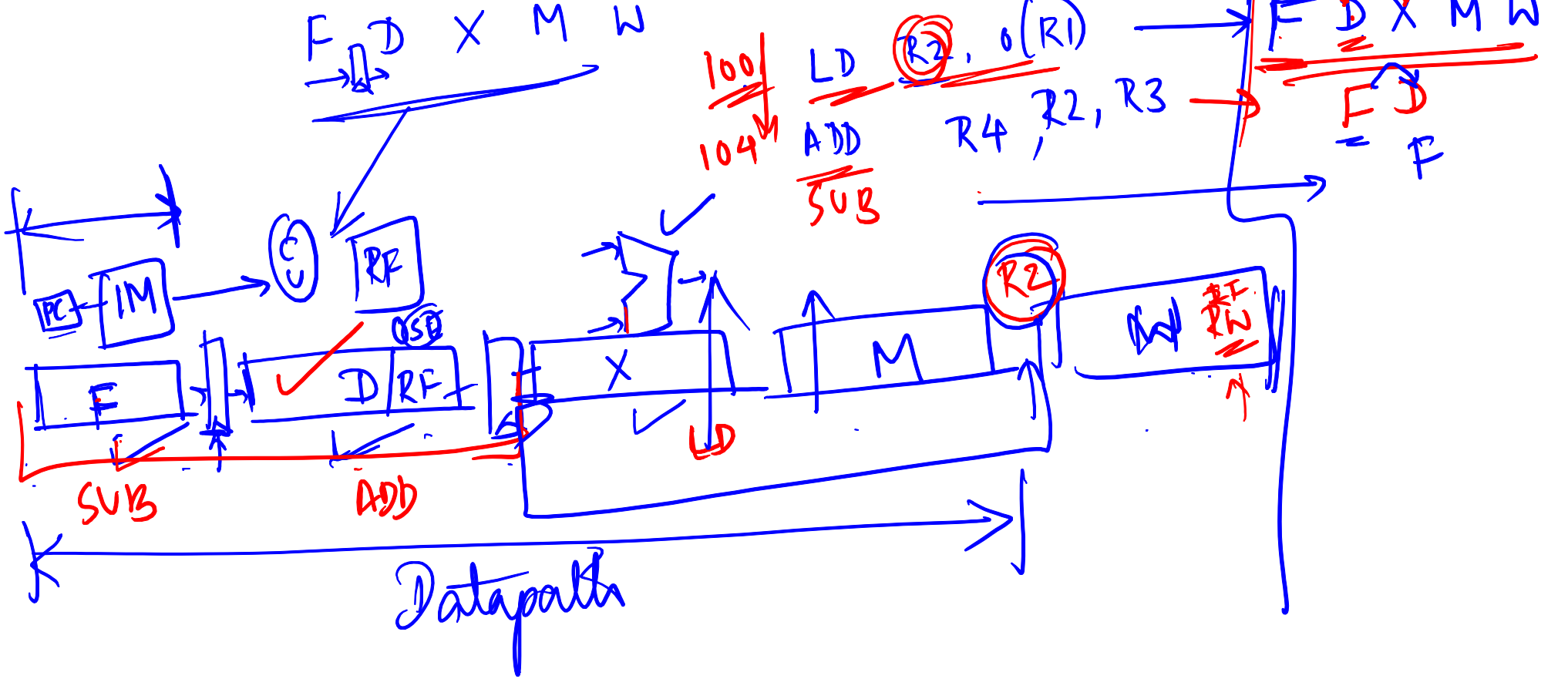


CO262


The Pipeline
PROCESSOR
MM, Virtual Memory,
Non-Volatile Memory
Persistent Memory
MEMORY
Interconnection
Networks
Interconnect
I/O Devices
I/O Devices
I/O Devices
Input and Output
Devices, Communication

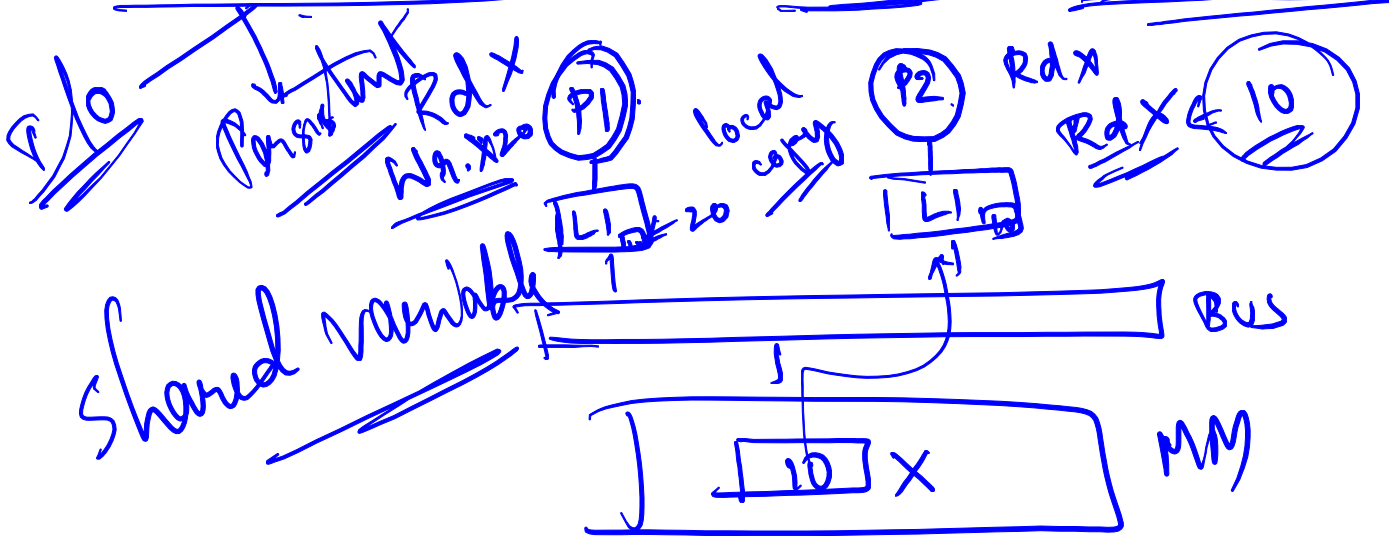
CO262 – Syllabus

- Processor
  - Pipelining, Hazards, Forwarding, Branch Prediction.



CO262 – Syllabus

- Processor
  - Pipelining, Hazards, Forwarding, Branch Prediction.
- Memory Systems
  - Memory hierarchy, SRAM, Cache Blocking, Cache coherence, DRAM, Virtual Machines, Virtual Memory, Non-Volatile Memory, RAID, Persistent NVMs



CO262 – Syllabus

- Processor
  - Pipelining, Hazards, Forwarding, Branch Prediction.
- Memory Systems
  - Memory hierarchy, SRAM, Cache Blocking, Cache coherence, DRAM, Virtual Machines, Virtual Memory, Non-Volatile Memory, RAID, Persistent NVMs
- I/O
  - Connecting and interfacing I/O devices. Memory mapped I/O, Interrupt driven I/O. DMA. Secondary storage.

CO262 – Syllabus

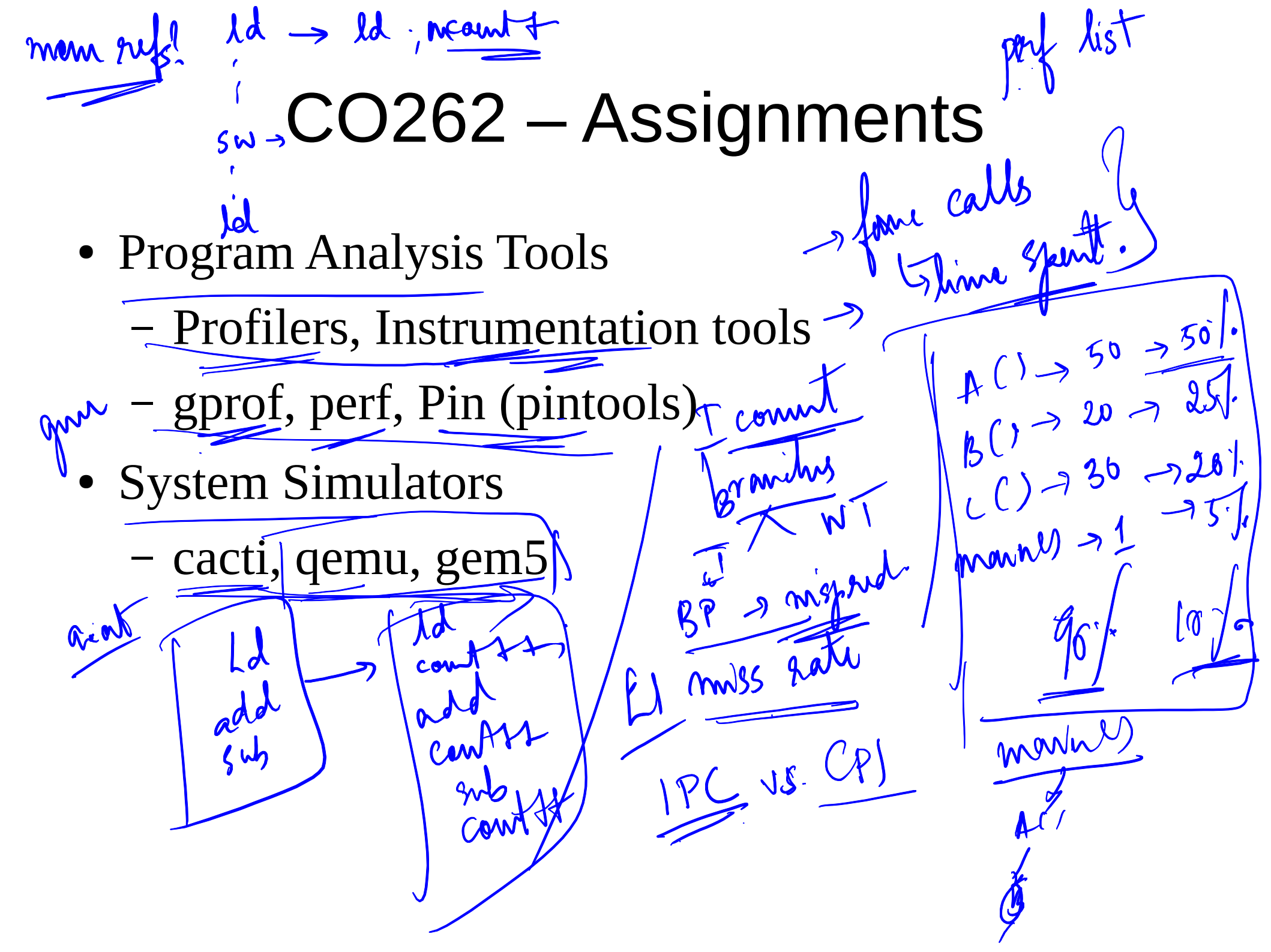
- Parallelism
  - Concept of Parallelism, ISA support for synchronization, Flynn's Classification, Vector Processing, Multithreading, Shared Memory and Message passing multiprocessors, Heterogeneous Computing, Clusters, Warehouse computing.

CO262 – Syllabus

- Parallelism
  - Concept of Parallelism, ISA support for synchronization, Flynn's Classification, Vector Processing, Multithreading, Shared Memory and Message passing multiprocessors, Heterogeneous Computing, Clusters, Warehouse computing.
- Interconnection Networks
  - Topologies – architecture and properties, Router Architecture, Flow control, Link design, Simulation.

CO262 – Assignments

- Program Analysis Tools
  - Profilers, Instrumentation tools
  - gprof, perf, Pin (pintools)
- System Simulators
  - cacti, qemu, gem5



CO262 – Reference Material

[PH6e/PH5e/PH4e] David A Patterson and John L Hennessy. Computer Organization and Design – The Hardware/Software Interface. Elsevier (6e, 2017 RISC-V edition; 5e, 2014 – MIPS edition; 4e, 2012 – ARM edition)

CO262 – Evaluation

Tutorials (20), Assignments (20), Course project (20), Quiz(5), MS (15), ES (20)