CS220 - Operating Systems

Spring 2020

Dr. Mohammad Nauman

Assistant Professor (CS)

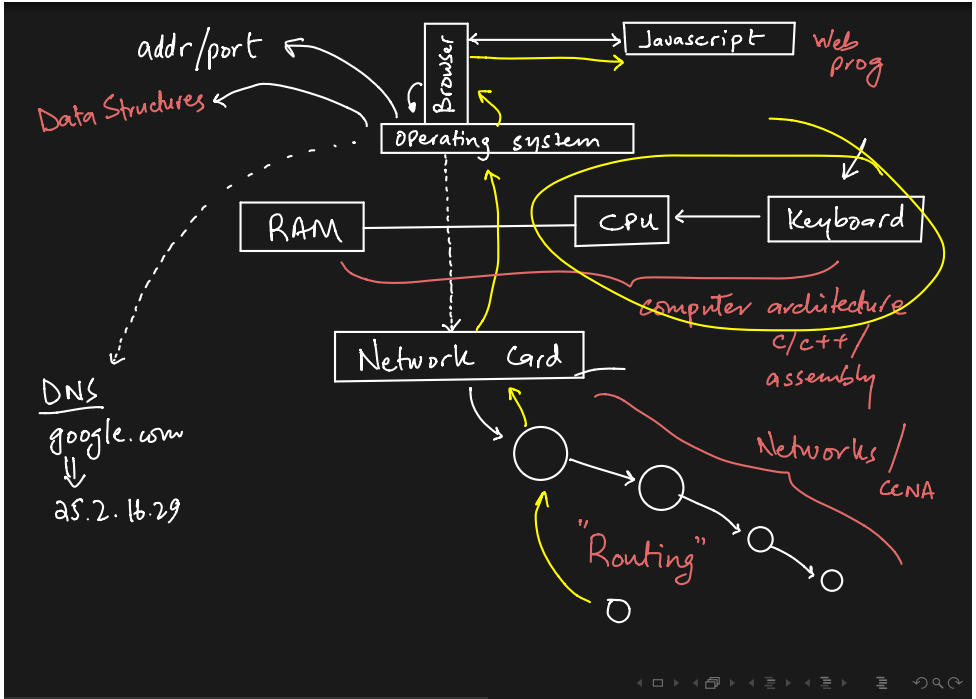
FAST National University of Computer and
Emerging Sciences, Peshawar Campus

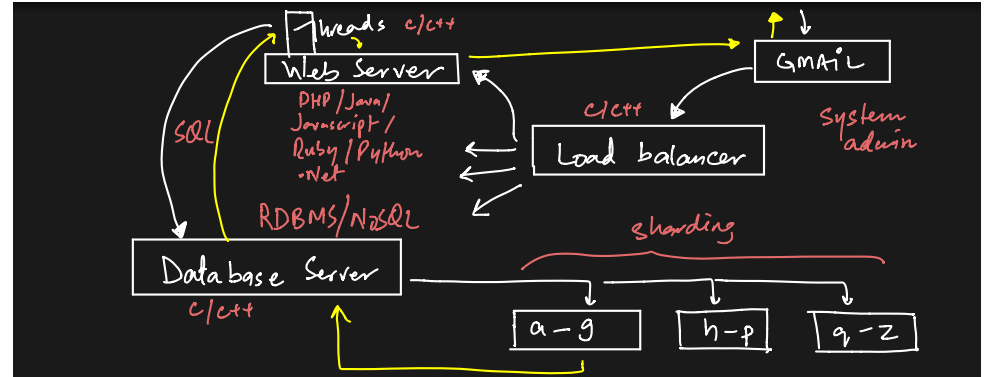
https://recluze.net

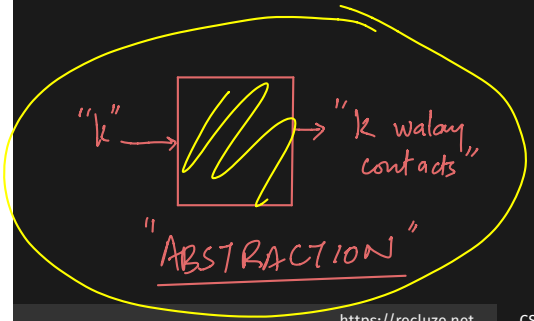
First things First

Where does this course fit in?

.. and what about the rest of the courses of this semester?


addr/port
Browser
Javascript
Web prog
Data Structures
Operating system
RAM
CPU
Keyboard
computer architecture
c/c++/ assembly
Network Card
DNS
google.com
25.2.16.29
Networks / CCNA
"Routing"





Machine Learning
Python
Matlab
Java
c/c++
Lua

Importance of Operating Systems

Operating systems course is typically a dry course

Very important in terms of job interviews

Importance of Operating Systems

Operating systems course is typically a dry course

Very important in terms of job interviews

- ... but ... not a good idea to approach it from an interview perspective

Importance of Operating Systems

Operating systems course is typically a dry course

Very important in terms of job interviews

- … but … not a good idea to approach it from an interview perspective

Has two sides:

- Theory: “achi wali”

Importance of Operating Systems

Operating systems course is typically a dry course

Very important in terms of job interviews

- … but … not a good idea to approach it from an interview perspective

Has two sides:

- Theory: “achi wali”
- Practice: OS is the backbone, the brain and the heart of all things computing!

OS Concepts in Practice

You need to have a good understanding of OS concepts for:

Programming large scale systems

- Managing industry grade databases/MISs

OS Concepts in Practice

You need to have a good understanding of OS concepts for:

Programming large scale systems

- Managing industry grade databases/MISs
- Backup, performance, security

OS Concepts in Practice

You need to have a good understanding of OS concepts for:

Programming large scale systems

- Managing industry grade databases/MISs
- Backup, performance, security
- Example: Apache worker pools

OS Concepts in Practice

You need to have a good understanding of OS concepts for:

Programming large scale systems

- Managing industry grade databases/MISs
- Backup, performance, security
- Example: Apache worker pools
- System administration

OS Concepts in Practice

You need to have a good understanding of OS concepts for:

Programming large scale systems

- Managing industry grade databases/MISs
- Backup, performance, security
- Example: Apache worker pools
- System administration
- IT and networks

OS Concepts in Practice

You need to have a good understanding of OS concepts for:

Programming large scale systems

- Managing industry grade databases/MISs
- Backup, performance, security
- Example: Apache worker pools
- System administration
- IT and networks
- Research and development

OS Concepts in Practice

You need to have a good understanding of OS concepts for:

Programming large scale systems

- Managing industry grade databases/MISs
- Backup, performance, security
- Example: Apache worker pools
- System administration
- IT and networks
- Research and development
- UI/UX

OS Concepts in Practice

You need to have a good understanding of OS concepts for:

Programming large scale systems

- Managing industry grade databases/MISs
- Backup, performance, security
- Example: Apache worker pools
- System administration
- IT and networks
- Research and development
- UI/UX
- Anything else that a computer touches!

Plan for this Semester

Topics to be covered (traditional):

- Intro to OS
- Processes

Plan for this Semester

Topics to be covered (traditional):

- Intro to OS
- Processes
- Threads
- Synchronization

Plan for this Semester

Topics to be covered (traditional):

- Intro to OS
- Processes
- Threads
- Synchronization
- Deadlocks
- Memory management

Plan for this Semester

Topics to be covered (traditional):

- Intro to OS
- Processes
- Threads
- Synchronization
- Deadlocks
- Memory management
- Filesystems and devices

Plan for this Semester

Topics to be covered (traditional):

- Intro to OS
- Processes
- Threads
- Synchronization
- Deadlocks
- Memory management
- Filesystems and devices
- Protection and security

Other Topics

From an Industry Perspective

- Containers and virtualization

Other Topics

From an Industry Perspective

- Containers and virtualization
- Cloud computing
- Provisioning

Other Topics

From an Industry Perspective

- Containers and virtualization
- Cloud computing
- Provisioning
- Mobile operating systems

Other Topics

From an Industry Perspective

- Containers and virtualization
- Cloud computing
- Provisioning
- Mobile operating systems
- Security models

Other Topics

From an Industry Perspective

- Containers and virtualization
- Cloud computing
- Provisioning
- Mobile operating systems
- Security models
- Industry grade security management systems*

Things to Keep in Mind

This is a fast-paced course

I'll skip everything that is not "important"

All the remaining theory is actually very practical

Things to Keep in Mind

This is a fast-paced course

I'll skip everything that is not "important"

All the remaining theory is actually very practical

You do not need to "solve" many problems here

Things to Keep in Mind

This is a fast-paced course

I'll skip everything that is not "important"

All the remaining theory is actually very practical

You do not need to "solve" many problems here

Concepts are easy but numerous

Understand the theme – not the details

Things to Keep in Mind

This is a fast-paced course

I'll skip everything that is not "important"

All the remaining theory is actually very practical

You do not need to "solve" many problems here

Concepts are easy but numerous

Understand the theme – not the details

I do not assume lab concepts but they should be very useful