COMP1047: Systems and Architecture

Dr. Fazl Ullah (Khan)

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Week 12
Computer Networks:
Revision

- Data and Communication
  - components
  - data Flow
- Network
  - types of Networks
- Topologies
  - types of topologies
- the Internet
  - overview
  - nuts and bolts
- Protocol
  - human
  - network

- Network Edge
  - Access Networks
- Network Core
  - Delay
  - Throughput
  - Delay

Mostly short and choice questions

- Why layered architecture is needed

- Tasks in sending and Receiving

- Open System Interconnection by International Standard Organization

- OSI layers and their functions:
  - Application layer
  - Presentation layer
  - Session layer
  - Transport layer
  - Network Layer
  - Data Link Layer
  - Physical layer

- TCP/IP Model

- Addressing
  - Physical
  - Logical
  - Port
  - Specific

- Services by OSI layers

Mostly short and choice questions

- Transport-layer Protocols
  - UDP
  - TCP
- Transport-layer Functions
  - Multiplexing and demultiplexing
  - Flow Control
  - Congestion Control
  - Reliable Transfer
- User Data Protocol
  - Message Format
  - CheckSum

- Transmission Control Protocol
  - Message Format
  - Buffer Overflow
  - Advertised Window Size

Mostly short and choice questions

- **TCP: Connection-oriented Protocol**
  - **Flow Control (Block TCP Problem)**
  - **TCP Acks. Seq. No. and RTT**
  - **TCP Connection Management**
- Congestion Control
  - Causes
  - Costs
- Performance Analysis
  - Performance Evaluation Approaches
  - NS2
  - Otcl scripts for NS2

- Analyzing Network Performance
  - Delay
  - Throughput
  - Packets drop/delivery

Mostly long questions

- Principles behind Internet Protocol
  - IP datagram header
  - Header format
- **Binary Numbers**
  - **Quick Review**
- **Connectionless Networking**
  - **Design issues**
- IP: Addressing
  - Addressing Types
  - IP Classes
  - Addressing Format

- IP: Addressing
  - Subnetting
  - Classless Inter-Domain Routing
  - Supernetting
  - Variable length subnet masking
- **IPv6**
  - **Rules**
  - **Notations**

Mostly long questions

Week-11

- The Industrial Revolution
  - Four Revolutions
  - IoT Market and Industry
- Introduction to IoT
  - Services
  - Architecture
  - Technologies
- Standardization
  - Open Connectivity Foundation
  - oneM2M
- Similar Technologies

- IoT Use Cases
  - IoT Applications
  - Healthcare
  - Transportation
  - Farming
- Security Problems in IoT
  - Smart Home
  - Assets Management
  - Autonomous Car
- IoT vision

Future Projects

- Revision and preparation

Some Q&A