

AP Computer Science Principles Unofficial Summary

Work in Progress - Under Development

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Chapter 1

Digital Information

Overview

Understanding how computers store and represent different types of information digitally, including numbers, text, images, and sound.

Chapter 2

The Internet

Overview

The Internet is a global network of interconnected computer networks that use standardized communication protocols. This unit covers core concepts about how the Internet works and its impact on society.

2.1 Internet Architecture

- **Devices:** Computers, routers, switches, and servers
- **Packets:** Small units of data that travel across networks
- **Bandwidth:** Maximum data transfer rate of a network

2.2 Protocols

- **TCP/IP:** Core protocols for reliable data transmission
- **HTTP/HTTPS:** Web communication protocols
- **DNS:** Domain Name System for converting URLs to IP addresses

2.3 Addressing and Routing

- **IP Addresses:** Unique identifiers for devices (IPv4, IPv6)
- **Routing:** How data finds its path across networks
- **Domain Names:** Human-readable web addresses

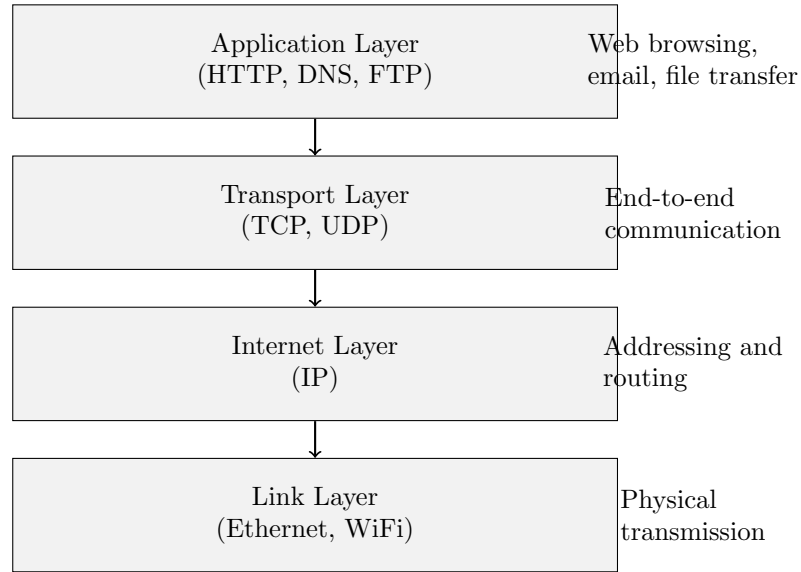


Figure 2.1: The four layers of the Internet protocol suite

2.4 Cybersecurity

- **Common Threats:**

- Phishing: Deceptive attempts to steal user data
- DDoS: Distributed Denial of Service attacks
- Malware: Malicious software types

- **Protection Methods:**

- Encryption: Securing data transmission
- Authentication: Verifying user identity
- Updates: Maintaining system security

2.5 Impact on Society

- **Digital Divide:** Inequality in Internet access
- **Privacy Concerns:** Data collection and surveillance
- **Innovation:** Economic and technological advancement

Chapter 3

Intro to App Design

Overview

Introduction to fundamental programming concepts through app development, emphasizing collaborative development practices and basic software design principles.

Chapter 4

Variables, Conditionals, and Functions

Overview

Core programming constructs that enable data storage, decision-making, and code organization, with emphasis on practical application in app development.

Chapter 5

Lists, Loops, and Traversals

Overview

Working with collections of data, implementing iteration, and processing data sequences to create more sophisticated applications.

Chapter 6

Algorithms

Overview

Study of algorithm design, analysis, and evaluation, focusing on efficiency and problem-solving strategies.

Chapter 7

Parameters, Return, and Libraries

Overview

Advanced programming concepts focusing on code reusability, modularity, and the use of external libraries.

Chapter 8

Create PT Prep

Overview

Preparation and practice for the Create Performance Task, focusing on project development and documentation.

Chapter 9

Data

Overview

Exploration of data analysis and visualization techniques, using real-world datasets to discover patterns and draw conclusions.

Chapter 10

Cybersecurity and Global Impacts

Overview

Examination of cybersecurity principles and the broader implications of computing on society, including ethical considerations and policy impacts.