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Spring 2023

COMP337 Course Competencies

The competencies for this course are given as task statements with associated sub-tasks/learning objectives. Embedded within the learning are the associated knowledge areas with the desired skill-level.

Competencies

1. **Design and develop for a customer a simple client-server socket-based application.**
    a. Articulate the organization of the Internet. [Explain]
    b. List and define the appropriate network terminology. [Explain]
    c. Describe the layered structure of a typical networked architecture. [Explain]
    d. Analyze the needs of specific networked application demands. SEP-Social Context [Evaluate]
    e. Describe the details of one application layer protocol. [Explain]
    f. Implement a simple client-server socket-based application. [Apply]
    g. Describe the operation of reliable delivery protocols. [Explain]
    h. List the factors that affect the performance of reliable delivery protocols. [Explain]
    i. Describe how the Internet tackles scalability challenges. [Explain]

Course competencies derived from and otherwise based on ACM curricular guidelines. By and large, these course competencies borrow directly from the March 2023 Version Gamma draft of the *Computer Science Curricula 2023*. For more information see https://csed.acm.org/cs2023-gamma/

2. **Design and implement a simple reliable protocol for an industry network by considering factors that affect the network's performance.**
    a. Articulate the organization of the Internet. [Explain]
    b. List and define the appropriate network terminology. [Explain]
    c. Describe the layered structure of a typical networked architecture. [Explain]
    d. Identify the different types of complexity in a network (edges, core, etc.) [Explain]
    e. Define the principles of naming, addressing, resource location. [Explain]
    f. Describe the operation of reliable delivery protocols. [Explain]
    g. List the factors that affect the performance of reliable delivery protocols. [Explain]
    h. Describe some TCP reliability design issues. [Explain]
    i. Design and implement a simple reliable protocol. [Apply]
    j. Describe various routing paradigms and hierarchies. [Explain]
    k. Describe how packets are forwarded in an IP network. [Explain]
    l. Describe how the Internet tackles scalability challenges. [Explain]
    m. Describe in detail on a MAC protocol. [Explain]
    n. Demonstrate understanding of encoding and framing solution tradeoffs. [Apply]
    o. Describe details of the implementation of Ethernet [Explain]
    p. Describe how switching works [Explain]
    q. Describe one kind of a LAN topology [Explain]

3. **Contrast fixed and dynamic allocation techniques as well as current approaches to congestion and present the results to a supervisor or executive.**
    a. Articulate the organization of the Internet. [Explain]
    b. List and define the appropriate network terminology .[Explain]
    c. Describe the layered structure of a typical networked architecture. Identify the different types of complexity in a network (edges, core, etc.) [Explain]
    d. Define the principles of naming, addressing, resource location. [Explain]
    e. Analyze the needs of specific networked application demands. SEP-Social Context [Evaluate]
    f. Describe the details of one application layer protocol.[Explain]
    g. Describe the operation of reliable delivery protocols. [Explain]
    h. List the factors that affect the performance of reliable delivery protocols. [Explain]
    i. Describe some TCP reliability design issues. [Explain]
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    o. Describe details of the implementation of Ethernet [Explain]
    p. Describe how switching works [Explain]
    q. Describe one kind of a LAN topology [Explain]

Dispositions

- Meticulous
- Professional
- Responsible
- Reactive
- Proactive
- Growth-Mindset
- Persistence
- Collaborative
- Creative