IDT 540

Instructional Web Site Project: Cognitive Tutor

Name: **Bill Bennett**

Description

Developing a Web-based cognitive tutor requires advance planning to ensure its success; planning ahead also reduces the amount of debugging and editing required throughout the development of the project. In order to design, develop, and implement this project a multitude of computer software products and technologies will be employed including: Adobe Acrobat Pro, Dreamweaver, Photoshop, Captivate, Media Encoder, Soundbooth, Presenter, Illustrator, Flash Builder, Flash Professional, Flash Player, Flash Media Server, ActionScript; Camtasia Studio; Lector Inspire; JavaScript; Apple Quicktime; and Microsoft Media Player, Expression Studio, Visual Studio, C#, and ASP.NET. In order for a Web-based cognitive tutor to be successful and efficient it must follow proven pedagogically-based instructional design techniques and developed using empirically established principles established in cognitive load theory. The design and development of the Web-based cognitive tutor must also follow time-tested guidelines of interface design including the use of strategies such as: sign posting, intuitive navigation, breadcrumbs, the ability for the user to save and return to the point where they left off. In order for the Web-based cognitive tutoring system to be implemented through a learning management system like Moodle or Blackboard it must also be SCORM compliant to provide proper integration with the learning management system.

Part I - ANALYSIS

1. **TOPIC:**

   This project involves creating a Web-based cognitive tutor which will be designed using the principles of cognitive load theory (CLT) and used in my *CSIS 202 Introduction to Networks and Data Communications* online course at Mt. San Jacinto College. It will consist of: an introductory module which will include pre-testing, instructional tutorials which incorporate multimedia content designed to enhance germaine cognitive timely feedback, self-explanation prompting, and adaptive sequencing.

2. **NEEDS ASSESSMENT:**

   The information technology (IT) industry is second only to the medical industry in job growth and wages paid to IT professionals is well above the state average for salaries (edd.ca.gov). Community colleges receive funds from the Perkins grant to develop courses that teach students skills for high paying jobs that are in demand. Parts of the assessment portion of the Perkins grant calls for retention and persistence by students to be increased in career and technical education programs by

colleges that receive funding. A cognitive tutor developed for teaching students networking will be an effective, efficient, and engaging way to meet the goals of Perkins and the needs of the community.

3. TARGET AUDIENCE:

The target audience for the cognitive tutor will be college students seeking entry level IT positions. The age range will vary from recent high school graduates transferring to the community college and older workers who are looking to change their career path.

4. GOALS:

This project aims to deliver effective, efficient and engaging instruction that will enhance a student's schema acquisition and construction abilities, rule automation, and transfer of learning which transfers to both near and far problem solving skills.

5. LEARNING OBJECTIVES:

Upon completion of the cognitive tutor the user will be able to:

- Convert decimal numbers into binary numbers accurately on each attempt
- Identify the class of an IP address correctly for each IP address presented
- Create a custom subnet mask which will function properly in a multi-segmented IP-based LAN

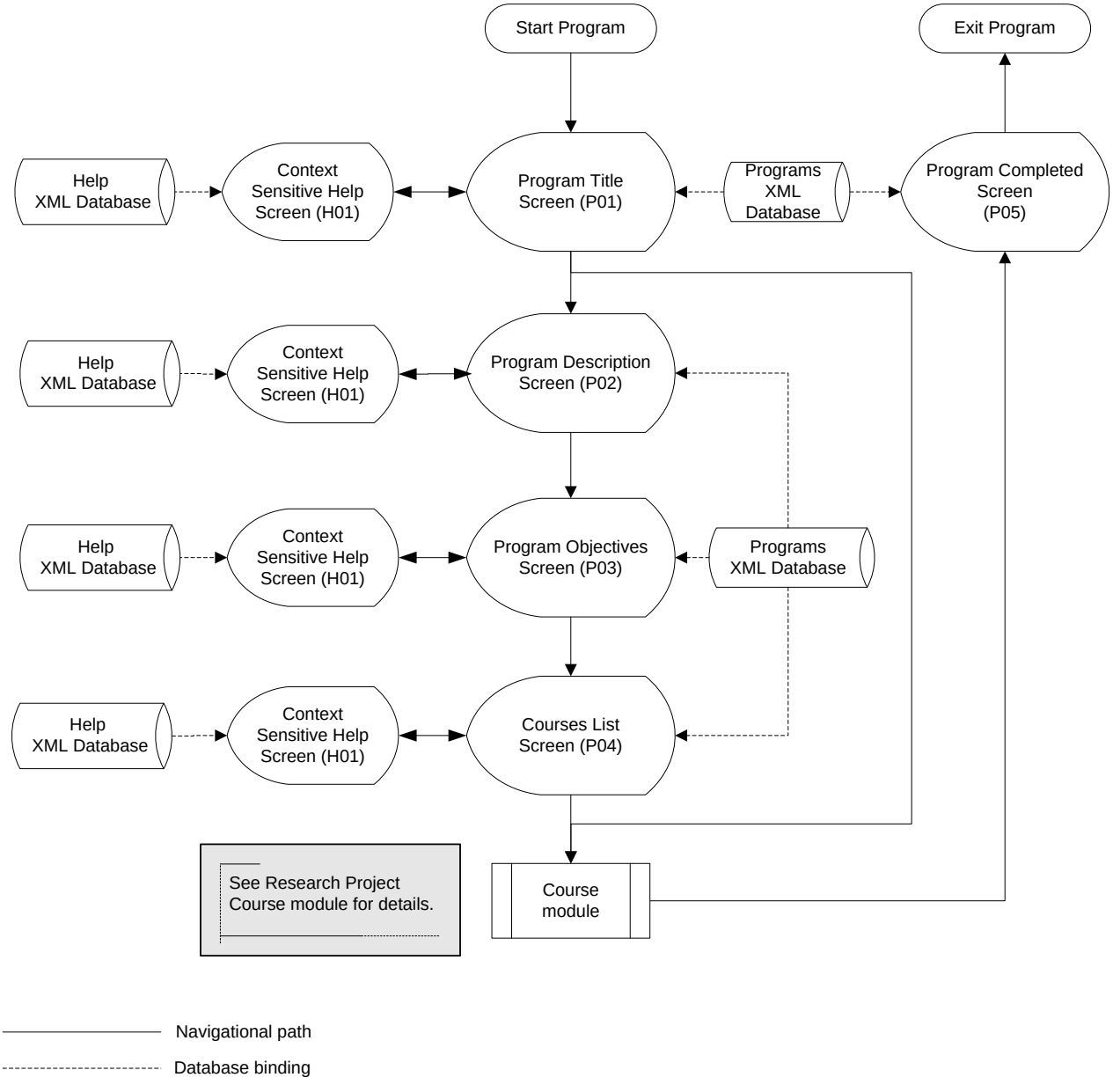
6. **PREREQUISITES:** What are the prerequisites for your program that the target audience must already have?

- Users of the cognitive tutor will need to have access to a computer
- Users of the cognitive tutor will need to have knowledge of how to activate a computer program from either a CD or the Internet (depending on implementation)
- For online access the use will need to have access to a computer which has Internet access

Part II - DESIGN

1. **FLOWCHARTING:**

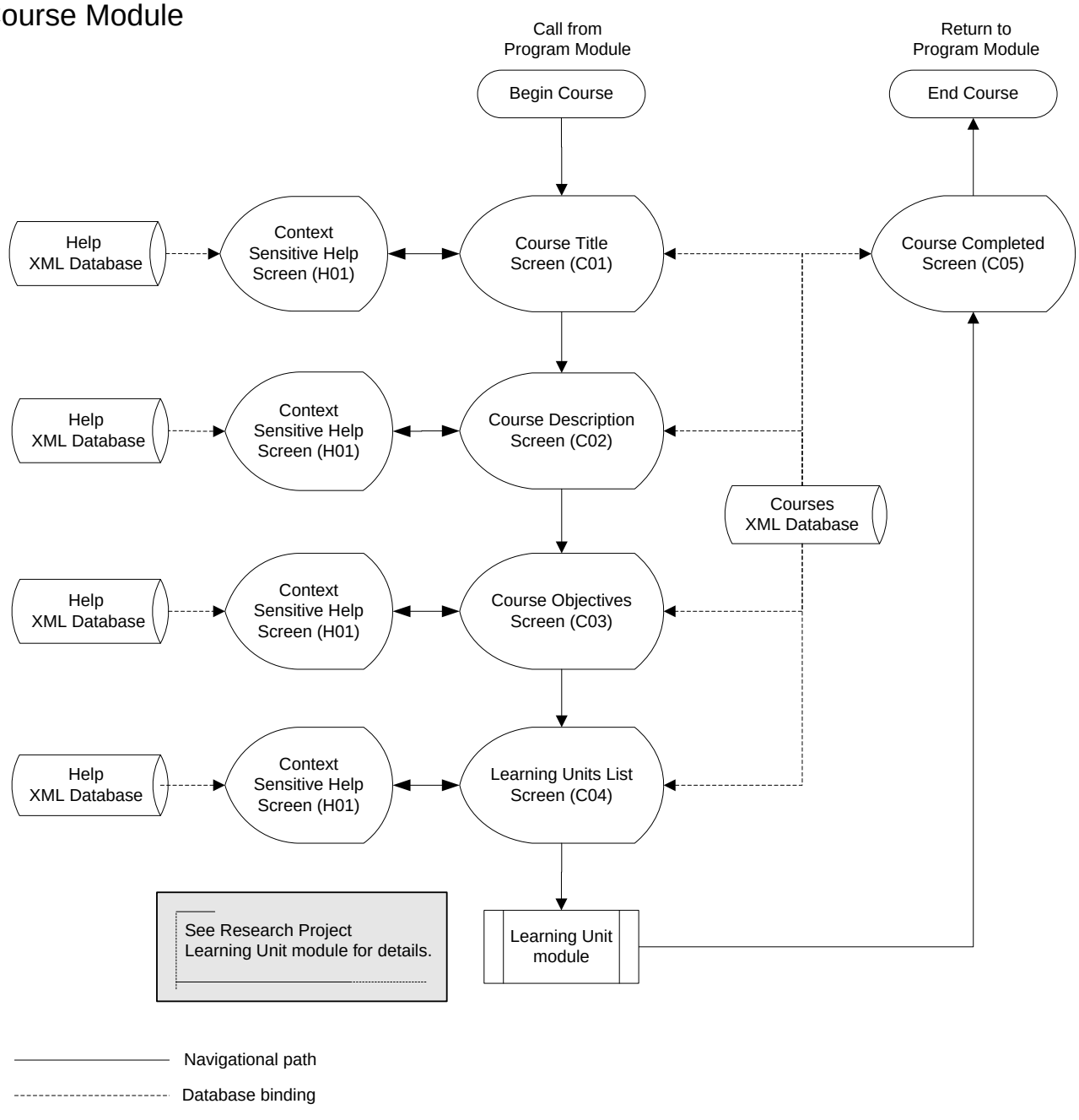
MSIDT
Research Project
Program Module



MSIDT

Research Project

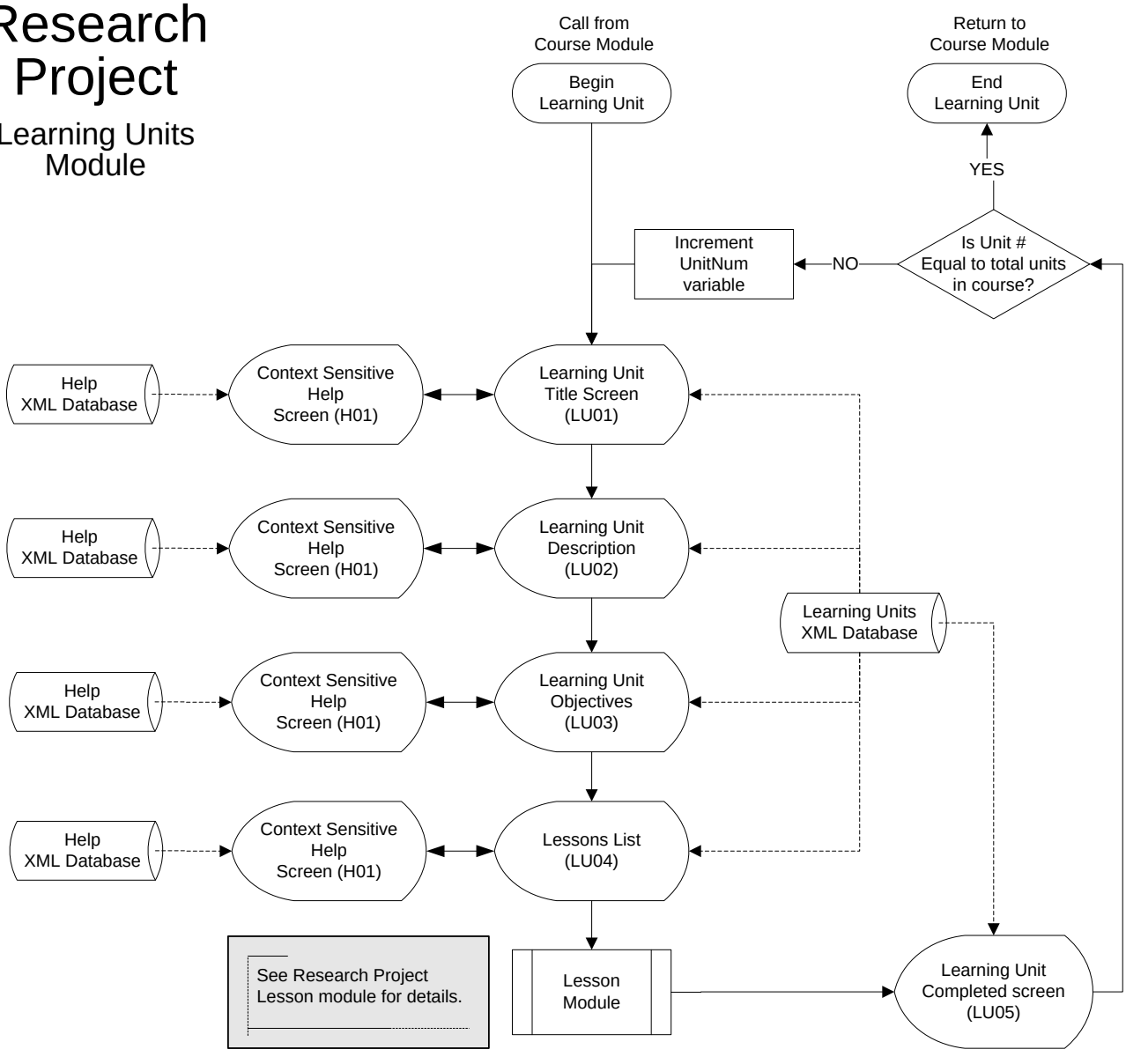
Course Module



MSIDT

Research Project

Learning Units Module



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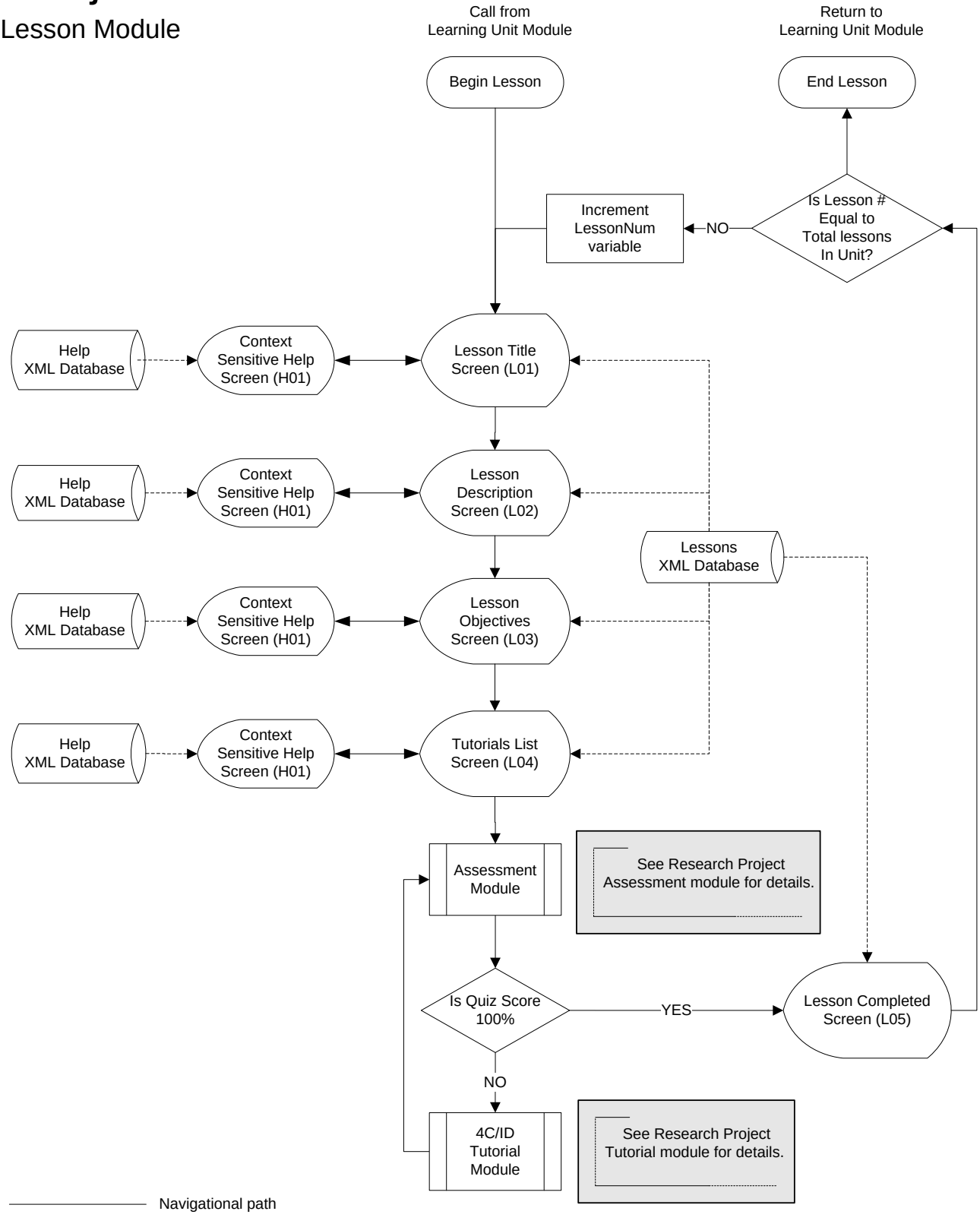
Lesson Module



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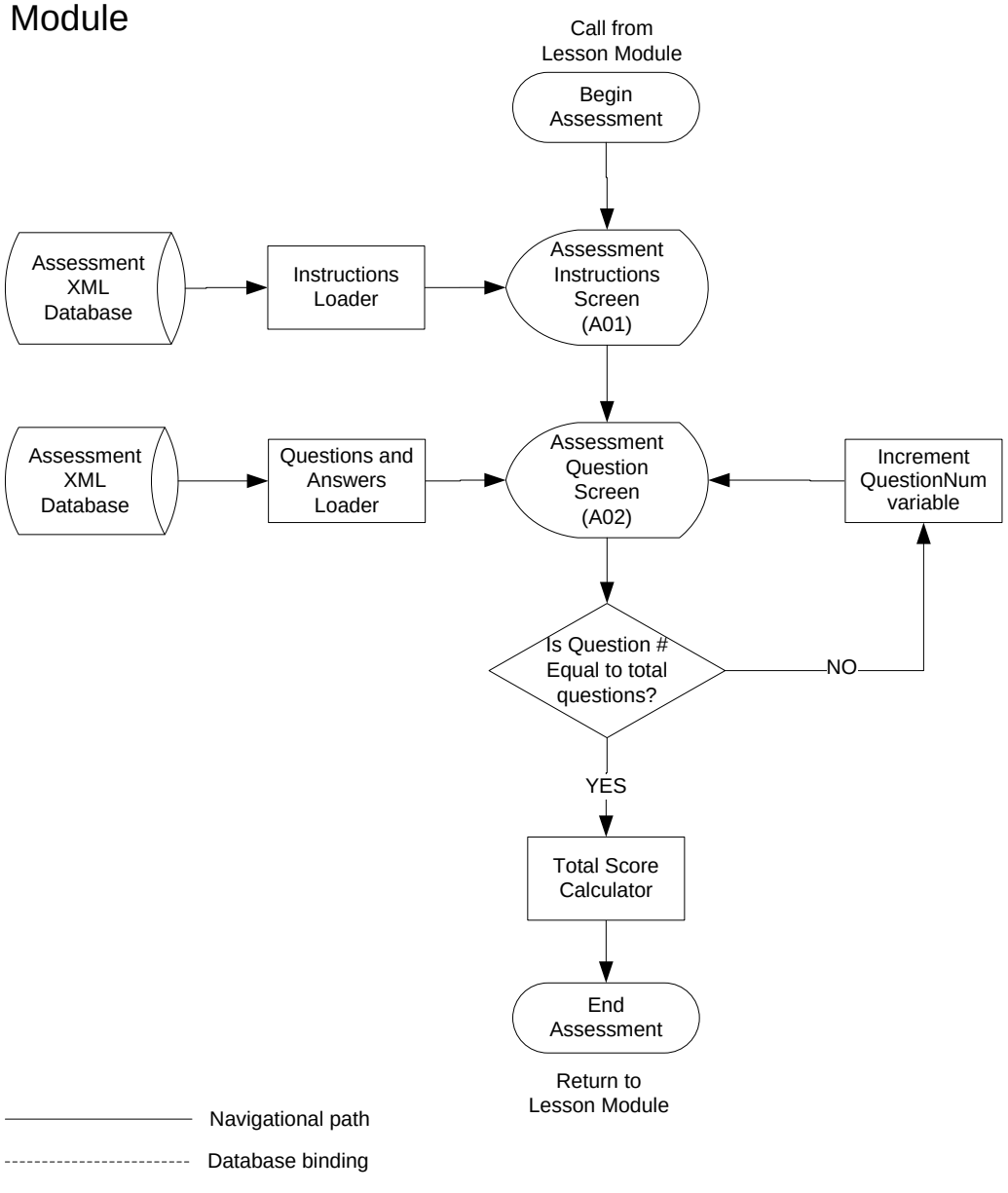
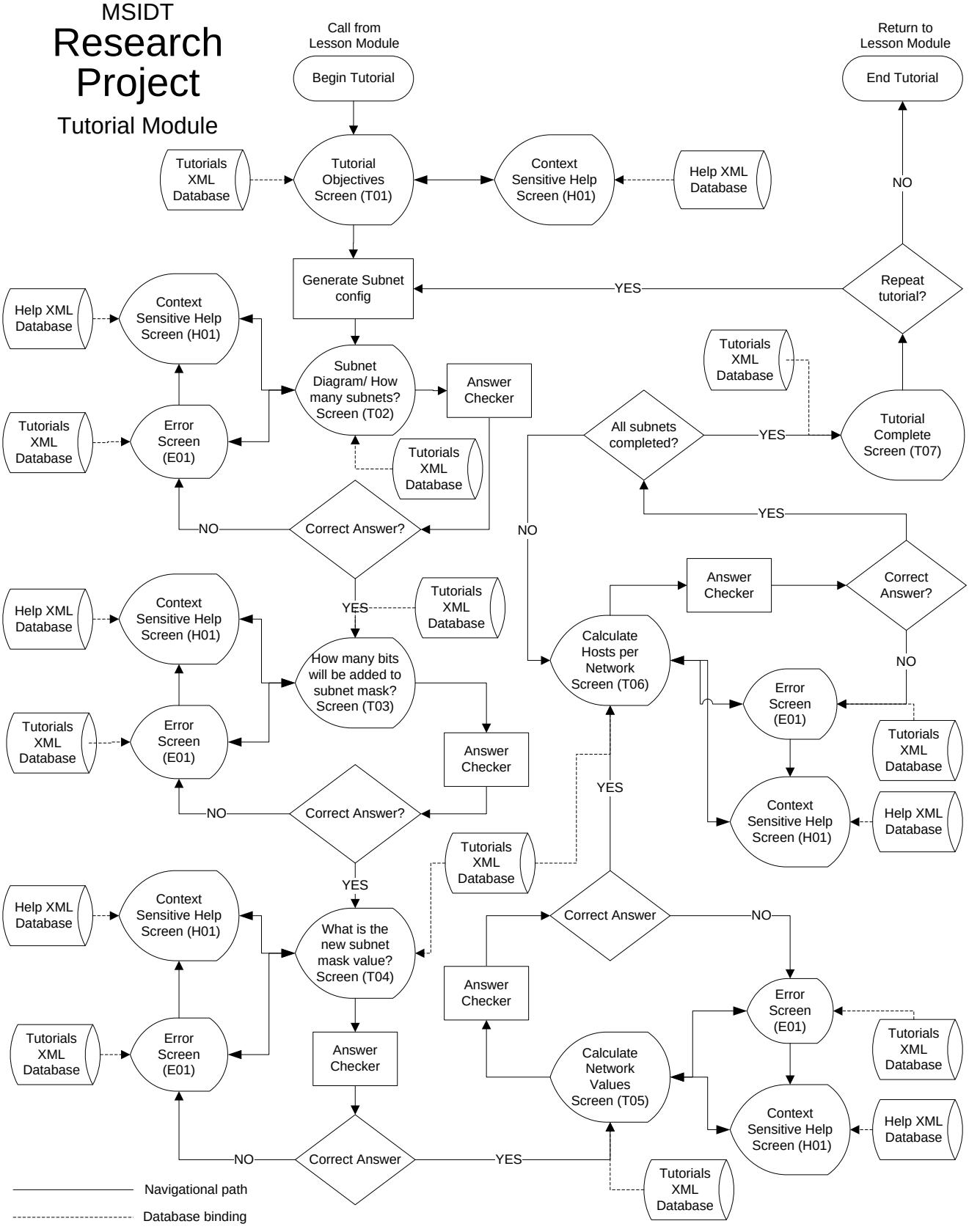
Assessment Module



MSIDT

Research Project

Tutorial Module



2. **SCREEN DESIGN PROTOTYPE:**

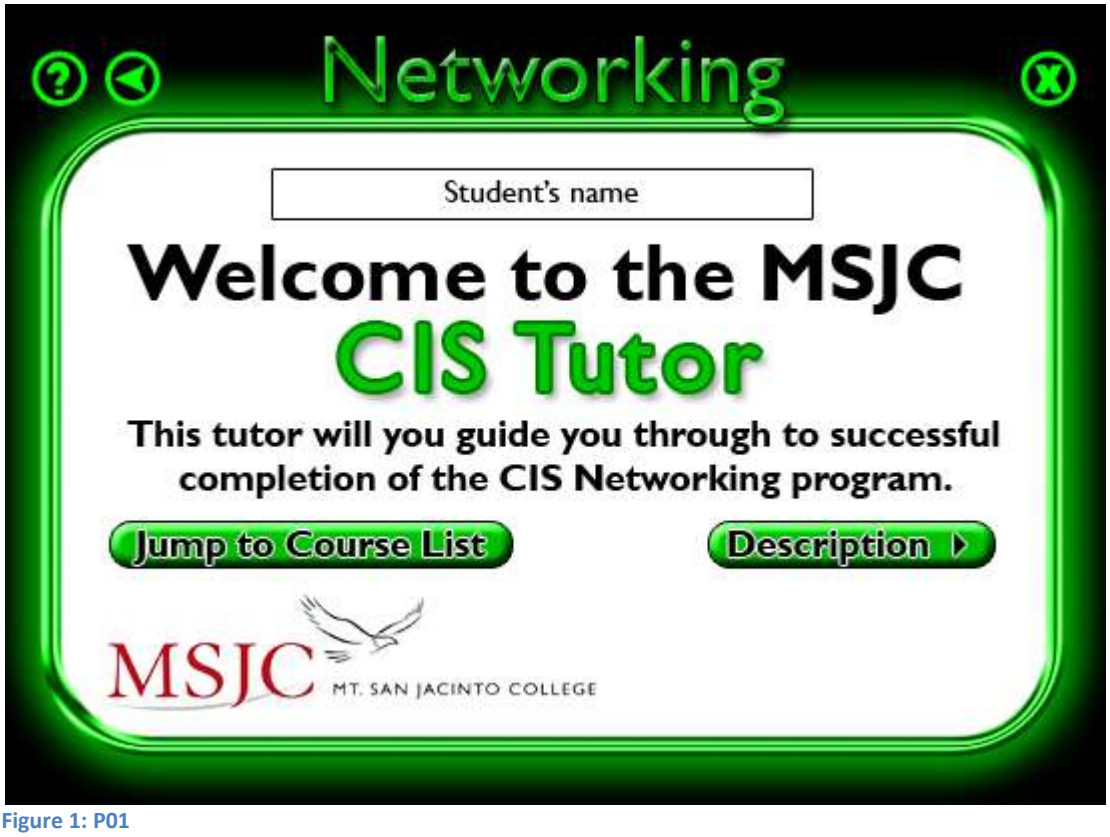


Figure 1: P01

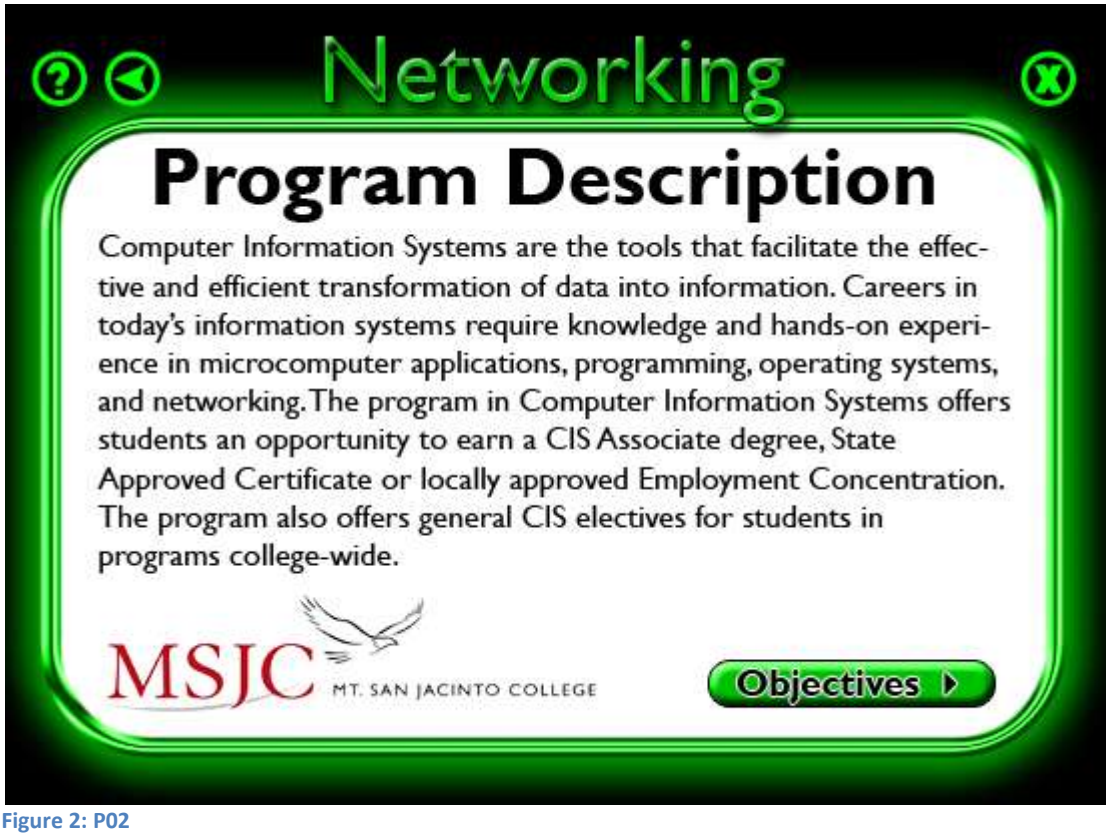


Figure 2: P02

Figure 3: P03

Figure 4: P04

Figure 5: P05

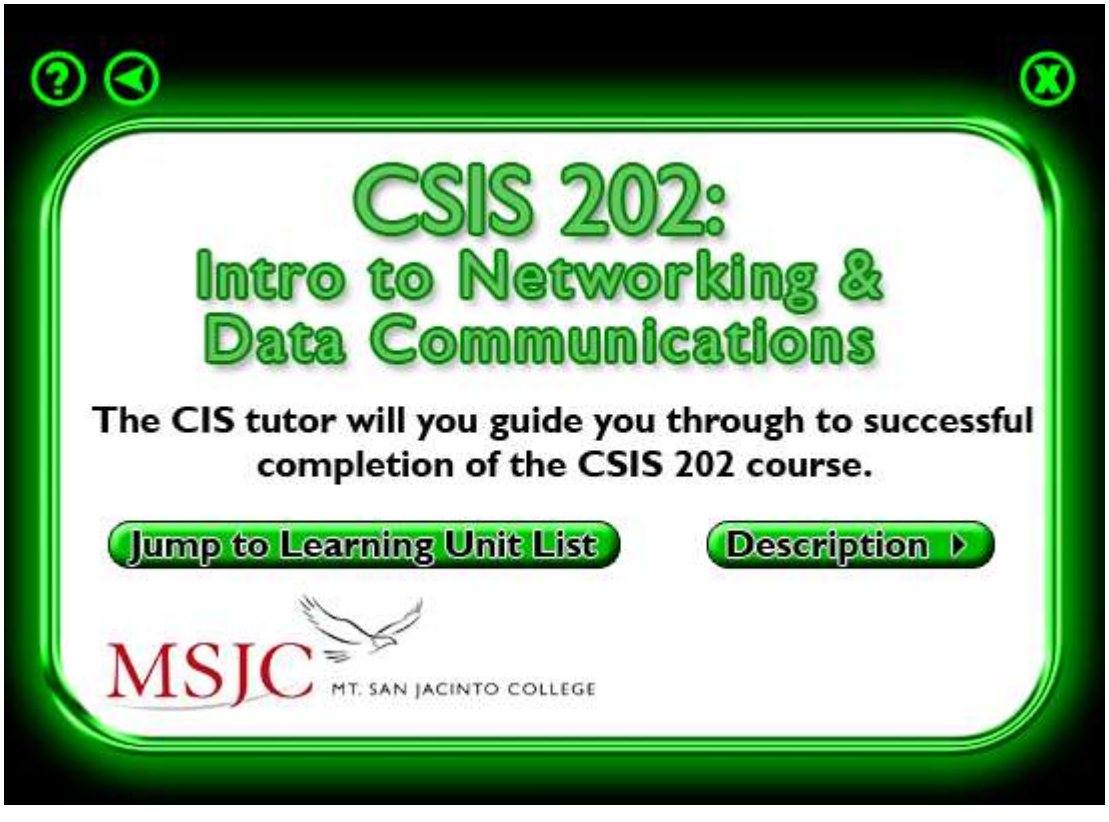


Figure 6: C01

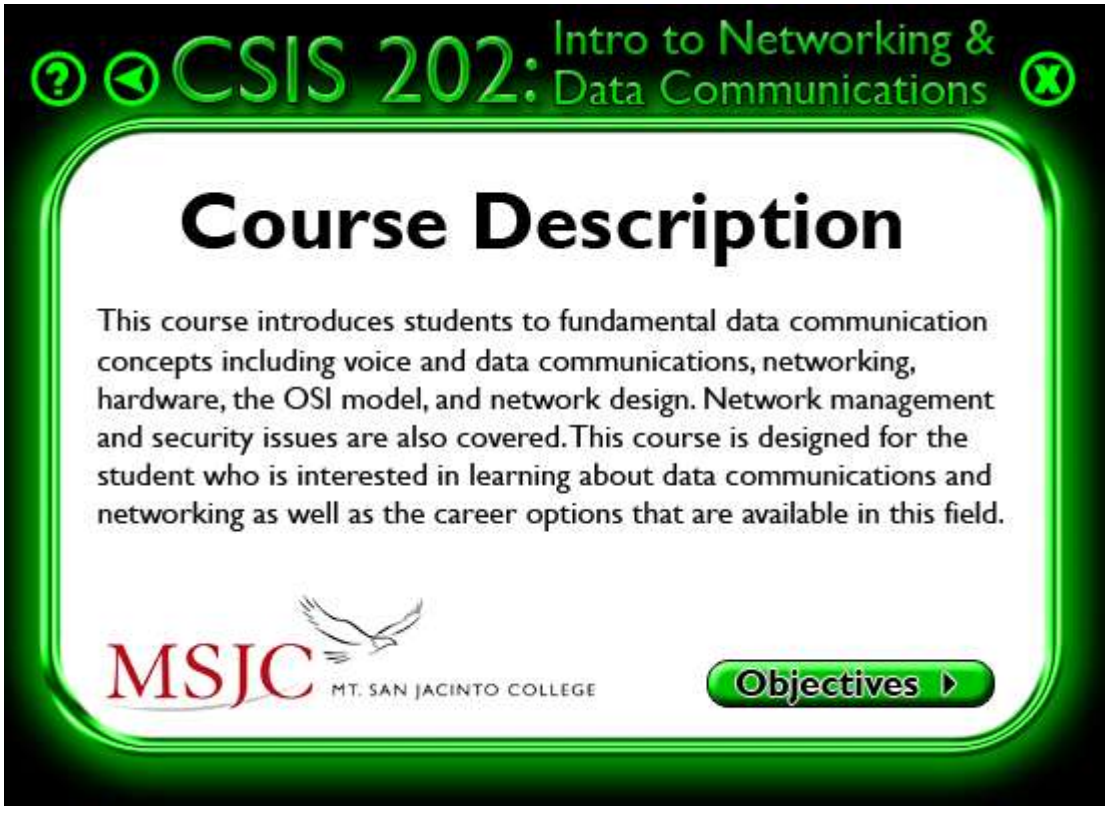


Figure 7: C02

Figure 8: C03

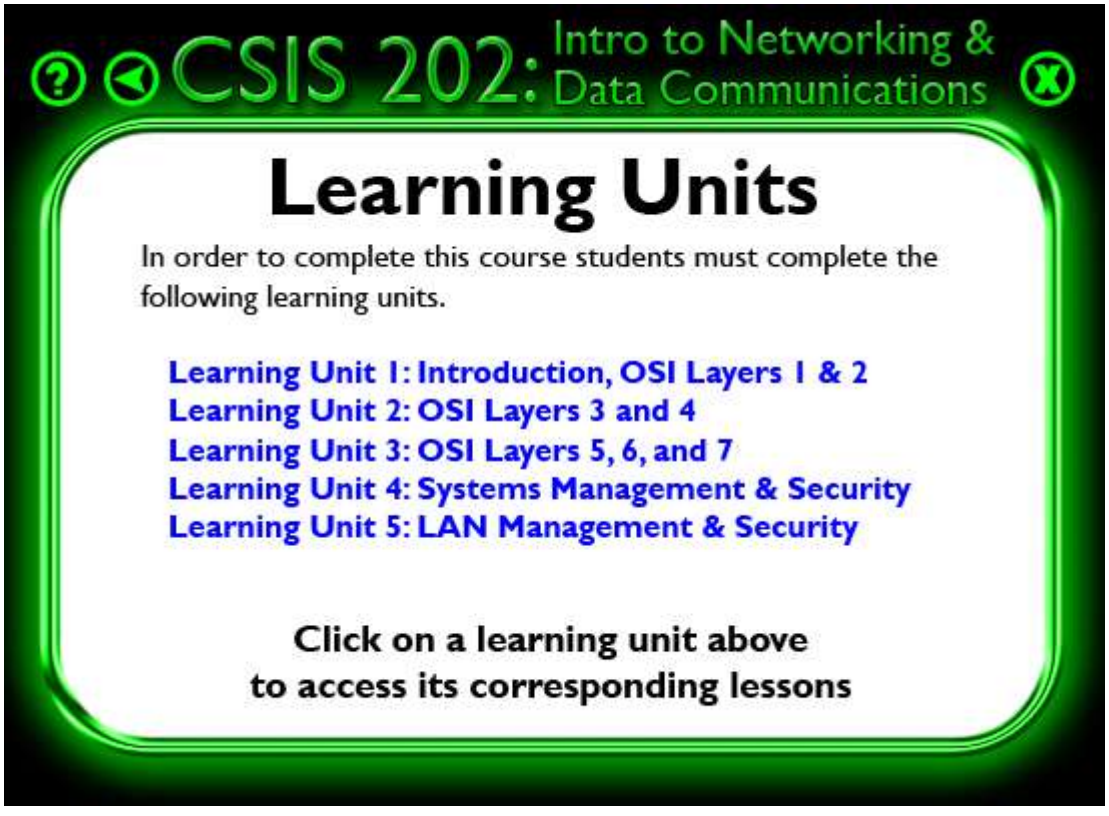


Figure 9: C04

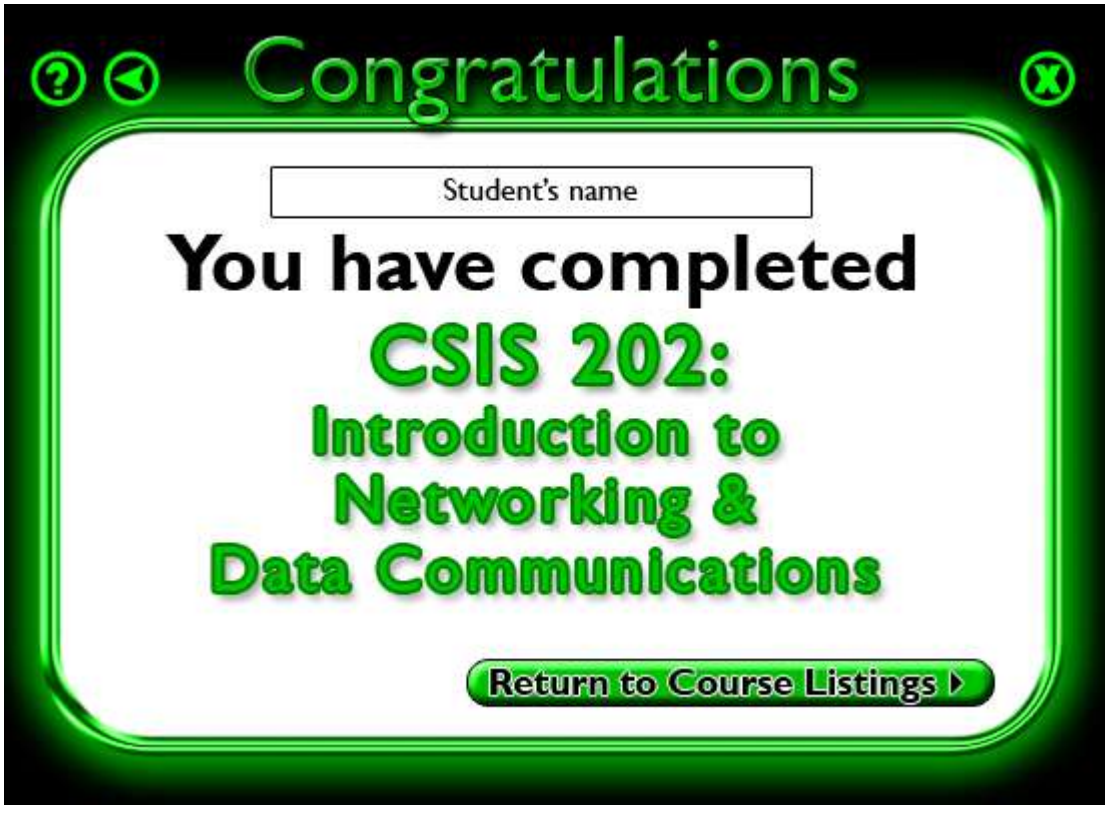


Figure 10: C05

Figure 11: LU01

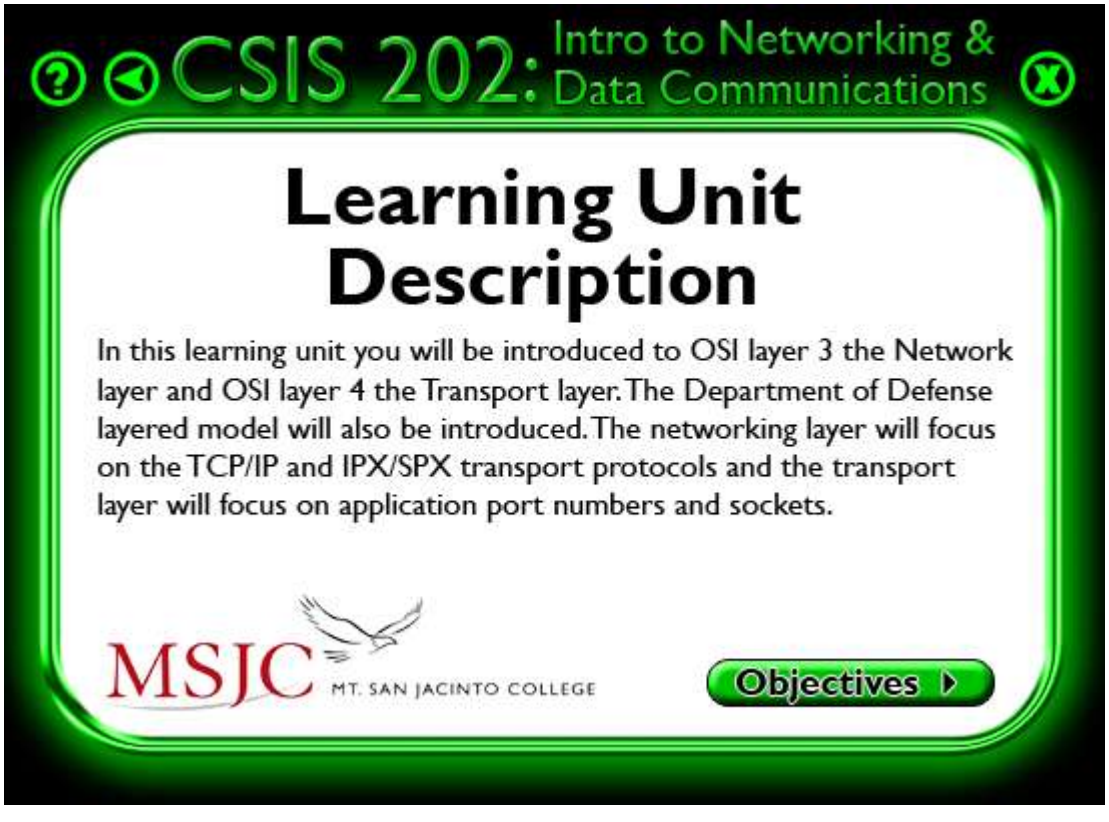


Figure 12: LU02

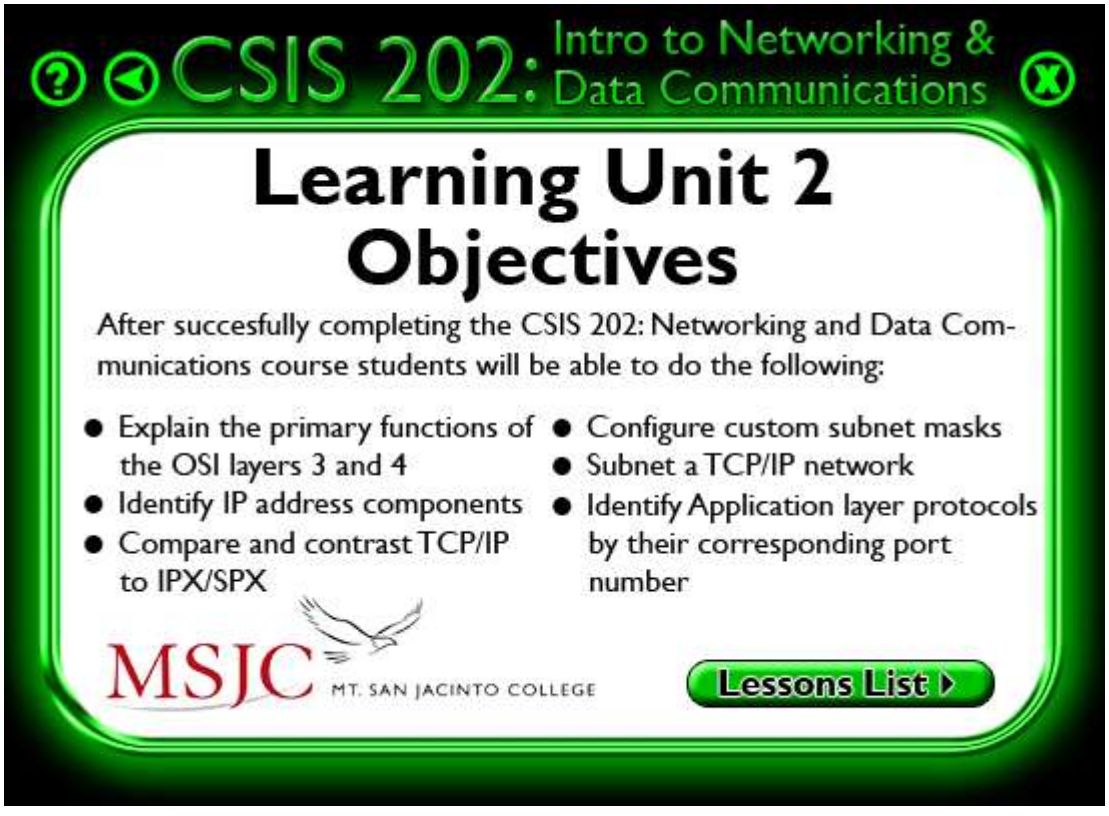


Figure 13: LU03

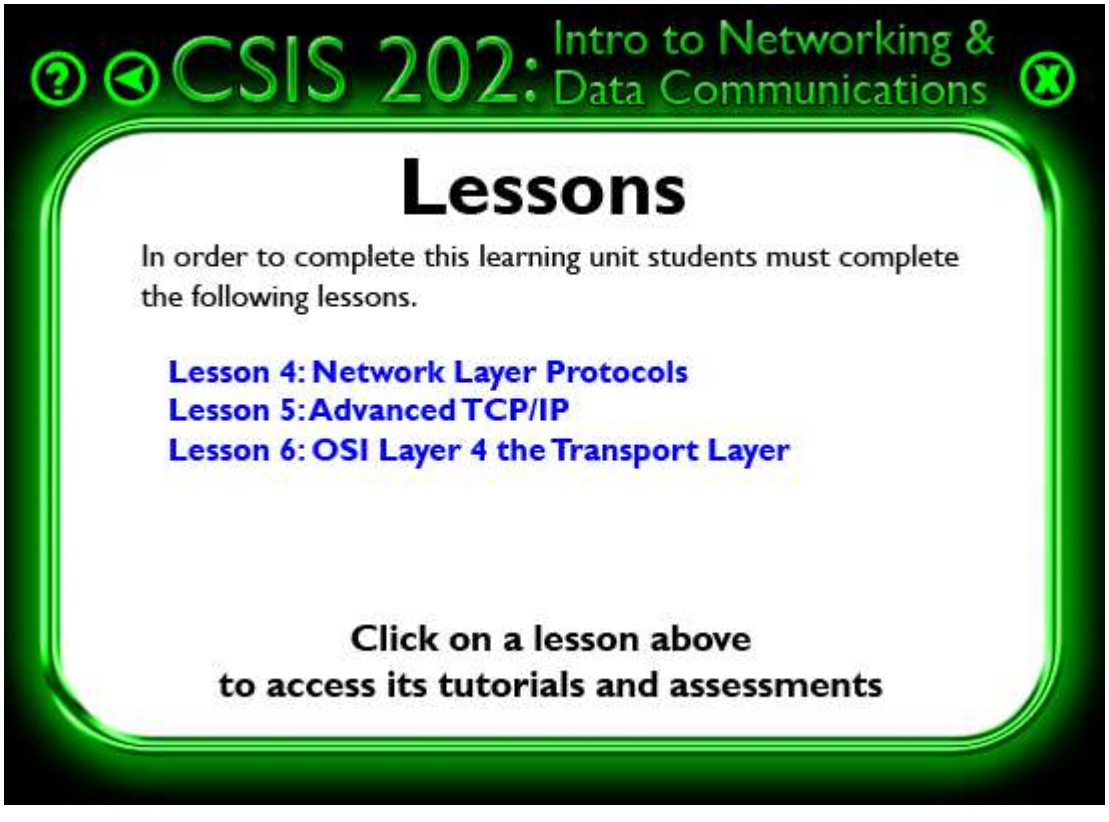


Figure 14: LU04

Figure 15: LU05

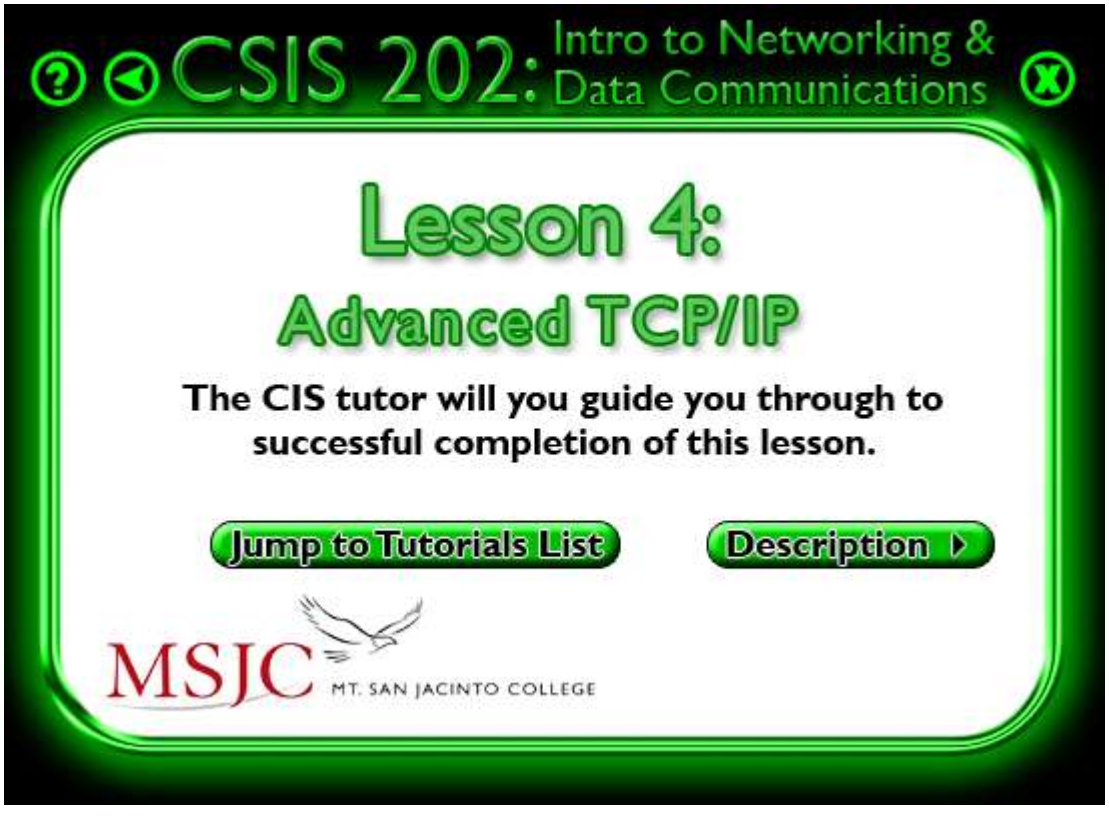


Figure 16: L01

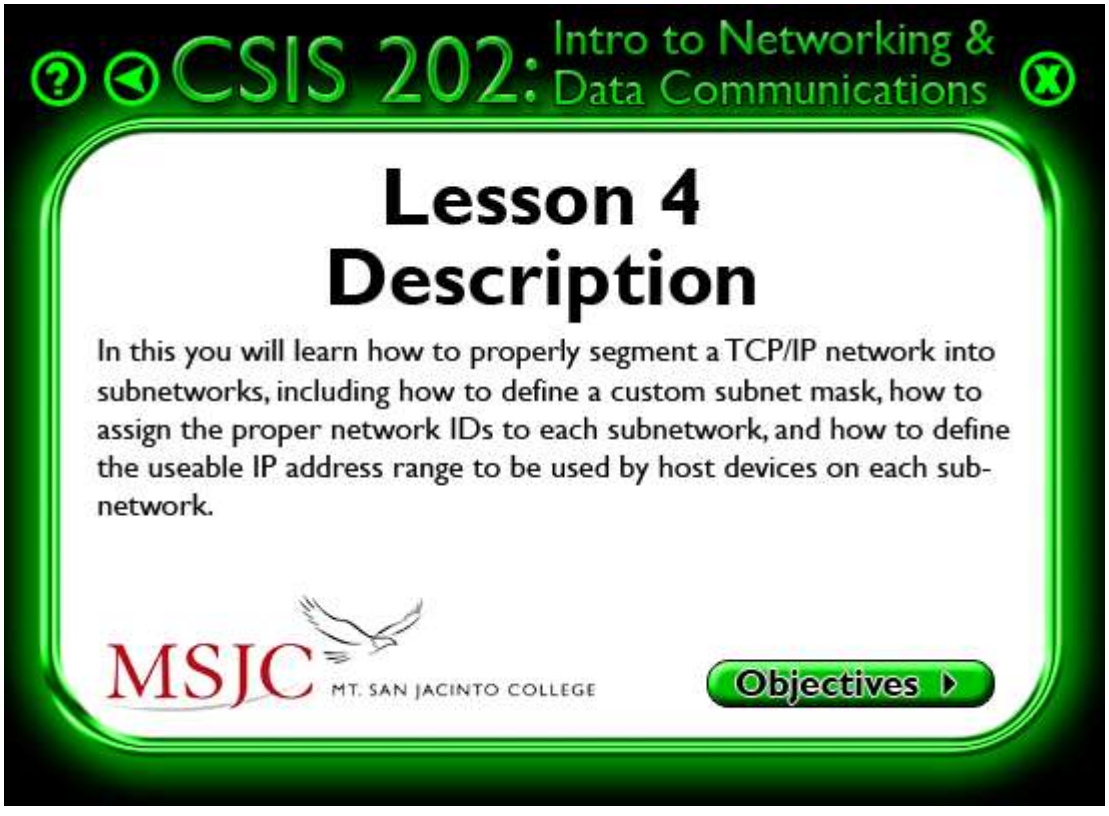


Figure 17: L02

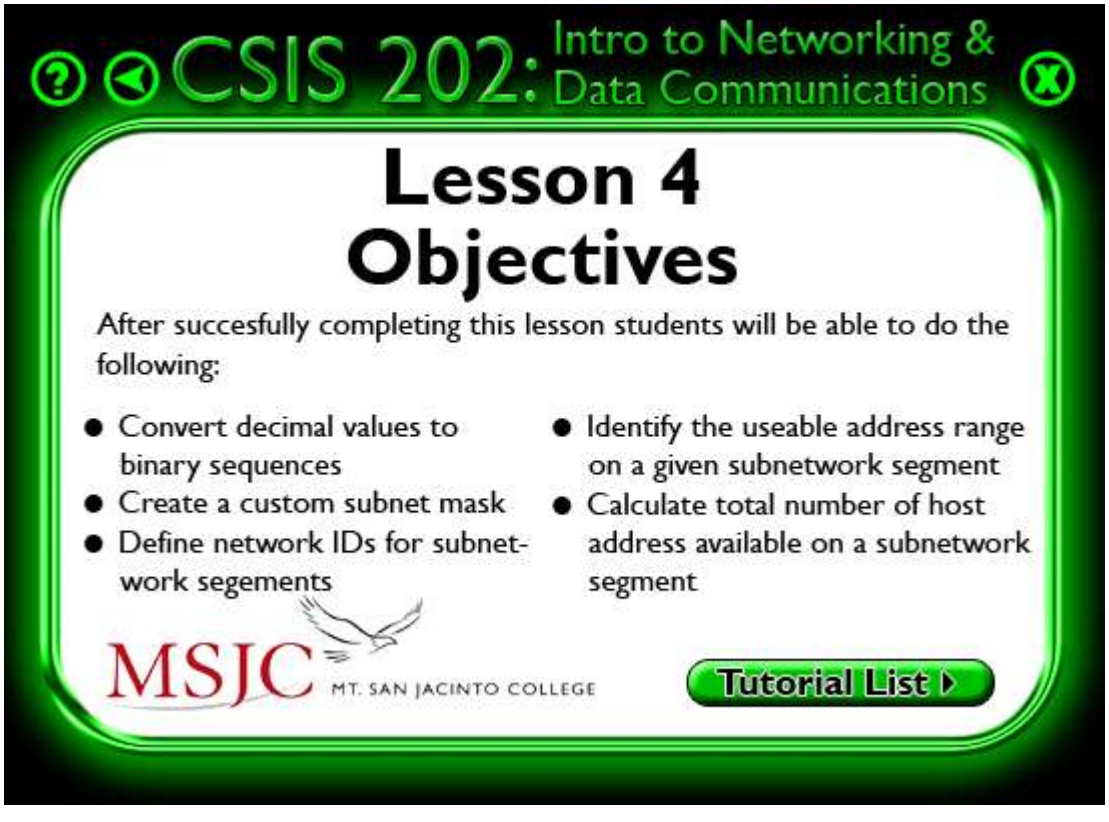


Figure 18: L03

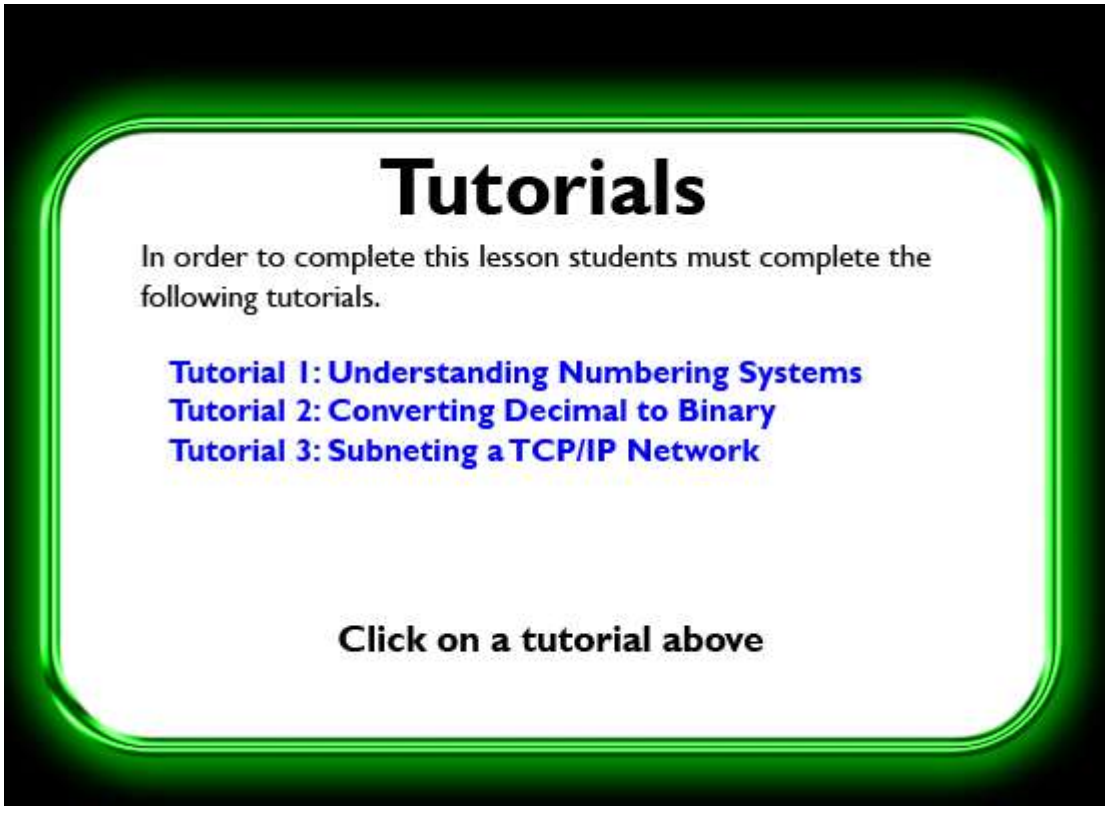
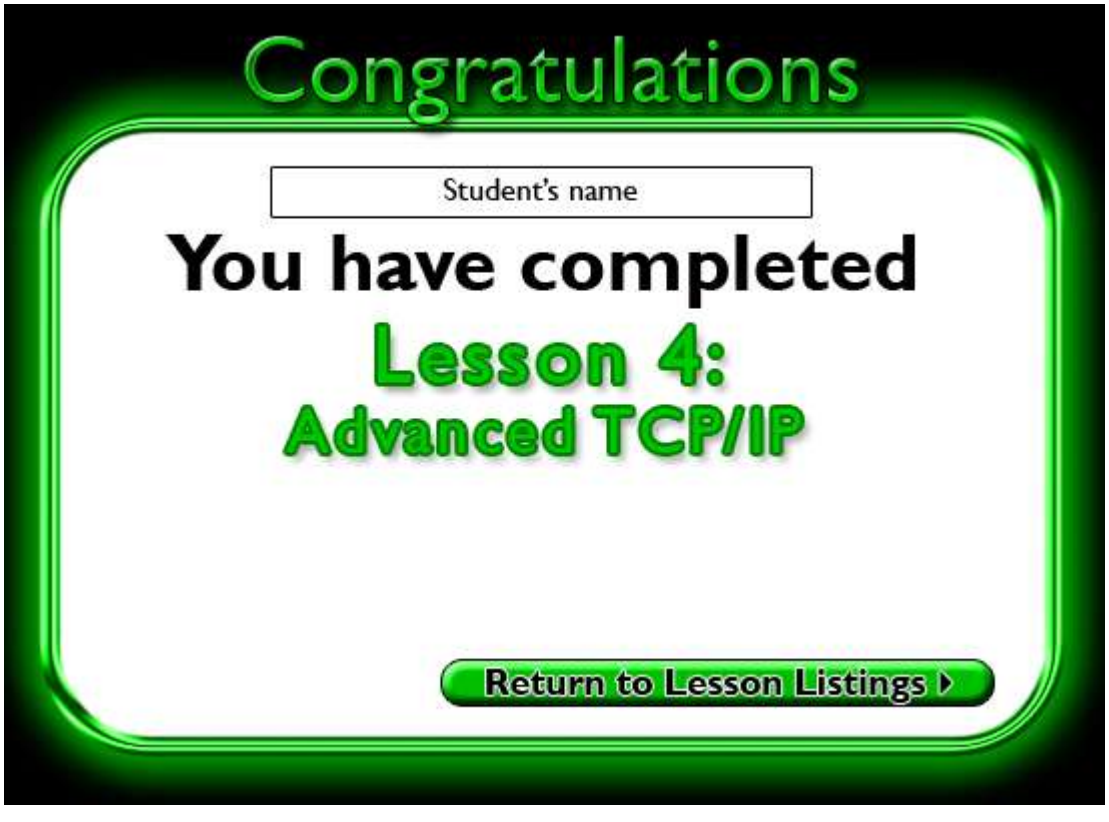


Figure 19: L04



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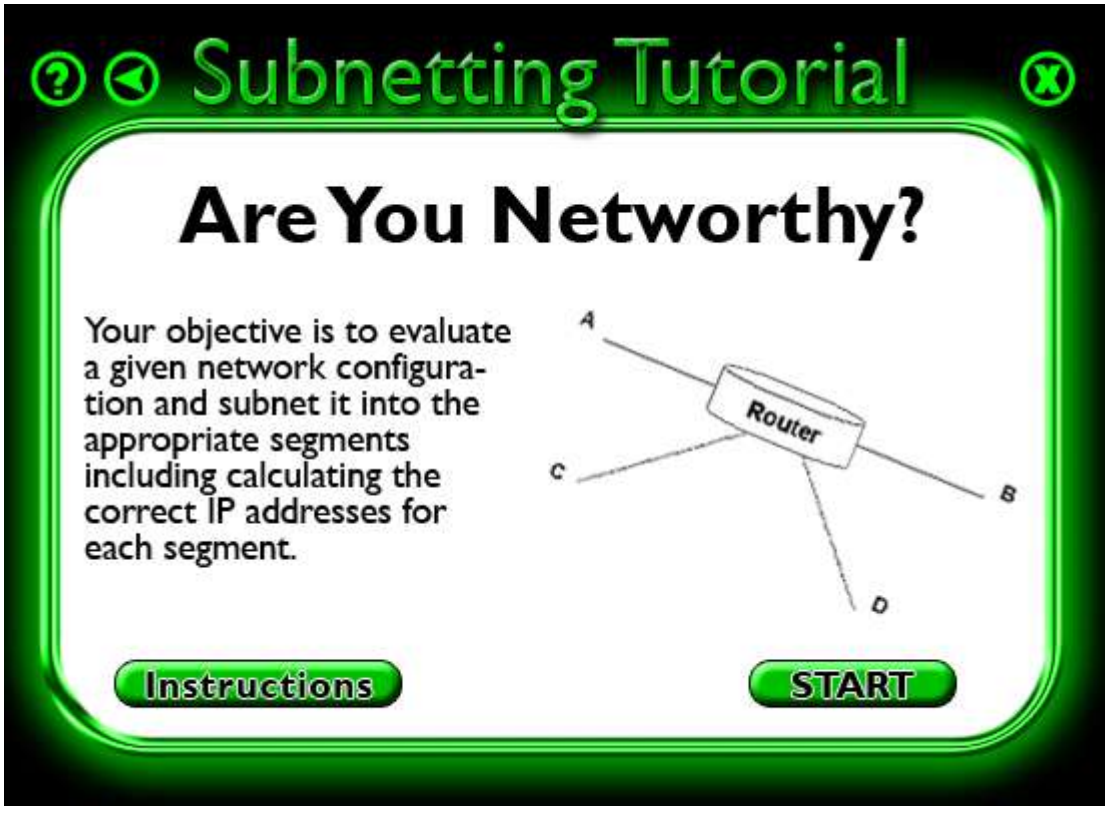

Figure 21: T01

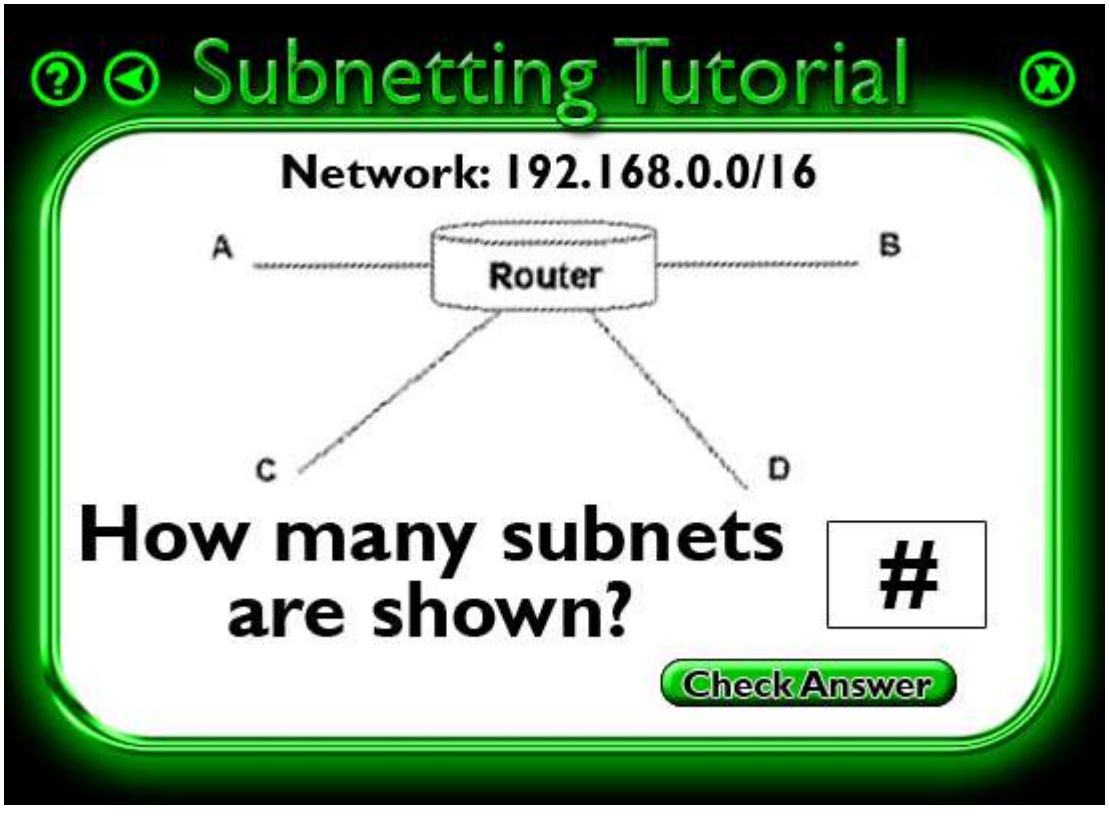

Figure 22: T02

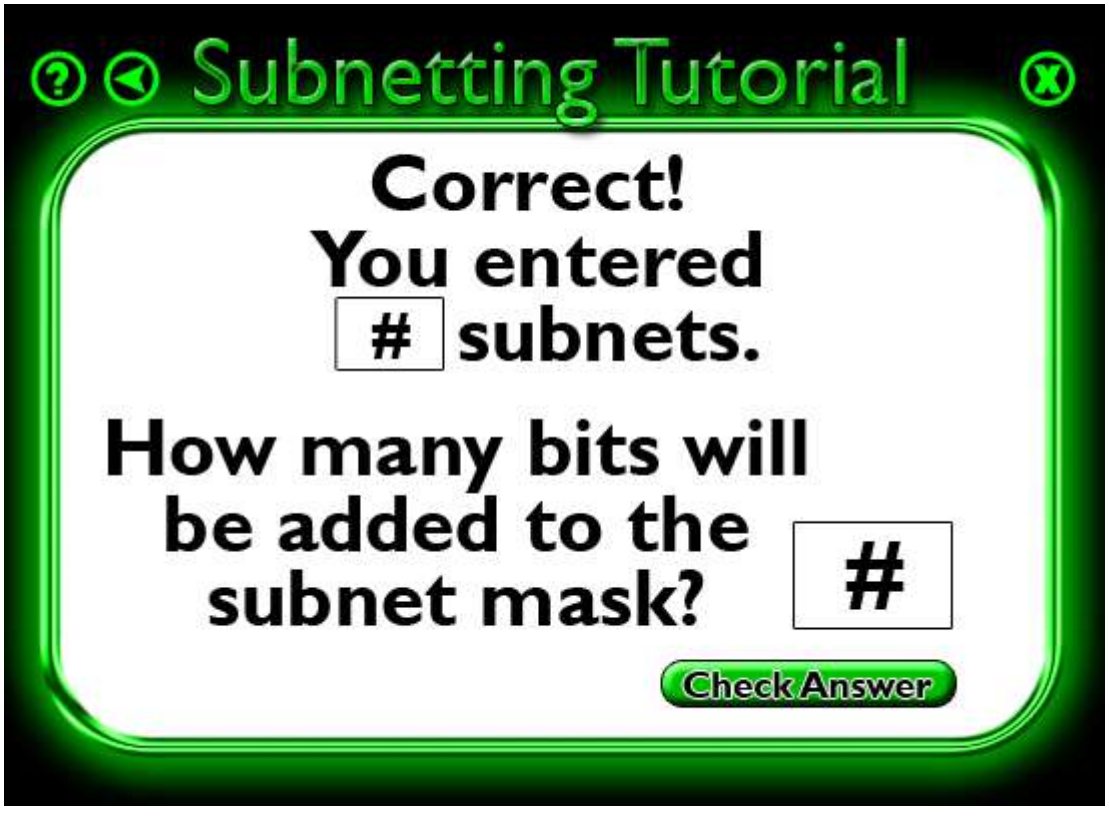

Figure 23: T03

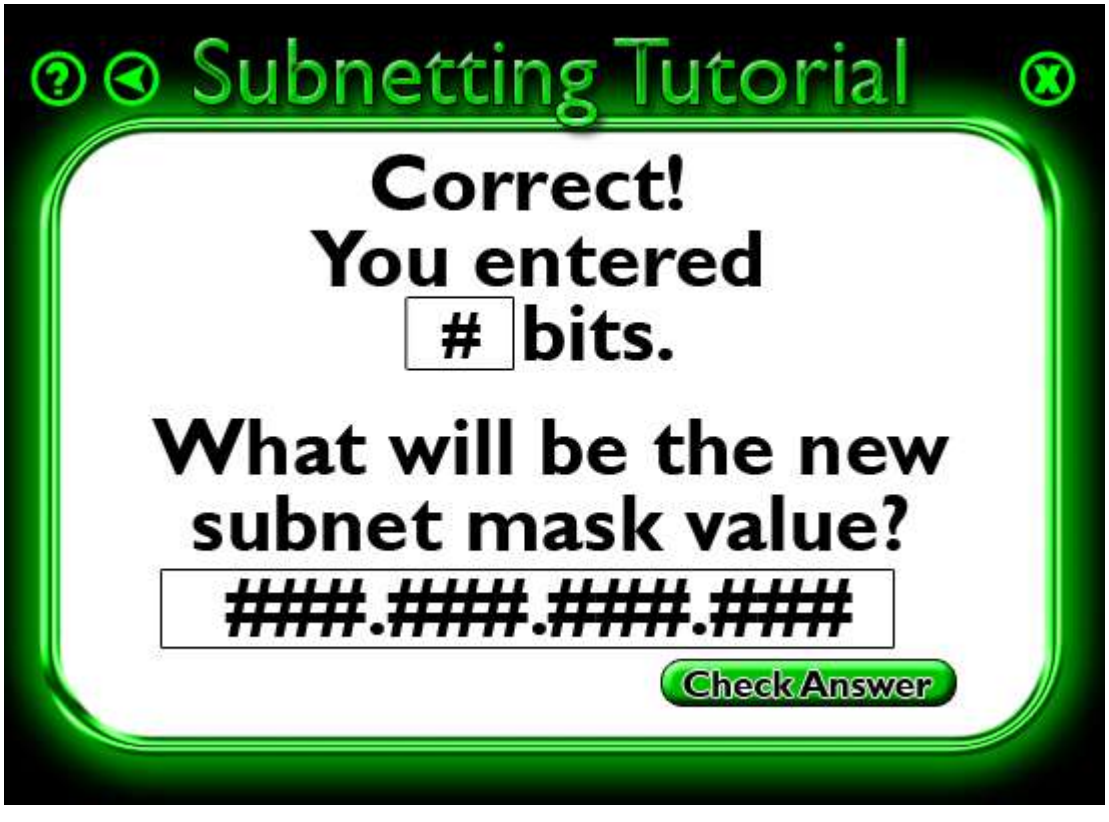

Figure 24: T04

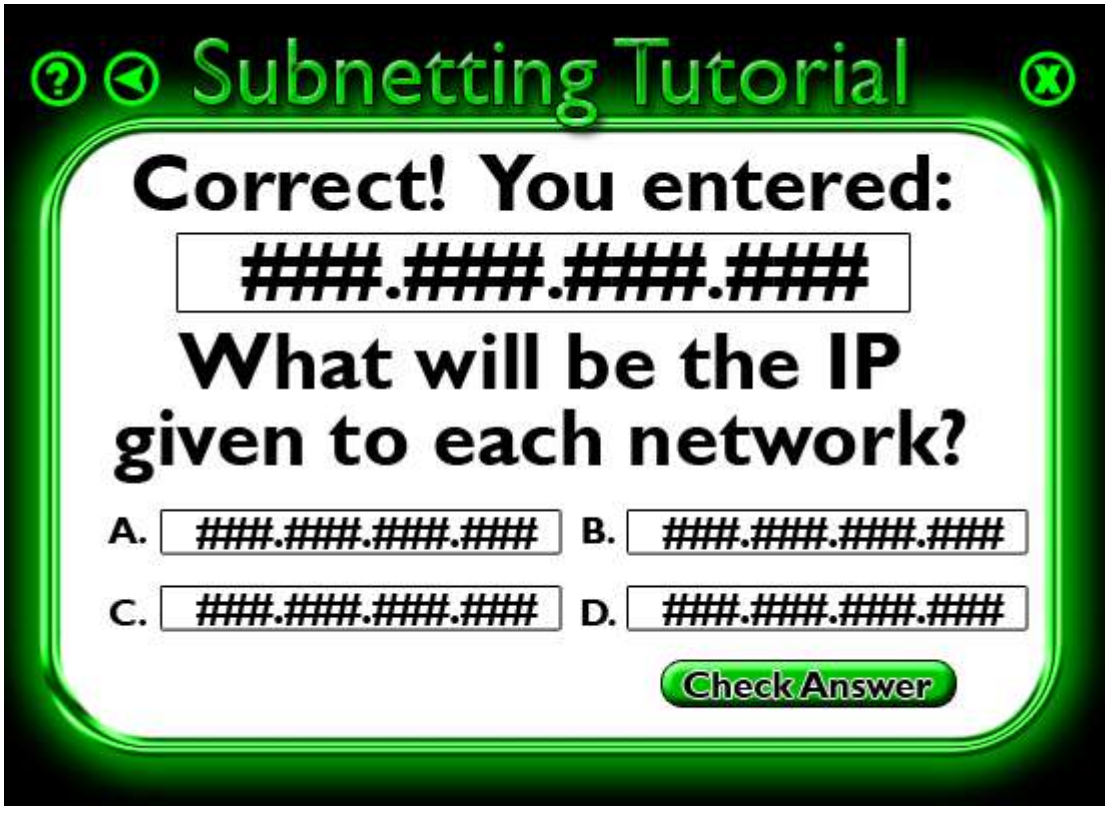

Figure 25: T05

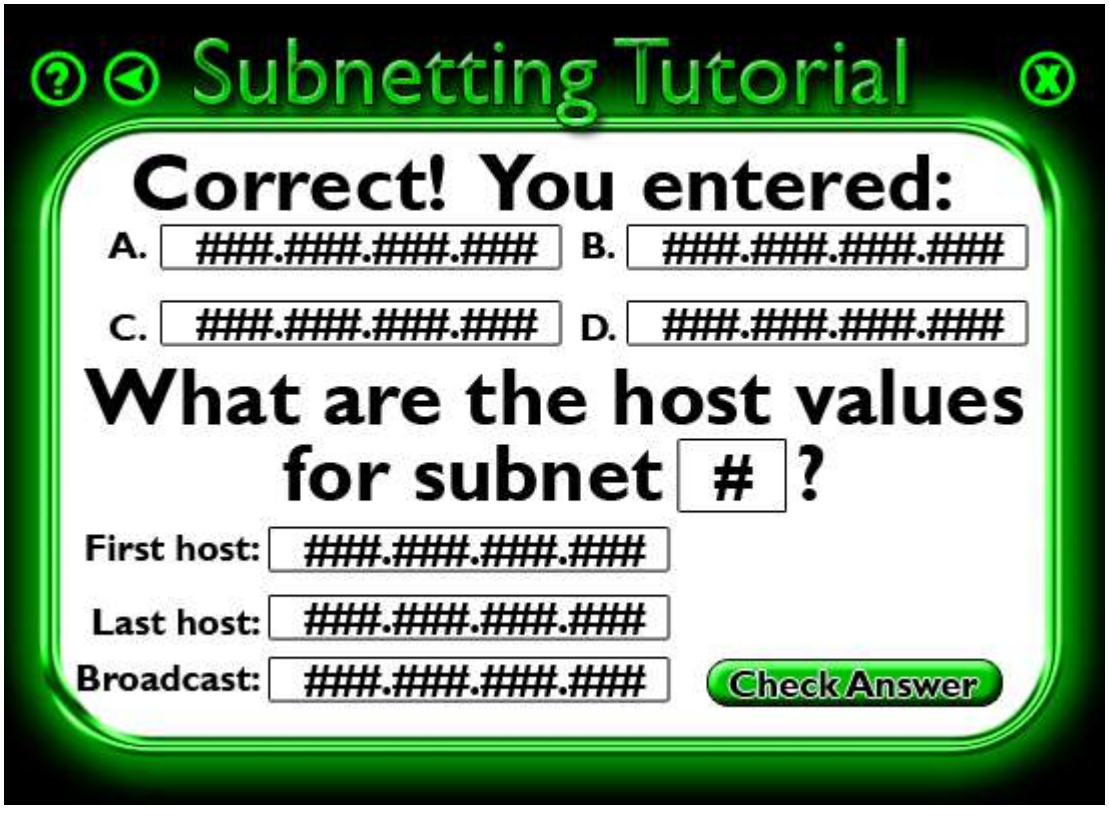

Figure 26: T06

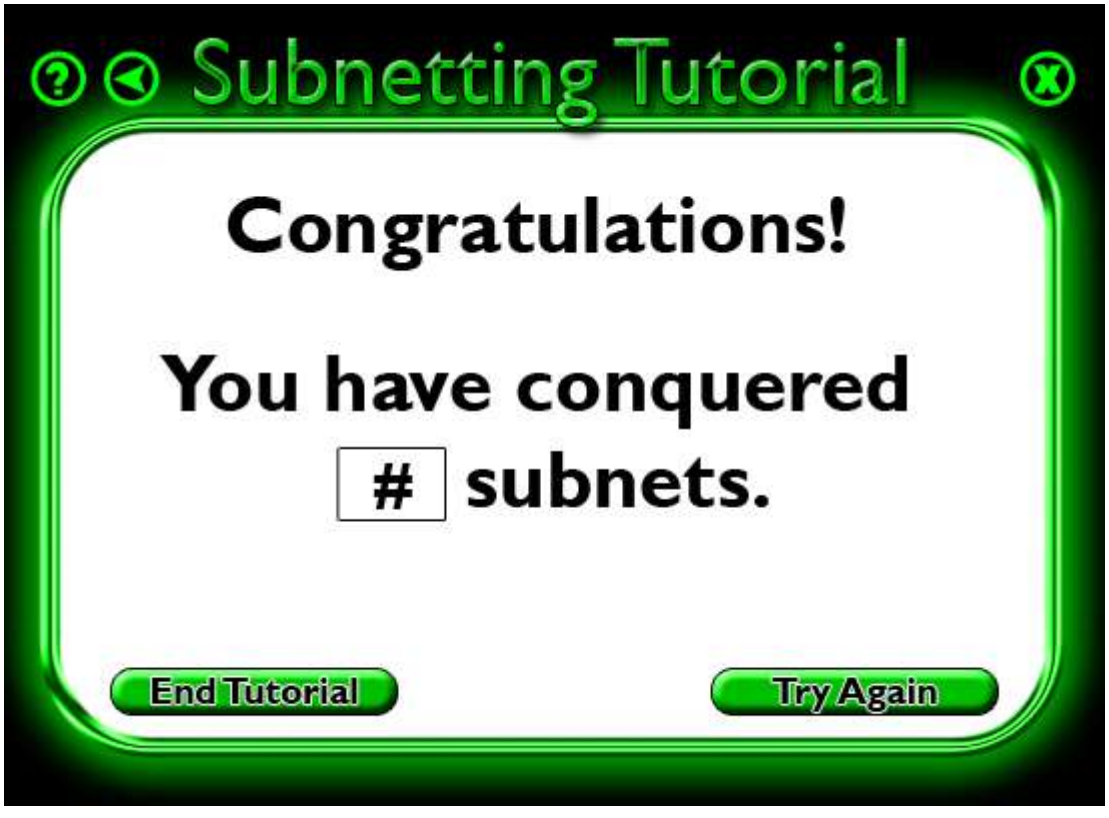

Figure 27: T07

Figure 28: E01

Figure 29: H01

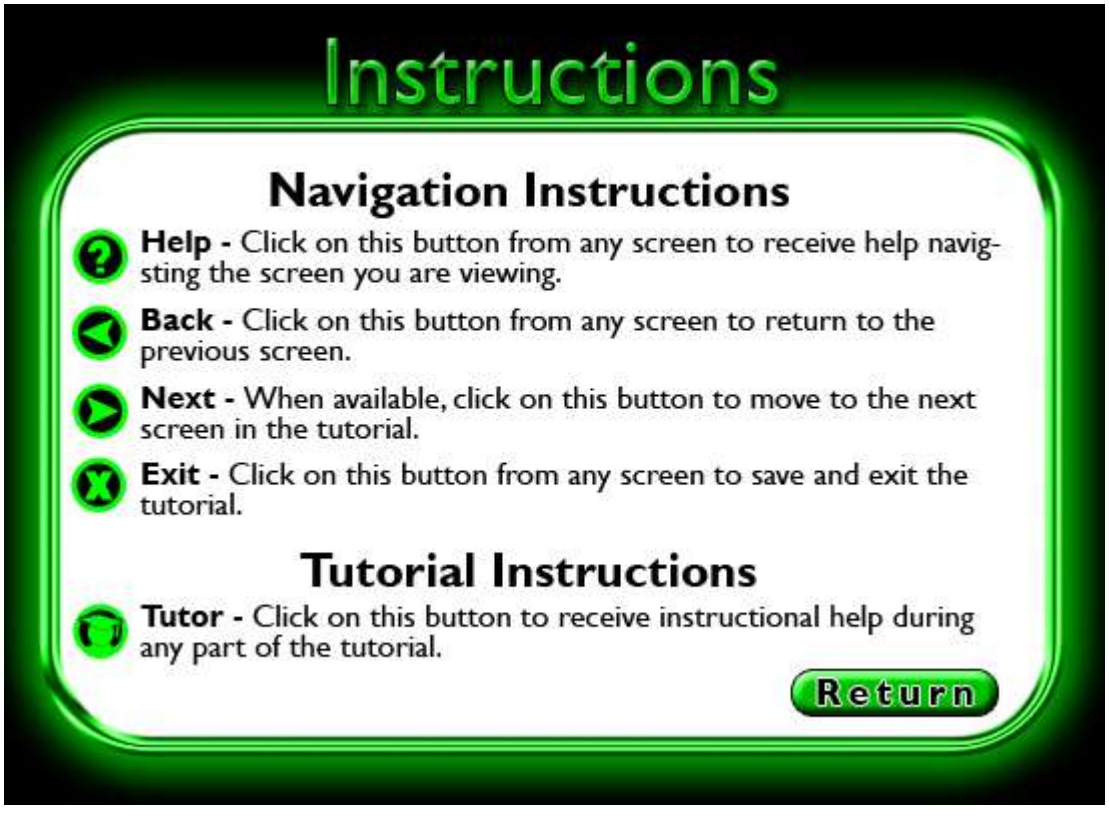

Figure 30: I01

3. **LEARNING & INTERACTIVE STRATEGIES:**

The cognitive tutor will consist of several types of instructional media including real world tasks, interactive tutorials, instructional videos, learning objectives to focus learners on intended outcomes, part-task practice, just-in-time feedback, random practice, partially worked examples, faded-worked examples, cognitive and skills-based assessments.

4. **NAVIGATIONAL CONTROLS:**

The cognitive tutor will use standard forward and backward navigation using next and back arrows in a global navigation bar when acceptable. Most of the cognitive tutor screens guide the user through the program step-by-step with buttons clearly marked as to their purpose. A context-sensitive Help button will be readily available from the global navigation bar at the top of each screen. Users who are operating the cognitive tutor within a learning management system will have the ability to bookmark their progress in the program for a quick and easy return to where they left off.

5. **INTERACTIVE CONTROLS:**

The cognitive tutor will use several types of assessment to evaluate the user learning progress which are all internally generated and, when installed in a learning management system, automatically recorded as the user progresses through the program. The assessment methods will include but are not limited to: partially-worked examples, faded examples, task completion assessment, concept attainment, reflection prompts, random practice, cognitive and skills-based.

Part III - IMPLEMENTATION

1. **FIELD-TESTING:**

   I will be enlisting several colleagues whom I consider to be very informed and skilled at online instruction to evaluate the cognitive tutor and provide me with their feedback concerning its ability to perform the intended goal, as wells its navigational coherence, and aesthetic and motivational appeal.

2. **RESULTS OF FIELD TESTING:**

   TBD

3. **MODIFICATIONS:**

   TBD