CS 300 Project One Milestone Three Guidelines and Rubric

Overview

This milestone will help prepare you for **Project One**.

In this milestone, you will continue working on a task for ABC University (ABCU). ABCU is looking for software to help its computer science advisors access course information for students. To do this, you will use what you have learned about data structures. In this milestone, you will create pseudocode for the Computer Science department at ABCU. This code will demonstrate your ability to import data from a file and store it in the tree data structure.

Directions

For this milestone, you will create pseudocode to load data into the tree data structure. There is no programming work in this milestone. You will develop pseudocode to help you carry your design in Project One.

Note: Throughout this milestone, we will use the word *course* to refer to the courses in the curriculum instead of *class*. *Class* has another meaning in object-oriented programming.

Specifically, you must address the following rubric criteria:

1. **Design pseudocode to define how the program opens the file, reads the data from the file, parses each line, and checks for file format errors.** The Course Information document linked in the Supporting Materials section contains all the information about how the courses required in the Computer Science curriculum for ABCU will be stored in the data file. Each line will consist of information about a single course including the course number, title, and prerequisites. The Course Information document includes the course data and a diagram of how the program will execute.

   Your pseudocode will need to validate the sample file to make certain it is formatted correctly and check for the following items:

   A. There are at least two parameters on each line. Some courses may not have any prerequisites.

   B. Any prerequisite that is provided on a line exists as a course in the file. In other words, any prerequisite at the end of a line must have another line in the file that starts with that course number.

2. **Design pseudocode to show how to create course objects and store them in the appropriate data structure.** Your pseudocode should show how to create course objects so that one course object holds data from a single line from the input file. Knowing the file format will help you parse and store each token of data in the appropriate course object instance variable. You should store each course object in the binary search tree data structure. Once the entire file has been processed, the binary search tree data structure will have multiple course objects, one per line in the file. **Hint**: You will need a loop to process all lines from the file and a struct to hold all the data from a single course.

3. **Design pseudocode that will print out course information and prerequisites**. Pseudocode for printing course information using a vector data structure is provided as an example in the Pseudocode Document linked in the Supporting Materials section. Develop the pseudocode for printing course information for the tree data structures using the base code that has been provided.

What to Submit

To complete this project, you must submit the following item:

Pseudocode

Your submission should include your completed pseudocode formatted as a Word document.

Supporting Materials

The following resources will support your work on the milestone:

Reading: Course Information

This document outlines the courses and pathway you will be designing for.

Reading: Pseudocode Document

This document provides sample pseudocode and a runtime analysis to support your work in this milestone. You already began work on the vector and hash table portions of this document during Project One Milestones One and Two. For this milestone, you should add to the work you completed by writing in the tree portion of the document you submitted previously. Note that the original Pseudocode Document is only provided again for reference.

Project One Milestone Three Rubric

Criteria	Proficient (100%)	Needs Improvement (85%)	Not Evident (0%)	Value
File Input	Designs pseudocode to open a file, read the data from a file, parse each line, and check for file format errors	Shows progress toward proficiency, but with errors or omissions; areas for improvement may include ensuring all parameters on each line are read and that any prerequisite exists as a class in the file	Does not attempt criterion	35
Course Object Pseudocode	Designs pseudocode that defines an object to hold data from an input file in the appropriate data structure	Shows progress toward proficiency, but with errors or omissions in the pseudocode; areas for improvement may include designing pseudocode for the appropriate data structure	Does not attempt criterion	30

Criteria	Proficient (100%)	Needs Improvement (85%)	Not Evident (0%)	Value
Print Course Information Pseudocode	Designs pseudocode that will print out information from a data structure that meets requirements	Shows progress toward proficiency, but with errors or omissions; areas for improvement may include searching for a single course, printing out prerequisites, or passing the appropriate data structure as a parameter	Does not attempt criterion	30
Articulation of Response	Clearly conveys meaning with correct grammar, sentence structure, and spelling, demonstrating an understanding of audience and purpose	Shows progress toward proficiency, but with errors in grammar, sentence structure, and spelling, negatively impacting readability	Submission has critical errors in grammar, sentence structure, and spelling, preventing understanding of ideas	5
			Total:	100%