CS 300 Project One Milestone One: Pseudocode

Overview

This pseudocode is designed to help prepare for Project One by outlining how to load course data into a vector data structure, validate the data, create course objects, and search for specific course information. This will demonstrate the ability to handle data structures and file operations in preparation for developing the software for ABC University (ABCU).

Directions

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.

pseudocode

Copy code

// Open the file

Open file "course\_data.txt" for reading

// Initialize a list to store courses

Initialize Vector<Course> courses

// Read the file line by line

While not EndOfFile(file)

Read line from file

Split line by comma into Array tokens

// Check for at least two parameters (courseNumber and name)

If Length(tokens) < 2

Print "Error: Incorrect format in line: " + line

Continue to next line

// Create a new Course object

Initialize Course course

course.courseNumber = tokens[0]

course.name = tokens[1]

// Add prerequisites if they exist

For i = 2 to Length(tokens) - 1

If not CourseExists(tokens[i], courses)

Print "Error: Prerequisite " + tokens[i] + " does not exist for course " + tokens[0]

Continue to next line

Add tokens[i] to course.prerequisites

// Add course to the vector

Add course to courses

Close file

2. Design pseudocode to show how to create course objects and store them in the appropriate data structure.

pseudocode

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// Define Course structure

Structure Course

String courseNumber

String name

Vector<String> prerequisites

// Function to check if a course exists in the vector

Function CourseExists(courseNumber, Vector<Course> courses)

For each course in courses

If course.courseNumber == courseNumber

Return true

Return false

3. Design pseudocode that will search the data structure for a specific course and print out course information and prerequisites.

pseudocode

Copy code

// Function to search for a course and print its information

Function SearchCourse(Vector<Course> courses, String courseNumber)

For each course in courses

If course.courseNumber == courseNumber

Print "Course Number: " + course.courseNumber

Print "Course Name: " + course.name

Print "Prerequisites: "

If Length(course.prerequisites) == 0

Print "None"

Else

For each prerequisite in course.prerequisites

Print prerequisite

Return

Print "Course not found."

// Example usage

SearchCourse(courses, "CSCI200")

Supporting Materials

Course Information (From PDF)

Course data consists of comma-separated values: courseNumber, name, prerequisite1, prerequisite2,...,prerequisiteN

Example course data:

css

Copy code

CSCI100,Introduction to Computer Science

CSCI101,Introduction to Programming in C++,CSCI100

CSCI200,Data Structures,CSCI101

MATH201,Discrete Mathematics

CSCI300,Introduction to Algorithms,CSCI200,MATH201

CSCI301,Advanced Programming in C++,CSCI101

CSCI350,Operating Systems,CSCI300

CSCI400,Large Software Development,CSCI301,CSCI350