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CS-300

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3-3 Project One Milestone One: Vector Data Structure

// Define a structure to hold course information

STRUCT Course

STRING courseNumber

STRING title

LIST OF STRING prerequisites

END STRUCT

// Initialize a vector to store Course objects

LIST OF Course courses

// Function to load course data from a file

FUNCTION loadCoursesFromFile(fileName)

// Open the specified file

OPEN file fileName FOR reading

IF file is not open THEN

PRINT "Error: Unable to open file"

RETURN

// Read each line from the file

WHILE there are lines in the file DO

line = READ line from file

tokens = PARSE line into tokens using comma as delimiter

// Check for minimum parameters

IF size of tokens < 2 THEN

PRINT "Error: Invalid course entry - less than two parameters"

CONTINUE

// Create a new Course object

Course newCourse

newCourse.courseNumber = tokens[0]

newCourse.title = tokens[1]

// Initialize prerequisites list

newCourse.prerequisites = EMPTY LIST

// Validate and add prerequisites if present

FOR i FROM 2 TO size of tokens - 1 DO

prerequisite = tokens[i]

IF prerequisite is not empty THEN

// Check if prerequisite exists in the vector

IF NOT courseExists(prerequisite, courses) THEN

PRINT "Error: Prerequisite " + prerequisite + " does not exist"

ELSE

ADD prerequisite to newCourse.prerequisites

END IF

END IF

END FOR

// Add the new Course object to the vector

ADD newCourse to courses

END WHILE

// Close the file

CLOSE file

END FUNCTION

// Function to parse a line into tokens

FUNCTION parseLine(line)

RETURN line.split(",") // Assuming comma-separated values

END FUNCTION

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

FUNCTION courseExists(courseNumber, courses)

FOR EACH course IN courses DO

IF course.courseNumber = courseNumber THEN

RETURN TRUE

END IF

END FOR

RETURN FALSE

END FUNCTION

// Function to print course information and prerequisites

FUNCTION printCourseInfo(courseNumber)

FOR EACH course IN courses DO

IF course.courseNumber = courseNumber THEN

PRINT "Course Number: " + course.courseNumber

PRINT "Title: " + course.title

IF size of course.prerequisites > 0 THEN

PRINT "Prerequisites: " + JOIN(course.prerequisites, ", ")

ELSE

PRINT "Prerequisites: None"

END IF

RETURN

END IF

END FOR

PRINT "Error: Course " + courseNumber + " not found"

END FUNCTION

// Main function to execute loading and printing

FUNCTION main()

CALL loadCoursesFromFile("courses.txt")

CALL printCourseInfo("CS101") // Example call to print info for a specific course

END FUNCTION