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CS-300

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4-3 Project One Milestone Two: Hash Table Data Structure

1. **Open, Read, and Parse the File**

FUNCTION LoadDataFromFile(filename)

OPEN file with name filename

IF file is not open

PRINT "Error: File cannot be opened."

RETURN

END IF

WHILE not EndOfFile

READ line from file

SPLIT line by commas into tokens (courseNumber, courseTitle, prerequisites)

// Validate line format

IF number of tokens < 2

PRINT "Error: Invalid format in line - less than two parameters."

CONTINUE to next line

END IF

// Validate prerequisites

FOR each prerequisite in prerequisites

IF prerequisite does not exist in file

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

CONTINUE to next line

END IF

END FOR

// Create course object

CALL CreateCourseObject(courseNumber, courseTitle, prerequisites)

// Insert course object into HashTable

CALL InsertCourseIntoHashTable(courseNumber, Course)

END WHILE

CLOSE file

END FUNCTION

1. **Creating Course Objects and Storing in a Hash Table**

FUNCTION CreateCourseObject(courseNumber, courseTitle, prerequisites)

SET newCourse to Course object

SET newCourse.courseNumber to courseNumber

SET newCourse.courseTitle to courseTitle

SET newCourse.prerequisites to prerequisites

END FUNCTION

FUNCTION InsertCourseIntoHashTable(courseNumber, Course)

SET hashIndex to result of CalculateHash(courseNumber)

IF HashTable[hashIndex] is empty

SET HashTable[hashIndex] to new LinkedList

END IF

APPEND Course to HashTable[hashIndex] (handle collision with linked list)

END FUNCTION

1. **Print Course Information**

FUNCTION PrintCourseInformation()

FOR each bucket in HashTable

FOR each course in LinkedList at bucket

PRINT "Course Number: " + course.courseNumber

PRINT "Course Title: " + course.courseTitle

IF course.prerequisites is not empty

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

ELSE

PRINT "Prerequisites: None"

END IF

PRINT new line

END FOR

END FOR

END FUNCTION