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CS-300 DSA Analysis and Design

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Module 3 Project 1 Vector Data Structure

// Define Course struct to store one line of data

struct Course{

string coursID

string courseName

vector<string> prereqs

string prelist

// Constructor

Course() {

courseID = “”

courseName = “”

preCount = 0

prelist = “”

}

}

// Main function

function Main () {

List<Course> courseList

string filePath

filePath = getUserInput(“Enter CSV file path: “)

if (filePath is empty) {

filePath = “default/path/to/file.csv”;

}

courseList = txtParser(filePath)

bool isValid = validateList(courseList)

if ( not isValid) { //Parse the file and validate

print(“Course file is invalid.”);

return;

}

string searchID = getUserInput(“Enter a course ID to search:”); //Get input from user

printCourseInfo(searchID, courseList); //Output information

}

// txtParser function

Function txtParser(string filePath) -> List<Course> {

List<Course> tempList

Open file at filePath

while (not end of file) {

Read next line from file

If (row[0] and row[1] are not empty) {

Course c

c.courseID = row[0]

c.courseName = row[1]

int i = 2

string preNames = “”

int preCount = 0

while (colum i exists and row[i] is not empty) {

preNames += row[i] + “, “

increment i

}

c.preCount = preCount

c.preList = preNames

tempList.add(c)

}

}

close file

return tempList

}

//searchList function

Function searchList (string id, List<course> courseList) -> Course {

For (each Course c in courseList) {

If (c.courseID == id) {

Return c

}

}

Return Course()

}

//printCourse function

Function printCourse (string id, List<Course> courseList) {

Course c = searchList(id, courseList)

Print(“Course ID: “ + c.courseID)

Print(“Course Name: “ + c.courseName)

If (c.preCount > 0) {

List<string> prereqs = split(c.preList, “, “)

For (each string preID in prereqs) {

If (preID is not empy) {

printCourse(preID, courseList)

}

}

}

}

validateList function

function validateList (List<Course> courseList) -> bool {

for (each Course c in courseList) {

List<string> prereqs = split(c.preList, “, “)

For (each string preID in prereqs) {

If (preID is not empty) {

Course temp = searchList(preID, courseList)

If (temp.couresID == “”) {

Return false

}

}

}

}

Return true

}