DEFINE STRUCT Course

STRING courseID

STRING courseName

INTEGER preCount

STRING preList

CONSTRUCTOR Course()

courseID = ""

courseName = ""

preCount = 0

preList = ""

END STRUCT

CLASS HashTable

STRUCT Bucket

Course course

STRING key

Bucket\* next

END STRUCT

METHOD hash(STRING key)

// Hashing logic

END METHOD

METHOD printAll()

// Print all courses

END METHOD

LIST<Bucket> hashTable

END CLASS

MAIN FUNCTION

LIST<Course> courseList

STRING csvPath

PROMPT user for CSV file path

IF no path provided THEN

USE default location

END IF

CALL txtParser(csvPath)

IF NOT validateList(courseList) THEN

PRINT "Validation failed."

RETURN

END IF

STRING userSearch

PROMPT user for course ID

CALL printCourse(userSearch)

END MAIN FUNCTION

FUNCTION txtParser(STRING filePath)

OPEN file at filePath

STRING line

WHILE NOT end of file DO

READ line

IF line is not empty THEN

Course tempCourse

tempCourse.courseID = EXTRACT first string from line

tempCourse.courseName = EXTRACT second string from line

WHILE NOT end of file DO

READ prerequisite

IF prerequisite is empty THEN BREAK

tempCourse.preCount++

tempCourse.preList += prerequisite + ","

END WHILE

ADD tempCourse to courseList

END IF

END WHILE

END FUNCTION

FUNCTION searchList(STRING key) RETURNS Bucket

FOR EACH bucket IN hashTable DO

IF bucket.course.courseID == key THEN RETURN bucket

END FOR

RETURN NULL

END FUNCTION

FUNCTION printCourse(STRING key)

Bucket tempCourse = searchList(key)

IF tempCourse is not NULL THEN

PRINT "Course ID: " + tempCourse.course.courseID

PRINT "Course Name: " + tempCourse.course.courseName

PRINT "Prerequisites: " + tempCourse.course.preList

ELSE

PRINT "Course not found."

END IF

END FUNCTION

FUNCTION validateList() RETURNS BOOLEAN

FOR EACH course IN courseList DO

FOR EACH prerequisite IN SPLIT(course.preList, ',') DO

IF searchList(prerequisite).courseID is empty THEN RETURN FALSE

END FOR

END FOR

RETURN TRUE

END FUNCTION

FUNCTION hash(STRING key) RETURNS INTEGER

// Compute hash value based on course ID

RETURN calculated hash value

END FUNCTION