# CS 300 3-3 Project One Milestone One: Vector Data Structure

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**Pseudocode**

// Define a structure to hold course information

structure Course

int courseNumber

string title

vector<int> prerequisites

// Define vector data structure to store courses

class CourseList:

// Internal vector to store courses

vector<Course> courses

// Method to add a course to the list

void AddCourse(Course course):

courses.push\_back(course)

// Method to print course details

void PrintCourse(Course course):

Print "Course Number: " + course.courseNumber

Print "Title: " + course.title

Print "Prerequisites: "

For each prereq in course.prerequisites:

Print prereq

// Method to search for a course by number and print its details

void SearchCourse(int courseNumber):

For each course in courses:

If course.courseNumber == courseNumber:

PrintCourse(course)

Return

Print "Course not found"

// Method to load courses from a file

void LoadCourses(string filename):

Open file for reading

If file is not open:

Print "Error opening file"

Return

While not end of file:

Read line from file

If line is not valid format:

Print "Error: Invalid format"

Continue

If prerequisites are not valid:

Print "Error: Invalid prerequisites"

Continue

Parse line to extract course number, title, and prerequisites

Create a new Course object

Set course.number, course.title, and course.prerequisites

AddCourse(course)

Close file

// Main function

int main():

Initialize CourseList

string filename = "course\_data.txt"

courseList.LoadCourses(filename)

int courseNumber

Print "Enter course number to search: "

Read courseNumber

courseList.SearchCourse(courseNumber)

Return 0

// Utility functions

bool validateFormat(string line):

// Ensure there are at least two parameters on each line

Split line into tokens

Return token count >= 2

bool validatePrerequisites(vector<Course>& courses, string line):

Split line into tokens

For each token starting from the second:

Check if token exists as a course in courses

If not, return false

Return true