

CSC 300 Data Structures in Java I
Winter 2023-2024
Class: M,W 1:30PM - 3:00PM
CDM 224

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Office Hours: W 3:00PM – 4:30PM

Course Policy Quiz

There is already a quiz on D2L called Course Policies. All students must correctly answer all questions on the quiz. Answers to all questions can be found in this syllabus and students must continue to retake the quiz until they get all the answers correct. Unlike the normal quizzes, you make retake the quiz as often as necessary and each time you retake it, you will only be asked the questions you missed. This quiz is what I use to determine if a student is participating in the class when the university asks me to report on non-participating students. Please complete this quiz as soon as possible by answering all questions correctly so that you are not marked as not participating. Note that the course policy quiz is not factored into your grade for the course.

Class Meetings

This class has both an in-person section and an asynchronous online section and both share the same course management site. Students in the in-person section are expected to be present and participate in the classroom, while asynchronous students are expected to follow along by viewing the recorded lectures in a timely manner.

Course Summary

This is the first course in a two-course sequence on data structures using Java. The course introduces basic Java programming, reviews recursion, introduces asymptotic notation, and focuses mainly on linear data structures including arrays, linked lists, stacks, queues, and data structures supporting disjoint-set operations. The implementation of the basic operations on each data structure are discussed and analyzed in terms of their efficiency. The applications covered highlight and exploit the unique characteristics of the data structures.

Prerequisites

CSC242 or CSC243

Learning Outcomes

After successful completion of this class, students should be able to:

- design and implement simple classes in Java
- draw a “boxes and arrows” memory model diagram for variables and objects in a program

- use arrays, lists, stacks, queues, and union-find to solve problems
- implement stack and queue data structures using arrays and using linked lists
- use a debugger to step through a program and to uncover the current state of its variables
- analyze the performance characteristics of programs

The Java programming language and development environment

We will be using the Java programming language as well as the Eclipse IDE. See D2L for links you can use to download these tools onto your computer (Content → Software), as well as for videos to walk you through the process of installing the tools on your computer (Content → Lecture Materials → Week 0).

Grading Policy

Your overall grade for the course will be computed as follows:

Homework	50%
Quizzes	10%
Midterm exam	15%
Final exam	10%
Final project	15%

Letter grades will be assigned according to the table below; however, the instructor reserves the right to adjust the scale in the student's favor. In other words, the table indicates the minimum letter grade you will receive for the given overall percentage. You may receive a slightly higher grade if the instructor deems an adjustment is necessary.

93-100	A
90-92	A-
87-89	B+
83-86	B
80-82	B-
77-79	C+
73-76	C
70-72	C-
67-69	D+
60-66	D
0-59	F

Textbooks and Printed Resources

Required

Algorithms 4e by Robert Sedgewick and Kevin Wayne (Addison-Wesley, 2011). ISBN: 9780321573513

Additional optional resources

- *How to Think Like a Computer Scientist* by Allen Downey.
<http://fpl.cs.depaul.edu/jriely/thinkajava/>
- *Java for Python Programmers* by Brad Miller. <http://fpl.cs.depaul.edu/jriely/java4python/>
- *Core Java SE9 for the Impatient, 2nd edition* by Cay Horstmann (Addison-Wesley, 2015).
ISBN: 9780134694726 (Check DePaul Library E-books)

Exams

Both the midterm and final exams will be administered as D2L quizzes. The midterm exam must be taken sometime between Feb. 15 and Oct. 18. (It basically takes the place of a homework assignment that week). The final exam must be taken between March 18 and March 21. Make sure to set time aside for the exams. Also, unlike quizzes, you will be allowed only one attempt on the exams.

Homework

Students should expect a homework assignment due every week. Homework is always due by 11:59PM the day before a class meeting which could be a Sunday. All assignments will be posted in the Submissions section of D2L and students must submit their assignments in the Submissions section of D2L before the due date posted for the assignment. The submission folder will remain open for an additional 8 hours after the deadline; however, submissions made after the deadline and before the submission folder closes will lose 2% per hour late. No submissions will be accepted after the 8 hour late window. All deadlines are enforced using the clock on the D2L.

Students are responsible for checking the Submissions section of D2L for assignments. Late assignments will not be accepted so please make sure to submit early to ensure you meet the posted deadline. You may resubmit as often as you like before the deadline. We will grade only the last submission you make (with the corresponding penalty if that final submission is late).

On many assignments, you will be allowed to resubmit to try to improve your grade. The names of the D2L submission folders for these resubmissions will end in 'R'. The deadline for the resubmission is one week after the original deadline and there is a 15-point penalty on resubmissions. If the grade on your resubmission is higher, it will replace the grade of your original submission for that assignment. Note that you are allowed to make use of the resubmit option even if you failed to submit anything originally.

Apart from resubmission chances mentioned above, I do not accept late submissions. However, I will drop the single lowest homework grade before computing the homework average. This means you can miss a single assignment without hurting your grade.

Homework Requirements and Guidelines

- I will typically give you some source files to begin with. You may not add new fields (variables outside of any methods) to the classes I give you unless the instructions specifically say you should. Generally, you will only be adding code inside of methods that are included in the class skeleton I provide. The exception is that you are free to add new **private** methods.
- Before calling any methods, make sure that you are allowed to do so. You are not allowed to use methods or libraries that we have not discussed in class. On many assignments, you aren't even allowed to call any methods you did not write yourself. Doing so can at times destroy the purpose of the assignment. Note that on one assignment, you will even be asked to provide definitions for String methods, so on that assignment you are not even allowed to make use of Java's String class in any way!
- You are **never** allowed to change the name of the files I provide or the name of the class itself.
- You are **never** allowed to change the method header lines in any code I provide. In other words, you may not change the name or return type of any method I include in the code I give you or the number of types of the arguments to those methods. I often give you skeleton code that I will call later from a testing harness. If you change the function header line, all tests will fail and you will receive a grade of 0.
- **Your code may never modify the input to a function or program unless the description of the assignment specifically states that you should modify the input.** For example, if a function takes an array as input, you are not allowed to sort the array, remove items from the array, change the values of any slots in the array, etc., unless the problem specifically says that you are allowed to do so.
- Your code should never include any printing statements unless the problem description specifically states that you must print something to the screen. Like python, "returning" a value and "printing" a value are two completely different things. If you add printing statements to help you debug your code, you must remove them or comment them out before submitting.
- I may provide you with multiple source files but ask you to modify and submit only one of them. Make sure you follow those instructions. I will only use the one required file when testing your code even if you submit multiple files. If you make changes to files other than the ones the instructions specify, your submission will not work and will receive a grade of 0.
- I will typically ask you to submit both the modified .java file as well as a screenshot of what happens when you run my test harness. Make sure to submit both! Failure to submit source code will result in a grade of 0. Failure to submit a screenshot when required will result in a loss of points. Do **not** submit .class files. I will only grade .java files.
- Get started early so that you can ask questions when you get stuck.
- Testing your code is absolutely vital. I often provide a testing harness so you can use to see what grade you will receive. However, that harness is not a good way to debug your code. You should write your own small tests to help you fix your code.
- Verify your submission! Make sure you receive a notification that your submission was accepted and also download the files you currently have submitted on D2L and verify that they are the files you intend to submit and that any screenshots are readable. This will only take a

couple of minutes and could save you from receiving a grade of 0 on an assignment that you completed but for which you submitted the wrong files.

Quizzes

Students should also expect a quiz almost every week. Quizzes are also due by 11:59PM the day before a class meeting. Quizzes can be retaken once before the deadline to try to improve your score. (Note that you will retake the entire quiz, not just the questions you missed.) The quizzes are meant to ensure that you are keeping up with the material, so please make sure you take advantage of them and ask questions in class if you don't understand the quiz answers.

Collaboration

Work in this class is individual work. Students may not work together on assignments, projects, quizzes, or exams. There are only two exceptions to this policy:

- Students may discuss assignment requirements and general strategies on how to solve homework assignments. However, students are never allowed to discuss actual code to solve a homework assignment.
- Students may ask and answer questions about homework on the discussion forums as long as no code is posted. Questions that require code to be included should be emailed directly to the instructor.

Allowed Sources

The only allowed sources on assignments, projects, quizzes, and exams, are the books for the course, material on the D2L site for the course, the Java API, and myself. In addition, tutors are an allowed source of help on homework, but not on the project nor on quizzes or exams. The point of assignments, quizzes, and exams is not whether you can use a search engine to find an answer, but whether you can work out the answer yourself.

Use of any sources other than those mentioned above in completing homework, quizzes, exams, or the project is an academic integrity violation in this class.

Email and Discussion Forum

Email and the D2L Discussion forum is the primary way I communicate with students outside of class. To make communication as smooth as possible, please make sure to do the following:

- Students should be sure to check their DePaul email (BlueM@il). I will use D2L to send you private email and it uses your BlueM@il address.
- Post any questions that do not include code for homework assignments on the D2L discussion forum. This makes it possible for other students to answer your question which means you may get an answer quicker this way than if you sent it to me via email. If you do send it to me via email, I will just copy and paste it to the discussion forum anyway (as long as it is not of a personal nature, like your grade in the class) so give your classmates a chance to answer your question and post it on the discussion forum yourself.
- All students must subscribe to the D2L discussion forum. I will make announcements to this forum and all students are responsible for announcements posted there. By subscribing, you will receive all discussion forum posts by email.
- If you send me an email, send it from your BlueM@il account. This will make minimize the chances of the email getting filtered and will maximize the chance that I will recognize the message as coming from a student. Also, include "CSC300" in the subject or you will receive a reply asking you which class you are in.
- If you ask me a question about the homework via email, make sure to include all of the following:
 - An explanation of what is going wrong. (What is happening vs what you were expecting)
 - If Eclipse provided an error message, a copy and paste of the exact error message
 - A screenshot of what you see when you get the error
 - A description of anything you have tried to solve the issue
 - Attach any .java files you wrote/modified in the email. Most of the time I won't look at them. But if I do need to look at them, you want to avoid a reply from me asking you to send them and then waiting another day for a reply from me. Make sure to add the .java file as an attachment. Do NOT send a screenshot of your code.
- If your question was answered in the lecture or on the discussion forum, I will simply refer you to the lecture or the discussion forum. So if you did not understand something I said in class or in the discussion forum, be specific. Point out exactly what you didn't understand in my prior communication so that you don't get a reply that just points you to the video or discussion forum.

Tentative Schedule

Below is the planned schedule for the class so that students can prepare ahead of time for each class. The schedule is tentative and subject to change, although the most likely deviation would be due to the amount of time required to cover the topics rather than the choice of topics or the order in which we cover them. Note that readings from Core Java are meant to help you get up to speed in Java. I am

happy to go over anything from that text if students have questions, but I will not otherwise be lecturing on the material from the Core Java book.

Week	Topics	Algorithms	Core Java
1	Introduction to Java including Strings and arrays.	Section 1.1	Chapter 1
2	Intro to classes and objects		Section 2.1-2.6
3	Data Abstraction	Section 1.2	Sections 3.1-3.3
4	Linked Lists		Sections 4.1-4.4
5	More Linked Lists		Sections 5.1-5.2
6	Stacks, Queues, Deques	Section 1.3	Section 6.1-6.3
7	Runtime Analysis	Section 1.4	
8	List Recursion		
9	Union Find	Section 1.5	
10	Heap / PriorityQueue	Section 2.4	

Changes to Syllabus

This syllabus is subject to change as necessary during the quarter. If a change occurs, it will be thoroughly addressed during class, posted on D2L and notice sent via email.

Respect for Diversity and Inclusion at DePaul University as aligned with our Vincentian Values

At DePaul, our mission calls us to explore “what must be done” in order to respect the inherent dignity and identity of each human person. We value diversity because it is part of our history, our traditions and our future. We see diversity as an asset and a strength that adds to the richness of classroom learning. In my course, I strive to include diverse authors, perspectives and teaching pedagogies. I also encourage open dialogue and spaces for students to express their unique identities and perspectives. I am open to having difficult conversations and I will strive to create an inclusive classroom that values all perspectives. If at any time, the classroom experience does not live up to this expectation, please feel free to contact me via email or during office hours

Online Course Evaluations

Evaluations are a way for students to provide valuable feedback regarding their instructor and the course. Detailed feedback will enable the instructor to continuously tailor teaching methods and course

content to meet the learning goals of the course and the academic needs of the students. They are a requirement of the course and are key to continue to provide you with the highest quality of teaching. The evaluations are anonymous; the instructor and administration do not track who entered what responses. A program is used to check if the student completed the evaluations, but the evaluation is completely separate from the student's identity. Since 100% participation is our goal, students are sent periodic reminders over three weeks. Students do not receive reminders once they complete the evaluation. Please see <https://resources.depaul.edu/teaching-commons/teaching/Pages/online-teaching-evaluations.aspx> for additional information.

Academic Integrity and Plagiarism

This course will be subject to the university's academic integrity policy. All students are expected to abide by the University's Academic Integrity Policy which prohibits cheating and other misconduct in student coursework. Publicly sharing or posting online any prior or current materials from this course (including exam questions or answers), is considered to be providing unauthorized assistance prohibited by the policy. Both students who share/post and students who access or use such materials are considered to be cheating under the Policy and will be subject to sanctions for violations of Academic Integrity.

More information can be found at <https://resources.depaul.edu/teaching-commons/teaching/academic-integrity/Pages/default.aspx>.

Posting work on online sites, such as Hero

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Academic Policies

All students are required to manage their class schedules each term in accordance with the deadlines for enrolling and withdrawing as indicated in the University Academic Calendar. Information on enrollment, withdrawal, grading and incompletes can be found at:

<http://www.cdm.depaul.edu/Current%20Students/Pages/PoliciesandProcedures.aspx>

Incomplete Grades

An incomplete grade is a special, temporary grade that may be assigned by an instructor when unforeseeable circumstances prevent a student from completing course requirements by the end of the term and when otherwise the student had a record of satisfactory progress in the course. All incomplete

requests must be approved by the instructor of the course and a CDM Associate Dean. Only exceptions cases will receive such approval. Information about the Incomplete Grades policy can be found at <http://www.cdm.depaul.edu/Current%20Students/Pages/Grading-Policies.aspx>

Preferred Name & Gender Pronouns

Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender, gender variance, and nationalities. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the quarter so that I may make appropriate changes to my records. Please also note that students may choose to identify within the University community with a preferred first name that differs from their legal name and may also update their gender. The preferred first name will appear in University related systems and documents except where the use of the legal name is necessitated or required by University business or legal need. For more information and instructions on how to do so, please see the Student Preferred Name and Gender Policy at <http://policies.depaul.edu/policy/policy.aspx?pid=332>

Students with Disabilities

Students seeking disability-related accommodations are required to register with DePaul's Center for Students with Disabilities (CSD) enabling them to access accommodations and support services to assist with their success. There are two office locations:

- Loop Campus (312) 362-8002
- Lincoln Park Campus (773) 325-1677
- Email: csd@depaul.edu

Students who register with the Center for Students with Disabilities are also invited to contact Dr. Gregory Moorhead, Director of the Center, privately to discuss how he may assist in facilitating the accommodations to be used in a course. This is best done early in the term. The conversation will remain confidential to the extent possible.

Please see <https://offices.depaul.edu/student-affairs/about/departments/Pages/csd.aspx> for Services and Contact Information.