CS 46B - Introduction to Data Structures, Section 01

San José State University

Spring 2021

About this Section

Day/Time :	Monday/Wednesday at 7:30pm - 8:45pm Pacific Standard Time (PST)
Duration :	01/27/2021 - 5/17/2021
Class Lecturer :	Dominic Abucejo
Email :	dominic.abucejo@sjsu.edu (prepend "[CS46B-01]" in the subject field)
Telephone :	Please use email for all communications

Description

Stacks and queues, recursion, lists, dynamic arrays, binary search trees, Iteration over collections, hashing, searching, elementary sorting, Big-O notation, standard collection classes. Weekly hands-on activity.

Pre-requisites

1. Knowledge of Java equivalent to that obtained by completing CS 046A or CS049J with grade of C- or better.

2. Eligibility for Math 030 or Math 030P, or instructor consent.

3. Math remediation completed or a post baccalaureate.

Course Learning Outcomes (CLO)

Upon successful completion of this course, students will be able to:

- Use and work with basic structures such as linked lists, stacks, queues, binary search trees, and iterators.
- Implement Java classes that embody data structures.
- Use pre-existing implementations such as the Java Collections framework.
- Make relative estimates of the running times of alternative algorithms using Big-O analysis.
- Formulate and test for pre-and post-conditions.
- Distinguish between different types of program defects and understand how testing and debugging are used to correct them.
- Implement simple sorting algorithms such as Insertion Sort and Selection Sort.
- Implement the Sequential Search and Binary Search algorithms.
- Implement simple recursive algorithms such as binary tree traversal.
- Work competently with commonly used tools for software development.
- Create custom data structures when appropriate pre-existing classes are not available

[Book information]

Big Java: Early Objects, 7e Abridged Print Companion with Wiley E-Text Reg Card Set 7th Edition

by Cay S. Horstmann (Links to an external site.) (Author)

- Publisher : Wiley; 7th edition (January 14, 2019)
- Language: : English
- ISBN-10 : 1119499534
- ISBN-13 : 978-1119499534

For a book purchase reference at SJSU:

https://sjsu.bncollege.com/shop/sjsu/textbook/big-java-early-objects-enhanced-etex-600009019082?sectionId=99064938&displayStoreId=65133&sectionList=&booksAddedforSec=&fromTBList=true (Links to an external site.)

or you can find it at Amazon or at some other online web bookstore of your choice.

If you prefer to not have a physical copy but an eText version, you can try this link below (if you want to rent it):

[About the eText version]

https://www.vitalsource.com/products/big-java-early-objects-enhanced-etext-cay-s-horstmann-v9781119499091 (Links to an external site.)

However, if you plan on renting the eText from vital source or from another bookstore, just make sure that the number of days rented will cover the spring semester duration. However, there are other required courses, after 46B, that will use Java so you should think about which type of book to keep for the long run and for your own references. My preference would be to get the book for long term reference, and because that has both eText and a physical copy; if you get that version of the book from i.e. Amazon.

[Zoom meeting details]

Dominic Abucejo is inviting you to a scheduled Zoom meeting.

Topic: SP21: CS-46B Sec 01 - Intro to Data Strc
Time: Jan 27, 2021 07:30 PM Pacific Time (US and Canada)
Every week on Mon, Wed, until May 31, 2021, 36 occurrence(s)

Please download and import the following iCalendar (.ics) files to your calendar system.
Weekly:
https://sjsu.zoom.us/meeting/tZMkde2rrT8vE91clnLvCCPIjqTuRgctrkSy/ics?icsToken=98tyKuGvpzkuGdeRtRCORpwEHYjoLOnztilYj_oMnxPrLzZwQTPfPPN2J4B4E8zC

Join from PC, Mac, Linux, iOS or Android:
https://sjsu.zoom.us/j/87924334599?pwd=T3dyVTdzaDlOZ0tPSFYrYzY1ejdidz09
Password: 962708

Or iPhone one-tap :
US: +13017158592,,87924334599# or +13126266799,,87924334599#
Or Telephone:
Dial(for higher quality, dial a number based on your current location) :
US: +1 301 715 8592 or +1 312 626 6799 or +1 646 876 9923 or +1 253 215 8782 or +1 346 248 7799 or +1 669 900 6833
Meeting ID: 879 2433 4599
Password: 962708
International numbers available: https://sjsu.zoom.us/u/kdd9WZRgJS

Or an H.323/SIP room system:
H.323:
162.255.37.138

Meeting ID: 879 2433 4599
Password: 962708

SIP: 87924334599@vip2.zoomcrc.com
Password: 962708

CLASS FORMAT

Classes will be taught online via Zoom Video Call Conferencing. In class programming practice, quizzes, surveys, as well as topic presentation will be provided (not in any specific order). Assignments, quizzes, projects, and exams will be provided via Canvas. All classes will be recorded and recordings will be made available for reference.

CANVAS

Course materials, syllabus, assignments, grading criteria, exams, and other information will be posted on the Canvas Learning Management System (course login website at http://sjsu.instructure.com).

Exams and Assignments

QUIZZES

There will be a minimum of one quiz per week. Quizzes will be given on every Wednesday during class.

PROJECTS

There will be two projects (totalling 10%) that will be started during the middle of the semester where students will spend 2 to 3 weeks to complete it. Students will work on a scientific topic which will have students explore the various kinds of algorithms and techniques to apply to reading and writing specific scientific data.

Exams

Two in-class exams (20%; 10% per exam) and a final exam (10%). Exams cannot be made up, except for reasons of illness, as certified by a doctor, or documentable extreme emergency.

Weekly Assignments

One assignment per week (30% total). New assignments will be posted on Canvas every Sunday night at 10:00pm. The problems are mostly related to the topic that will be covered on that week's lecture. You have time to look at the problems and try to get ready to solve them by attending the class and ask questions. All assignments are due on the following Sunday before midnight.

Labs

You must enroll for a lab section and attend all labs. You will fail the course if you don't pass the lab section. You will fail the lab and the class if you miss more than 2 labs. Provided you get a passing grade in the labs, it counts as 10% of your total grade.

Please do not use up your 2 allowed misses in the first few weeks of class for non emergencies.

Incomplete work

Points will be deducted for incomplete question responses and solutions that are partially functional. Consult individual assignment for details of point allocation for each problem.

Late assignments

No late assignments, but you will have 2 late passes to use, but then you will have until the end of the day of the following Tuesday to try and complete the assignment that was originally due on the past Sunday, and then all regular grading applies. When you submit late, it will be noted by the graders for the record. Once you use up your late passes, a late will be recorded as 0 points.

Makeup Exams

You must submit only your own work on exams. Makeup exams will only be given in cases of illness (documented by a doctor) or in cases of documentable, extreme emergency.

About Performing Individual Work

1. All homework and exams must be your own individual work.

2. It is okay to have general discussions about homework assignments (on the Canvas discussion board) or reading external material for your own learning consumption.

3. You may never copy anything from anyone without attribution. This means if you find code on i.e. "StackOverflow" or another web site, you need to give the URL as comment in your code and document where you found the code in a comment at the top of your class so that the professor can look at it if necessary. By all means, do not ever copy word for word and line for line. The code must be rewritten in your own style but you must give credit to where it belongs.

4. You may copy from the textbook, your lab material, or anything we do in class without attribution.

5. For homework and exams, you may not copy anything from any other student at all, and you may not collaboratively produce results in pairs or teams.

6. Your work must be entirely your own.

7. It is never okay to give your completed code to another student before the due date.

8. A first incident of cheating will result in a 0 on that assignment or exam. A second incident will result in a failure for the class.

9. Any kind of cheating will be reported

TECHNOLOGY REQUIREMENTS

Students are required to have an electronic device (laptop, desktop or tablet) with a camera and built-in microphone. SJSU has a free equipment loan program available for students. Students are responsible for ensuring that they have access to reliable Wi-Fi during tests. If students are unable to have reliable Wi-Fi, they must inform the instructor, as soon as possible

CLASSROOM/ZOOM MEETING ETIQUETTE

It is very important for each student to attend classes and to participate. For all zoom meetings that you are invited to, all audio must be initially muted and laptop video camera must be started or enabled when joining any meeting.

Remember that you are joining a video meeting, and so there are a several important things to keep in mind:

- Be on time to class
- Always dress appropriately when joining any video conferencing meeting. Any complaints related to this must be brought to the instructor's attention and will then be addressed by the instructor and by school officials.
- Mute Your Microphone: To help keep background noise to a minimum, make sure you mute your microphone when you are not speaking.
- Be Mindful of Background Noise and Distractions: Find a quiet place to "attend" class, to the greatest extent possible. ○ Avoid video setups where people may be walking behind you, people talking/making noise, etc. ○ Avoid activities that could create additional noise, such as shuffling papers, listening to music in the background, etc.
- Position Your Camera Properly: Be sure your webcam is in a stable position and focused at eye level.
- Limit Your Distractions/Avoid Multitasking: You can make it easier to focus on the meeting by turning off notifications, closing or minimizing running apps, and putting your smartphone away (unless you are using it to access Zoom).
- Use Appropriate Virtual Backgrounds: If using a virtual background, it should be appropriate and professional and should NOT suggest or include content that is objectively offensive or demeaning.
- Do not screen capture or record video meetings (due to privacy and copyrights)
- Do not share any passwords to Zoom meetings with other people who are not participating in the course
- Unmute your audio if you have any questions, and mute when you are done.

Use of Camera in Class

- PC or laptop cameras should initially be enabled once joining a meeting. If you have any special needs or requests for any accommodations on a case by case basis please inform the class lecturer.
- Please consider the fact that students may be concerned about appearing on camera themselves, for disability-related or religious reasons, or concern for other family members, including children, who live with you in close quarters. The privacy of a student's home life and access to a room for privacy should not be a barrier to a student's success in a particular course.

Recording of Zoom Classes

- All Zoom meetings will be recorded by the class lecturer for all meetings.
- Many students indicated in the Spring 2020 Student Success Survey that having recordings of class lectures was helpful for studying and reviewing material, or catching up on portions missed due to internet connectivity issues or other disruptions. Recordings will be made available for viewing but they will not be made available for downloading and then viewing.
- This course or portions of this course (i.e., lectures, discussions, student presentations) will be recorded for instructional or educational purposes. The recordings will only be shared with students enrolled in the class through Canvas. The recordings will be deleted at the end of the semester. If, however, you would prefer to remain anonymous during these recordings, then please speak with the instructor about possible accommodations (e.g., temporarily turning off identifying information from the Zoom session, including student name and picture, prior to recording)
- Students are not allowed to record without instructor permission.
- Students are prohibited from recording class activities (including class lectures, office hours, advising sessions, etc.), distributing class recordings, or posting class recordings. Materials created by the instructor for the course (syllabi, lectures and lecture notes, presentations, etc.) are copyrighted by the instructor.
- The university policy (S12-7) is in place to protect the privacy of students in the course, as well as to maintain academic integrity through reducing the instances of cheating. Students who record, distribute, or post these materials will be referred to the Student Conduct and Ethical Development office. Unauthorized recording may violate university and state law. It is the responsibility of students that require special accommodations or assistive technology due to a disability to notify the instructor.
- University policy (S12-7) requires consent from all individuals who will appear in a class recording. If a student does not wish to be identified in a class recording, please let the class lecturer know so that you can be set to an "anonymous" option (e.g., student temporarily turning off identifying information from the Zoom session, including name and picture, prior to recording).

UNIVERSITY POLICIES

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs' Syllabus Information web page at

http://www.sjsu.edu/gup/syllabusinfo (Links to an external site.).

Notable Dates

- Monday, February 8, 2021 .... Last Day to Drop Courses Without an Entry on Student's Permanent Record (D)
- Monday - Friday ..... March 29, 2021 - April 2, 2021 ..... Spring Recess (*SPRING RECESS*)

GRADING INFORMATION

Grading Bracket

Percentage	LetterGrade
93.50 - 100%	A
89.50 - 93.49%	A-
86.50 - 89.49%	B+
82.50 - 86.49%	B
79.50 - 82.49%	B-
76.50 - 79.49%	C+
72.50 - 76.49%	C
69.50 - 72.49%	C-
66.50 - 69.49%	D+
62.50 - 66.49%	D
59.00 - 62.49%	D-
0 - 58.99%	F

Your final class grade will be weighted as follows:

- Weekly Assignments (30%)
- Lab reports (10%)
- Projects (10%)
- Participation (5%)
- Quizzes (15%)
- Two Midterm Exams (20% total; 10% per exam)
- Final Examination (10%)

Weekly Topic Schedule

Week	Date	Topics
1	01/27/2021	Introduction to the Course / Introduction to data structures
2	02/01/2021	Introduction to data structures continued, inheritance
2	02/03/2021	Polymorphism
3	02/08/2021	Inner Classes, Interfaces
3	02/10/2021	Equality & Comparison
4	02/15/2021	Sets
4	02/17/2021	Exceptions & Assertions
5	02/22/2021	I/O
5	02/24/2021	I/O
6	03/01/2021	Recursion
6	03/03/2021	Review
7	03/08/2021	Midterm 1
7	03/10/2021	Recursion & Backtracking

8	03/15/2021	Sorting & Searching
8	03/17/2021	Sorting & Searching
9	03/22/2021	Algorithm Complexity, Big O
9	03/24/2021	The Collection Framework
10	03/29/2021 - 04/02/2021	Spring Recess (break)
11	04/05/2021	The Collection Framework
11	04/07/2021	Review
12	04/12/2021	Midterm 2
12	04/14/2021	Hash Tables
13	04/19/2021	Trees
13	04/21/2021	Custom Collections
14	04/26/2021	Custom Collections continued
14	04/28/2021	Custom Collections continued
15	05/03/2021	Binary Search Trees
15	05/05/2021	Binary Search Trees

16	05/10/2021	General Graphs
16	05/12/2021	General Graphs and Review
17	05/17/2021	Review (last day of class)
	05/19/2021	Final Exam Reference: Final Exam Schedules (visit the "Night Classes" section)