


Midterm 2 Study Guide

Basic Information

1

Midterm Information

- 90 minutes
- 200 points
- May contain multiple choice and short answer questions



Summer 2021 Sacramento State - Cook - CSC 130 2

2

What Will Be Covered

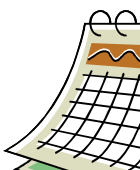
- Exam will cover Parts 8 to 15
- No question will be asked that is not in the lecture notes
- Download from: devincook.com/csc/130

Fall 2021 Sacramento State - Cook - CSC 130 3

3

Exam Time & Date

- July 10 (Saturday)
- 9:00 am – 10:30 pm
- Don't start later than 10:30 – the exam will automatically stop you at midnight




Summer 2021 Sacramento State - Cook - CSC 130 4

4

Exam Format

- Canvas supports multiple choice and fill in the blank
- If you fill in an answer – use lowercase (they are case sensitive)




Summer 2021 Sacramento State - Cook - CSC 130 5

5

Exam Format

- Bring scratch paper!
You will need it!
- Many questions will have you hand-sort or hand-compute a result



Summer 2021 Sacramento State - Cook - CSC 130 6

6

Canvas & Apple Safari

- Apple Safari is an excellent web browser, however...
- Student's have reported malfunctions when using Canvas – in particular, *images do not work properly*



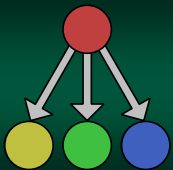
7

Canvas & Apple Safari

- The Final will make use of multiple images
- So please use:
 - Firefox
 - Edge
 - Chrome



8



Trees

Part 8

9

Part 8 – Important to Understand

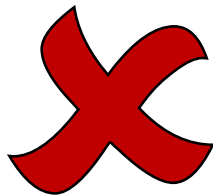
- Tree terminology
- Tree are recursively defined
- Tree traversals
- Binary trees



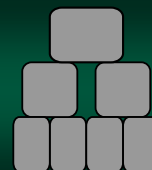
10

Part 8 – Don't Worry About

- Example trees
- ...especially the Cheese one



11



Heaps & Priority Queues

Part 9

12

Part 9 – Important to Understand

- Heaps – both min-heaps and max-heaps
- Priority Queues
- Heaps in arrays (how the math works)
- Heap Sort



Summer 2021

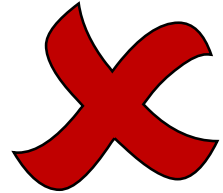
Sacramento State - CS&E - CS&E 130

13

13

Part 9 – Don't Worry About

- All the various alternative names for upheap and downheap

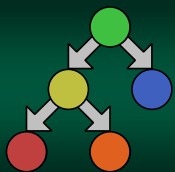


Summer 2021

Sacramento State - CS&E - CS&E 130

14

14



Binary Search
Trees

Part 10

Summer 2021

Sacramento State - CS&E - CS&E 130

15

15

Part 10 – Important to Understand

- Binary Search Trees (BST)
- The dangers of a BST



Summer 2021

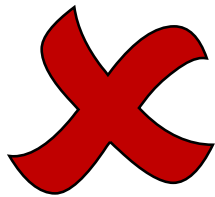
Sacramento State - CS&E - CS&E 130

16

16

Part 10 – Don't Worry About

- *Know it all*

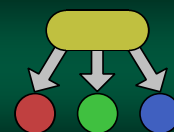


Summer 2021

Sacramento State - CS&E - CS&E 130

17

17



Balanced Trees

Part 11

Summer 2021

Sacramento State - CS&E - CS&E 130

18

18

Part 11 – Important to Understand

- 2-3 Trees
- AVL Trees
- Red-Black Trees – what they really are



Summer 2021

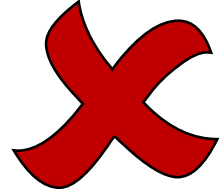
Sacramento State - CS&E - CS&E 130

19

19

Part 11 – Don't Worry About

- Who created these trees algorithms and when



Summer 2021

Sacramento State - CS&E - CS&E 130

20

20



Hashing

Part 12

21

Part 12 – Important to Understand

- General approach of Hash Tables
- Hash functions
- Open Hashing
- Closed Hashing



Summer 2021

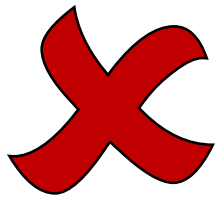
Sacramento State - CS&E - CS&E 130

22

22

Part 12 – Don't Worry About

- All the examples
- Sample hash function – MAD algorithm

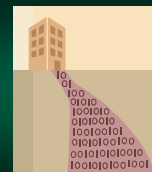


Summer 2021

Sacramento State - CS&E - CS&E 130

23

23



Set Data Structures

Chapter 13

24

Part 13 – Important to Understand

- Union-Find
- Bit Vectors



Summer 2021

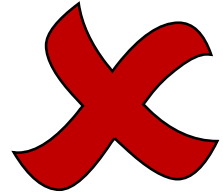
Sacramento State - CS&E - CS&E 130

25

25

Part 13 – Don't Worry About

- *Know it all*

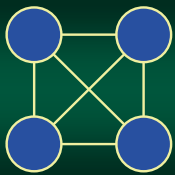


Summer 2021

Sacramento State - CS&E - CS&E 130

26

26



Graphs

Part 14

Part 14 – Important to Understand

- Graph terminology
- Definition of trees
- Cycles
- Weighted Graphs
- Directed Graphs



Summer 2021

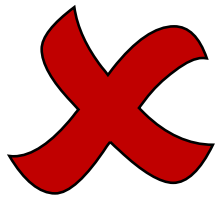
Sacramento State - CS&E - CS&E 130

28

28

Part 14 – Don't Worry About

- *Know it all*

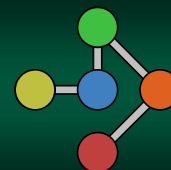


Summer 2021

Sacramento State - CS&E - CS&E 130

29

29



Minimum Spanning Trees

Part 15

30

Part 14 – Important to Understand

- Unpracticality of Brute Force
- Kruskal Algorithm
- Prim-Jarnik Algorithm



Summer 2021

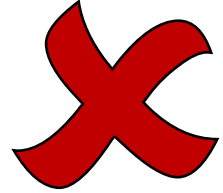
Sacramento State - CS&E - CS&E 130

31

31

Part 14 – Don't Worry About

- Years these algorithms were created (which is the same year)



Summer 2021

Sacramento State - CS&E - CS&E 130

32

32