

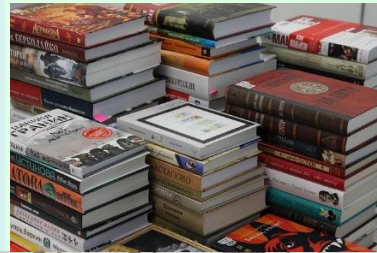
DATA STRUCTURES & ALGORITHMS.

CS106.3

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COURSEWORK

2020 SUMMER



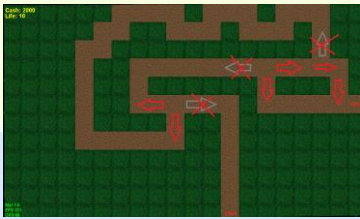
TYPE :- INDIVIDUAL & MANDATORY

DURATION :- 7th AUGUST 2020

1. Explain in steps how would you solve the following problems and argue/discuss; you must identify the well-known algorithms or data structures behind these situations.

- a. You need to watch the breaking news, but you cannot remember where you kept the TV remote. How would you find it?

First I will think about when did I watch TV last time and where were I sitting. And will go to that place and look for it. If I find it there it's okay I can watch news but if I can't find it, so there I'll ask my family about TV remote and will find it with them. And I can search the TV remote by Linear search. Then, definitely I can find it.



- b. You have to go to a super market and buy Dhal and Salmon. Are you using the same strategy, or can you find quicker way?

I will ask a sale girl about where Salmon and Dhal are. And I search Linear and find it.



- c. You must keep one-meter distance from the customers at the super market gate. Can you by pass those people (or in other words cut the line) and buy foods or do you have to wait the one in front moves? Is there a computer science scenario for this situation?

In this current situation we should wait the one in front moves. Because safety first. Yeah there is. Exactly stay in queue, to come my time.



- d. Now that you have some spare time, your mother asked you to clean the cabinet and arrange the Porcelain plates, How would you arrange them? What do you think we call this scenario in computer science?

First I'll get the Porcelain plates in out. After that I'll clean up whole cabinet and I'll clean all plates. Then I'll keep the neatly on shelves of cabinet and close the door. Then I'll use for that Stack data structure and will do it well.



- e. To make things worse, your mom asked you to categorize the kitchen cabinet as well. How would you arrange the spices in alphabetical order if they all are mixed? Eg :- Chili, Curry powder, Turmeric, Pepper, Salt, Clove, Cardamom, Nutmeg, Cumin and Garlic.

I'll divide every spices and put them different bottles and I will label them. Then I will look them, keep them alphabetically order as well on the kitchen cabinet. So I'll do to use Binary search method.

Eg :- Cardamom, Chili, Clove, Cumin, Curry powder, Garlic, Nutmeg, Pepper, Salt and Turmeric.



2. Assume the government allowed citizens to collect goods from super markets weigh no more than 20 Kilograms. If the package and goods are like the following figure. How would you pick in order to maximize the value? Explain your steps.



We want to make this package maximum price and minimum value. But maximum value goods put the **Bottom** and minimum value goods put the **Top**, then package is very tight and suite. So we can use to do this Binary search, Linear search, Selection sort or Bubble sort. And if necessary Tree structure can be used for this. Eg :- Top and Bottom the arrange for this package.

1st Step :- \$9 6kg

2nd Step :- \$7 4kg

3rd Step :- \$6 4kg

4th Step :- \$5 3kg

5th Step :- \$4 2kg

6th Step :- \$3 1kg

\$9 6kg	\$7 4kg	\$6 4kg	\$5 3kg	\$4 2kg	\$3 1kg
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