Project file of

Data Structures Lab:IT206

B.Tech(ICT) 2nd Semester

Batch 2020-2024

COVID Resources Portal:

Co-FIGHT

Submitted to:

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Problem Statement

The second wave of COVID in India has just retreated and God knows how many people gasped for Oxygen cylinders, related and miscellaneous medical supplies. Two of the major concerns are as follows:

- Getting a good medical treatment is the most basic requirement in treatment of any disease. Hence, the foremost important part of the treatment to begin is to get proper **hospitalization** as soon as possible. The urgent need of many essential supplies resulted in people indulging in black-marketeering and hoarding. Hospital beds were booked under false names or using the power of money or even using personal contacts across hospitals and civic administrations.

- The commodity-ordering system on the other hand solves a different problem altogether. We have personally seen COVID-positive patients going to stores and **buying essentials** for themselves. They could order from websites but the private sector might not go very easy on them, price-wise. We have also seen cases wherein individuals hoard supplies, create an artificial scarcity, only to sell them at higher rates.

How we approached the problem

We went on to build a small prototype program-code to try and put an end to malpractices ravaging in the middle of one of the most challenging events in recent history. The entire program is called **Co-FIGHT** and is divided into two parts:

1) **Co-BLink**

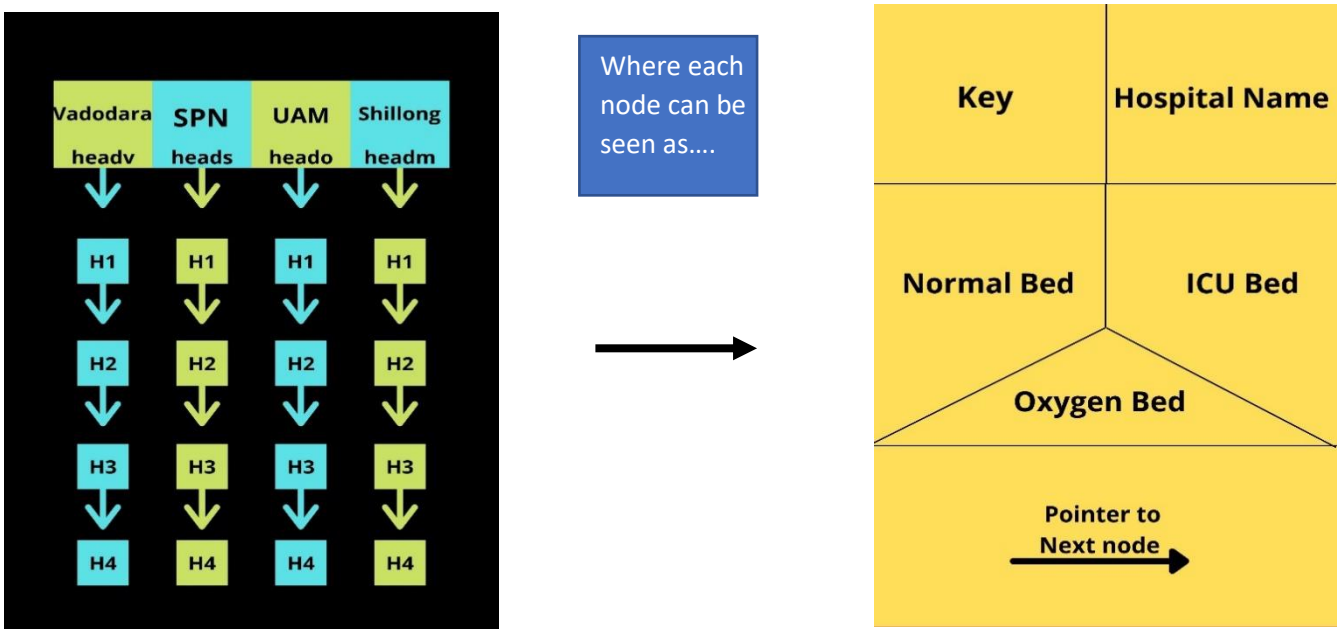
The bed-booking system keeps track of hospital beds of 3 kinds namely:

(A)Normal
(B)Oxygen
(C)Intensive Care Unit (ICU)

It records the data across cities and provides with a facility to book any bed using a custom-made arrangement of an array and linked lists at the implementational level, anytime, anywhere with just a few clicks. It collects basic data of the patients like name, age and blood group and finally books the desired bed and updates the number of available beds.

Here is the overall structure of the program:

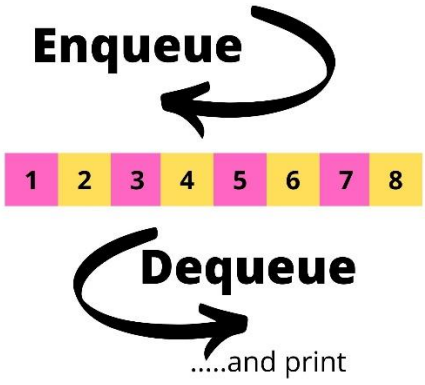
- Firstly an array's units pointing to linked lists of respective cities. The link lists are that of structures, where each structure belongs to a particular hospital, and holds the details of number of beds in them.



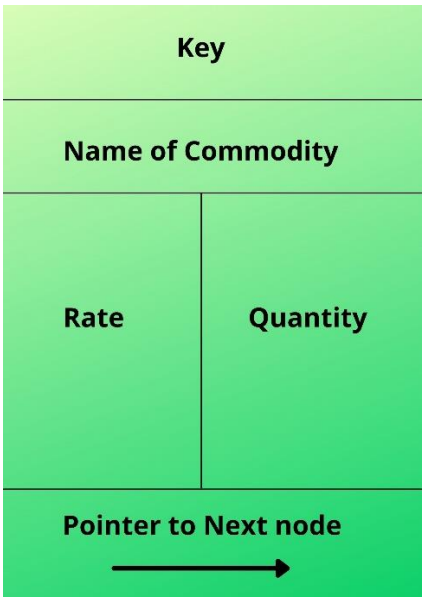
2) Co-Kart

We designed an essential-commodity ordering system that, at least in our minds, is controlled by the civic or state level administration so as to check on the price rise issue. An online system also keeps a check on hoarding, by not setting an upper limit on the number of pieces of a particular item a person can purchase.

- This works using a **Queue**, which has an array-based implementation in our code. The array is that of pointers to structures, wherein each structure contains details of a given product.

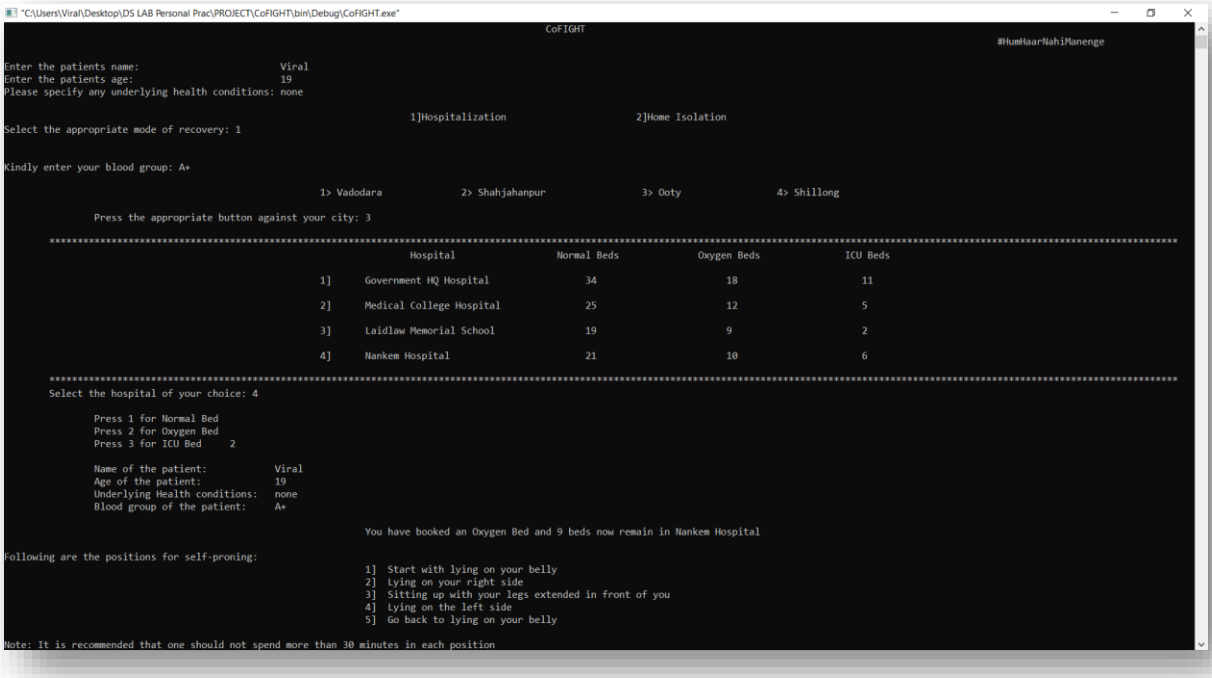


Where each node can be seen as....



Output Snippets of Program

1)Co-BLink



```
"C:\Users\Viral\Desktop\DS LAB Personal Prac\PROJECT\CoFIGHT\bin\Debug\CoFIGHT.exe"
                                                CoFIGHT
                                                                                                #HumHaarNahiManenge

Enter the patients name:                        Viral
Enter the patients age:                         19
Please specify any underlying health conditions: none

                                                        1]Hospitalization                       2]Home Isolation
Select the appropriate mode of recovery: 1


Kindly enter your blood group: A+

                                                1> Vadodara             2> Shahjahanpur             3> Ooty             4> Shillong

        Press the appropriate button against your city: 3

    ********************************************************************************************************************************************************************
                                                        Hospital                Normal Beds             Oxygen Beds             ICU Beds

                                                1]      Government HQ Hospital          34                      18                      11

                                                2]      Medical College Hospital        25                      12                      5

                                                3]      Laidlow Memorial School         19                      9                       2

                                                4]      Nankem Hospital                 21                      10                      6

    ********************************************************************************************************************************************************************
    Select the hospital of your choice: 4

            Press 1 for Normal Bed
            Press 2 for Oxygen Bed
            Press 3 for ICU Bed     2

            Name of the patient:            Viral
            Age of the patient:             19
            Underlying Health conditions:   none
            Blood group of the patient:     A+

                                                You have booked an Oxygen Bed and 9 beds now remain in Nankem Hospital

Following are the positions for self-proning:
                                                1]  Start with lying on your belly
                                                2]  Lying on your right side
                                                3]  Sitting up with your legs extended in front of you
                                                4]  Lying on the left side
                                                5]  Go back to lying on your belly

Note: It is recommended that one should not spend more than 30 minutes in each position
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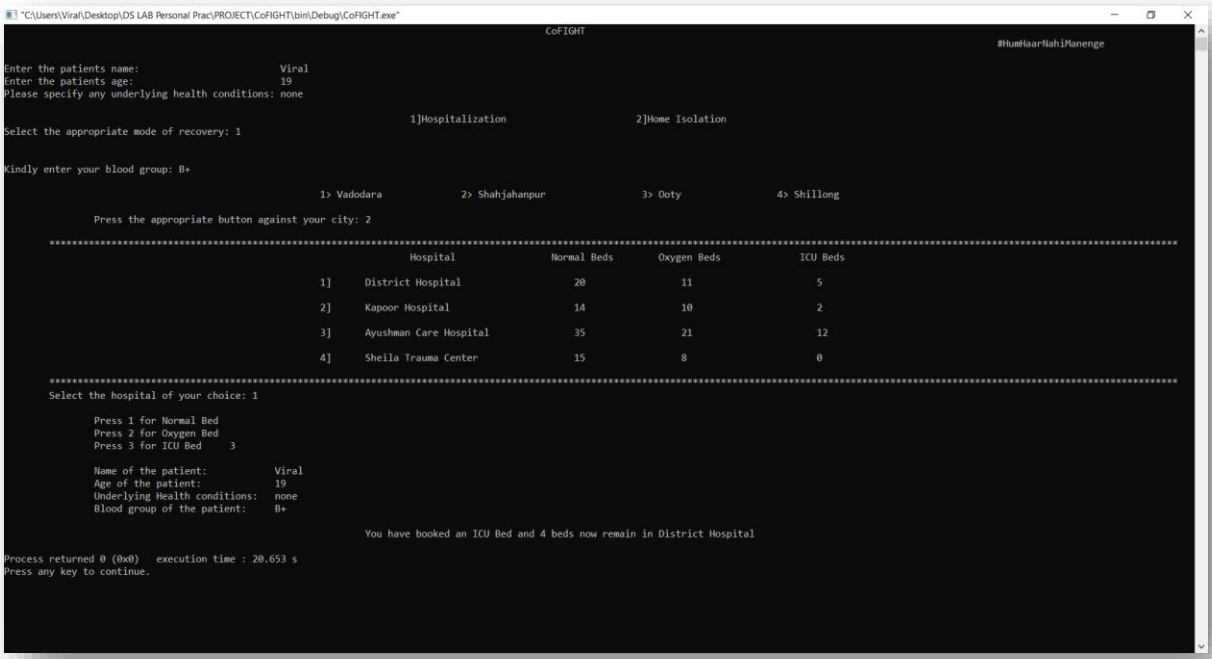


```
"C:\Users\Viral\Desktop\DS LAB Personal Prac\PROJECT\CoFIGHT\bin\Debug\CoFIGHT.exe"
                                                CoFIGHT
                                                                                                #HumHaarNahiManenge

Enter the patients name:                        Viral
Enter the patients age:                         19
Please specify any underlying health conditions: none

                                                        1]Hospitalization                       2]Home Isolation
Select the appropriate mode of recovery: 1


Kindly enter your blood group: B+

                                                1> Vadodara             2> Shahjahanpur             3> Ooty             4> Shillong

        Press the appropriate button against your city: 2

    ********************************************************************************************************************************************************************
                                                        Hospital                Normal Beds             Oxygen Beds             ICU Beds

                                                1]      District Hospital               20                      11                      5

                                                2]      Kapoor Hospital                 14                      10                      2

                                                3]      Ayushman Care Hospital          35                      21                      12

                                                4]      Sheila Trauma Center            15                      8                       0

    ********************************************************************************************************************************************************************
    Select the hospital of your choice: 1

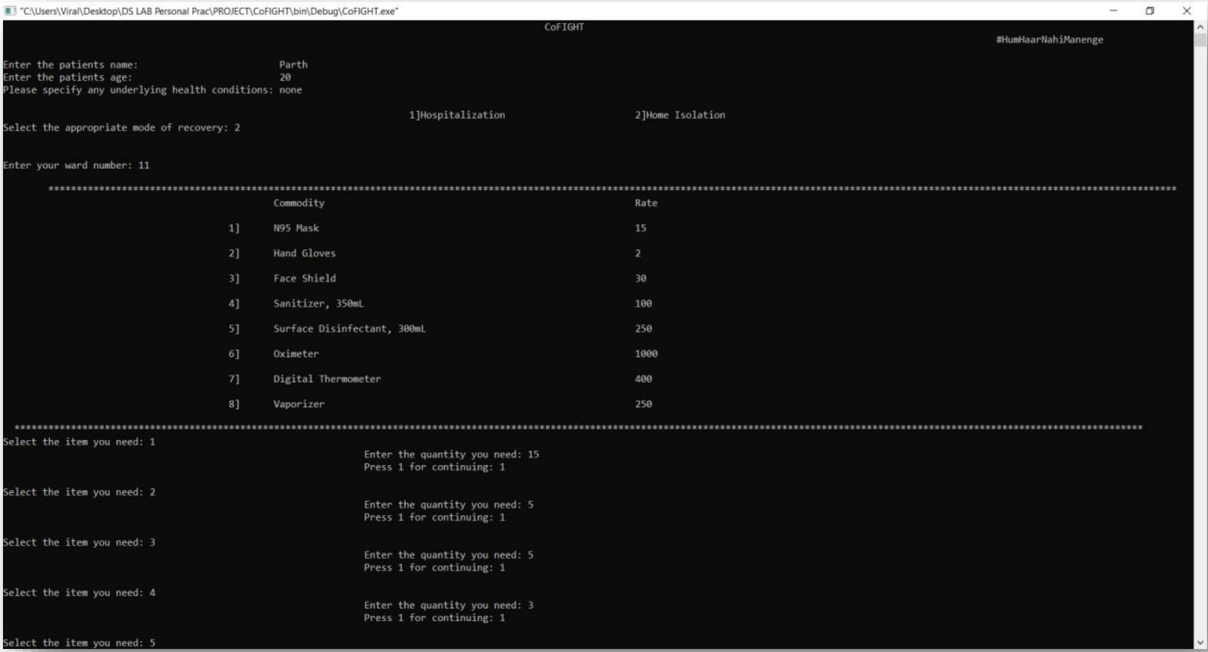
            Press 1 for Normal Bed
            Press 2 for Oxygen Bed
            Press 3 for ICU Bed     3

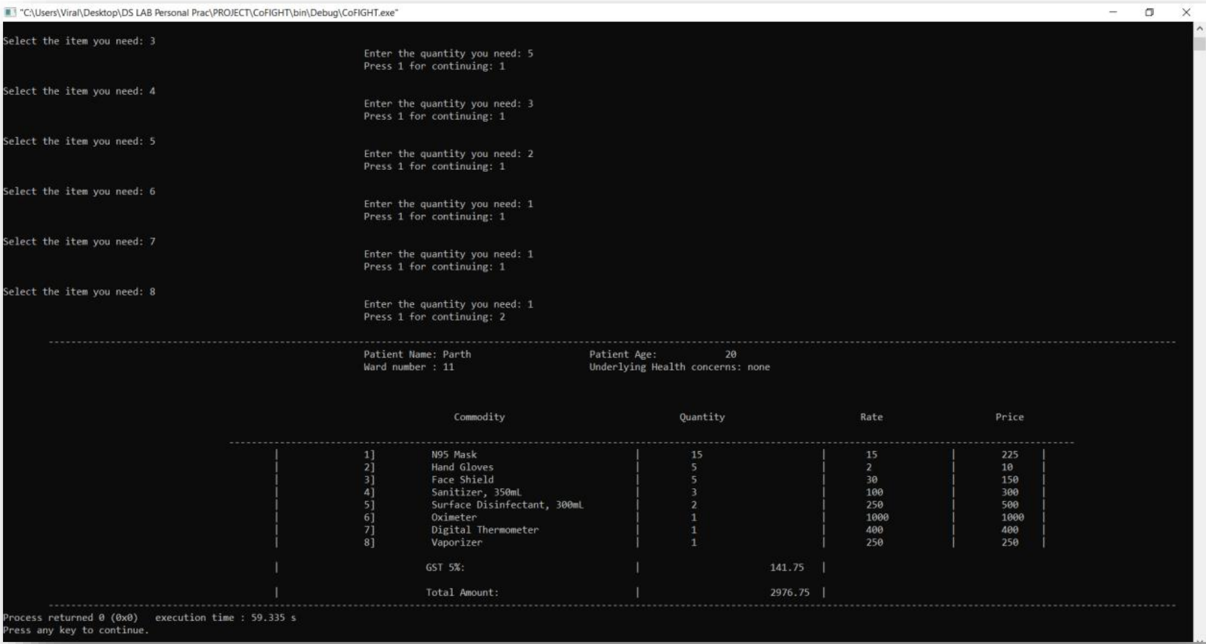
            Name of the patient:            Viral
            Age of the patient:             19
            Underlying Health conditions:   none
            Blood group of the patient:     B+

                                                You have booked an ICU Bed and 4 beds now remain in District Hospital

Process returned 0 (0x0)   execution time : 20.653 s
Press any key to continue.
```

2)Co-Cart


"C:\Users\Viral\Desktop\DS LAB Personal Prac\PROJECT\CoFIGHT\bin\Debug\CoFIGHT.exe"
CoFIGHT
#HumHaarNahiManenge
Enter the patients name: Parth
Enter the patients age: 20
Please specify any underlying health conditions: none
1]Hospitalization 2]Home Isolation
Select the appropriate mode of recovery: 2
Enter your ward number: 11
Commodity Rate
1] N95 Mask 15
2] Hand Gloves 2
3] Face Shield 30
4] Sanitizer, 350mL 100
5] Surface Disinfectant, 300mL 250
6] Oximeter 1000
7] Digital Thermometer 400
8] Vaporizer 250
Select the item you need: 1
Enter the quantity you need: 15
Press 1 for continuing: 1
Select the item you need: 2
Enter the quantity you need: 5
Press 1 for continuing: 1
Select the item you need: 3
Enter the quantity you need: 5
Press 1 for continuing: 1
Select the item you need: 4
Enter the quantity you need: 3
Press 1 for continuing: 1
Select the item you need: 5


"C:\Users\Viral\Desktop\DS LAB Personal Prac\PROJECT\CoFIGHT\bin\Debug\CoFIGHT.exe"
Select the item you need: 3
Enter the quantity you need: 5
Press 1 for continuing: 1
Select the item you need: 4
Enter the quantity you need: 3
Press 1 for continuing: 1
Select the item you need: 5
Enter the quantity you need: 2
Press 1 for continuing: 1
Select the item you need: 6
Enter the quantity you need: 1
Press 1 for continuing: 1
Select the item you need: 7
Enter the quantity you need: 1
Press 1 for continuing: 1
Select the item you need: 8
Enter the quantity you need: 1
Press 1 for continuing: 2
Patient Name: Parth Patient Age: 20
Ward number : 11 Underlying Health concerns: none
Commodity Quantity Rate Price
1] N95 Mask 15 15 225
2] Hand Gloves 5 2 10
3] Face Shield 5 30 150
4] Sanitizer, 350mL 3 100 300
5] Surface Disinfectant, 300mL 2 250 500
6] Oximeter 1 1000 1000
7] Digital Thermometer 1 400 400
8] Vaporizer 1 250 250
GST 5%: 141.75
Total Amount: 2976.75
Process returned 0 (0x0) execution time : 59.335 s
Press any key to continue.

Synopsis

CoFIGHT

#HumHaarNahiManenge

Book A Bed	Find Resources for home Quarantine
Enter basic details	Enter basic details
Choose your City	Choose preferred essentials
Book any of the 3 kinds of Beds in your city	Get a printed bill

Things we learnt

- ✓ Realizing how the world of technology (especially **data structures** in this case) is internally woven into the society and can help with its problems.
- ✓ Implementing data structures and **optimizing space** in order to solve a real-life problem.
- ✓ Applying a **linked list** got us to understand memory usage which could increase with the use of arrays.
- ✓ We learnt about application of Queues and where exactly in the **FIFO** (First-in First-out) principle required.
- ✓ Learnt basic **Digital art**, an important skill these days, using CANVA (application).

Limitations

- ➢ The bed booking system could have been on a **real-time** basis.
- ➢ Due to application of Linked lists, **time complexity** to access the node of any hospital becomes O(n).
- ➢ The commodity ordering system does not keep a **memory** of previous bills.
- ➢ The system cannot be used by hospitals, NGO's or other good-willing organizations because of the **upper limit** of ordering the number of pieces of a selected essential.