

K.E. Society's
Rajarambapu Institute of Technology, Rajaramnagar
(An Autonomous Institute, Affiliated to Shivaji University, Kolhapur)
Computer Science and Information Technology Department

Data Structures and Algorithms Laboratory (CI2111)

Project title : Railway Reservation System

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Introduction

- **This system is basically concerned with the reservation of railway tickets to the passengers.**
- **In this we are discussing that how the reservation is done with the feature of cancelling and waiting list.**
- **In the project we are going to include entities like**
 - **Reservation**
 - **Cancellation**
 - **Display reserved and waiting list passengers.**

Objectives of the project

- All the manual work should be converted into computerized so that the load of employees should decrease.
- The data should be stored in computer rather than in register manually.
- Booking can be done by sitting at your home only, no need to visit the booking counter.

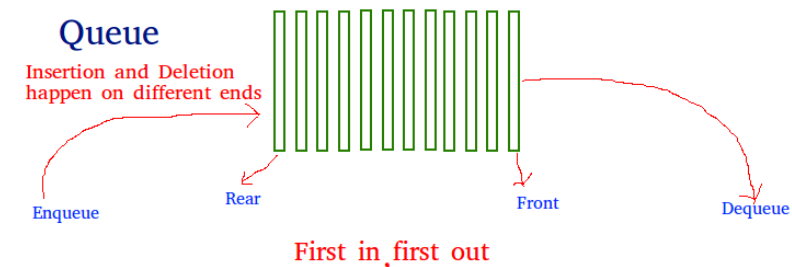
Data Structure Used

Singly Linked List

- Linked List is a sequential collection of nodes. Which is faster than array in terms of deletion of nodes. It's memory is dynamically allocated in runtime. This saves time and space.
- Each node consists of four different data field :
 - #Name
 - #Age
 - #Registration Number
 - #Link to the next node

Linear Queue

- Queue is a data structure in which insertion and deletion takes place from the ends. It follows First In First Out (FIFO) Principle.
- Linear Queue data structure is used here to store the waiting list passengers. If anyone cancels their ticket then that seat is allocated to the first passenger in the queue.



Software requirements

- Operating System : OSx
- Frontend : C programming
- Backend : C programming
- IDE : Visual Studio Code / DEV C++



Implementation modules

Node creation :

```
typedef struct NODE
{
    int reg_no;
    int age;
    char name[20];
    struct NODE *next;
} node;
```

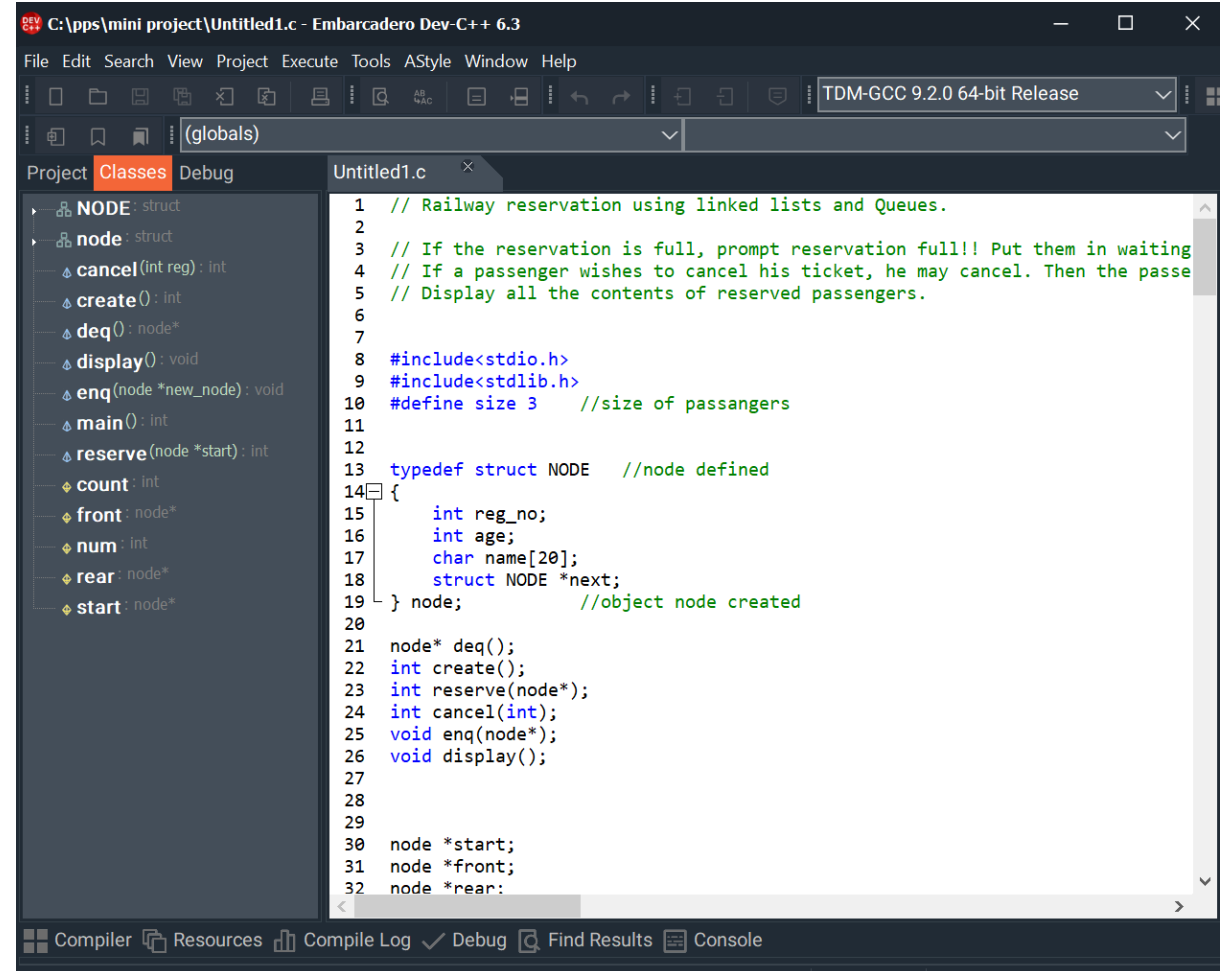


NODE 1	
DATA	Link to next node
Name	
Age	
Registration Number	

Implementation modules

Functions created :

- `int create();`
- `int reserve(node*);`
- `int cancel(int);`
- `void display();`
- `node* deq();`
- `void enq(node*);`



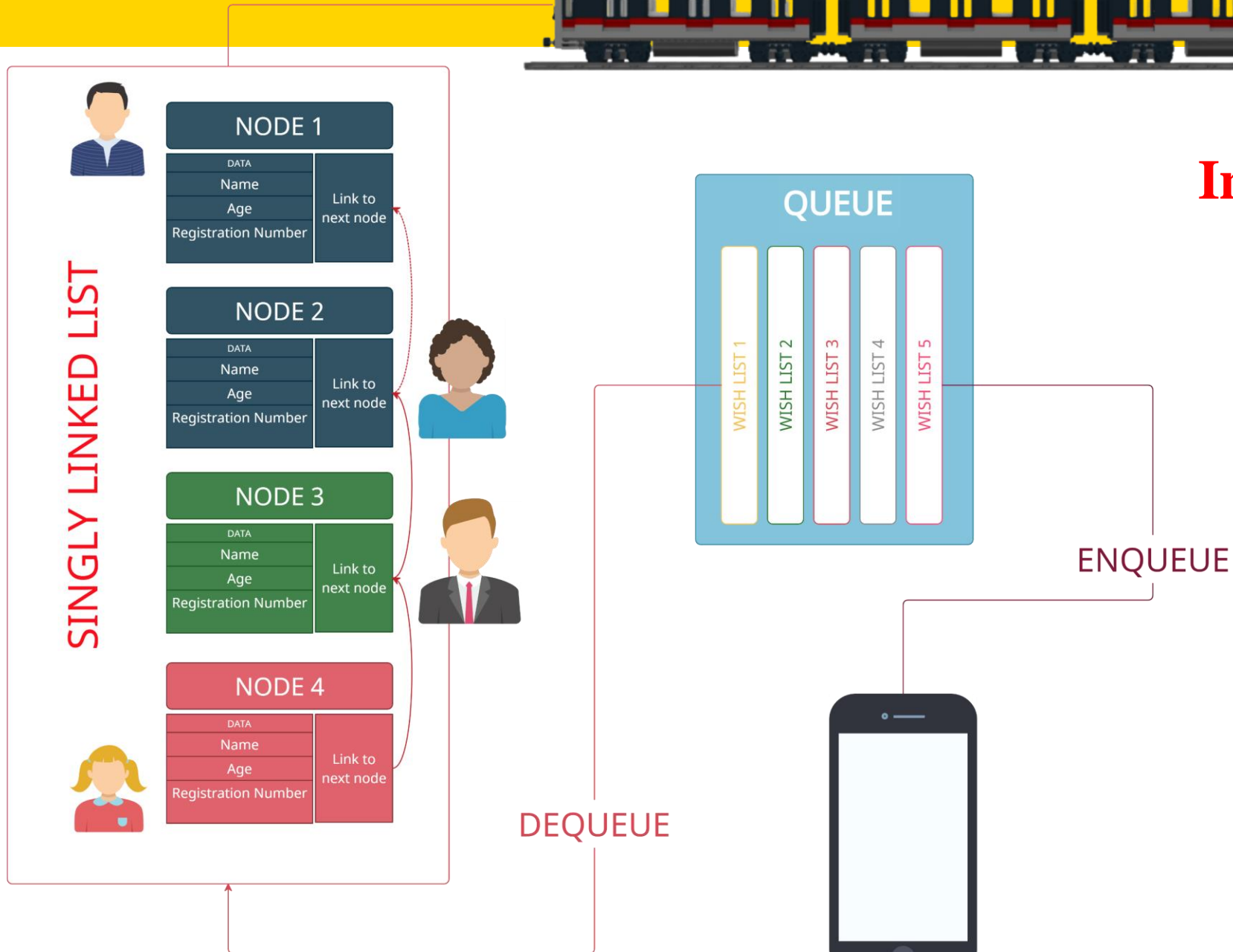
```

1 // Railway reservation using linked lists and Queues.
2
3 // If the reservation is full, prompt reservation full!! Put them in waiting
4 // If a passenger wishes to cancel his ticket, he may cancel. Then the passe
5 // Display all the contents of reserved passengers.
6
7
8 #include<stdio.h>
9 #include<stdlib.h>
10 #define size 3 //size of passengers
11
12
13 typedef struct NODE //node defined
14 {
15     int reg_no;
16     int age;
17     char name[20];
18     struct NODE *next;
19 } node; //object node created
20
21 node* deq();
22 int create();
23 int reserve(node*);
24 int cancel(int);
25 void enq(node*);
26 void display();
27
28
29
30 node *start;
31 node *front;
32 node *rear;
  
```




Implementation modules

flowchart



Results

```

C:\apps\mini project\Untitled1.exe
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Data Structure Laboratory

Mini Project

Title : Railway Reservation

Group Members :
1. Akshata Savadikar PRN2010037
2. Swaroop Mane PRN2010015
3. Aman Shikalgar PRN2010003
4. Chinmay Pawar PRN2010005
5. Vishwajit Mangrulkar PRN2010005

**RAILWAY RESERVATION **

Do you want to -
1. Book a ticket
2. Cancel Booking
3. Display passenger details
4. exit

1
Name: aman
Age : 21

Booking Successful!!! Enjoy your journey! Your Reg No is 1

Do you want to -
1. Book a ticket
2. Cancel Booking
3. Display passenger details
4. exit
  
```

```

C:\apps\mini project\Untitled1.exe
Rajarambapu Institute OF Technology, Rajaramnagar

Data Structure Laboratory

Mini Project

Title : Railway Reservation

Group Members :
4. Chinmay Pawar PRN2010005
5. Vishwajit Mangrulkar PRN2010005

**RAILWAY RESERVATION **

Do you want to -
1. Book a ticket
2. Cancel Booking
3. Display passenger details
4. exit

1
Name: aman
Age : 21

Booking Successful!!! Enjoy your journey! Your Reg No is 1

Do you want to -
1. Book a ticket
2. Cancel Booking
3. Display passenger details
4. exit

2

Give the Registration number to be cancelled
1

Registration cancelled successfully

Do you want to -
1. Book a ticket
2. Cancel Booking
3. Display passenger details
4. exit
  
```

```
C:\apps\mini project\Untitled1.exe
Rajarambapu Institute Of Technology, Rajaramnagar

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5. Vishwajit Mangrulkar  PRN2010005

**RAILWAY RESERVATION **

Do you want to -
1. Book a ticket
2. Cancel Booking
3. Display passenger details
4. exit

1
Name: aman
Age : 21
Booking Successful!!! Enjoy your journey! Your Reg No is 1

Do you want to -
1. Book a ticket
2. Cancel Booking
3. Display passenger details
4. exit

2
Give the Registration number to be cancelled
```

```
C:\apps\mini project\Untitled1.exe
4. exit

1
Name: akshata
Age : 19
Booking Successful!!! Enjoy your journey! Your Reg No is 3

Do you want to -
1. Book a ticket
2. Cancel Booking
3. Display passenger details
4. exit

3
Registration Number: 1
Name : vishwajeet

Registration Number: 2
Name : chinmay

Registration Number: 3
Name : akshata

Do you want to -
1. Book a ticket
2. Cancel Booking
3. Display passenger details
4. exit

1
Name: swaroop
Age : 20
```

```
C:\apps\mini project\Untitled1.exe
Give the Registration number to be cancelled
1
Registration cancelled successfully

Do you want to -
1. Book a ticket
2. Cancel Booking
3. Display passenger details
4. exit

1
Name: vishwajeet
Age : 18
Booking Successful!!! Enjoy your journey! Your Reg No is 1

Do you want to -
1. Book a ticket
2. Cancel Booking
3. Display passenger details
4. exit

1
Name: chinmay
Age : 19
Booking Successful!!! Enjoy your journey! Your Reg No is 2

Do you want to -
1. Book a ticket
2. Cancel Booking
3. Display passenger details
4. exit
```

```
C:\apps\mini project\Untitled1.exe
Age : 20
Booking Successful!!! Enjoy your journey! Your Reg No is 4

Do you want to -
1. Book a ticket
2. Cancel Booking
3. Display passenger details
4. exit

1
Name: pankaj
Age : 30
Booking Full!!!
You are added to waiting list. Waiting list number 1

Do you want to -
1. Book a ticket
2. Cancel Booking
3. Display passenger details
4. exit

2
Give the Registration number to be cancelled
2
Registration cancelled successfully

Do you want to -
1. Book a ticket
2. Cancel Booking
3. Display passenger details
4. exit

3
```

```

C:\apps\mini project\Untitled1.exe
Registration cancelled successfully

Do you want to -
1. Book a ticket
2. Cancel Booking
3. Display passenger details
4. exit

3

Registration Number: 1
Name : vishwajeet

Registration Number: 3
Name : akshata

Registration Number: 4
Name : swaroop

Registration Number: 2
Name : pankaj

Do you want to -
1. Book a ticket
2. Cancel Booking
3. Display passenger details
4. exit

-

```

```

C:\apps\mini project\Untitled1.exe
Age : 20

Booking Successful!!! Enjoy your journey! Your Reg No is 4

Do you want to -
1. Book a ticket
2. Cancel Booking
3. Display passenger details
4. exit

1
Name: pankaj
Age : 30

Booking Full!!!
You are added to waiting list. Waiting list number 1

Do you want to -
1. Book a ticket
2. Cancel Booking
3. Display passenger details
4. exit

2

Give the Registration number to be cancelled
2

Registration cancelled successfully

Do you want to -
1. Book a ticket
2. Cancel Booking
3. Display passenger details
4. exit

3

```

Advantages

- **Reduces the burden of traveler waiting in the booking counter.**
- **User-friendly.**
- **Convenient.**
- **Time savings.**
- **Helpful during COVID.**

Future Enhancements

- **We can optimise our time complexity using some of different data structure.**
- **We can add features such as prioritising on the basis of age or railway employees and gender.**
- **We can add feature of tatkal reservation.**
- **We can provide this solution on online portal.**

References

- www.youtube.com
- www.tutorialspoint.com
- www.greeksforgreek.org

