==

Roll Number: SYCOC303   Division: C

PRN Number: 122B2B303   Batch: C4

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==

Problem Statement:

The ticket booking system of Cinemax theatre has to be implemented using C++ program. There are 15 rows and 10 seats in each row. Doubly linked lists have to be maintained to keep track of free seats in rows. Assume some random booking to start with. Use an array to store pointers (Head pointer) to each row. On demand

a. The list of available seats is to be displayed

c. The seats are to be booked

d. The booking can be cancelled

==

INPUT:

```
/*
 *    ===================================
 *          Program Name: Theatre.cpp
 *     Created on: December 22, 2022
 *       Author: Vinayak Shete
 *   ===================================
 */


 #include <iostream>
#include <stdlib.h>
#include <math.h>


using namespace std;


struct Node
```

```
{
        char ch;
        int no;
        Node *prev,*next;
}*head;


Node* arr[15];
Node *tmp=NULL;


class Theatre
{
    int pswd;
        public:
                //creating a theatre seats
                void create()
                {
                        int i,j;
                        Node *head, *tmp;
                        int seatno=001;
                        for(i=0;i<15;i++)
                        {
                                Node *nn=new Node();
                                head=nn;
                                arr[i]=head;
                                nn->prev=NULL;
                                nn->ch='v';
                                nn->no=seatno;
                                seatno++;
                                tmp=nn;
                                for(j=1;j<10;j++)
                                {
                                        Node *nn1 = new Node();
                                        tmp->next=nn1;
                                        nn1->prev=tmp;
                                        nn1->next=NULL;
                                        nn1->ch='v';
                                        nn1->no=seatno;
```

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```
                                seatno++;

                                tmp=nn1;

                        }

                }

        }


        //displaying the all seat status
        void display()
        {
                int i,j;
                cout<<"============================== Screen this way
==============================\n\n";
                for(i=0;i<15;i++)
                {
                        Node *tmp=arr[i];
                        for(j=0;j<10;j++)
                        {
                                cout<<"|"<<tmp->no<<"|"<<tmp->ch<<"|";
                                cout<<"   ";
                                // cout<<"\t";
                                tmp=tmp->next;
                        }
                        cout<<"\n";
                }
        }


        //displaying only vacant seats
        void display_vacant()
        {
                int i,j;
                cout<<"============================== Screen this way
==============================\n\n";
                for(i=0;i<15;i++)
                {
                        Node *tmp=arr[i];
                        for(j=0;j<10;j++)
                        {
```

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```
                        if(tmp->ch=='B')
                        {
                            cout<<"|"<<tmp->ch<<"|";
                            cout<<"  ";
                        }
                        else{
                            cout<<"|"<<tmp->no<<"|"<<tmp->ch<<"|";
                            cout<<"  ";
                            // cout<<"\t";
                        }
                            tmp=tmp->next;
                    }
                    cout<<"\n";
            }
        }


        //function for booking a seat
        void book()
        {
            int no,row,col,i;
            cout<<"Enter seat number to book the seat: ";
            cin>>no;
            row = floor(no/10);
            col=no%10;
            Node *tmp;
            tmp=arr[row];
            if(tmp->ch=='V')
            {
                cout<<"Enter your security pin: ";
                cin>>pswd;
                for(i=1;i<col;i++)
                tmp=tmp->next;
                tmp->ch='B';
            }
            else
            {
                cout<<"This seat is already booked!";
```

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```
            }
        }

        //function for cancelling booking
        void cancel()
        {
            int no,row,col,i;
            cout<<"Enter seat number to cancel the seat: ";
            cin>>no;
            row = floor(no/10);
            col=no%10;
            Node *tmp;
            tmp=arr[row];
            for(i=1;i<col;i++)
                tmp=tmp->next;
            if(tmp->ch=='B')
            {
                int no1;
                cout<<"Enter your security pin: ";
                cin>>no1;
                if(pswd==no1)
                {
                    tmp->ch='V';
                    cout<<"Your booking has been successfullly cancelled!";
                }
                else
                {
                    cout<<"\nSecurity password Mismatch!";
                }
            }
            else
            {
                cout<<"This seat is not booked!";
            }
        }

};
```

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```cpp
int main()
{
        Theatre t;
        int ch;


        t.create();


        do{
        cout<<"========= Welcome to the  Pavillion Multiplex=========";
        cout<<"\n1. Display all seats status\n2. Display vacant seats\n3. Book a
seat\n4. Cancel a seat\nEnter your choice: ";
        cin>>ch;


        switch(ch)
        {
            case 1:
                t.display();
            break;
            case 2:
                t.display_vacant();
            break;
            case 3:
                t.book();
            break;
            case 4:
                t.cancel();
            break;
        }


        cout<<"\nTo continue press 1: ";
        cin>>ch;
        }while(ch==1);
        cout<<"Thankyou!";
        return 0;
}
```

===

OUTPUT:

```
========== Welcome to the  Pavillion Multiplex==========
1. Display all seats status
2. Display vacant seats
3. Book a seat
4. Cancel a seat
Enter your choice: 1
============================== Screen this way ===============================

|1|V|    |2|V|    |3|V|    |4|V|    |5|V|    |6|V|    |7|V|    |8|V|    |9|V|    |10|V|
|11|V|   |12|V|   |13|V|   |14|V|   |15|V|   |16|V|   |17|V|   |18|V|   |19|V|   |20|V|
|21|V|   |22|V|   |23|V|   |24|V|   |25|V|   |26|V|   |27|V|   |28|V|   |29|V|   |30|V|
|31|V|   |32|V|   |33|V|   |34|V|   |35|V|   |36|V|   |37|V|   |38|V|   |39|V|   |40|V|
|41|V|   |42|V|   |43|V|   |44|V|   |45|V|   |46|V|   |47|V|   |48|V|   |49|V|   |50|V|
|51|V|   |52|V|   |53|V|   |54|V|   |55|V|   |56|V|   |57|V|   |58|V|   |59|V|   |60|V|
|61|V|   |62|V|   |63|V|   |64|V|   |65|V|   |66|V|   |67|V|   |68|V|   |69|V|   |70|V|
|71|V|   |72|V|   |73|V|   |74|V|   |75|V|   |76|V|   |77|V|   |78|V|   |79|V|   |80|V|
|81|V|   |82|V|   |83|V|   |84|V|   |85|V|   |86|V|   |87|V|   |88|V|   |89|V|   |90|V|
|91|V|   |92|V|   |93|V|   |94|V|   |95|V|   |96|V|   |97|V|   |98|V|   |99|V|   |100|V|
|101|V|  |102|V|  |103|V|  |104|V|  |105|V|  |106|V|  |107|V|  |108|V|  |109|V|  |110|V|
|111|V|  |112|V|  |113|V|  |114|V|  |115|V|  |116|V|  |117|V|  |118|V|  |119|V|  |120|V|
|121|V|  |122|V|  |123|V|  |124|V|  |125|V|  |126|V|  |127|V|  |128|V|  |129|V|  |130|V|
|131|V|  |132|V|  |133|V|  |134|V|  |135|V|  |136|V|  |137|V|  |138|V|  |139|V|  |140|V|
|141|V|  |142|V|  |143|V|  |144|V|  |145|V|  |146|V|  |147|V|  |148|V|  |149|V|  |150|V|

To continue press 1:
```

```
To continue press 1: 1
========== Welcome to the  Pavillion Multiplex==========
1. Display all seats status
2. Display vacant seats
3. Book a seat
4. Cancel a seat
Enter your choice: 3
Enter seat number to book the seat: 65
Enter your security pin: 1256
```

```
Enter your choice: 1
============================== Screen this way ===============================

|1|V|    |2|V|    |3|V|    |4|V|    |5|V|    |6|V|    |7|V|    |8|V|    |9|V|    |10|V|
|11|V|   |12|V|   |13|V|   |14|V|   |15|V|   |16|V|   |17|V|   |18|V|   |19|V|   |20|V|
|21|V|   |22|V|   |23|V|   |24|V|   |25|V|   |26|V|   |27|V|   |28|V|   |29|V|   |30|V|
|31|V|   |32|V|   |33|V|   |34|V|   |35|V|   |36|V|   |37|V|   |38|V|   |39|V|   |40|V|
|41|V|   |42|V|   |43|V|   |44|V|   |45|V|   |46|V|   |47|V|   |48|V|   |49|V|   |50|V|
|51|V|   |52|V|   |53|V|   |54|V|   |55|V|   |56|V|   |57|V|   |58|V|   |59|V|   |60|V|
|61|V|   |62|V|   |63|V|   |64|V|   |65|B|   |66|V|   |67|V|   |68|V|   |69|V|   |70|V|
|71|V|   |72|V|   |73|V|   |74|V|   |75|V|   |76|V|   |77|V|   |78|V|   |79|V|   |80|V|
|81|V|   |82|V|   |83|V|   |84|V|   |85|V|   |86|V|   |87|V|   |88|V|   |89|V|   |90|V|
|91|V|   |92|V|   |93|V|   |94|V|   |95|V|   |96|V|   |97|V|   |98|V|   |99|V|   |100|V|
|101|V|  |102|V|  |103|V|  |104|V|  |105|V|  |106|V|  |107|V|  |108|V|  |109|V|  |110|V|
|111|V|  |112|V|  |113|V|  |114|V|  |115|V|  |116|V|  |117|V|  |118|V|  |119|V|  |120|V|
|121|V|  |122|V|  |123|V|  |124|V|  |125|V|  |126|V|  |127|V|  |128|V|  |129|V|  |130|V|
|131|V|  |132|V|  |133|V|  |134|V|  |135|V|  |136|V|  |137|V|  |138|V|  |139|V|  |140|V|
|141|V|  |142|V|  |143|V|  |144|V|  |145|V|  |146|V|  |147|V|  |148|V|  |149|V|  |150|V|
```

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```
Enter your security pin: 105

To continue press 1: 1
========== Welcome to the  Pavillion Multiplex==========
1. Display all seats status
2. Display vacant seats
3. Book a seat
4. Cancel a seat
Enter your choice: 2
============================== Screen this way ==============================

|1|V|   |2|V|   |3|V|   |4|V|   |5|V|   |6|V|   |7|V|   |8|V|   |9|V|   |10|V|
|11|V|  |12|V|  |13|V|  |14|V|  |15|V|  |16|V|  |17|V|  |18|V|  |19|V|  |20|V|
|21|V|  |22|V|  |23|V|  |24|V|  |25|V|  |26|V|  |27|V|  |28|V|  |29|V|  |30|V|
|31|V|  |32|V|  |33|V|  |34|V|  |35|V|  |36|V|  |37|V|  |38|V|  |39|V|  |40|V|
|41|V|  |42|V|  |43|V|  |44|V|  |45|V|  |46|V|  |47|V|  |48|V|  |49|V|  |50|V|
|51|V|  |52|V|  |53|V|  |54|V|  |55|V|  |56|V|  |57|V|  |58|V|  |59|V|  |60|V|
|61|V|  |62|V|  |63|V|  |B|    |B|    |66|V|  |67|V|  |68|V|  |69|V|  |70|V|
|71|V|  |72|V|  |73|V|  |74|V|  |75|V|  |76|V|  |77|V|  |78|V|  |79|V|  |80|V|
|81|V|  |82|V|  |83|V|  |84|V|  |85|V|  |86|V|  |87|V|  |88|V|  |89|V|  |90|V|
|91|V|  |92|V|  |93|V|  |94|V|  |95|V|  |96|V|  |97|V|  |98|V|  |99|V|  |100|V|
|101|V|  |102|V|  |103|V|  |104|V|  |105|V|  |106|V|  |107|V|  |108|V|  |109|V|  |110|V|
|111|V|  |112|V|  |113|V|  |114|V|  |115|V|  |116|V|  |117|V|  |118|V|  |119|V|  |120|V|
|121|V|  |122|V|  |123|V|  |124|V|  |125|V|  |126|V|  |127|V|  |128|V|  |129|V|  |130|V|
|131|V|  |132|V|  |133|V|  |134|V|  |135|V|  |136|V|  |137|V|  |138|V|  |139|V|  |140|V|
|141|V|  |142|V|  |143|V|  |144|V|  |145|V|  |146|V|  |147|V|  |148|V|  |149|V|  |150|V|

To continue press 1:
```

```
To continue press 1: 1
========== Welcome to the  Pavillion Multiplex==========
1. Display all seats status
2. Display vacant seats
3. Book a seat
4. Cancel a seat
Enter your choice: 4
Enter seat number to cancel the seat: 65
Enter your security pin: 1654

Security password Mismatch!
To continue press 1: 1
========== Welcome to the  Pavillion Multiplex==========
1. Display all seats status
2. Display vacant seats
3. Book a seat
4. Cancel a seat
Enter your choice: 4
Enter seat number to cancel the seat: 56
This seat is not booked!
To continue press 1: 1
```

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```
4. Cancer a seat
Enter your choice: 2
============================== Screen this way ===============================

|1|V|    |2|V|    |3|V|    |4|V|    |5|V|    |6|V|    |7|V|    |8|V|    |9|V|    |10|V|
|11|V|   |12|V|   |13|V|   |14|V|   |15|V|   |16|V|   |17|V|   |18|V|   |19|V|   |20|V|
|21|V|   |22|V|   |23|V|   |24|V|   |25|V|   |26|V|   |27|V|   |28|V|   |29|V|   |30|V|
|31|V|   |32|V|   |33|V|   |34|V|   |35|V|   |36|V|   |37|V|   |38|V|   |39|V|   |40|V|
|41|V|   |42|V|   |43|V|   |44|V|   |45|V|   |46|V|   |47|V|   |48|V|   |49|V|   |50|V|
|51|V|   |52|V|   |53|V|   |54|V|   |55|V|   |56|V|   |57|V|   |58|V|   |59|V|   |60|V|
|61|V|   |62|V|   |63|V|   |64|V|   |B|      |66|V|   |67|V|   |68|V|   |69|V|   |70|V|
|71|V|   |72|V|   |73|V|   |74|V|   |75|V|   |76|V|   |77|V|   |78|V|   |79|V|   |80|V|
|81|V|   |82|V|   |83|V|   |84|V|   |85|V|   |86|V|   |87|V|   |88|V|   |89|V|   |90|V|
|91|V|   |92|V|   |93|V|   |94|V|   |95|V|   |96|V|   |97|V|   |98|V|   |99|V|   |100|V|
|101|V|  |102|V|  |103|V|  |104|V|  |105|V|  |106|V|  |107|V|  |108|V|  |109|V|  |110|V|
|111|V|  |112|V|  |113|V|  |114|V|  |115|V|  |116|V|  |117|V|  |118|V|  |119|V|  |120|V|
|121|V|  |122|V|  |123|V|  |124|V|  |125|V|  |126|V|  |127|V|  |128|V|  |129|V|  |130|V|
|131|V|  |132|V|  |133|V|  |134|V|  |135|V|  |136|V|  |137|V|  |138|V|  |139|V|  |140|V|
|141|V|  |142|V|  |143|V|  |144|V|  |145|V|  |146|V|  |147|V|  |148|V|  |149|V|  |150|V|

To continue press 1: 1
========== Welcome to the  Pavillion Multiplex==========
1. Display all seats status
2. Display vacant seats
3. Book a seat
4. Cancel a seat
Enter your choice: 4
Enter seat number to cancel the seat: 65
Enter your security pin: 1256
Your booking has been successfullly cancelled!
To continue press 1: 1
```

```
========== Welcome to the  Pavillion Multiplex==========
1. Display all seats status
2. Display vacant seats
3. Book a seat
4. Cancel a seat
Enter your choice: 1
============================== Screen this way ===============================

|1|V|    |2|V|    |3|V|    |4|V|    |5|V|    |6|V|    |7|V|    |8|V|    |9|V|    |10|V|
|11|V|   |12|V|   |13|V|   |14|V|   |15|V|   |16|V|   |17|V|   |18|V|   |19|V|   |20|V|
|21|V|   |22|V|   |23|V|   |24|V|   |25|V|   |26|V|   |27|V|   |28|V|   |29|V|   |30|V|
|31|V|   |32|V|   |33|V|   |34|V|   |35|V|   |36|V|   |37|V|   |38|V|   |39|V|   |40|V|
|41|V|   |42|V|   |43|V|   |44|V|   |45|V|   |46|V|   |47|V|   |48|V|   |49|V|   |50|V|
|51|V|   |52|V|   |53|V|   |54|V|   |55|V|   |56|V|   |57|V|   |58|V|   |59|V|   |60|V|
|61|V|   |62|V|   |63|V|   |64|V|   |65|V|   |66|V|   |67|V|   |68|V|   |69|V|   |70|V|
|71|V|   |72|V|   |73|V|   |74|V|   |75|V|   |76|V|   |77|V|   |78|V|   |79|V|   |80|V|
|81|V|   |82|V|   |83|V|   |84|V|   |85|V|   |86|V|   |87|V|   |88|V|   |89|V|   |90|V|
|91|V|   |92|V|   |93|V|   |94|V|   |95|V|   |96|V|   |97|V|   |98|V|   |99|V|   |100|V|
|101|V|  |102|V|  |103|V|  |104|V|  |105|V|  |106|V|  |107|V|  |108|V|  |109|V|  |110|V|
|111|V|  |112|V|  |113|V|  |114|V|  |115|V|  |116|V|  |117|V|  |118|V|  |119|V|  |120|V|
|121|V|  |122|V|  |123|V|  |124|V|  |125|V|  |126|V|  |127|V|  |128|V|  |129|V|  |130|V|
|131|V|  |132|V|  |133|V|  |134|V|  |135|V|  |136|V|  |137|V|  |138|V|  |139|V|  |140|V|
|141|V|  |142|V|  |143|V|  |144|V|  |145|V|  |146|V|  |147|V|  |148|V|  |149|V|  |150|V|

To continue press 1:
```