Hotel Management

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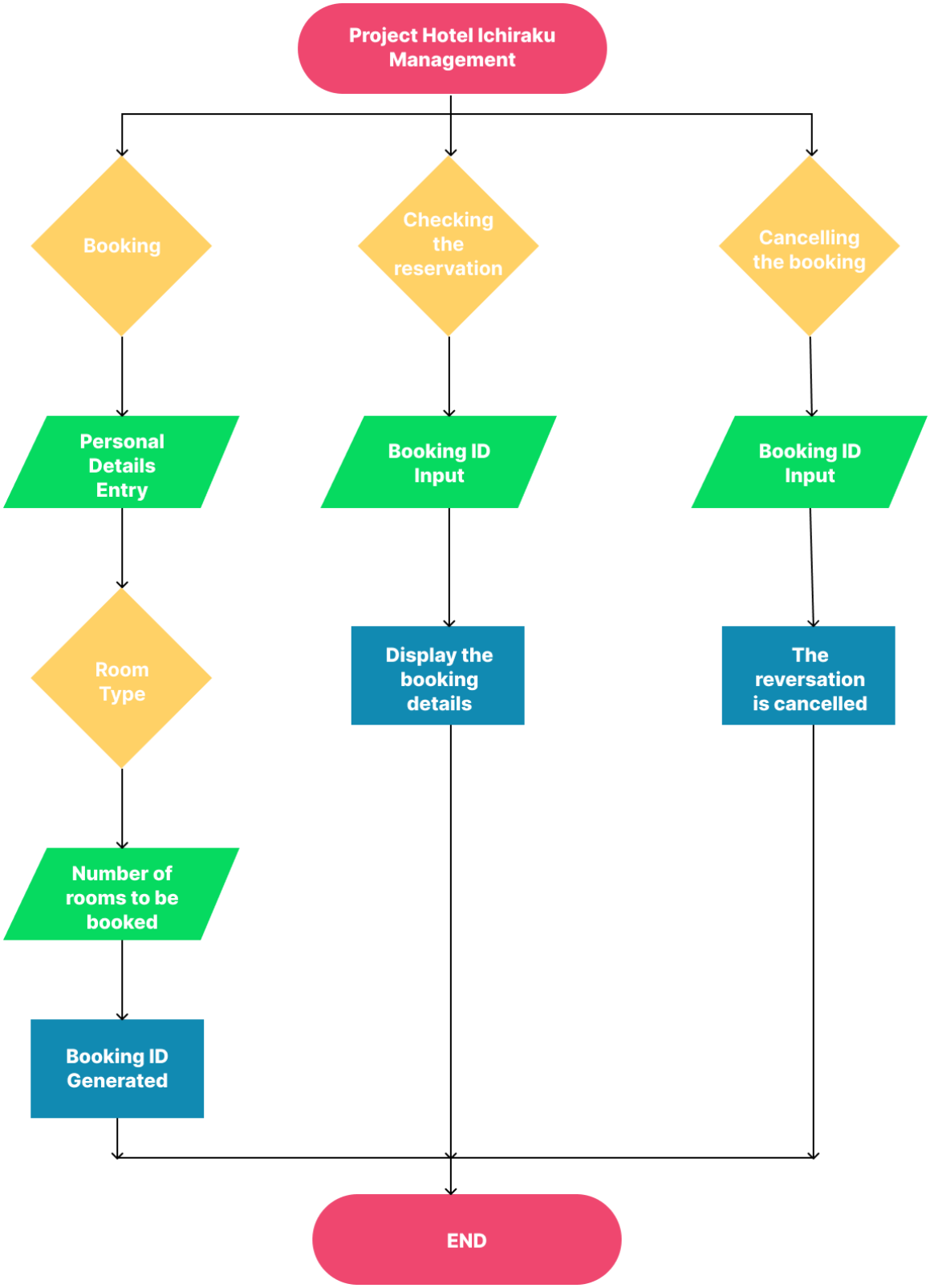
Description:

Since the advent of technology, people are relying more on online bookings rather than offline. The problems faced by customers while booking the hotel rooms have also increased. Thus this project will help in tackling issues such as the refund policies while canceling the booked rooms and instant updates on the availability of rooms. This application is to maintain customer details and booking and canceling of rooms.. Implementation of security and safeguarding of User's details will be taken care of properly.
Hence we decided to use AVL trees to implement the project as AVL trees are self balanced binary search trees the searching, insertion and deletion are faster as the complexity is O(logn) and hence for larger data sets AVl trees are more efficient.

Flowchart:


Project Hotel Ichiraku Management
Booking
Checking the reservation
Cancelling the booking
Personal Details Entry
Booking ID Input
Booking ID Input
Room Type
Display the booking details
The reversation is cancelled
Number of rooms to be booked
Booking ID Generated
END

Data Structures:

Input data:
Customer details
Check-in Check-out details
Types of room
Room availability
Prepaid or Pay at delivery option

The data will be stored in the form of objects of classes. Since it ensures security of the data through data hiding and abstraction. Then those objects will be stored in linked lists and BST. Since we need to search through which rooms are free.

Snapshots:

AVL TREE IMPLEMENTATION:

```
~/ADS-PROJECT$ g++ Avl.cpp
~/ADS-PROJECT$ ./a.out

            *****HOTEL ICHIRAKU*****
         ---Welcome to Hotel Ichiraku---
         Hope you enjoy your stay!!

Select Operation:
    1]Book room
    2]Check Reservation
    3]Cancel Booking
    0]Exit
Enter your choice: 1

Enter name: Subhi11
Invalid name!! Name should only contain letters
Enter name: Subhiksha
Enter age: 18
Enter your email id: subhi.sakthi@gmail.com
Enter your phone number: 7338887847

Select room type:
    1]Single bed Room
    2]Double bed Room
    3]Both
Enter your choice: 3
Number of available single bed rooms:120
Enter number of rooms to be booked:1
Number of available double bed rooms: 140
Enter number of rooms to be booked:2
Booking Successfull!!!
Your Booking Id is: 1234
```

```
Select Operation:
    1]Book room
    2]Check Reservation
    3]Cancel Booking
    0]Exit
Enter your choice: 1

Enter name: Sakthivel
Enter age: 9
Invalid Age limit!! Please enter age above 18
Enter age: 49
Enter your email id: asakthi@lntecc.com
Enter your phone number: 9937937407

Select room type:
    1]Single bed Room
    2]Double bed Room
    3]Both
Enter your choice: 2
Number of available rooms: 138
Enter number of rooms to be booked:1
Booking Successfull!!!
Your Booking Id is: 1235

Select Operation:
    1]Book room
    2]Check Reservation
    3]Cancel Booking
    0]Exit
Enter your choice: 1
```

```
Enter name: Gokul
Enter age: 22
Enter your email id: gkkannan.gmail
Invalid email id!! Please enter a valid email id
Enter your email id: gkkannan@gmail.com
Enter your phone number: 7397651407

Select room type:
    1]Single bed Room
    2]Double bed Room
    3]Both
Enter your choice: 1
Number of available rooms:119
Enter number of rooms to be booked:121

The number of rooms you have entered has exceeded the number of
 the rooms available.
Enter the number of rooms to be booked: 12
Booking Successfull!!!
Your Booking Id is: 1236
```

```
Select Operation:
    1]Book room
    2]Check Reservation
    3]Cancel Booking
    0]Exit
Enter your choice: 1
```

```
Enter name: baka
Enter age: 80
Enter your email id: baka@hotmail.com
Enter your phone number: 99771457814
Invalid phone number!! Please enter phone number of 10 digits
Enter your phone number: 9874650231

Select room type:
    1]Single bed Room
    2]Double bed Room
    3]Both
Enter your choice: 2
Number of available rooms: 137
Enter number of rooms to be booked:-1

The number of rooms cannot be negative!!
Enter the number of rooms to be booked: 65
Booking Successfull!!!
Your Booking Id is: 1237

Select Operation:
    1]Book room
    2]Check Reservation
    3]Cancel Booking
    0]Exit
Enter your choice: 1
```

```
Enter name: Vijaya
Enter age: 49
Enter your email id: vijaya@yahoo.com
Enter your phone number: 7373732803

Select room type:
    1]Single bed Room
    2]Double bed Room
    3]Both
Enter your choice: 3
Number of available single bed rooms:107
Enter number of rooms to be booked:2
Number of available double bed rooms: 72
Enter number of rooms to be booked:4
Booking Successfull!!!
Your Booking Id is: 1238
```

```
Select Operation:
    1]Book room
    2]Check Reservation
    3]Cancel Booking
    0]Exit
Enter your choice: 2

Enter your booking id: 1237

Reservation Status: Booked
Name:baka
Booking Id:1237
Number of double rooms booked:65

Time taken by program for searching is : 38 microseconds
```

```
Select Operation:
    1]Book room
    2]Check Reservation
    3]Cancel Booking
    0]Exit
Enter your choice: 3

Enter your booking id: 1237

Reservation Status: Booked
Name:baka
Booking Id:1237
Number of double rooms booked:65

Your booking has been successfully deleted!!
Reservation Status: Booking cleared

Select Operation:
    1]Book room
    2]Check Reservation
    3]Cancel Booking
    0]Exit
Enter your choice: 2

Enter your booking id: 1237

Time taken by program for searching is : 0 microseconds

Reservation Status: Not Booked
```

```
Select Operation:
    1]Book room
    2]Check Reservation
    3]Cancel Booking
    0]Exit
Enter your choice: 0

Preorder traversal of the constructed AVL tree is
1235 1234 1238 1236 ~/ADS-PROJECT$
```

Linked List Implementation:

```
                    *****HOTEL ICHIRAKU*****
               ---Welcome to Hotel Ichiraku---
               Hope you enjoy your stay!!
 Select Operation: 1]Book room      2]Check Reservation     3]Cancel Booking        0]Exit
 Enter your choice: 1
 Select room type: 1]Single Room        2]Double Room       3]Both
 Enter your email id: surya17@gmail.com
 Enter your phone number: 13489482
 Booking Successfull!!!
  Your Booking Id is: 1234
```

```
Select Operation: 1]Book room      2]Check Reservation     3]Cancel Booking        0]Exit
Enter your choice: 1
Select room type: 1]Single Room        2]Double Room       3]Both
Enter your choice: 3
Number of available Single rooms:118
Enter number of single rooms to be booked:3
Enter Name:sethu
Enter age:29
Enter your email id: seth@gmail.com
Enter your phone number: 2348942
Booking Successfull!!!
Number of available Double rooms: 140
Enter number of double rooms to be booked: 3
Booking Successfull!!!
 Your Booking Id is: 1235
```

```
Select Operation: 1]Book room      2]Check Reservation     3]Cancel Booking        0]Exit
Enter your choice: 2
Enter your booking id: 1235

Reservation Status: Booked
Name:sethu
Booking Id:1235
Number of single rooms booked:3
Number of double rooms booked:3

Time taken by program for searching is : 6853 microseconds
```

```
Select Operation: 1]Book room      2]Check Reservation     3]Cancel Booking        0]Exit
Enter your choice: 3
Enter your booking id: 1234
Cancellation Successful
Select Operation: 1]Book room      2]Check Reservation     3]Cancel Booking        0]Exit
Enter your choice: 19
sethu
29
1235
```

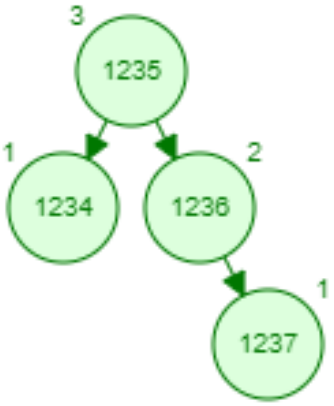
```
 Select Operation: 1]Book room      2]Check Reservation     3]Cancel Booking        0]Exit
 Enter your choice: 1
 Select room type: 1]Single Room        2]Double Room       3]Both
 Enter your choice: 1
 Number of available rooms:117
 Enter number of rooms to be booked:333
 Entered number of rooms cannot be booked.................
```

```
 Select Operation: 1]Book room      2]Check Reservation     3]Cancel Booking        0]Exit
 Enter your choice: 1
 Select room type: 1]Single Room        2]Double Room       3]Both
 Enter your choice: 2
 Number of available rooms: 140
 Enter number of rooms to be booked: 139
 Enter Name:surya
 Enter age:18
 Enter your email id: surya@gmail.com
 Enter your phone number: 49832342
 Booking Successfull!!!
```

```
Select Operation: 1]Book room      2]Check Reservation     3]Cancel Booking        0]Exit
Enter your choice: 1
Select room type: 1]Single Room        2]Double Room       3]Both
Enter your choice: 2
Number of available rooms: 1
Enter number of rooms to be booked: 3
Entered number of rooms cannot be booked.................
```

Inference:

After insertion in AVL trees:



Time required for searching the node 1237:

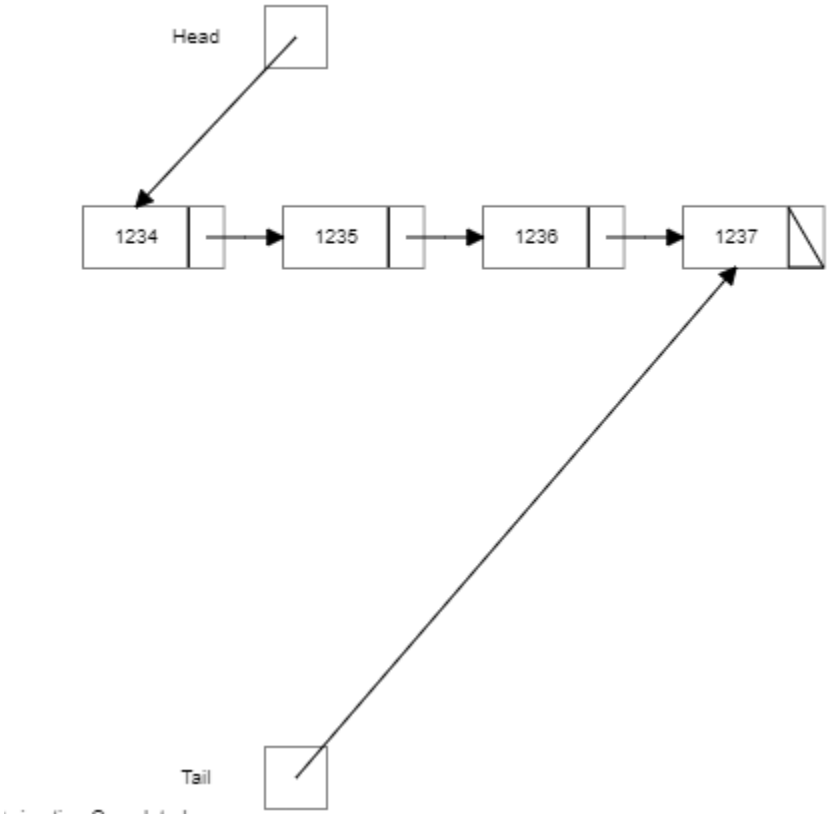
```
Select Operation:
    1]Book room
    2]Check Reservation
    3]Cancel Booking
    0]Exit
Enter your choice: 2

Enter your booking id: 1237

Reservation Status: Booked
Name:Subramanian
Booking Id:1237
Number of single rooms booked:2
Number of double rooms booked:4

Time taken by program for searching is : 32 microseconds
```

After insertion in linked list:



Time required for searching the node 1237:

```
Select Operation:
    1]Book room
    2]Check Reservation
    3]Cancel Booking
    0]Exit
Enter your choice: 2
Enter your booking id: 1237

Reservation Status: Booked
Name:3
Booking Id:1237
Number of single rooms booked:3
Number of double rooms booked:3

Time taken by program for searching is : 88 microseconds
```

Thus AVL trees are better for searching than linked lists since the time taken is lesser for the same node to be searched i.e., 32 microseconds < 88 microseconds.

Result:

Thus the hotel management system was implemented using 2 different data structures and the output was shown. We have proven practically that AVL trees are better than linked lists in terms of searching a node.