FUNDAMENTALS OF PROGRAMMING

BSPT0024 - FINAL PROJECT REPORT

SEMESTER II SESSION 2024/2025

Course Name: Fundamentals of Programming
Course Code: BSPT0024
Section: C1S1
Project Title: Hotel Room Booking System

Group Members:

- **Malek** - Section C1S1
- **Mohammed** - Section C1S1
- **Mojtaba Ahmed** - Section C1S1
- **Yousif** - Section C1S1
- **Zeyad** - Section C1S1

Study Case Question

You're looking for any available room for the holiday next month. Below are some of the hotel rooms available and their prices:

Room Type	Room ID	Price (RM)	Maximum Occupants
Single Room	1	RM 50	1
Double Room	2	RM 90	2
Deluxe Room	3	RM 150	4
Suite	4	RM 250	6

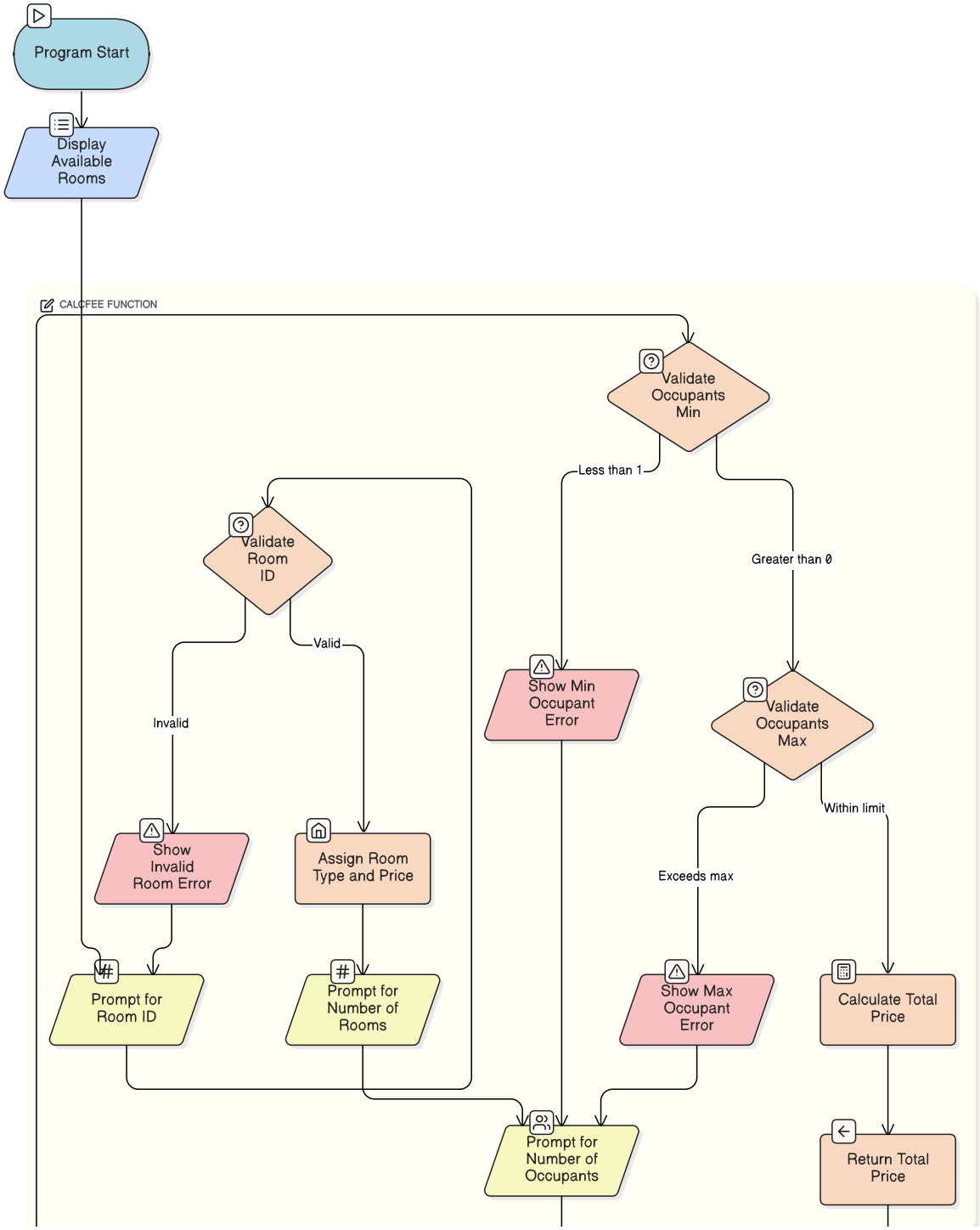
Requirements:

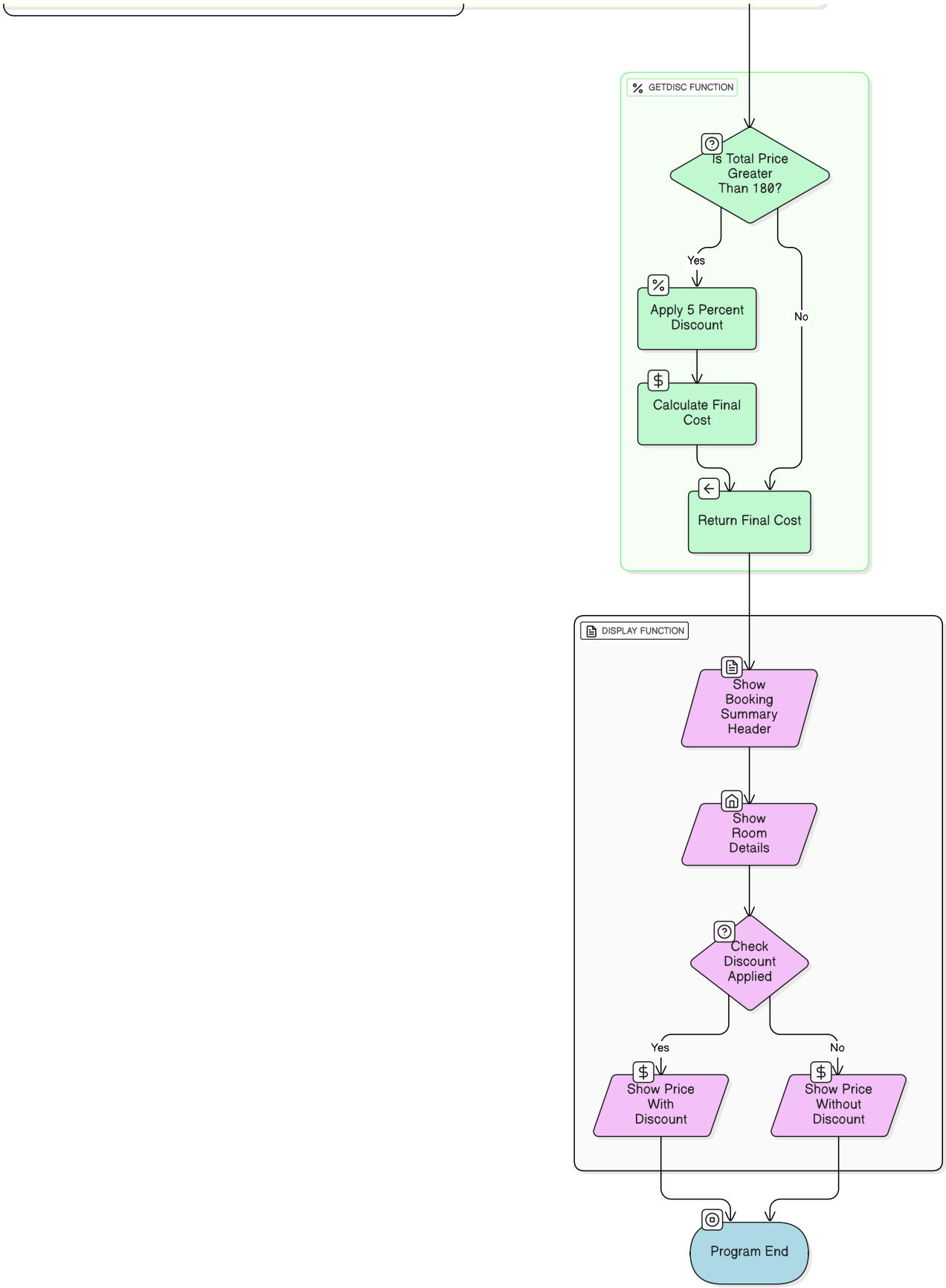
- Create room details using an array and show available rooms and prices to users
- Function `calcFee()` receives number of customers, booked rooms, and price per room to calculate total cost
- Function `getDisc()` receives total cost and calculates final cost after discount (5% if total > RM 180)
- Function `main()` prompts for room ID, quantity, and occupants with proper validation
- Print a formatted receipt with booking summary

Member Task Distribution

Member	Section	Task
Malek	C1S1	Program Design & Logic
Mohammed	C1S1	Function Implementation
Mojtaba	C1S1	Flowchart & Report Documenting
Yousif	C1S1	Testing & Debugging
Zeyad	C1S1	Code Integration & Output Formatting

System Flowchart




GETDISC FUNCTION
Is Total Price Greater Than 180?
Yes
No
Apply 5 Percent Discount
Calculate Final Cost
Return Final Cost
DISPLAY FUNCTION
Show Booking Summary Header
Show Room Details
Check Discount Applied
Yes
No
Show Price With Discount
Show Price Without Discount
Program End

Source Code

```
#include <iostream>
#include<iomanip>
using namespace std;
// global variable
float total_be,discount, room_price,final_cost;
int id,book_rooms,occupant;
string room;


//the declaration of the function;
float CalcFee(){
    //user input(id)
    room_num:
    cout<<"enter the room id you want to Book: ";
    cin>>id;
    // cout<<endl;

    //Validate room number;
    switch(id){
        case 0:
        room="single room";
        room_price=50;
        break;

        case 1:
        room="Double room";
        room_price=90;
        break;

        case 2:
        room="Deluxe room";
        room_price=150;
        break;

        case 3:
        room="suite";
        room_price=250;
        break;

        default:
        cout<<"Invalid room id"<<endl;
        goto room_num;
    }


    cout<<"enter the quantity of rooms to book: ";
    cin>>book_rooms;    //user input(quantity)
    cout<<endl;
```

```
    int max_occupants[] = {1, 2, 4, 6};     // Define max occupants for
each room type

    label:
    cout<<"enter the number of occupants: ";
    cin>>occupant;      //user input (occupant)
    cout<<endl<<endl<<endl;

    if(occupant<1){
        cout<<"Occupant cant be less than 1"<<endl;
        goto label;
    }

    // Check if occupants exceed max allowed for the selected room
    if (id >= 0 && id < 4 && occupant > max_occupants[id]) {
        cout << "Number of occupants exceeds the maximum allowed for this
room type (" << max_occupants[id] << "). Please enter a valid number." <<
endl;
        goto label;
    }

    total_be=book_rooms*room_price;     //total price befor discount
    return total_be;
}

//declaration of the function
float getDisc(){
    //the condition
    if (total_be>180){
        discount=total_be*0.05;         //the discount
        final_cost= total_be-discount;  //the final cost of the rooms;
    }
    return final_cost;
}

void display(string room, int book_rooms, float total_be, float final_cost,
int occupant, int id){
    cout<<"==================== Booking Summery====================="
<<endl;
    cout<<"Room Type: "<<room<<endl;
    cout<<"Number of Rooms Booked: "<<book_rooms<<endl;
    cout<<"Number of Occupants: "<<occupant<<endl;
    if(total_be>180){ //condition of price more than 180;
        cout<<"Total price (befor Discount): RM "<<fixed<<setprecision(2)
<<total_be<<endl;
        cout<<"Discount Amount (5%): RM "<<discount<<endl;
        cout<<"Total price (after discount): RM "<<final_cost<<endl;
    }else{
        cout<<"Total price: RM "<<fixed<<setprecision(2)<<total_be<<endl;
    }
}
```

```
int main(){

    string names[]={"single room","Double Room","Deluxe Room","Suite"};
//Basically all of this for just to make the user see our Available Rooms;

    string prices[]={"50.00","90.00","150.00","     250.00"};

    string max_occupants[]={"1","2","4","6"};

    cout<<setw(67)<<"WELCOME TO OUR HOTEL "<<"\n"<<endl;    //welcome
massage;


    cout<<"Available Rooms:"<<endl;
    cout<<"\n"<<"Room id"<<setw(13)<<"Room type"<<setw(28)<<"price per
Room(RM)"<<setw(25)<<"Max occupants"<<"\n"<<endl;
    cout<<"-------------------------------------------------------------------
-------------------"<<endl;

    for(int p=0;p<4;p++){
        cout<<p<<setw(21)<<names[p]<<setw(22)<<prices[p]<<setw(23)
<<max_occupants[p]<<"\n"<<endl;
    }

    cout<<"\n"<<"\n"<<endl;
    //calling the function
    float total_cost = CalcFee();
    float final_cost = getDisc();

    display(room, book_rooms, total_cost, final_cost, occupant, id);
//calling the function display

    return 0;

}
```

Program Output Examples

Sample Output 1 (With Discount):

```
                                                WELCOME TO OUR HOTEL

Available Rooms:

Room id    Room type          price per Room(RM)            Max occupants

--------------------------------------------------------------------------------
--------
0          single room                 50.00                      1

1          Double Room                 90.00                      2

2          Deluxe Room                150.00                      4

3                Suite                250.00                      6



enter the room id you want to Book: 2
enter the quantity of rooms to book: 2

enter the number of occupants: 8



==================== Booking Summery=====================
Room Type: Deluxe room
Number of Rooms Booked: 2
Number of Occupants: 8
Total price (before Discount): RM 300.00
Discount Amount (5%): RM 15.00
Final cost (after discount): RM 285.00
Thank you for choosing our hotel!
```

Sample Output 2 (No Discount):

```
                                              WELCOME TO OUR HOTEL

Available Rooms:

Room id    Room type          price per Room(RM)            Max occupants

--------------------------------------------------------------------------------
--------
0          single room                 50.00                      1

1          Double Room                 90.00                      2

2          Deluxe Room                150.00                      4

3                Suite                250.00                      6



enter the room id you want to Book: 1
enter the quantity of rooms to book: 1

enter the number of occupants: 2



==================== Booking Summery=====================
Room Type: Double room
Number of Rooms Booked: 1
Number of Occupants: 2
Total price: RM 90.00
Thank you for choosing our hotel!
```

Sample Output 3 (Error Handling):

```
                                                WELCOME TO OUR HOTEL

Available Rooms:

Room id    Room type          price per Room(RM)            Max occupants

--------------------------------------------------------------------------------
--------
0          single room                 50.00                      1

1          Double Room                 90.00                      2

2          Deluxe Room                150.00                      4

3                Suite                250.00                      6



enter the room id you want to Book: 1
enter the quantity of rooms to book: 1

enter the number of occupants: 3



Number of occupants exceeds the maximum allowed for this room type (2).
Please enter a valid number.
enter the number of occupants: 4



Number of occupants exceeds the maximum allowed for this room type (2).
Please enter a valid number.
enter the number of occupants: 2



==================== Booking Summery=====================
Room Type: Double room
Number of Rooms Booked: 1
Number of Occupants: 2
Total price: RM 90.00
Thank you for choosing our hotel!
```

Conclusion

What we accomplished beyond the basic requirements:

1. Added input validation - The program checks if users enter valid room IDs and won't let them continue with wrong numbers
2. Added occupancy limits - We made sure people can't book more occupants than the room allows (like trying to put 5 people in a single room)
3. Made error handling - When users enter wrong information, the program asks them to try again instead of crashing
4. Improved the user interface - We made a nice welcome message and formatted table showing all available rooms

What we learned:

1. How to write functions and make them work together in a program
2. How to use arrays to store different types of information
3. How to check user input and show error messages when something is wrong
4. How to work as a team by dividing tasks between group members
5. How to format output to make it look professional

This project helped us understand the basics of programming and how to solve problems using code. We learned that programming requires patience and careful planning, but it's rewarding when everything works correctly.

References

Academic Resources:

1. Course Slides: Fundamentals of Programming Concepts - Chapter 3: TECHNICAL APPROACHES

TO PROGRAMMING

2. Course Slides: Fundamentals of Programming Concepts - Chapter 7: ARRAYS

Online Resources:

1. Stack Overflow. (2024). C++ Programming Help and Best Practices.
2. GeeksforGeeks. (2024). C++ Input Validation and Error Handling.