

Airline Flight Reservation System

Final Project

LBYEC2A - EQ8

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Objectives

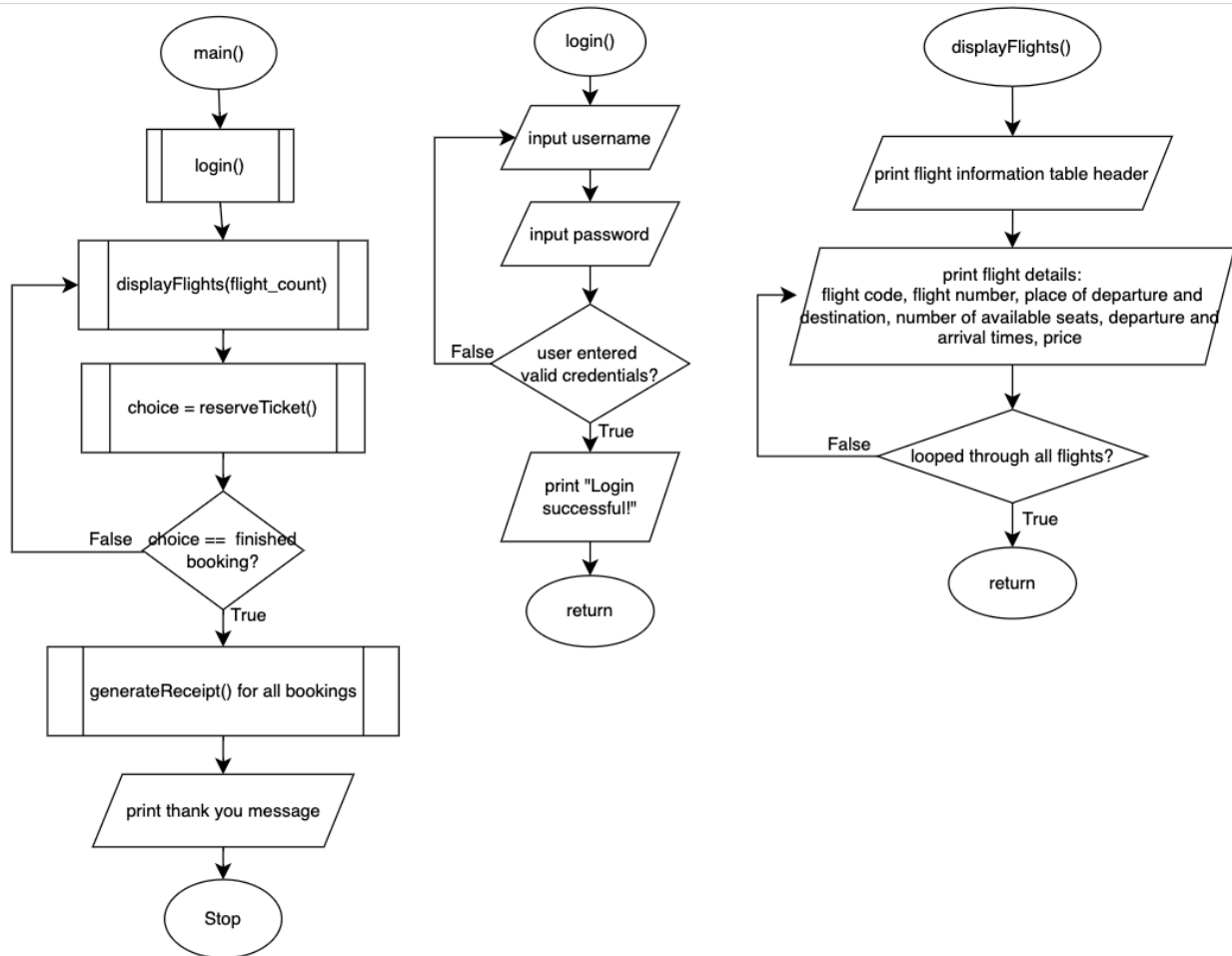
The objectives of the Airline Flight Reservation/Purchasing System are to:

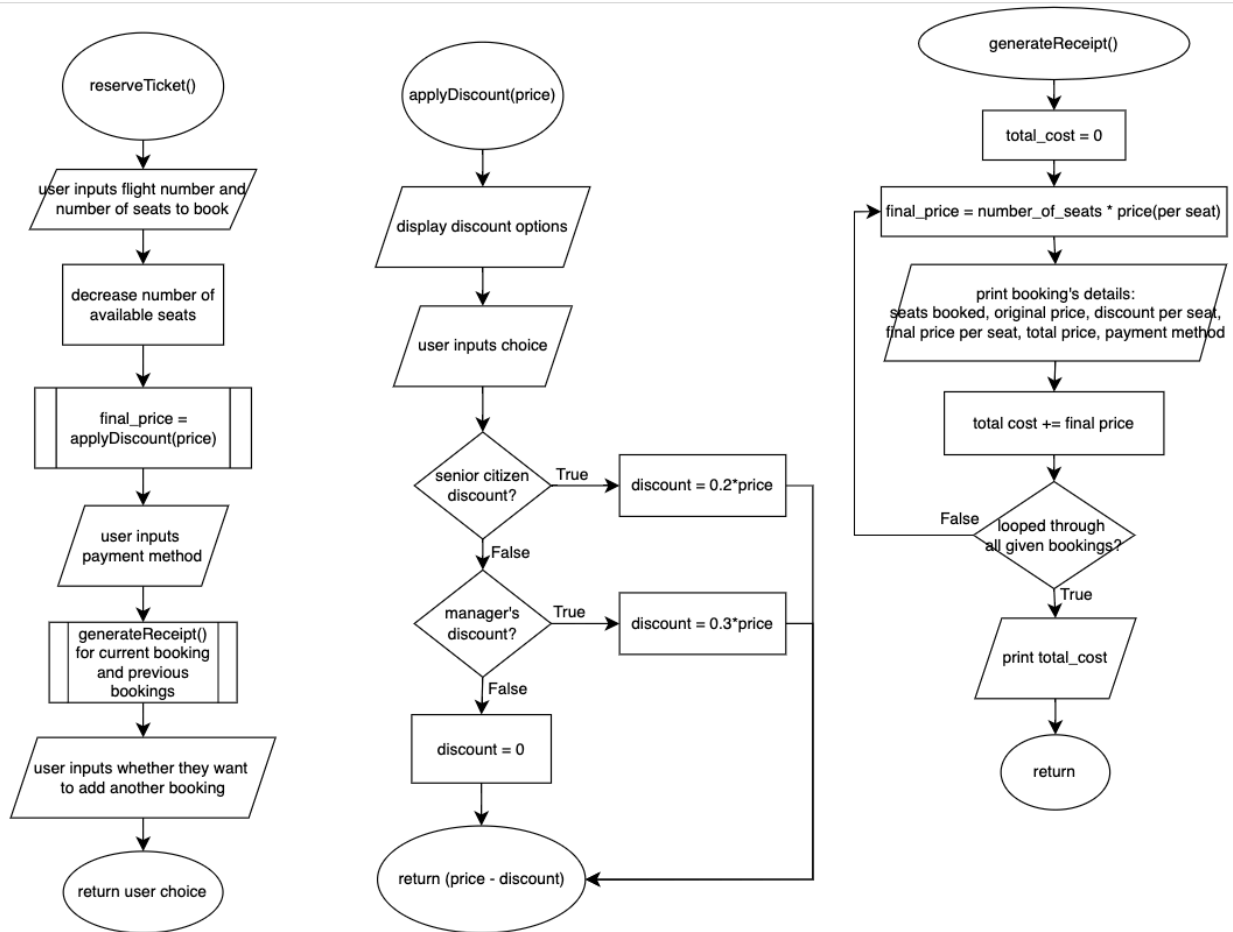
- To simulate a basic airline reservation and ticket purchasing experience using the C programming language.
- To allow users to log in with predefined credentials and access flight schedules.
- To enable users to reserve tickets, apply valid discounts, and receive a transaction receipt.
- To apply the basic C programming topics the students have learned in this project, such as input/output, conditionals and loop statements, arrays (one-dimensional and two-dimensional), and functions.

Problem

Develop the Airline Flight Reservation System. It is a console-based program developed in C that simulates a basic flight booking process. Upon launching the program, the user is prompted to log in using a predefined username and password. Upon entering a valid username and password, the screen clears to simulate moving to a new page, making the program feel more dynamic and organized. Once logged in, the user is shown a list of available flights with detailed information, including the flight number, origin, destination, number of available seats, departure and arrival times, and price. After choosing a flight, the user is asked to select a discount type: no discount, a 20% discount for Senior Citizens or PWDs, or a 30% Manager's Discount. The user then selects a payment method (Cash or Card), and the booking receipt is displayed, which includes the flight number, the total discounted price, and the selected payment method. The user is then prompted if they want to book another ticket. This process repeats until the user chooses to exit the program, and a final transaction summary receipt is generated, along with a "Thank you for using our Airline Reservation system!" message, and the program is terminated.

Flowchart





Codes:

```

#include <stdio.h>
#include <string.h>
#include <stdlib.h> // for system("clear")
#include <ctype.h> // for toupper()

#define MAX_SEATS 23
#define MAX_BOOKINGS 100

//flight details arrays
char flight_no[5][10] = {"FL123", "FL456", "FL789", "FL025", "FL684"};
char departure[5][20] = {"Manila", "Manila", "Cebu", "Clark", "Manila"};
char arrival[5][20] = {"Cebu", "Davao", "Davao", "Narita", "Incheon"};
  
```

```
int available_seats[5] = {MAX_SEATS, MAX_SEATS, MAX_SEATS, MAX_SEATS,
MAX_SEATS};
char departureTime[5][20] = {"06:00 AM", "03:30 PM", "11:00 AM", "03:15 AM", "02:00 PM"};
char arrivalTime[5][20] = {"07:30 AM", "04:15 PM", "12:45 PM", "09:30 AM", "06:30 PM"};
float price[5] = {4998, 4231, 3678, 15945, 8643};
```

```
//booking details arrays
char booked_flight_no[MAX_BOOKINGS][10];
float booked_price[MAX_BOOKINGS];
char payment_method[MAX_BOOKINGS][10];
float booked_discount[MAX_BOOKINGS];
int booked_seats[MAX_BOOKINGS];
```

```
//function prototypes
void login();
void displayFlights(int size);
int reserveTicket(int size, int booking_count);
float applyDiscount(float price, int discount_type);
void generateReceipt(int booking_count);
```

```
void enter_to_continue() {
    printf("Press Enter to continue...");
    getchar();
    getchar(); //wait for Enter
}
```

```
//main function
int main() {
    int flight_count = 5;
    int choice;
    int booking_count = 0;

    login();
    system("clear"); //clear screen after successful login

    do {
        system("clear"); //clear screen before showing flights
        displayFlights(flight_count);
        booking_count = reserveTicket(flight_count, booking_count);

        int valid_input = 0; //to check input validity
        while (!valid_input) {
            printf("Do you want to book another ticket? (1-Yes, 0-No): ");
            scanf("%d", &choice);
```

```

        if (choice == 1 || choice == 0) {
            valid_input = 1; // if a valid input is entered, set valid_input to 1 (true)
        } else {
            printf("Invalid choice! Please enter 1 for Yes or 0 for No.\n"); //else, continue loop
        }
    }
} while (choice == 1);

if (booking_count > 0) {
    printf("\n--- FINAL TRANSACTION SUMMARY ---\n");
    generateReceipt(booking_count);
}

printf("Thank you for using the Airline Reservation System!\n");
return 0;
}

//login function
void login() {
    char username[20], password[20];
    do {
        printf("\nEnter USERNAME: ");
        scanf("%s", username);
        printf("Enter PASSWORD: ");
        scanf("%s", password);

        if (strcmp(username, "STUDENT") != 0 || strcmp(password, "TAFT2401") != 0) {
            printf("Invalid credentials! Try again.\n");
            printf("Press Enter to continue...");
            while(getchar() != '\n');
            getchar(); //wait for Enter
            system("clear"); //clear screen
        }
    } while (strcmp(username, "STUDENT") != 0 || strcmp(password, "TAFT2401") != 0);

    printf("Login successful!\n");
    enter_to_continue();
}

//function to display flight info
void displayFlights(int size) {
    printf("\nAvailable Flights:\n");
    printf("-----\n");

```

```

printf("%-6s %-10s %-10s %-10s %-10s %-16s %-16s %-10s\n", "Code", "Flight", "From",
"To", "Seats", "Departure Time", "Arrival Time", "Price");
printf("-----\n");
for (int i = 0; i < size; i++) {
    printf("%02d %-10s %-10s %-10s %-10d %-16s %-14s PHP %.2f\n", i + 1, flight_no[i],
departure[i], arrival[i], available_seats[i], departureTime[i], arrivalTime[i], price[i]);
}
printf("-----\n");
}

```

//function to make a booking(input flight number and number of seats, generate receipt for the individual booking)

```

int reserveTicket(int size, int booking_count) {
    char flight_code_input[3];
    int selected_index = -1;

    printf("\nEnter Flight Code to reserve (e.g., 01, 02): ");
    scanf("%s", flight_code_input);

    //convert input to integer index
    if (strlen(flight_code_input) == 2 && flight_code_input[0] >= '0' && flight_code_input[1] >= '0') {
        int code = atoi(flight_code_input);
        if (code >= 1 && code <= size) {
            selected_index = code - 1;
        }
    }

    if (selected_index == -1) { //for invalid flight code
        printf("Invalid flight code!\n");
        enter_to_continue();
        return booking_count;
    }

    if (available_seats[selected_index] <= 0) { //for full flights
        printf("No available seats for this flight.\n");
        enter_to_continue();
        return booking_count;
    }

    //ask the user how many seats they want to book
    int seats_to_book = 0;
    int valid_seat_input = 0;
    while (!valid_seat_input) {
        printf("Enter number of seats to book (1-%d): ", available_seats[selected_index]);
    }
}

```

```

scanf("%d", &seats_to_book);

//check if the input is valid
if (seats_to_book >= 1 && seats_to_book <= available_seats[selected_index]) {
    valid_seat_input = 1; //valid input
} else {
    printf("Invalid number of seats. Please enter a number between 1 and %d.\n",
available_seats[selected_index]);
}
}

//update the available seats after booking
available_seats[selected_index] -= seats_to_book;

//apply discount
int discount_type = 0;
float final_price = applyDiscount(price[selected_index], discount_type);

//get payment method
int valid_input = 0;
char payment_method_input[10];
while (!valid_input) {
    printf("\nEnter Payment Method (Cash/Card): ");
    scanf("%s", payment_method_input);

    //convert input to uppercase
    for (int i = 0; payment_method_input[i] != '\0'; i++) {
        payment_method_input[i] = toupper(payment_method_input[i]);
    }

    //checking if it is a valid payment method
    if (strcmp(payment_method_input, "CASH") == 0 || strcmp(payment_method_input,
"CARD") == 0) {
        valid_input = 1;
        printf("Payment method accepted: %s\n", payment_method_input);
    } else {
        printf("We only accept CASH or CARD payment.\n");
    }
}

//store the booking details in arrays
strcpy(booked_flight_no[booking_count], flight_no[selected_index]);
booked_price[booking_count] = final_price;
booked_discount[booking_count] = price[selected_index] - final_price;

```



```

strcpy(payment_method[booking_count], payment_method_input);
booked_seats[booking_count] = seats_to_book;
booking_count++;

//generate receipt for individual booking
printf("\n----- BOOKING RECEIPT ----- \n");
generateReceipt(booking_count);

enter_to_continue();
system("clear"); //clear screen before next booking

return booking_count;
}

//function to apply and calculate discount
float applyDiscount(float price, int discount_type) {
    float discount = 0;

    printf("\nDiscount Options:\n1. No Discount\n2. Senior Citizen/PWD (20%%)\n3. Manager's
Discount (30%%)\nEnter choice: ");
    scanf("%d", &discount_type);

    //calculate discount
    if (discount_type == 2) discount = 0.20 * price;
    else if (discount_type == 3) discount = 0.30 * price;
    else if (discount_type == 1) discount = 0;
    else printf("Invalid input entered. Discount is set to PHP 0.00\n");

    return price - discount; //return discounted price
}

//function to generate receipt
void generateReceipt(int booking_count) {
    float total_cost = 0;

    for (int i = 0; i < booking_count; i++) {
        float original_price = booked_price[i] + booked_discount[i];
        float total_final_price = booked_price[i] * booked_seats[i];

        printf("\n%-17s  %15s\n", "Flight Number", booked_flight_no[i]);
        printf("%-17s  %15d\n", "Seats Booked", booked_seats[i]);
        printf("%-17s  %15.2f\n", "Original Price", original_price);
        printf("%-17s  %15.2f\n", "Discount per Seat", booked_discount[i]);
        printf("%-17s  %15.2f\n", "Final Price/Seat", booked_price[i]);
    }
}

```

```

printf("%-17s  %15.2f\n", "Total Price", total_final_price);
printf("%-17s  %15s\n", "Payment Method", payment_method[i]);
printf("-----\n");

total_cost += total_final_price;
}

printf("\n%-17s  %15.2f\n", "TOTAL AMOUNT PAID", total_cost);
printf("-----\n\n");
}

```

Output screenshots

```

Enter USERNAME: student
Enter PASSWORD: taft
Invalid credentials! Try again.
Press Enter to continue...

```

```

Enter USERNAME: STUDENT
Enter PASSWORD: TAFT2401
Login successfull
Press Enter to continue...

```

Available Flights:

Code	Flight	From	To	Seats	Departure Time	Arrival Time	Price
01	FL123	Manila	Cebu	23	06:00 AM	07:30 AM	PHP 4998.00
02	FL456	Manila	Davao	23	03:30 PM	04:15 PM	PHP 4231.00
03	FL789	Cebu	Davao	23	11:00 AM	12:45 PM	PHP 3678.00
04	FL025	Clark	Narita	23	03:15 AM	09:30 AM	PHP 15945.00
05	FL684	Manila	Incheon	23	02:00 PM	06:30 PM	PHP 8643.00

Enter Flight Code to reserve (e.g., 01, 02): 03

Enter number of seats to book (1-23): 3

Discount Options:

1. No Discount
2. Senior Citizen/PWD (20%)
3. Manager's Discount (30%)

Enter choice: 1

Enter Payment Method (Cash/Card): CARD

Payment method accepted: CARD

----- BOOKING RECEIPT -----

Flight Number	FL789
Seats Booked	3
Original Price	3678.00
Discount per Seat	0.00
Final Price/Seat	3678.00
Total Price	11034.00
Payment Method	CARD

TOTAL AMOUNT PAID 11034.00

Press Enter to continue...

Do you want to book another ticket? (1-Yes, 0-No): 4

Invalid choice! Please enter 1 for Yes or 0 for No.

Do you want to book another ticket? (1-Yes, 0-No): 1

Available Flights:

Code	Flight	From	To	Seats	Departure Time	Arrival Time	Price
01	FL123	Manila	Cebu	23	06:00 AM	07:30 AM	PHP 4998.00
02	FL456	Manila	Davao	23	03:30 PM	04:15 PM	PHP 4231.00
03	FL789	Cebu	Davao	20	11:00 AM	12:45 PM	PHP 3678.00
04	FL025	Clark	Narita	23	03:15 AM	09:30 AM	PHP 15945.00
05	FL684	Manila	Incheon	23	02:00 PM	06:30 PM	PHP 8643.00

Enter Flight Code to reserve (e.g., 01, 02): 8

Invalid flight code!

Press Enter to continue...

Do you want to book another ticket? (1-Yes, 0-No): 1

Available Flights:

Code	Flight	From	To	Seats	Departure Time	Arrival Time	Price
01	FL123	Manila	Cebu	23	06:00 AM	07:30 AM	PHP 4998.00
02	FL456	Manila	Davao	23	03:30 PM	04:15 PM	PHP 4231.00
03	FL789	Cebu	Davao	20	11:00 AM	12:45 PM	PHP 3678.00
04	FL025	Clark	Narita	23	03:15 AM	09:30 AM	PHP 15945.00
05	FL684	Manila	Incheon	23	02:00 PM	06:30 PM	PHP 8643.00

Enter Flight Code to reserve (e.g., 01, 02): 01

Enter number of seats to book (1-23): 2

Discount Options:

1. No Discount
2. Senior Citizen/PWD (20%)
3. Manager's Discount (30%)

Enter choice: 3

Enter Payment Method (Cash/Card): gcash

We only accept CASH or CARD payment.

Enter Payment Method (Cash/Card): cash

Payment method accepted: CASH

----- BOOKING RECEIPT -----

Flight Number FL789
 Seats Booked 3
 Original Price 3678.00
 Discount per Seat 0.00
 Final Price/Seat 3678.00
 Total Price 11034.00
 Payment Method CARD

Flight Number FL123
 Seats Booked 2
 Original Price 4998.00
 Discount per Seat 1499.40
 Final Price/Seat 3498.60
 Total Price 6997.20
 Payment Method CASH

TOTAL AMOUNT PAID 18031.20

Press Enter to continue...

Do you want to book another ticket? (1-Yes, 0-No): 0

```
--- FINAL TRANSACTION SUMMARY ---

Flight Number      FL789
Seats Booked       3
Original Price     3678.00
Discount per Seat   0.00
Final Price/Seat   3678.00
Total Price        11034.00
Payment Method     CARD
-----

Flight Number      FL123
Seats Booked       2
Original Price     4998.00
Discount per Seat  1499.40
Final Price/Seat   3498.60
Total Price        6997.20
Payment Method     CASH
-----

TOTAL AMOUNT PAID    18031.20
-----

Thank you for using the Airline Reservation System!
logout

Saving session...
...copying shared history...
...saving history...truncating history files...
...completed.

[Process completed]
```

Conclusion

This project allowed us to bring together the concepts we have learned throughout our LBYES2A C-programming class and apply them in a practical, real-world scenario. Through the development of our Airline Flight Reservation System, we successfully implemented key structures such as conditional statements, loops, arrays, string functions, and modular functions. The system demonstrates our ability to simulate an end-to-end booking process, from login authentication to flight selection, discount application, payment processing, and receipt generation. Beyond just fulfilling academic requirements, this project helped us deepen our understanding of the C language by encouraging us to think critically, structure our code logically, and design with the user experience in mind.

We were also able to learn several valuable skills when programming. Firstly, creativity was necessary as my group had to brainstorm on what to add to our system to improve user experience. This led to several revisions, such as adding newlines after certain sequences, adding an option to book multiple seats, and aligning the flight and receipt details in columns. Patience was also a very important aspect in creating our program, as we are used to creating very small

algorithms that perform simple tasks such as mathematical calculations. Patience allowed us to create the program function by function and perform the necessary troubleshooting.

For future development of this program, we recommend looking into using UI/UX to make the output more user-friendly, as if the user is booking flights on an app or website. We also recommend allowing the user to view the available seats using 2D arrays and pick their desired seat numbers.

Code link:

<https://drive.google.com/file/d/1k7aWYAx4o6Qj-M-titYRyJVh4IyfctuC/view?usp=sharing>