

Introduction to Computers and Programming

Homework 10

2023/12/05

1. Deadline

You have one week to complete the homework. Hand in your homework via E3 before 2023/12/12 23:55. Please finish your homework as soon as possible. In addition, make sure that your code can be executed on Visual Studio Community 2019. We will use Online Judge for grading.

2. Problems

2.1 DinTaiFung Reservation System

DinTaiFung is a well-known restaurant celebrated for its culinary excellence. To enhance the dining experience and streamline the process, the management has decided to implement a reservation system. This system aims to provide patrons with the convenience of securing a spot at their preferred time.

This reservation system must include the following functions:

- **Login:** Input an ID and password. If the ID does not exist or the password is wrong, then login fails.
 - **Make Reservation:** Insert a new reservation record, including branch name, date, number of customers.
 - **Reservation Enquiry/Canceling:** Display all records for the current user, then let the user choose one of them to delete.
- **Registration:** Insert a new member record, including an ID, name and password. If the ID already exists or format of ID is wrong, then registration fails.

How to make reservation?

1. Show all the branches to customers, let customers choose which branch they want.
2. Print available dates for making a reservation, let customers choose which date they want.
3. Let customers choose the hour they want to make the reservation.
4. Let customers choose the number of customers they want to make the reservation.
5. Print the details of the reservation, including the branch code, date, hour, and number of customers.

branchCode	Branch names
1	Taipei Xinyi
2	Taipei Fuxing
3	Taipei Tienmu
4	Taipei Taipei 101
5	Taipei Nanxi
6	Taipei A4
7	Taipei A13
8	Taipei Xinsheng
9	Taipei Banqiao
10	Hsinchu
11	Taichung
12	Kaohsiung

There are some requirements:

1. **Valid ID:** There are 10 characters in ID, with the first character being an uppercase English letter and the next nine characters being digits. The last digit of the ID is called checksum. To check if an ID is valid, you need to first convert the first English letter to digits using the table below. After conversion,

you will get 11 digits in total. Then, multiply the first 10 digits (except checksum) by the weights 1, 9, 8, 7, 6, 5, 4, 3, 2, 1, respectively, and sum the results. If the remainder of the sum divided by 10 plus the checksum equals 10, then this is a valid ID.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
10	11	12	13	14	15	16	17	34	18	19	20	21	22	35	23	24	25	26	27	28	29	32	30	31	33

Example: A123456789

ID	A		1	2	3	4	5	6	7	8	9
	1	0									
weight	1	9	8	7	6	5	4	3	2	1	checksum

weighted sum = $1*1 + 0*9 + 1*8 + 2*7 + 3*6 + 4*5 + 5*4 + 6*3 + 7*2 + 8*1 = 121$

remainder = $121 \% 10 = 1$ $10 - 1(\text{remainder}) = 9(\text{checksum})$, valid.

- 2. Available days and hours:** The available dates start from 7 days after the current date, and the available hours start from one hour after the current hour. For example, if the current hour is 8 PM, the available dates would be from today onwards for the next six days, with the available hour of the first day (current day) starting from 9 PM. If the current hour is 11 PM, the available dates would be from tomorrow onwards for the next seven days.

Example1: current date 11/30 20:30

available dates(hours): 11/30(21~23), 12/01(0~23), 12/02(0~23), 12/03(0~23), 12/04(0~23), 12/05(0~23), 12/06(0~23)

Example2: current date 11/30 23:10

available dates(hours): 12/01(0~23), 12/02(0~23), 12/03(0~23), 12/04(0~23), 12/05(0~23), 12/06(0~23), 12/07(0~23)

Set the current date to 2023/12/05:17 (2023/12/05, 5PM). If you can set the current date to the system time, you will get extra credit (20 points).

Input/Output

The screen dialog should appear as follows:

(While we won't strictly penalize output format errors, please follow the format below.)

```

Welcome to the Din Tai Fung Reservation System!

1. Login
2. Registration
3. End

Enter your choice (1~3): 2

Please enter your ID number: A123456780
Invalid ID number. Please try again.

1. Login
2. Registration
3. End

Enter your choice (1~3): 2

Please enter your ID number: A123456789
Enter your password: 000
Enter your name: Alan
Registration successful!

1. Login
  
```

2. Registration

3. End

Enter your choice (1~3): 1

Please enter your ID number: A123456780

Invalid ID number. Please try again.

1. Login

2. Registration

3. End

Enter your choice (1~3): 1

Please enter your ID number: A123456789

Enter your password: 000

Login!

1. Make Reservation

2. Reservation Enquiry/Canceling

3. Log Out

Enter your choice (1~3): 1

Please choose the branch (1-12):

1. Taipei Xinyi

2. Taipei Fuxing

3. Taipei Tienmu

4. Taipei Taipei 101

5. Taipei Nanxi

6. Taipei A4

7. Taipei A13

8. Taipei Xinsheng

9. Taipei Banqiao

10. Hsinchu

11. Taichung

12. Kaohsiung

Enter your choice (1~12): 10

The current date is 2023/12/02:02

Available days:

1. 2023/12/02

2. 2023/12/03

3. 2023/12/04

4. 2023/12/05

5. 2023/12/06

6. 2023/12/07

7. 2023/12/08

Enter your choice (0 to end): 1

Enter hour (3~23):10

Enter the number of customers (1~30, 0 to end):5

Brach	Date	Hour	No of Customers
Hsinchu	2023-12-02	10	5

Reservation successful!

1. Make Reservation
2. Reservation Enquiry/Canceling
3. Log Out

Enter your choice (1~3): 2

	Brach	Date	Hour	No of Customers
1.	Hsinchu	2023-12-02	10	5

Choose a reservation to cancel (0: keep all reservations): 0

1. Make Reservation
2. Reservation Enquiry/Canceling
3. Log Out

Enter your choice (1~3): 1

Please choose the branch (1-12):

1. Taipei Xinyi
2. Taipei Fuxing
3. Taipei Tienmu
4. Taipei Taipei 101
5. Taipei Nanxi
6. Taipei A4
7. Taipei A13
8. Taipei Xinsheng
9. Taipei Banqiao
10. Hsinchu
11. Taichung
12. Kaohsiung

Enter your choice (1~12): 4

The current date is 2023/12/02:02

Available days:

1. 2023/12/02
2. 2023/12/03
3. 2023/12/04
4. 2023/12/05
5. 2023/12/06
6. 2023/12/07
7. 2023/12/08

Enter your choice (0 to end): 5

Enter hour (0~23):12

Enter the number of customers (1~30, 0 to end):30

Brach	Date	Hour	No of Customers
Taipei Taipei 101	2023-12-06	12	30

Reservation successful!

1. Make Reservation
2. Reservation Enquiry/Canceling
3. Log Out

Enter your choice (1~3): 2

	Brach	Date	Hour	No of Customers
1.	Hsinchu	2023-12-02	10	5
2.	Taipei Taipei 101	2023-12-06	12	30

Choose a reservation to cancel (0: keep all reservations): 1

Reservation deleted!

1. Make Reservation
2. Reservation Enquiry/Canceling
3. Log Out

Enter your choice (1~3): 2

	Brach	Date	Hour	No of Customers
1.	Taipei Taipei 101	2023-12-06	12	30

Choose a reservation to cancel (0: keep all reservations): 0

1. Make Reservation
2. Reservation Enquiry/Canceling
3. Log Out

Enter your choice (1~3): 3

1. Login
2. Registration
3. End

Enter your choice (1~3): 3

Thank you! Goodbye!

Press any key to close this window . . .

For the details above:

Brach			Date	Hour	No of Customers
Taipei	Taipei	101	2023-12-06	12	30
20 characters			15 characters	8 characters	20 characters
Reservation successful!					

	Brach		Date	Hour	No of Customers
1.	Hsinchu		2023-12-02	10	5
2.	Taipei	Taipei 101	2023-12-06	12	30
3 characters	20 characters	15 characters	8 characters	20 characters	
Choose a reservation to cancel (0: keep all reservations): 1					

3. Project Requirements

You need to split your code into three files, main.cpp, function.cpp, and struct.cpp.

- **main.cpp:** Only includes the main function.
- **function.cpp:** Includes the **definition** of functions, or variables, etc.
- **struct.h:** Only includes the **declaration** of structs, functions, or variables, etc.

4. Submission format

Your submission should follow the format below, or you might get some penalty for the wrong format.

- xxxxxxxx_hw_w13.zip
 - xxxxxxxx_main.cpp
 - xxxxxxxx_function.cpp
 - xxxxxxxx_struct.h
 -

xxxxxxx is your student ID