

Design and Testing for Question 2

Design Description

The program is designed to stimulate a member management system for a society which allows the user to enter relevant information about a member, list out members' details based on certain filters and disable one person's membership.

Design Rationale

For the operation to enter relevant information about a member, first the program asks the user to input the information one by one interactively. Since the membership numbers were already created, the program just needs to store this information and assume all the numbers are unique, ranging from 0000 to 9999 as the maximum number of members is 10,000. But for the testing purpose, the program at the very beginning asks the user to specify how many people maximum can join the society. The designer used a class named Member with membership number, surname, first name, date of join (day, month, year) and whether they are still a member as private attributes to store the information. In public section, a constructor is used to initialise all the data and relevant functions to get access to a particular private attribute. The designer also created a MemberManger class to store all member objects into an array once they are created by using the function Add() from MemberManger class.

For the second operation to show a list of members based on certain filters, the designer used the quick sort program which is provided by the lecturer to sort out all the member objects into increasing order in the array. In order to make sure the quick sort program know how to compare the value between two member objects, the designer wrote the functions to overload the operator > and operator <= in the Member class to compare year, month, day, surname and first name. Once the array is sorted, the designer set up filter to print out the list of members in different 10-year sections based on the time difference between members' joining date and the user input of current date. The program only shows those are still currently validate members and have been in the society for more than ten years.

In order to disable one's membership, the user needs to input a membership number and then the program calls the function Disable_membership() from MemberManger class. The program will give a feedback message to prompt the user whether this operation has been completed or not.

Testing Strategy

The testing strategy the designer applied is to check if the program will give the results the designer expected in different scenarios by inputting various data sets. The testing strategy

also takes potential input error handling into consideration. So at the testing stage, the designer deliberately enters some wrong format input such as a letter, a symbol, a negative number or a number which doesn't fit the range of membership number, day, month or year. By deliberately making these kind of mistakes, the designer can test how the program copes with these to ensure it works robustly. Additionally, the designer has tested the results for each block of codes (e.g. quick-sort the array) to ensure it works before putting each section of codes together as a completed program.

Testing Results

For the convenience of testing, i created 9 members using the constructor as below:

```
Member m1(3103,"Aloy", "Baker", 20, 2, 1969, 1);
member_list.Add(m1);
Member m2(3254, "Xerxes", "Smith", 21, 7, 1963, 1);
member_list.Add(m2);
Member m3(123, "Berth", "Wright", 8, 6, 1975, 1);
member_list.Add(m3);
Member m4(4934, "Herminone", "Turner", 21, 2, 1969, 1);
member_list.Add(m4);
Member m5(1498, "Elle", "Wright", 8, 6, 1975, 1);
member_list.Add(m5);
Member m6(1, "Non", "Member", 11, 8, 1978, 0);
member_list.Add(m6);
Member m7(57, "Cassie", "Chen", 10, 10, 1963, 1);
member_list.Add(m7);
Member m8(1264, "Non", "Amember", 11, 8, 1978, 0);
member_list.Add(m8);
Member m9(1266, "New", "Member", 11, 1, 2019, 1);
member_list.Add(m9);
```

- **Testing for the general structure**
 - Entering wrong kinds of input for max size of members
 - E.g. I entered 'a' '-1' '-' '0', the program all displayed: "Please enter a proper number to specify the maximum number of members for the society."
 - Entering wrong kinds of input for choosing from the menu
 - E.g. I entered '7' '-10' 'c' to choose from the menu, the program all displayed "Sorry, the system cannot recognise your choice. Try again."
 - Entering 4 to quit the program, this feedback message appeared:
 - "Thank you for using the program."
- **Testing for Operation 1**
 - Since I had already created 9 members and specified the max size as 9, when i tried to add more record, this is what was displayed before entering any details about a member "Sorry the number of members in the society has reached its maximum. You cannot add any more record. "
 - Entering wrong kinds of input

- E.g. I entered 'a', 'abc', 'letter', '123456', '-65387' for membership number, the program all displayed: "Please enter a proper four digit membership number"
- E.g. I entered '56' '-20' 'gaga' '2020' for day, month and year of join, the program displayed "Please enter a proper date (day, month, year) that the member joined the society."

o Whether a person actually is added into the list

- E.g. I entered all the information properly and then the program displayed: "The details of this member has been added successfully into the system." Then when I chose the operation 2 to print out the list, the person I entered was printed out.

• Testing for Operation 2

- Directly choosing operation 2 with 9 members created in advance. Here is the result when entering the current date as 20/02/2019:

Long-standing members at 20/02/2019:

50 years+

Mem No.	Date Joined	Name
3254	21/07/1963	Xerxes Smith
0057	10/10/1963	Cassie Chen
3103	20/02/1969	Aloy Baker

40 years+

Mem No.	Date Joined	Name
4934	21/02/1969	Herminone Turner
0123	08/06/1975	Berth Wright
1498	08/06/1975	Elle Wright

- If choosing this operation again with the current date 21/02/2019, the result changed:

Long-standing members at 21/02/2019:

50 years+

Mem No.	Date Joined	Name
3254	21/07/1963	Xerxes Smith
0057	10/10/1963	Cassie Chen
3103	20/02/1969	Aloy Baker
4934	21/02/1969	Herminone Turner

40 years+

Mem No.	Date Joined	Name
0123	08/06/1975	Berth Wright
1498	08/06/1975	Elle Wright

- If choosing this operation again with the current date 21/02/2009, the result changed:

Long-standing members at 21/02/2009:

40 years+

Mem No.	Date Joined	Name
3254	21/07/1963	Xerxes Smith
0057	10/10/1963	Cassie Chen
3103	20/02/1969	Aloy Baker
4934	21/02/1969	Herminone Turner

30 years+

Mem No.	Date Joined	Name
0123	08/06/1975	Berth Wright
1498	08/06/1975	Elle Wright

- If choosing this operation again with the current date 21/02/1965, the result changed:

Long-standing members at 21/02/1965:

There is no member who has joined the society for more than 10 years compared with the current date.

- After disabling a member's membership (Cassie Chen's), then choosing this operation again with the current date 20/02/2019, the result changed **as Cassie Chen is not displayed anymore:**

Long-standing members at 20/02/2019:

50 years+

Mem No.	Date Joined	Name
3254	21/07/1963	Xerxes Smith
3103	20/02/1969	Aloy Baker

40 years+

Mem No.	Date Joined	Name
4934	21/02/1969	Herminone Turner
0123	08/06/1975	Berth Wright
1498	08/06/1975	Elle Wright

- **Testing for operation 3**

- o Entered membership number 57, and a feedback message appeared: "This person's membership is not current anymore."

- o Entered random membership number "64262", this message appeared:
"Sorry the system didn't find anyone to mark as non-current member with the membership number you have entered."
- o If i entered any characters and symbols, e.g. "gerwagrwa" "%!", these wrong format input are caught as the program displayed this message to ask the user to input again "Please enter a proper membership number."