Hong Kong Diploma of Secondary Education Examination 2016

Information and Communication Technology (Coursework)

Option D : Software Development

Title : Extracurricular Activities System

Cheung Sha Wan Catholic Secondary School

1. Design

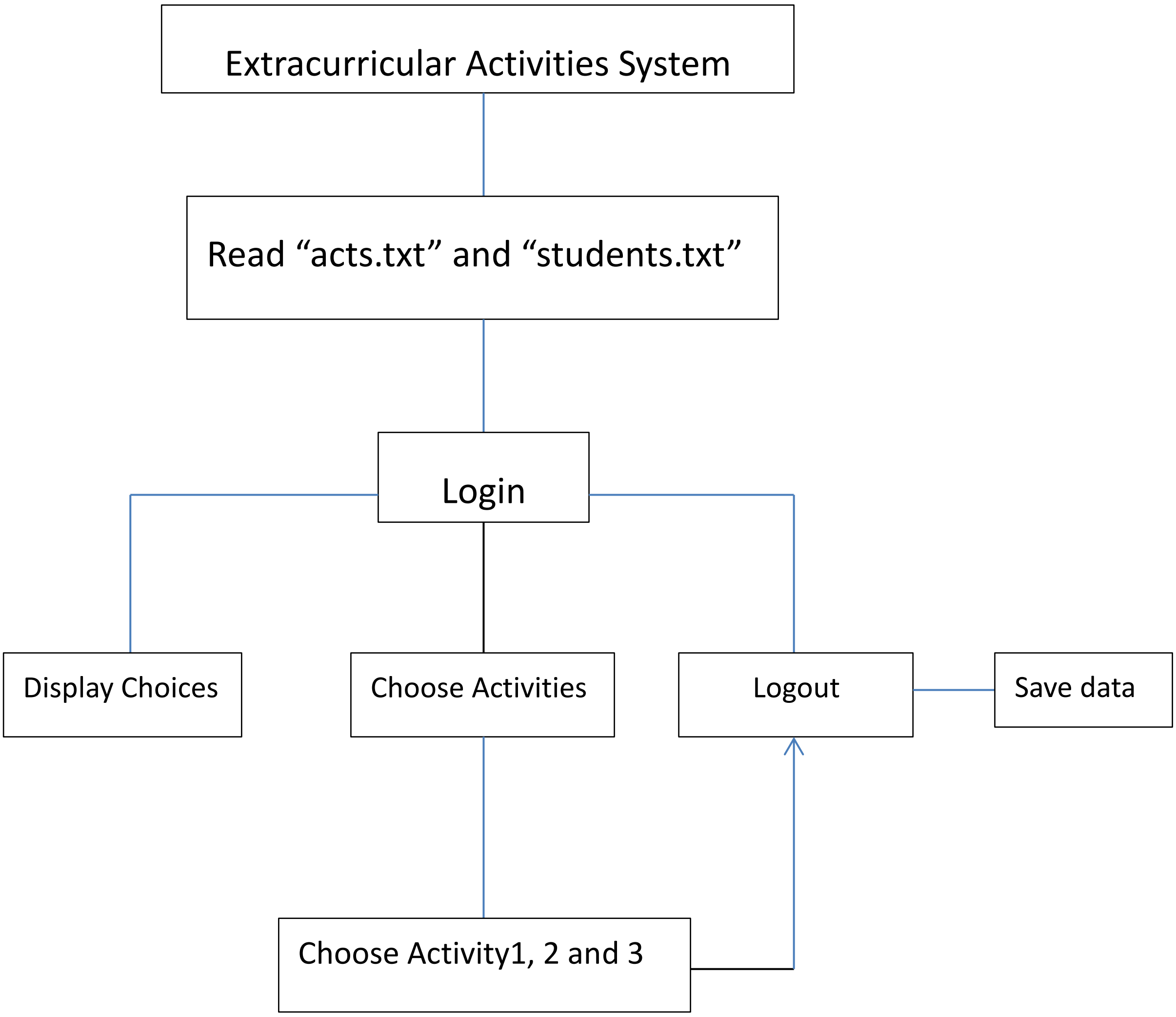
I designed a program to let students to choose the extracurricular activities that they like. There are different functions in my program, for example, students need to login using their own accounts before making decisions. Other functions like displaying their choices and logout their account after using. All choices will be saved after students have logout the program.

There are rules and assumptions about the program:

1. Students need to use their own account to login.
2. Each student can only choose at most three activities.
3. Students cannot choose the same activity for twice.
4. Students cannot choose the subject if the quota of it is zero.

To make the program clear, I divided it into several parts:

- Reading text files
- Login
- Choosing activities
- Displaying decisions
- Logout
- Saving changes to the text files


Extracurricular Activities System
Read "acts.txt" and "students.txt"
Login
Display Choices
Choose Activities
Logout
Save data
Choose Activity1, 2 and 3

Data Flow:

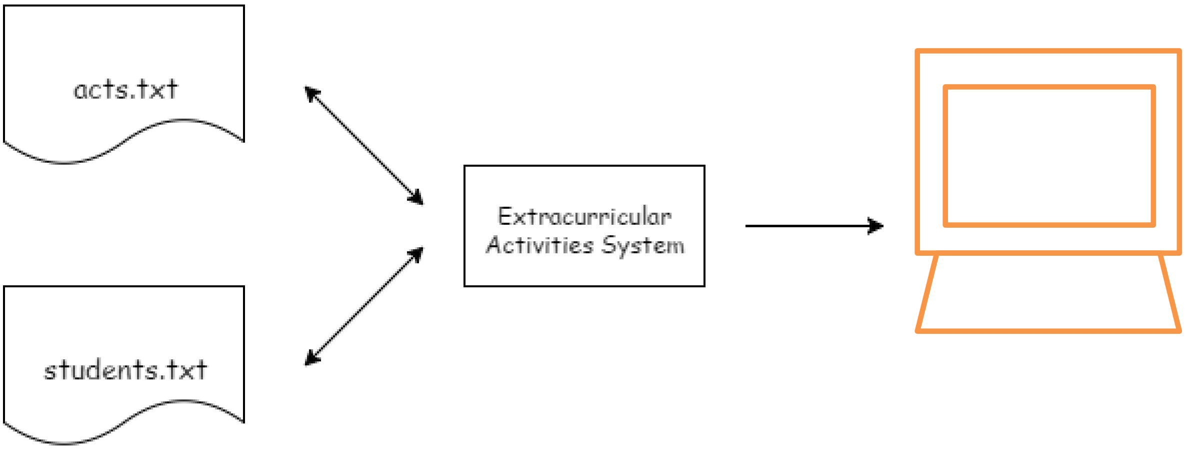
The program will read 2 text files in the same folder

i. Students.txt—storing students' ID, passwords, names and selected activities

ii. Acts.txt-storing all activities and quota

The program will display the corresponding content under commands of the users

The program will make changes and save to the 2 files after students have finished choosing the activities and logged out.



Data File Formats

Students.txt:

-This text file store the User ID, the passwords, names and the three activities

-The file is to indicate whether the user has input the correct data

-The file also saves the choices of the students on activities selection

Format of data:

User ID: string type

e.g. s002

Password: string type

Default password: 1234

Name: string

Activity 1: string

Activity 2: string

Activity 3: string

Acts.txt:

This file stores all the activity choices for students

With each of the activity, there is a quota

The quota for all activities in this program is 29 at original

Format of data:

Activity: string

Quota: integer

2. Implementation

I will introduce the implementation of the Extracurricular Activities System and functions of the program. I will display the program codes and user interface.

The following parallel array will be used to store the student ID, student password, student name, whether the student has made decision or not, activity 1, activity 2 and activity 3 respectively in the text file of students.txt.

```
studid : array[1..max_stud] of string
studpw: array[1..max_stud] of string
studname : array[1..max_stud] of string
studdone : array[1..max_stud] of char
studact1 : array[1..max_stud] of integer
studact2 : array[1..max_stud] of integer
studact3 : array[1..max_stud] of integer
```

max_stud is a constant defined 100 at the beginning.

The following parallel array will be used to store the extracurricular activities and the quota of each activity respectively in the text file of acts.txt.

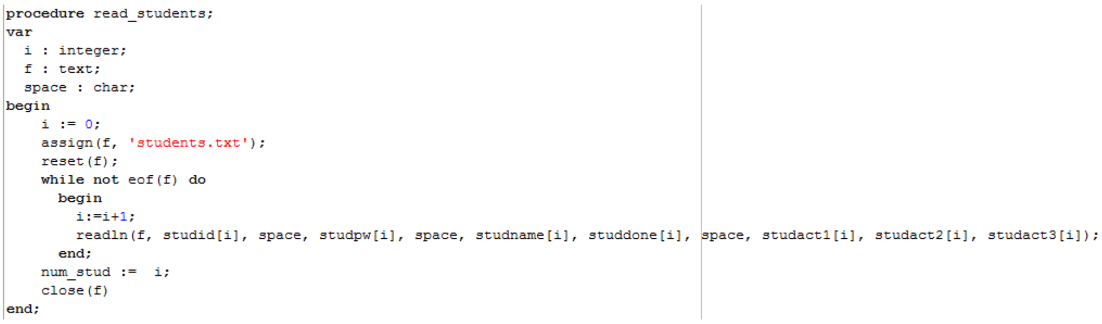
```
ea : array[0..max_ea] of string
quota : array[0..max_ea] of integer
```

max_ea is a constant defined 21 at the beginning.

Procedures

1. Read_students

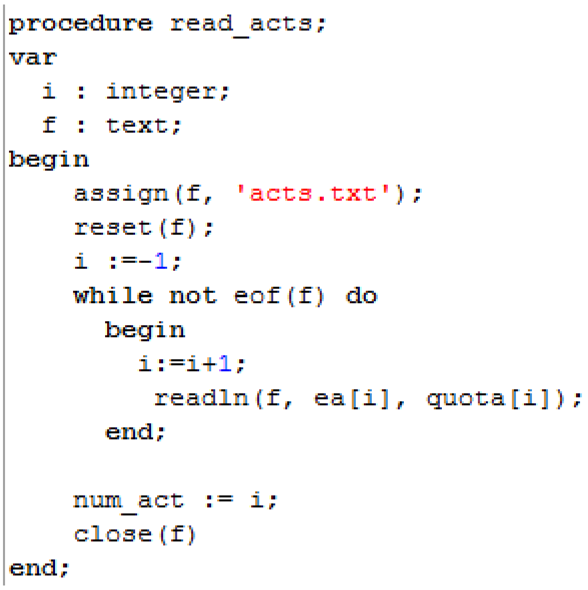
This procedure read “students.txt”



```
procedure read_students;
var
  i : integer;
  f : text;
  space : char;
begin
    i := 0;
    assign(f, 'students.txt');
    reset(f);
    while not eof(f) do
      begin
        i:=i+1;
        readln(f, studid[i], space, studpw[i], space, studname[i], studdone[i], space, studact1[i], studact2[i], studact3[i]);
      end;
    num_stud :=  i;
    close(f)
end;
```

2.Read_acts

This procedure read “acts.txt”

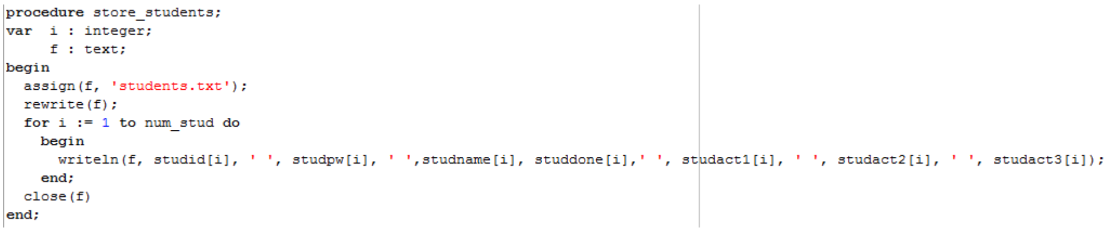


```
procedure read_acts;
var
  i : integer;
  f : text;
begin
    assign(f, 'acts.txt');
    reset(f);
    i :=-1;
    while not eof(f) do
      begin
        i:=i+1;
         readln(f, ea[i], quota[i]);
      end;

    num_act := i;
    close(f)
end;
```

3.Store_students

This procedure save the choices of students into

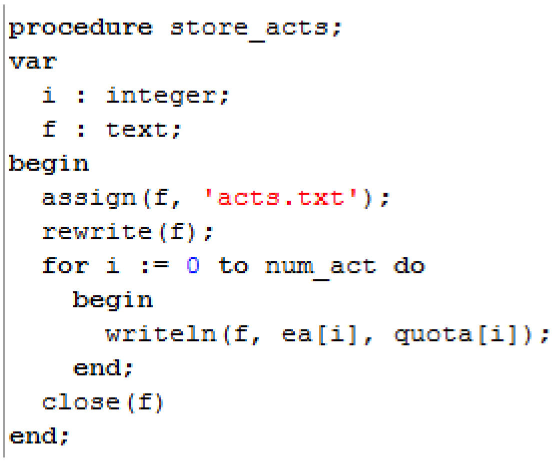
“students.txt”



```
procedure store_students;
var  i : integer;
     f : text;
begin
  assign(f, 'students.txt');
  rewrite(f);
  for i := 1 to num_stud do
    begin
      writeln(f, studid[i], ' ', studpw[i], ' ',studname[i], studdone[i],' ', studact1[i], ' ', studact2[i], ' ', studact3[i]);
    end;
  close(f)
end;
```

4. Store_acts

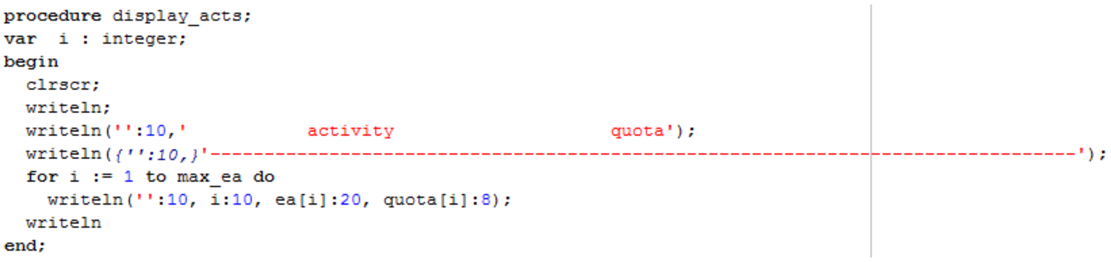
This procedure store the remaining quota corresponding to the activities students choose into “acts.txt”.



```
procedure store_acts;
var
  i : integer;
  f : text;
begin
  assign(f, 'acts.txt');
  rewrite(f);
  for i := 0 to num_act do
    begin
      writeln(f, ea[i], quota[i]);
    end;
  close(f)
end;
```

5. Display_acts

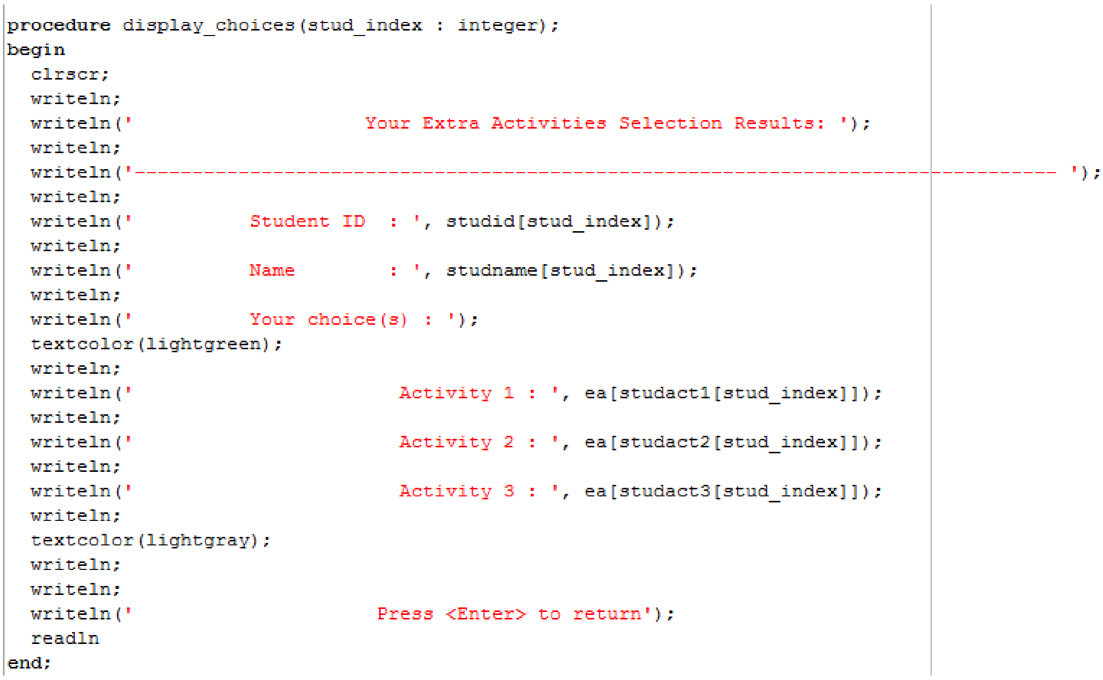
This procedure show the whole list of extracurricular activities



```
procedure display_acts;
var  i : integer;
begin
  clrscr;
  writeln;
  writeln('':10,'           activity                    quota');
  writeln({'':10,}'----------------------------------------------------------------------------------');
  for i := 1 to max_ea do
    writeln('':10, i:10, ea[i]:20, quota[i]:8);
  writeln
end;
```

6. Display_choices

This procedure display the corresponding student ID , name and the choices they have made .



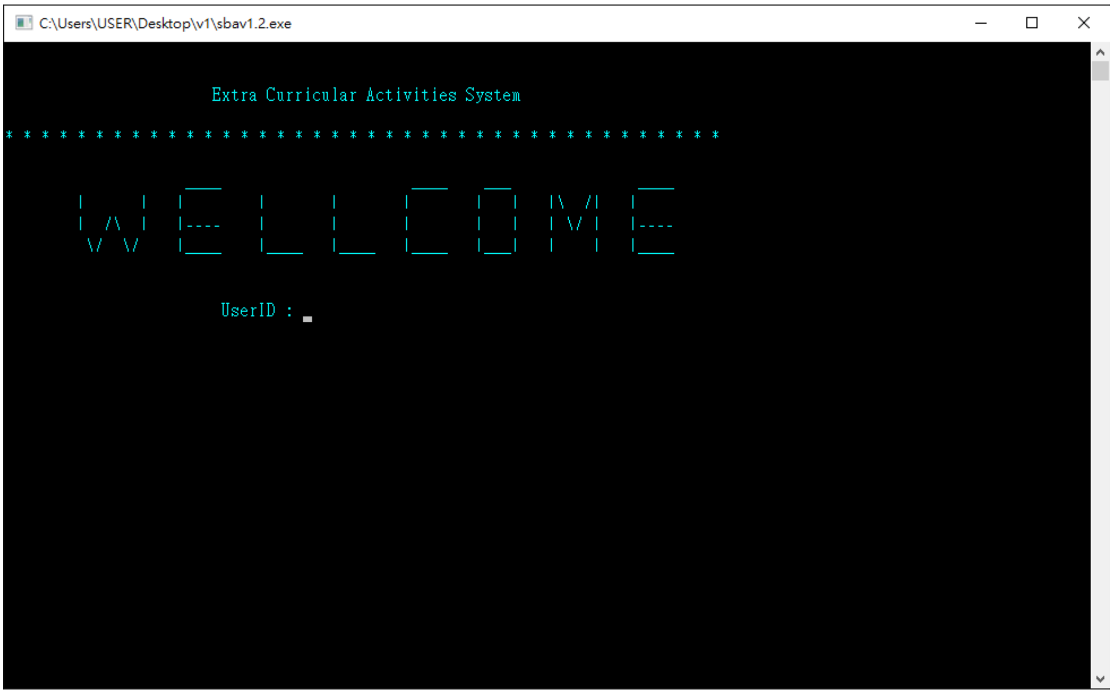
```
procedure display_choices(stud_index : integer);
begin
  clrscr;
  writeln;
  writeln('                    Your Extra Activities Selection Results: ');
  writeln;
  writeln('------------------------------------------------------------------------------ ');
  writeln;
  writeln('          Student ID  : ', studid[stud_index]);
  writeln;
  writeln('          Name        : ', studname[stud_index]);
  writeln;
  writeln('          Your choice(s) : ');
  textcolor(lightgreen);
  writeln;
  writeln('                       Activity 1 : ', ea[studact1[stud_index]]);
  writeln;
  writeln('                       Activity 2 : ', ea[studact2[stud_index]]);
  writeln;
  writeln('                       Activity 3 : ', ea[studact3[stud_index]]);
  writeln;
  textcolor(lightgray);
  writeln;
  writeln;
  writeln('                     Press <Enter> to return');
  readln
end;
```

I use Dev-pascal for program coding

The name of my program is ‘sbav1.2.exe’

The program requires “acts.txt” and “students.txt” to carry out normal execution.

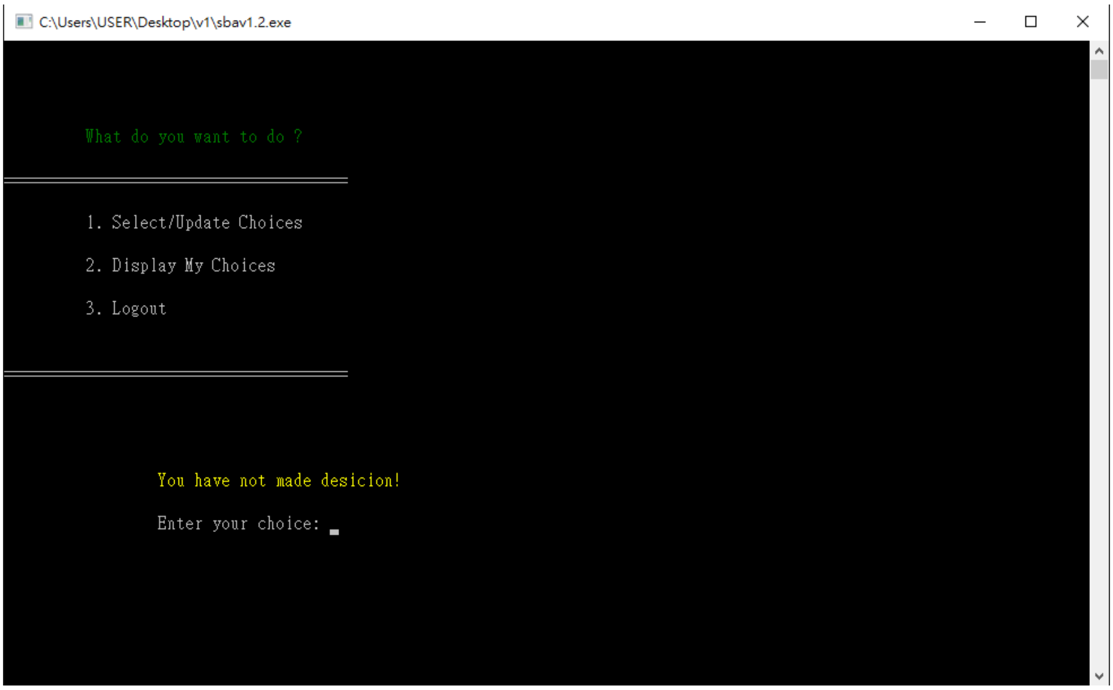
Here is the sample:



C:\Users\USER\Desktop\v1\sbav1.2.exe

```
                       Extra Curricular Activities System

* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                    ____                     ____    ___              ____
        |      |   |        |       |       |       |   |   |\  /|   |
        |  /\  |   |----    |       |       |       |   |   | \/ |   |----
         \/  \/    |____    |____   |____   |____   |___|   |    |   |____

                        UserID : 
```

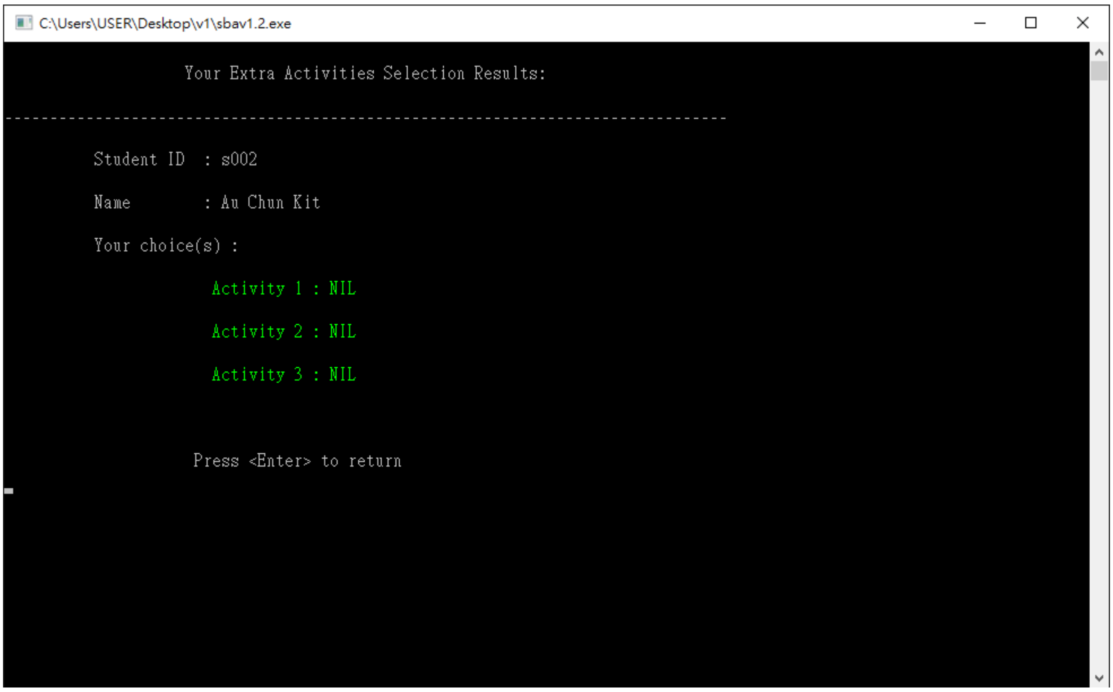
After logging in successfully, the menu will show like this:



```
C:\Users\USER\Desktop\v1\sbav1.2.exe

        What do you want to do ?

==========================================

        1. Select/Update Choices

        2. Display My Choices

        3. Logout

==========================================


               You have not made desicion!

               Enter your choice: _
```

As the student has not made any decision, so words "You have not made decisions!" in yellow will appear and remind that student to make decisions.

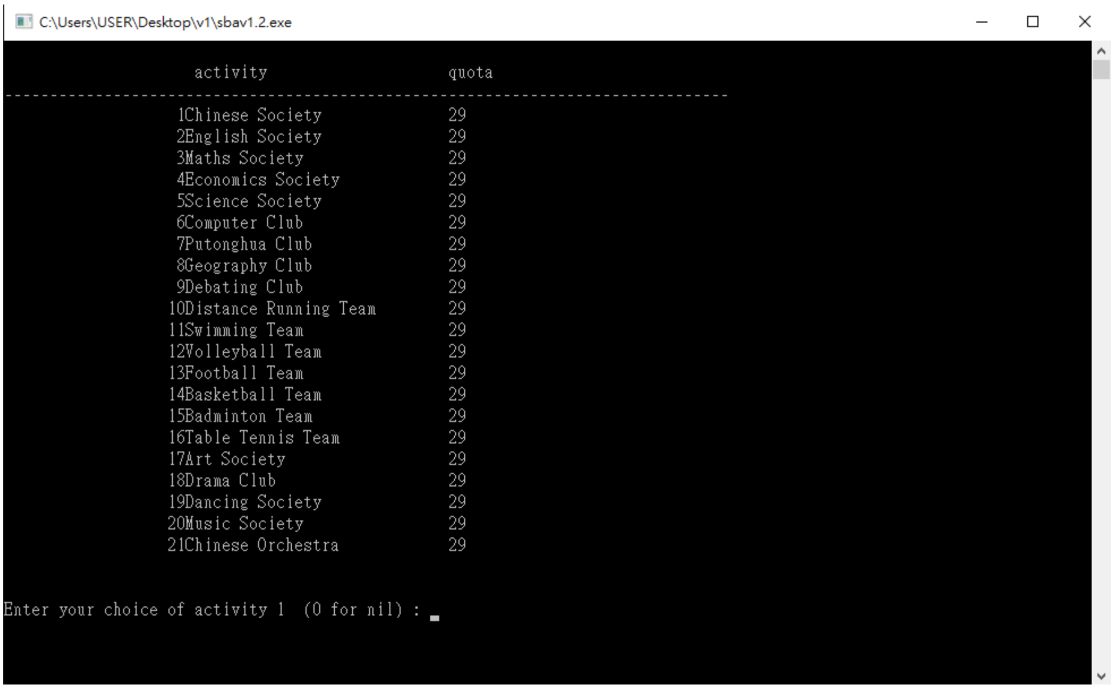
When the student press '2', it will be like this:



```
C:\Users\USER\Desktop\v1\sbav1.2.exe
                    Your Extra Activities Selection Results:
--------------------------------------------------------------------------------

          Student ID  : s002

          Name        : Au Chun Kit

          Your choice(s) :

                       Activity 1 : NIL

                       Activity 2 : NIL

                       Activity 3 : NIL


                     Press <Enter> to return
_
```

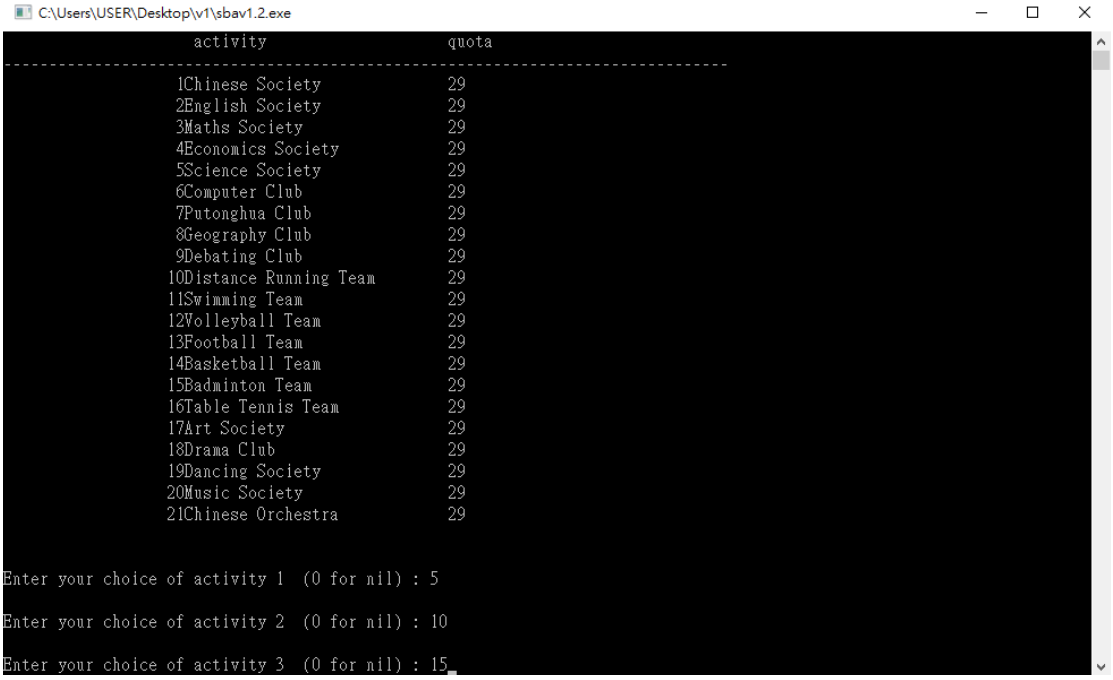
Since the student has not made decisions, nothing can be shown

And now go back to the main menu and press ’1’, an activities list will appear:



```
                    activity                    quota
------------------------------------------------------------------------------
                  1Chinese Society              29
                  2English Society              29
                  3Maths Society                29
                  4Economics Society            29
                  5Science Society              29
                  6Computer Club                29
                  7Putonghua Club               29
                  8Geography Club               29
                  9Debating Club                29
                 10Distance Running Team        29
                 11Swimming Team                29
                 12Volleyball Team              29
                 13Football Team                29
                 14Basketball Team              29
                 15Badminton Team               29
                 16Table Tennis Team            29
                 17Art Society                  29
                 18Drama Club                   29
                 19Dancing Society              29
                 20Music Society                29
                 21Chinese Orchestra            29

Enter your choice of activity 1  (0 for nil) :
```

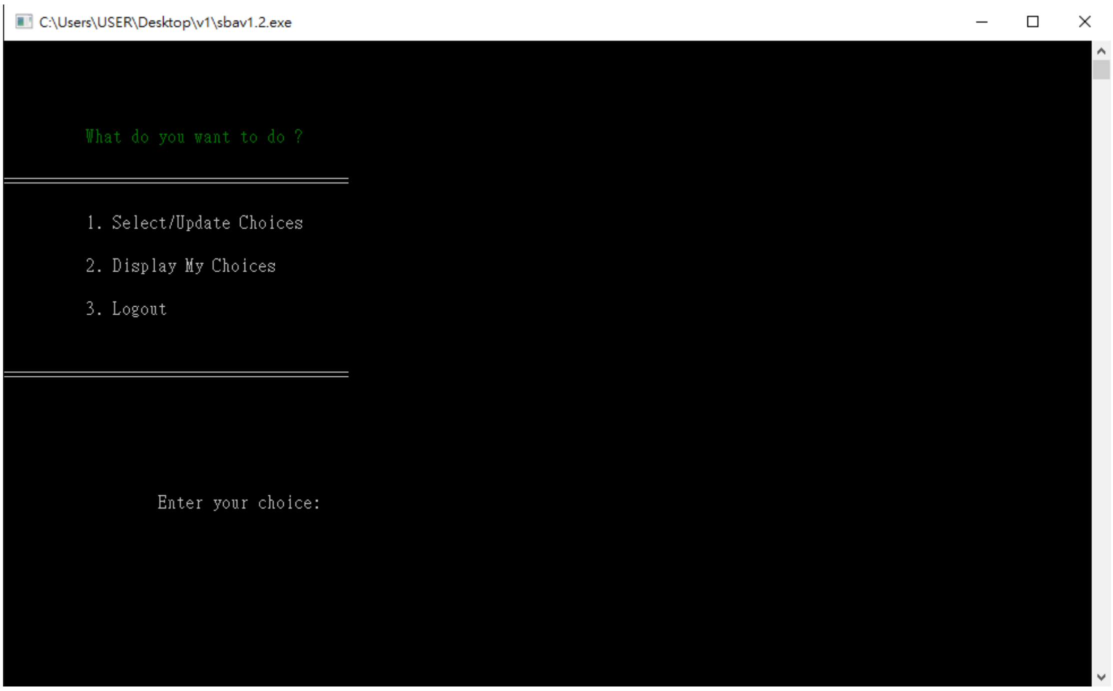
When the student s002 randomly choose three: 5, 10 and 15. Meanwhile, student can choose 0 for nil for any of the activity choice or choose 0 for all activity choices if they do not want to join any of them.



C:\Users\USER\Desktop\v1\sbav1.2.exe

```
                        activity                        quota
---------------------------------------------------------------------------------------------
                      1Chinese Society                  29
                      2English Society                  29
                      3Maths Society                    29
                      4Economics Society                29
                      5Science Society                  29
                      6Computer Club                    29
                      7Putonghua Club                   29
                      8Geography Club                   29
                      9Debating Club                    29
                     10Distance Running Team            29
                     11Swimming Team                    29
                     12Volleyball Team                  29
                     13Football Team                    29
                     14Basketball Team                  29
                     15Badminton Team                   29
                     16Table Tennis Team                29
                     17Art Society                      29
                     18Drama Club                       29
                     19Dancing Society                  29
                     20Music Society                    29
                     21Chinese Orchestra                29


Enter your choice of activity 1  (0 for nil) : 5

Enter your choice of activity 2  (0 for nil) : 10

Enter your choice of activity 3  (0 for nil) : 15
```

After the student has input 5, 10 and 15 and press 'Enter', the program will record his decision and go back to the menu

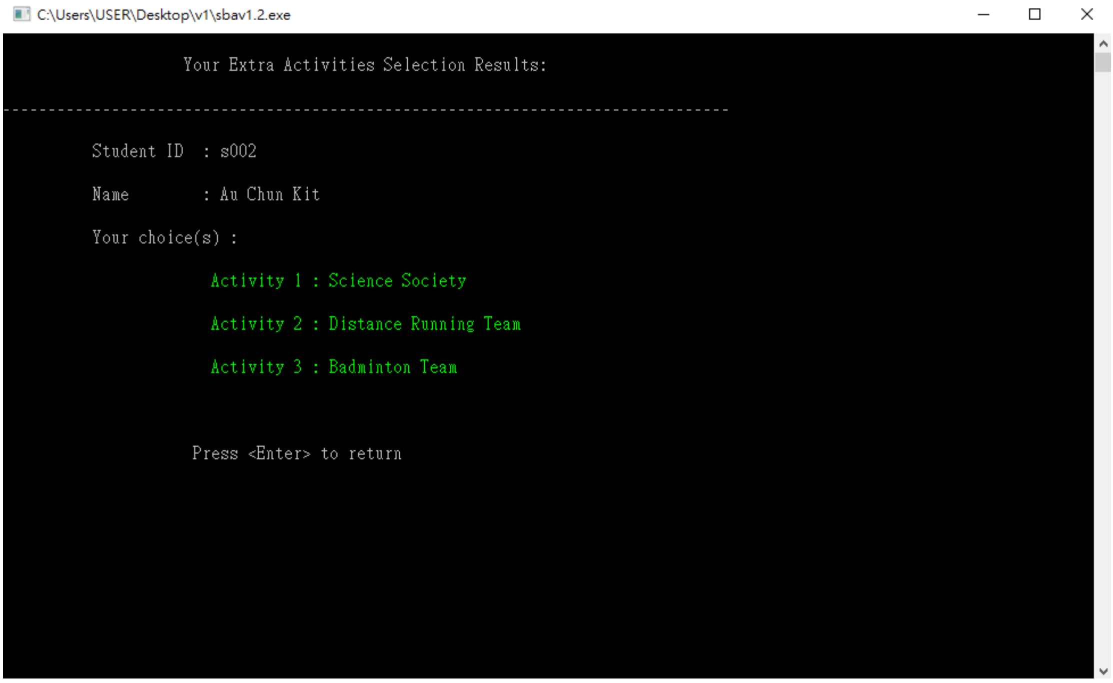


C:\Users\USER\Desktop\v1\sbav1.2.exe

```
          What do you want to do ?

==============================================

          1. Select/Update Choices

          2. Display My Choices

          3. Logout

==============================================



                   Enter your choice:
```

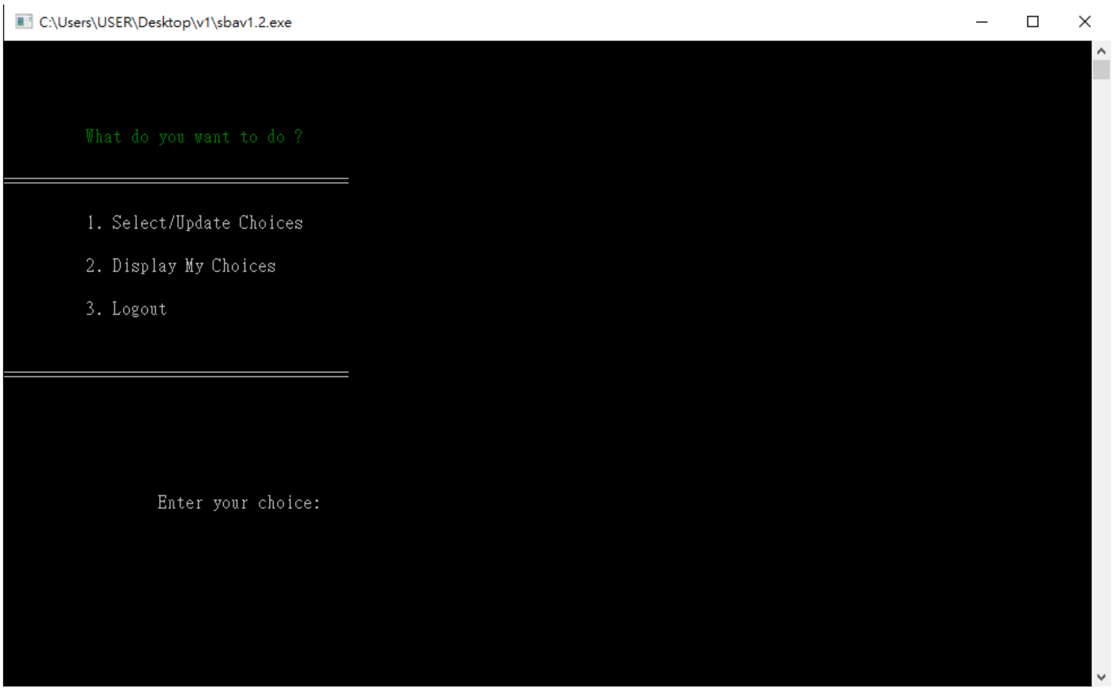
As the student has made choices, words "You have not made decisions!” will not appear

Now press ’2’ and the program will display the detail information of the student and what activities he had chosen.



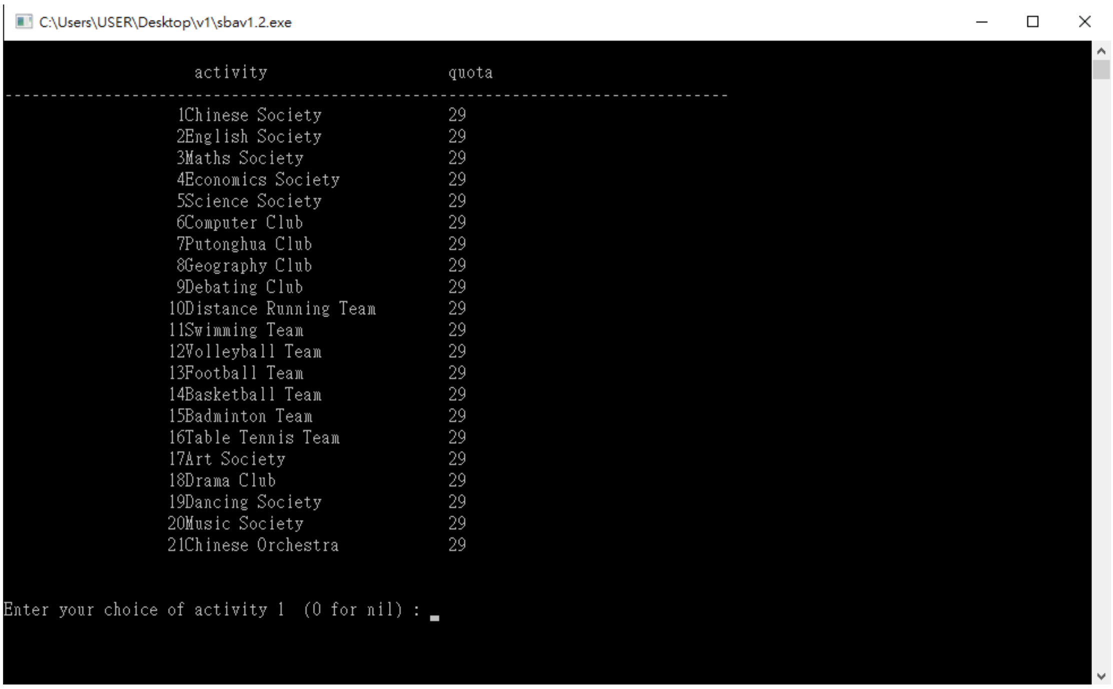
```
                    Your Extra Activities Selection Results:

----------------------------------------------------------------------------------

          Student ID  : s002

          Name        : Au Chun Kit

          Your choice(s) :

                         Activity 1 : Science Society

                         Activity 2 : Distance Running Team

                         Activity 3 : Badminton Team


                     Press <Enter> to return
```

Student can press ‘Enter’ to return to the menu



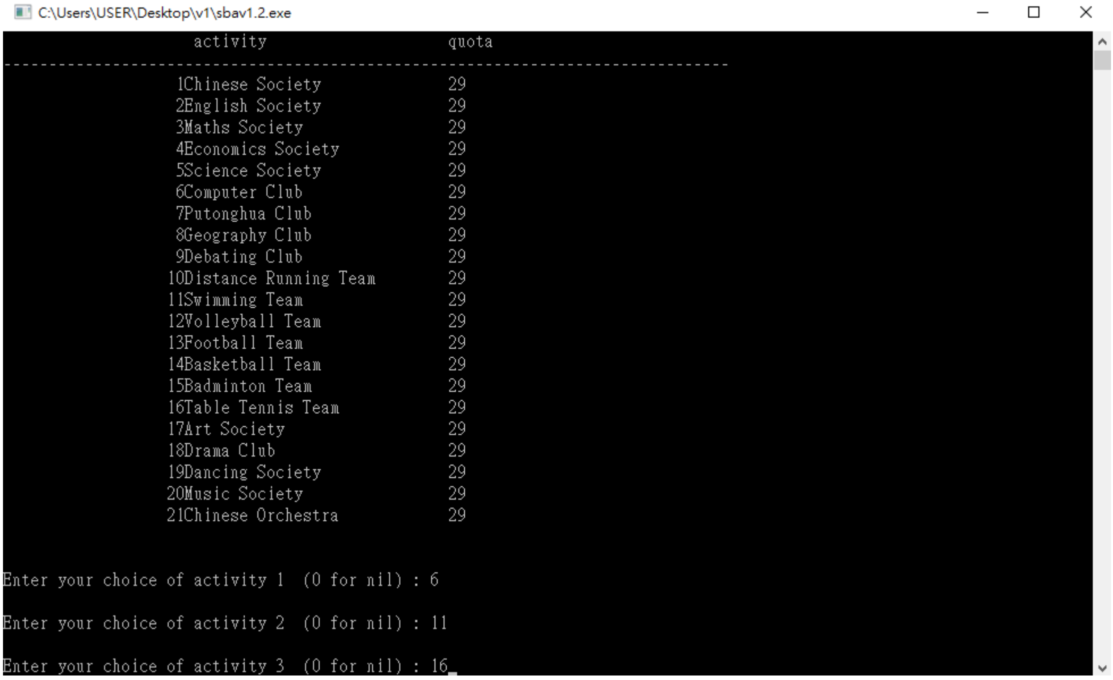
```
    What do you want to do ?

=========================

    1. Select/Update Choices

    2. Display My Choices

    3. Logout

=========================


          Enter your choice:
```

If the student wants to make changes or update their choices, they can press'1' and go back to the activity list and choose again. The quota of all the activities he had chosen before will be reset to ensure that one student cannot take more than one quota in a kind of activity



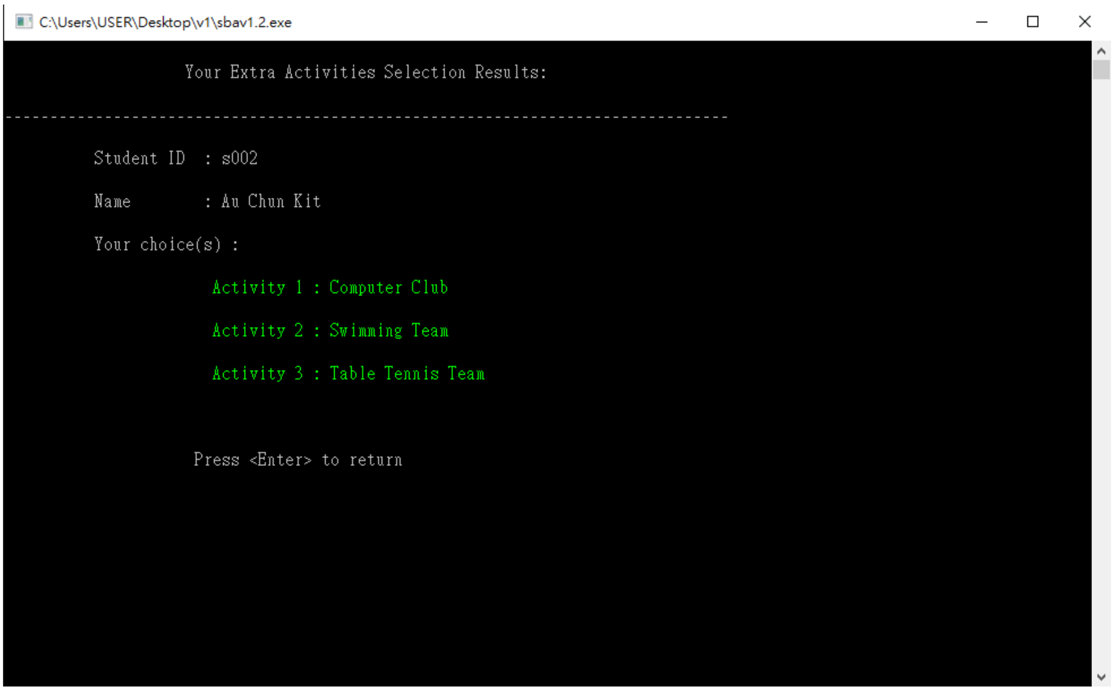
```
                    activity                    quota
-------------------------------------------------------------------------------
                  1Chinese Society              29
                  2English Society              29
                  3Maths Society                29
                  4Economics Society            29
                  5Science Society              29
                  6Computer Club                29
                  7Putonghua Club               29
                  8Geography Club               29
                  9Debating Club                29
                 10Distance Running Team        29
                 11Swimming Team                29
                 12Volleyball Team              29
                 13Football Team                29
                 14Basketball Team              29
                 15Badminton Team               29
                 16Table Tennis Team            29
                 17Art Society                  29
                 18Drama Club                   29
                 19Dancing Society              29
                 20Music Society                29
                 21Chinese Orchestra            29


Enter your choice of activity 1  (0 for nil) :
```

When the student has changed his mind and wants to join different activities, for example 6, 11 and 16



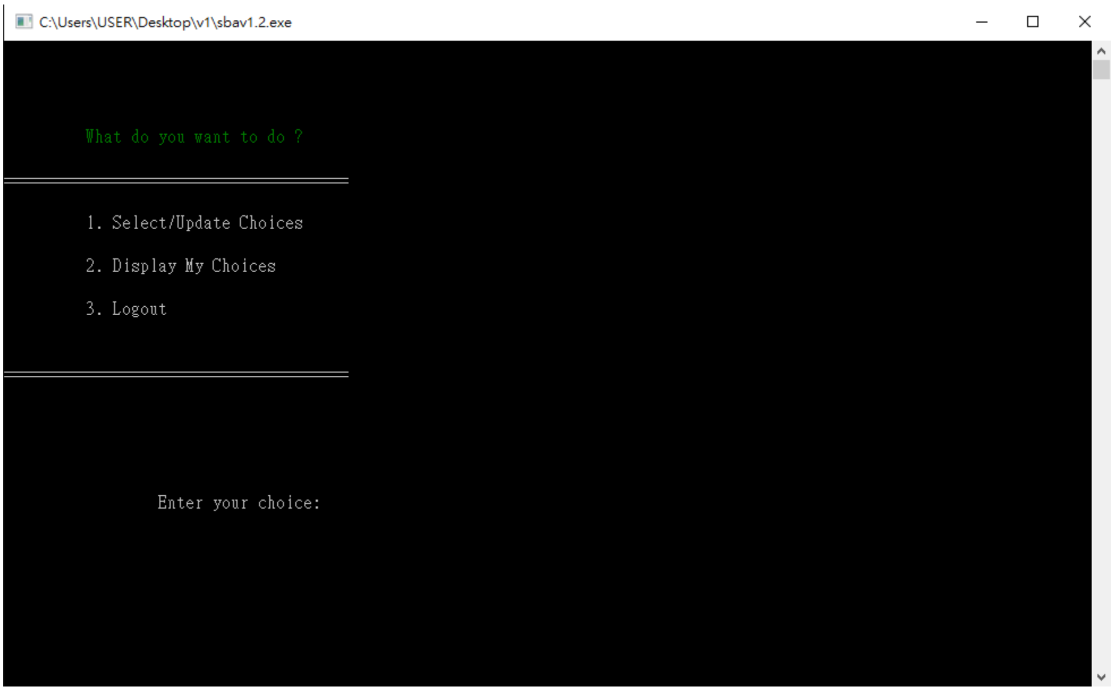
```
                    activity                    quota
-------------------------------------------------------------------------------
                  1Chinese Society              29
                  2English Society              29
                  3Maths Society                29
                  4Economics Society            29
                  5Science Society              29
                  6Computer Club                29
                  7Putonghua Club               29
                  8Geography Club               29
                  9Debating Club                29
                 10Distance Running Team        29
                 11Swimming Team                29
                 12Volleyball Team              29
                 13Football Team                29
                 14Basketball Team              29
                 15Badminton Team               29
                 16Table Tennis Team            29
                 17Art Society                  29
                 18Drama Club                   29
                 19Dancing Society              29
                 20Music Society                29
                 21Chinese Orchestra            29


Enter your choice of activity 1  (0 for nil) : 6

Enter your choice of activity 2  (0 for nil) : 11

Enter your choice of activity 3  (0 for nil) : 16
```

And press ‘Enter’, the program will also store his decisions and now press ‘2’ in the menu to check his choices, we can see that the record has changed as well



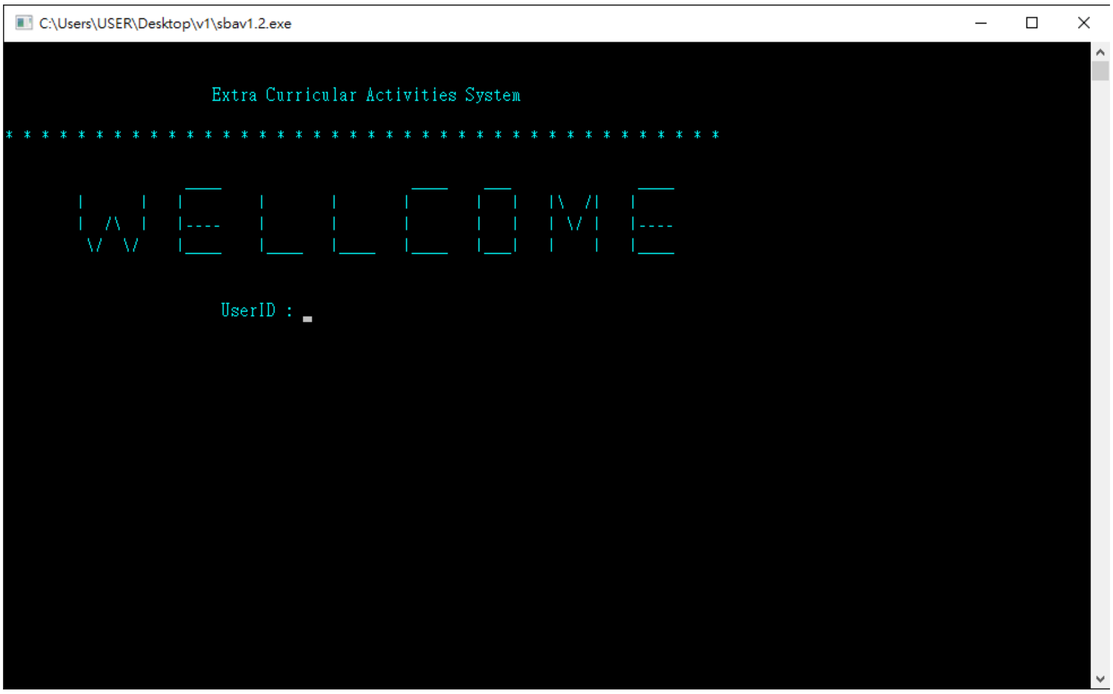
```
C:\Users\USER\Desktop\v1\sbav1.2.exe

                Your Extra Activities Selection Results:

-------------------------------------------------------------------------------

        Student ID  : s002

        Name        : Au Chun Kit

        Your choice(s) :

                   Activity 1 : Computer Club

                   Activity 2 : Swimming Team

                   Activity 3 : Table Tennis Team


                 Press <Enter> to return
```

Now if the student has finished making decisions and want to logout, he just need to return to the menu and press'3'



```
C:\Users\USER\Desktop\v1\sbav1.2.exe


        What do you want to do ?

==================================

        1. Select/Update Choices

        2. Display My Choices

        3. Logout


==================================



               Enter your choice:
```

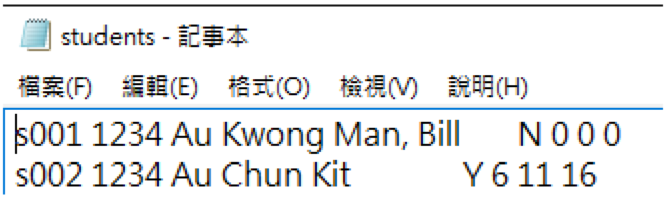
then the program will go to the welcome page



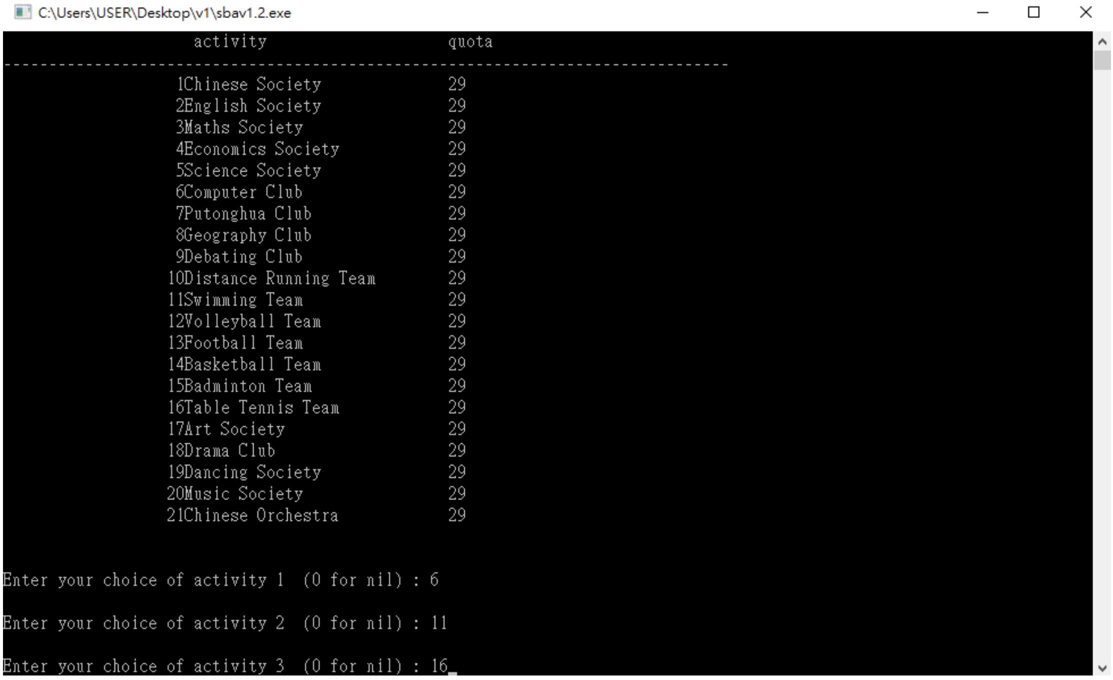
```
                      Extra Curricular Activities System

* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                    ____                     ____    ___              ____
        |      |   |        |       |       |       |   |   |\  /|   |
        |  /\  |   |----    |       |       |       |   |   | \/ |   |----
         \/  \/    |____    |____   |____   |____   |___|   |    |   |____

                        UserID : 
```

To ensure there are no errors in storing the information,

I check “students.txt” first, here is the stored data



```
s001 1234 Au Kwong Man, Bill     N 0 0 0
s002 1234 Au Chun Kit            Y 6 11 16
```

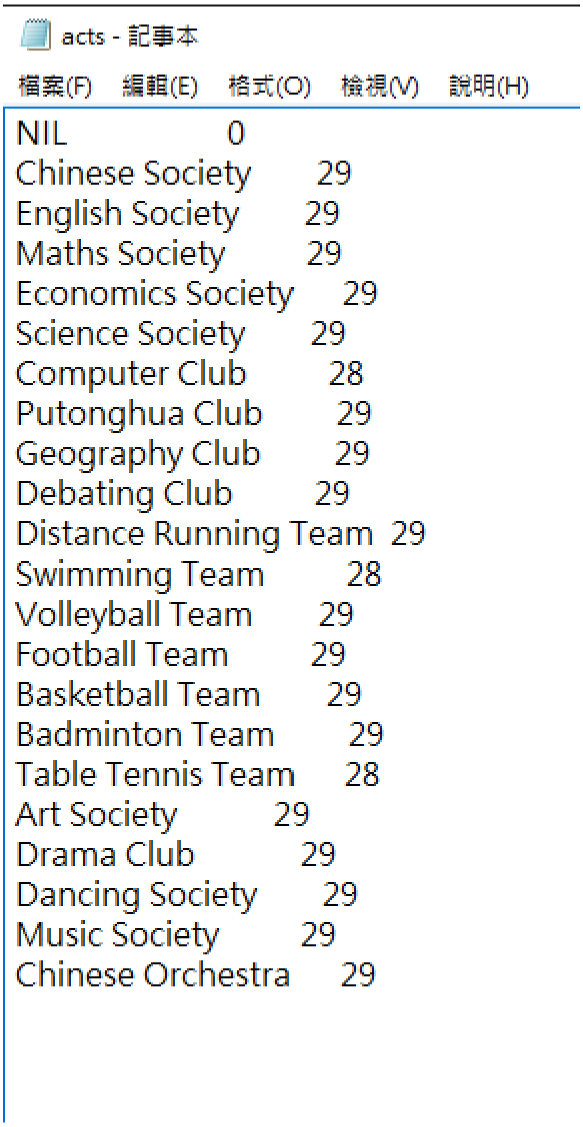


```
                     activity                    quota
--------------------------------------------------------------------------------
                   1Chinese Society              29
                   2English Society              29
                   3Maths Society                29
                   4Economics Society            29
                   5Science Society              29
                   6Computer Club                29
                   7Putonghua Club               29
                   8Geography Club               29
                   9Debating Club                29
                  10Distance Running Team        29
                  11Swimming Team                29
                  12Volleyball Team              29
                  13Football Team                29
                  14Basketball Team              29
                  15Badminton Team               29
                  16Table Tennis Team            29
                  17Art Society                  29
                  18Drama Club                   29
                  19Dancing Society              29
                  20Music Society                29
                  21Chinese Orchestra            29


Enter your choice of activity 1  (0 for nil) : 6

Enter your choice of activity 2  (0 for nil) : 11

Enter your choice of activity 3  (0 for nil) : 16_
```

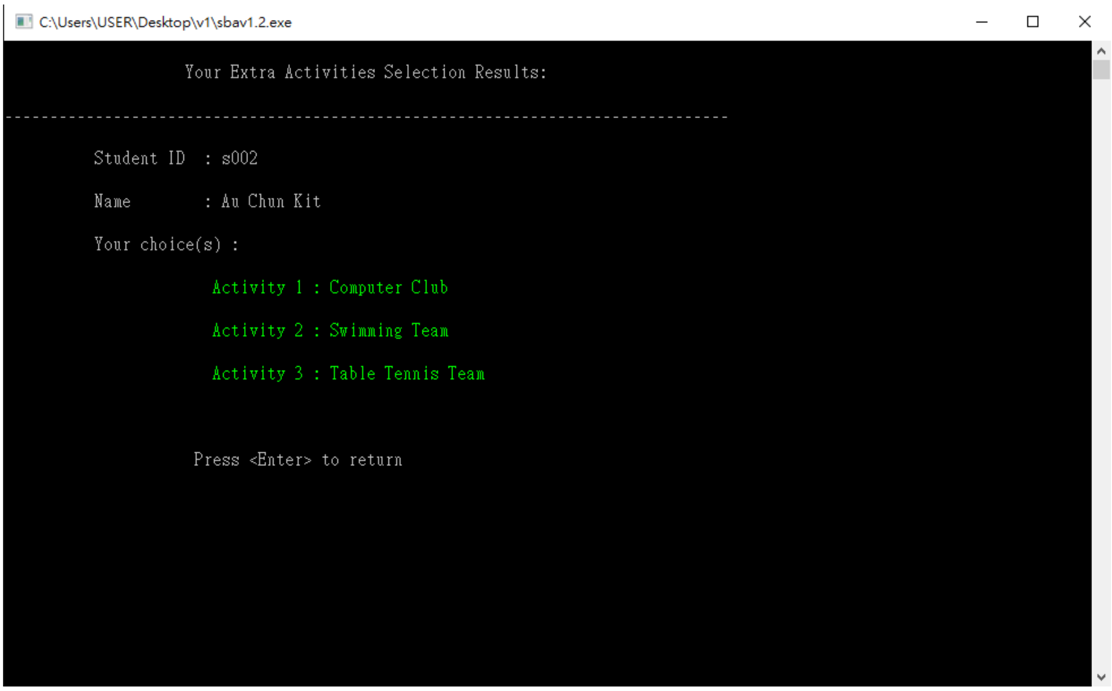
The record is corresponding to the final decision made by

student s002.

After that, I check “acts.txt”, here is the stored data



```
NIL              0
Chinese Society      29
English Society      29
Maths Society        29
Economics Society     29
Science Society      29
Computer Club        28
Putonghua Club       29
Geography Club       29
Debating Club        29
Distance Running Team  29
Swimming Team        28
Volleyball Team      29
Football Team        29
Basketball Team      29
Badminton Team       29
Table Tennis Team     28
Art Society          29
Drama Club           29
Dancing Society      29
Music Society        29
Chinese Orchestra     29
```



```
                    Your Extra Activities Selection Results:

-------------------------------------------------------------------------------

          Student ID  : s002

          Name        : Au Chun Kit

          Your choice(s) :

                       Activity 1 : Computer Club

                       Activity 2 : Swimming Team

                       Activity 3 : Table Tennis Team


                     Press <Enter> to return
```

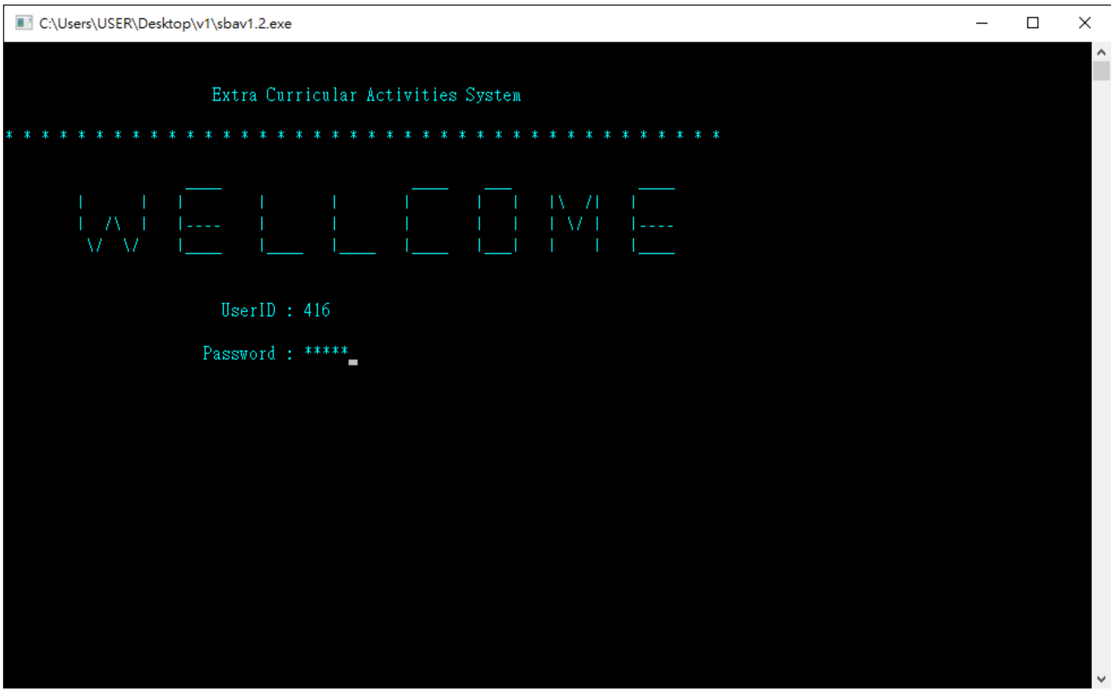
Quotas of items that student s002 chose have reduced by one respectively.

These mean that the storing process has no error occurs.

3. Testing and Evaluation

The program is tested by inputting some incorrect or invalid decision or choices and check for errors.

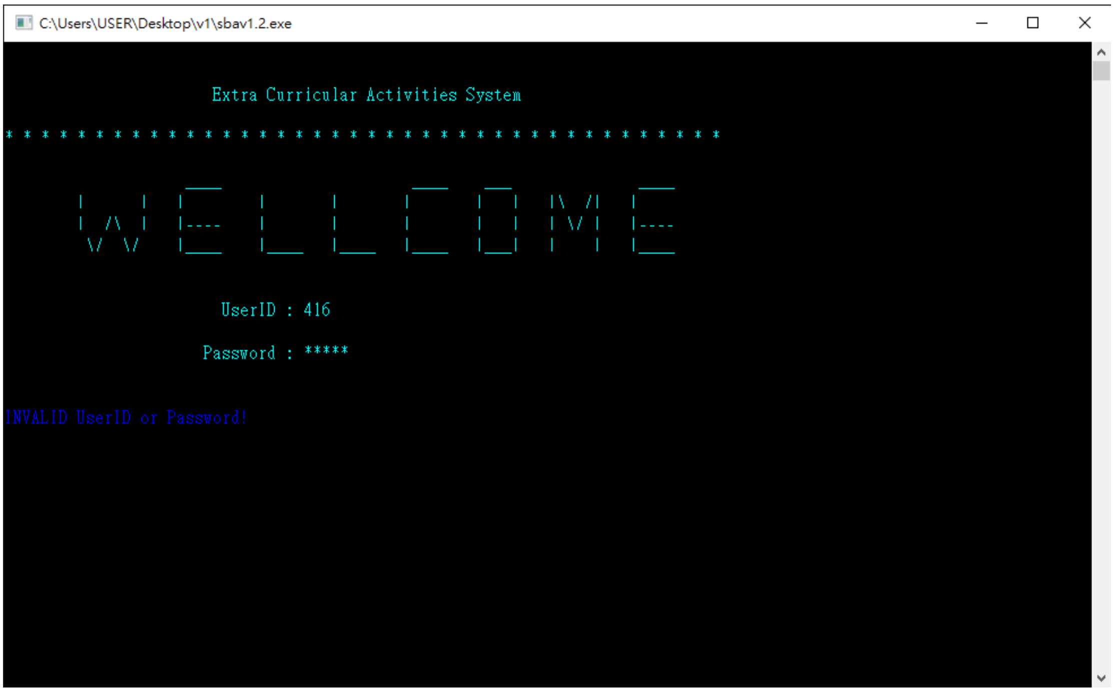
In the welcome page, I input the number 416 for ‘UserID’ and password ‘vkyqi’.



C:\Users\USER\Desktop\v1\sbav1.2.exe

```
                       Extra Curricular Activities System

* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                    ____                     ____    ___               ____
        |      |   |        |       |       |       |   |   |\   /|   |
        |  /\  |   |----    |       |       |       |   |   |  \/ |   |----
         \/  \/    |____    |____   |____   |____   |___|   |     |   |____

                        UserID : 416

                      Password : *****
```

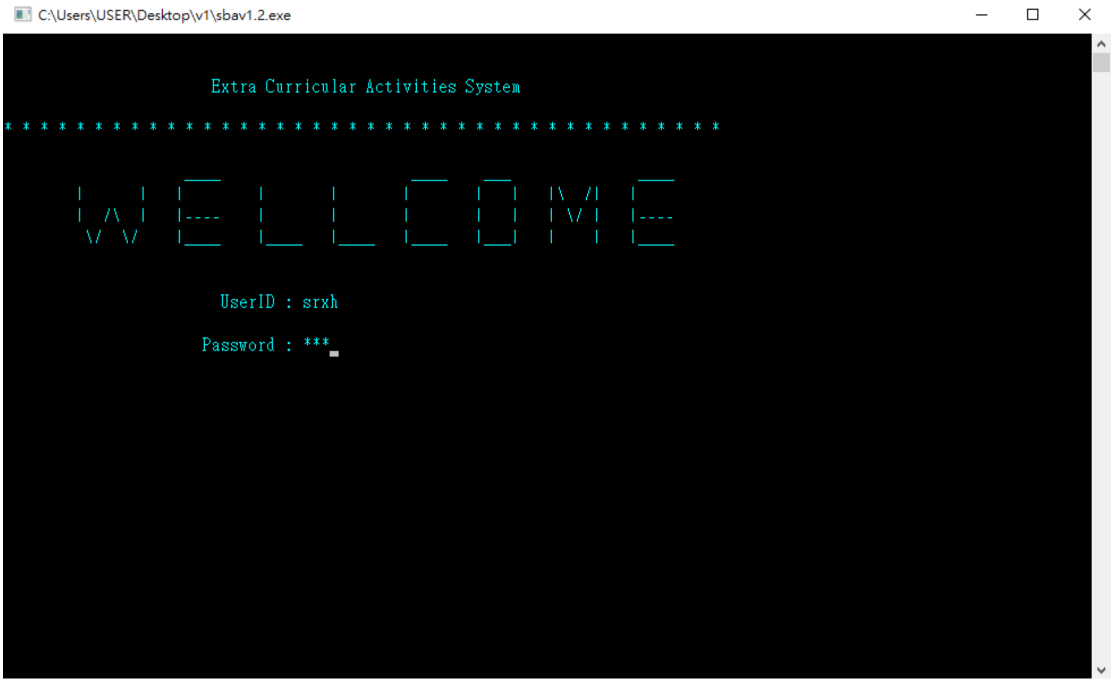
And I press’Enter’,



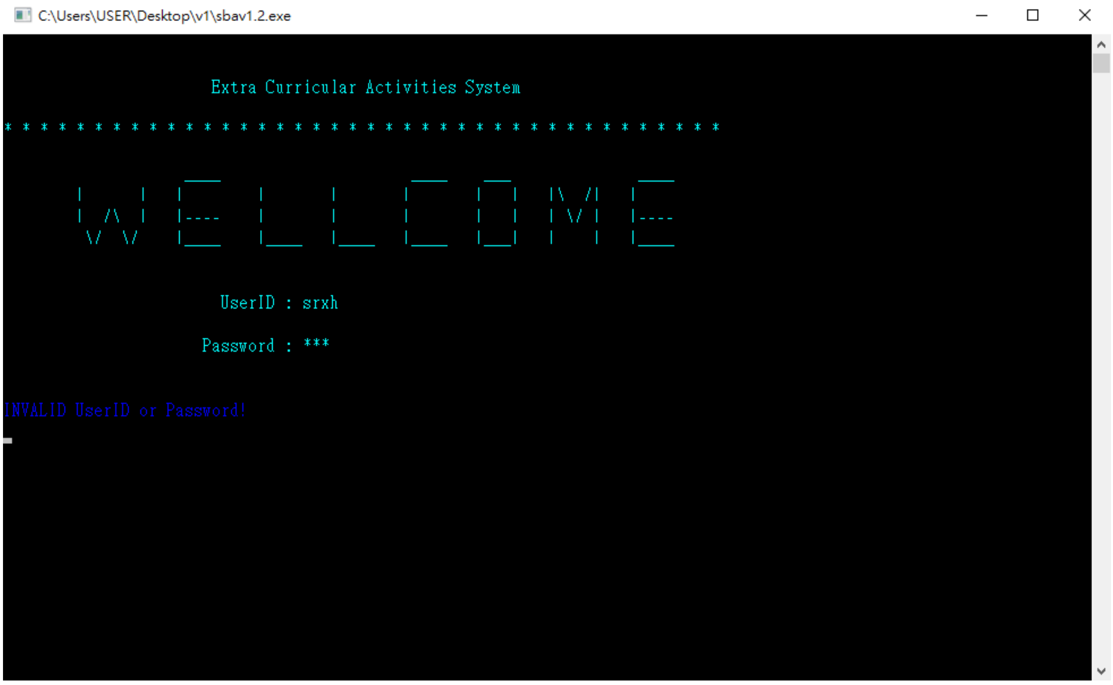
```
                      Extra Curricular Activities System

* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                 ___                     ___   ___           ___
     |     |    |         |       |       |     |   |   |\  /|  |
     |  /\ |    |----     |       |       |     |   |   | \/ |  |----
      \/  \/    |___      |___    |___    |___  |___|   |    |  |___

                       UserID : 416

                     Password : *****

INVALID UserID or Password!
```

A warning “INVALID UserID or Password!” in blue colour will appear and require the user to try again.

I try again with ‘srxh’ as UserID and ‘321’as password and press ‘Enter’



```
                      Extra Curricular Activities System

* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                 ___                     ___   ___           ___
     |     |    |         |       |       |     |   |   |\  /|  |
     |  /\ |    |----     |       |       |     |   |   | \/ |  |----
      \/  \/    |___      |___    |___    |___  |___|   |    |  |___

                       UserID : srxh

                     Password : ***_
```

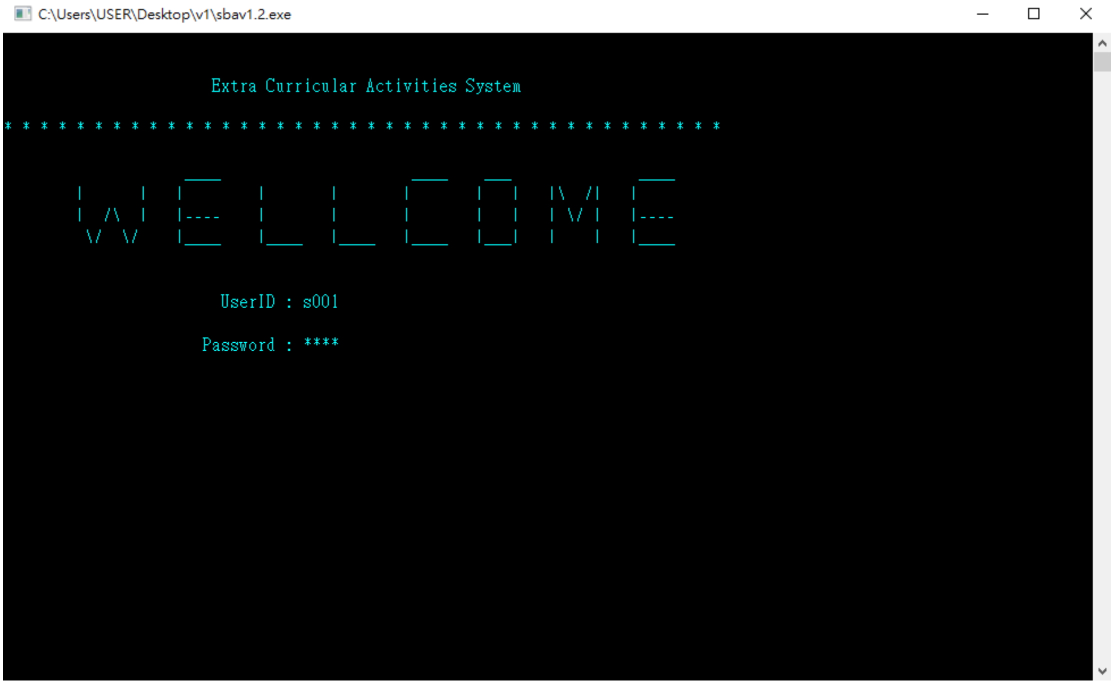


C:\Users\USER\Desktop\v1\sbav1.2.exe

```
                       Extra Curricular Activities System

* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * 

                 ____                 ____   ____          ____
        |     |  |         |       |       |       |    |  |\  /|  |
        |  /\ |  |----     |       |       |       |    |  | \/ |  |----
         \/  \/  |____     |____   |____   |____   |____|  |    |  |____

                        UserID : srxh

                      Password : ***

INVALID UserID or Password!
_
```

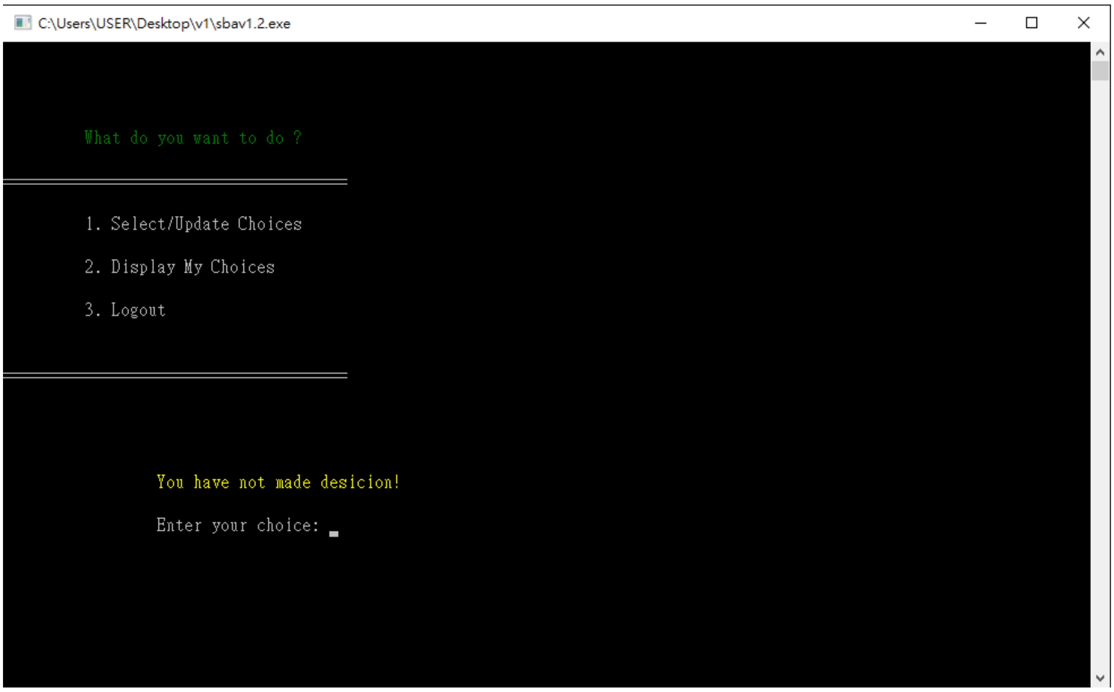
The same warning appears.

No bugs are found in the login section and now I use account s001 and its corresponding password:1234 to login



C:\Users\USER\Desktop\v1\sbav1.2.exe

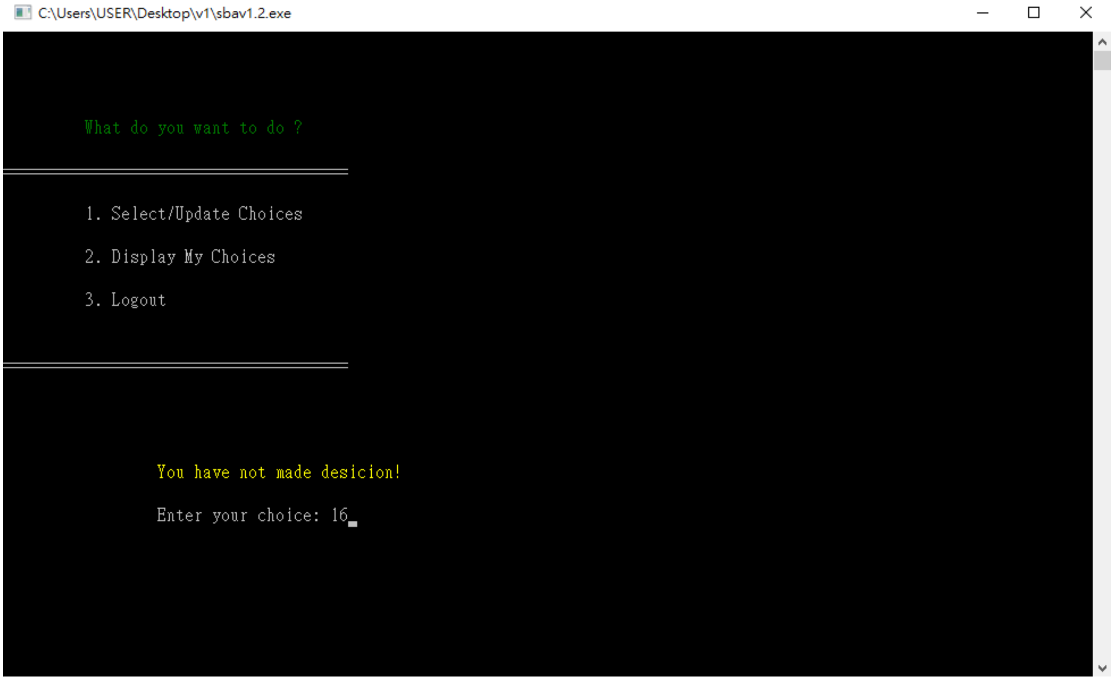
```
                       Extra Curricular Activities System

* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * 

                 ____                 ____   ____          ____
        |     |  |         |       |       |       |    |  |\  /|  |
        |  /\ |  |----     |       |       |       |    |  | \/ |  |----
         \/  \/  |____     |____   |____   |____   |____|  |    |  |____

                        UserID : s001

                      Password : ****
```



```
        What do you want to do ?
================================
        1. Select/Update Choices

        2. Display My Choices

        3. Logout

================================

               You have not made desicion!

               Enter your choice: _
```

It comes to the main menu

When I input ‘16’(the range supposed to be 1 to 3)

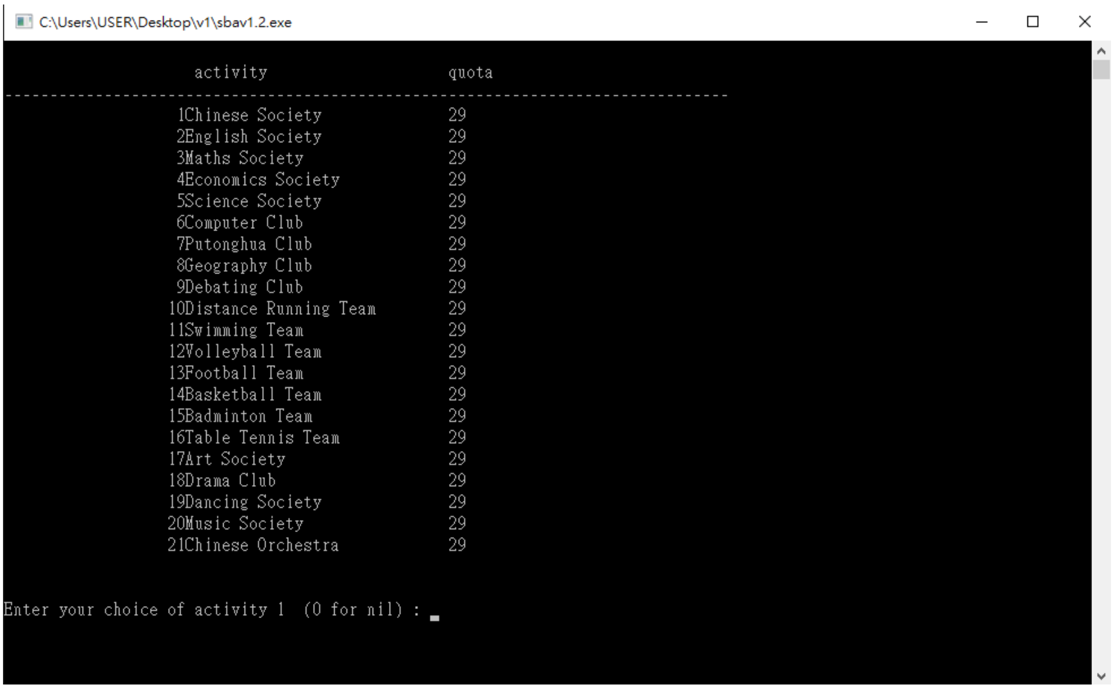


```
        What do you want to do ?
================================
        1. Select/Update Choices

        2. Display My Choices

        3. Logout

================================

               You have not made desicion!

               Enter your choice: 16_
```

Press ’Enter’, no action will be done by the program and remains in this page. However, there is still a bug when

I input words other than integer or when the integer is too large, the program will be forced to close.

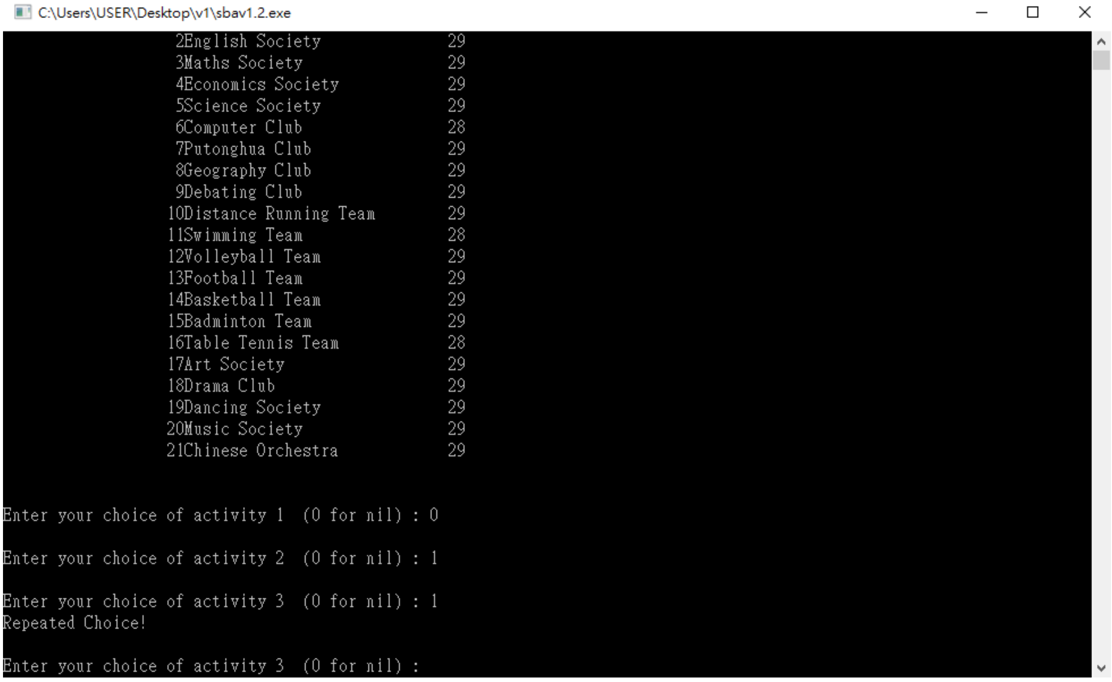
Now press’1’ and enter the list



```
                 activity                   quota
------------------------------------------------------------------------------
                1Chinese Society            29
                2English Society            29
                3Maths Society              29
                4Economics Society          29
                5Science Society            29
                6Computer Club              29
                7Putonghua Club             29
                8Geography Club             29
                9Debating Club              29
               10Distance Running Team      29
               11Swimming Team              29
               12Volleyball Team            29
               13Football Team              29
               14Basketball Team            29
               15Badminton Team             29
               16Table Tennis Team          29
               17Art Society                29
               18Drama Club                 29
               19Dancing Society            29
               20Music Society              29
               21Chinese Orchestra          29


Enter your choice of activity 1  (0 for nil) :
```

Student can choose 0 for nil at any of the activity choice or choose 0 for all activity choices if they do not want to join any of them.

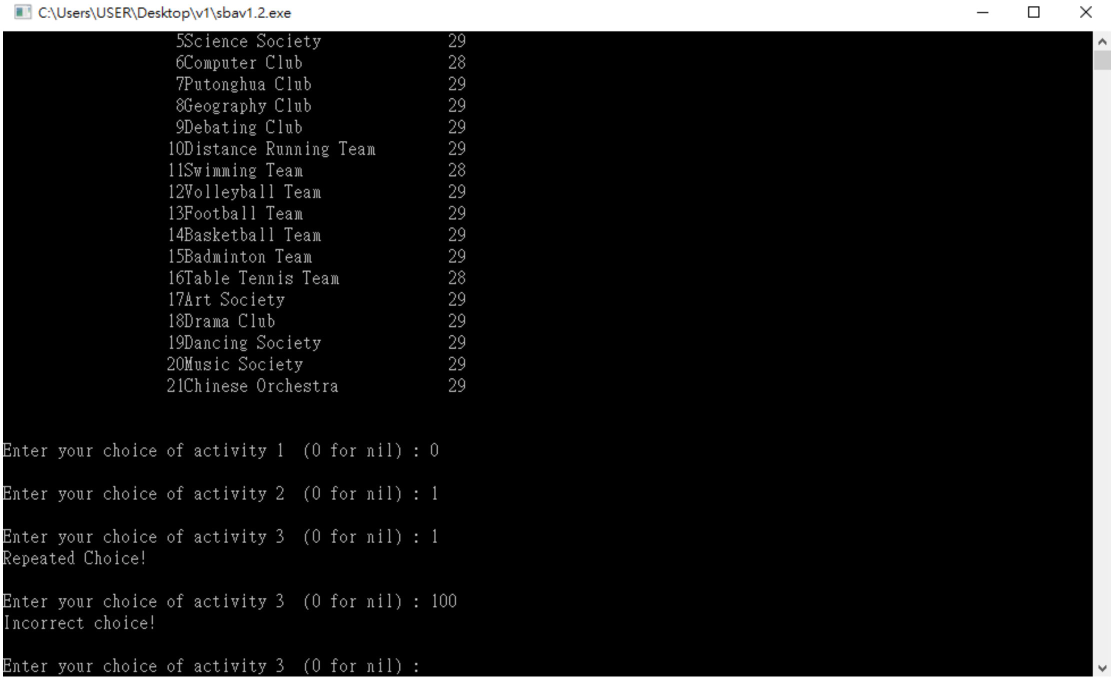
If the student input duplicated choice, a warning will appear and remind student to input again



```
                   2English Society              29
                   3Maths Society                29
                   4Economics Society            29
                   5Science Society              29
                   6Computer Club                28
                   7Putonghua Club               29
                   8Geography Club               29
                   9Debating Club                29
                  10Distance Running Team        29
                  11Swimming Team                28
                  12Volleyball Team              29
                  13Football Team                29
                  14Basketball Team              29
                  15Badminton Team               29
                  16Table Tennis Team            28
                  17Art Society                  29
                  18Drama Club                   29
                  19Dancing Society              29
                  20Music Society                29
                  21Chinese Orchestra            29


Enter your choice of activity 1  (0 for nil) : 0

Enter your choice of activity 2  (0 for nil) : 1

Enter your choice of activity 3  (0 for nil) : 1
Repeated Choice!

Enter your choice of activity 3  (0 for nil) :
```

If the student input a number out of range 1 to 22, a

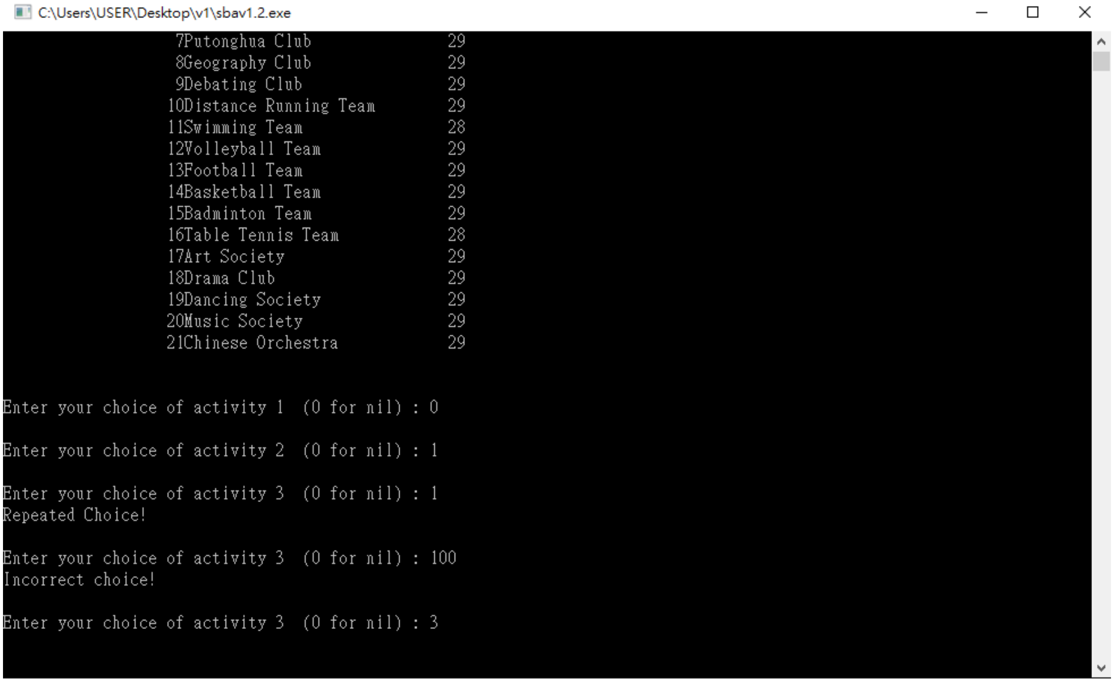
different warning will appear



```
                   5Science Society              29
                   6Computer Club                28
                   7Putonghua Club               29
                   8Geography Club               29
                   9Debating Club                29
                  10Distance Running Team        29
                  11Swimming Team                28
                  12Volleyball Team              29
                  13Football Team                29
                  14Basketball Team              29
                  15Badminton Team               29
                  16Table Tennis Team            28
                  17Art Society                  29
                  18Drama Club                   29
                  19Dancing Society              29
                  20Music Society                29
                  21Chinese Orchestra            29


Enter your choice of activity 1  (0 for nil) : 0

Enter your choice of activity 2  (0 for nil) : 1

Enter your choice of activity 3  (0 for nil) : 1
Repeated Choice!

Enter your choice of activity 3  (0 for nil) : 100
Incorrect choice!

Enter your choice of activity 3  (0 for nil) :
```

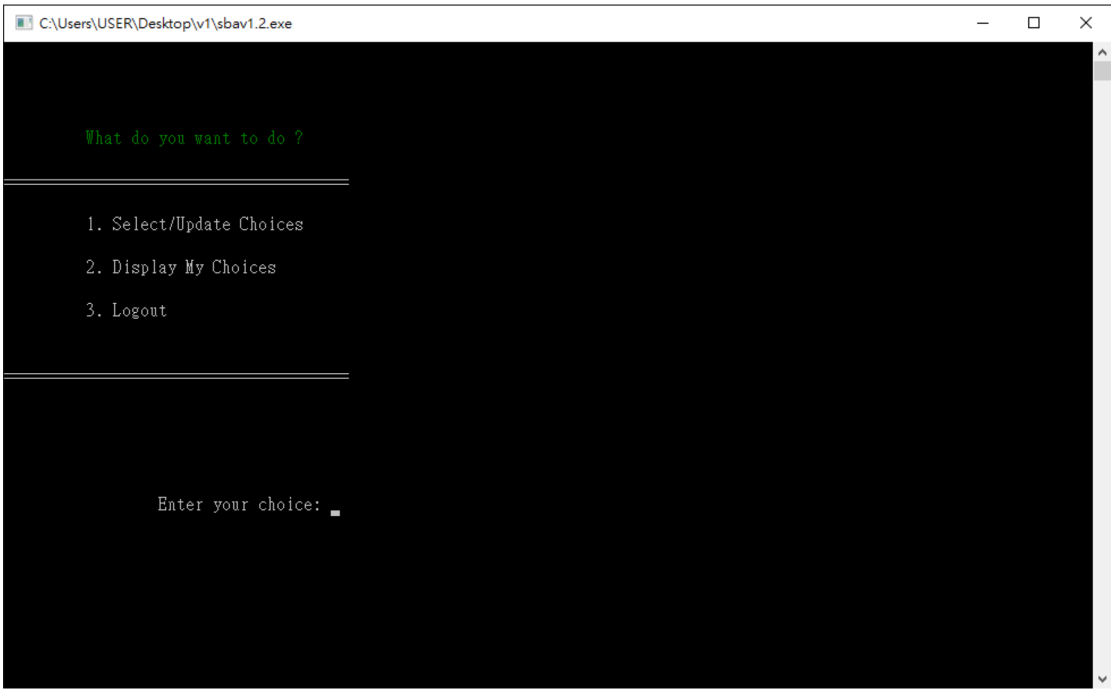
When the student input a suitable range finally and press

‘Enter’, the program will store the choices



C:\Users\USER\Desktop\v1\sbav1.2.exe

```
                   7Putonghua Club              29
                   8Geography Club              29
                   9Debating Club               29
                  10Distance Running Team       29
                  11Swimming Team               28
                  12Volleyball Team             29
                  13Football Team               29
                  14Basketball Team             29
                  15Badminton Team              29
                  16Table Tennis Team           28
                  17Art Society                 29
                  18Drama Club                  29
                  19Dancing Society             29
                  20Music Society               29
                  21Chinese Orchestra           29


Enter your choice of activity 1  (0 for nil) : 0

Enter your choice of activity 2  (0 for nil) : 1

Enter your choice of activity 3  (0 for nil) : 1
Repeated Choice!

Enter your choice of activity 3  (0 for nil) : 100
Incorrect choice!

Enter your choice of activity 3  (0 for nil) : 3
```



C:\Users\USER\Desktop\v1\sbav1.2.exe

```


         What do you want to do ?

=====================================

         1. Select/Update Choices

         2. Display My Choices

         3. Logout


=====================================




                 Enter your choice: _
```

Evaluation

My program runs normally when the user input correct type of data. For example, they input integer values (1 to 3) in the menu when choosing functions.

My program is also user-friendly because they can make decision with all the activities listed out and make comparison. It is convenient for users.

Moreover, my program is reusable. When users want to update their choices, they can login again at any time they like and make changes. My program will restore the quotas of the activities that being chosen by the user before and provide the latest information of quotas left whatever they are stilling logging in or they login again.

Student can choose 0 for nil at any of the activity choice or choose 0 for all activity choices if they do not want to join any of them. The program provides freedom to users.

Last but not least, the security level is high. Only the administrator can know all the information of students including their names, UserIDs, passwords, what activities they have chosen. Students will not know what their schoolmates have chosen. They only know how many quotas left for each activity. This ensures the privacy of the users.

4.Conclusion and Discussion

My program provides convenience and privacy for the users. They can change their choices for many times and at any time. Their privacy such as names, passwords will be kept by the administrator and will not be disclosed to other people.

However, my problem will encounter errors and forced to close if users input wrong type of information and commands into the program.

I will try my best to find out the problem and solve them with new knowledge or under the help of other people.

During the process of setting up this program, I have learnt some skills in combining different procedures and understand the logical consequences of a program. Writing a program requires a lot of effort, time and assistance from classmates and subject teachers. I have encountered several errors and bugs when I was implementing my program. But under the assistance from classmates and subject teachers, I deleted all the bugs and finally a complete program was built. I acquired many debug skills which will be useful in writing program in the future.

5. Project Management

5/2015	Choice of Topic
9/2015	Background research + Define the objectives + Propose Functions
10/2015	Design of Solution
10/2015	Implementation
11/2015	Testing & Evaluation
12/2015	Conclusion & Discussion + Final Report

Appendices (Program codes)

```
program act;
uses
      crt;
const
    max_ea = 21;
    max_stud = 100;

var
        user_id:string;
        password:string;
        i:integer;
        f:text;
        x:integer;
        ea : array[0..max_ea] of string[23];
        quota : array[0..max_ea] of integer;
        studid : array[1..max_stud] of string[4];
        studpw: array[1..max_stud] of string[4];
        studname : array[1..max_stud] of string[25];
    studdone : array[1..max_stud] of char;
    studact1 : array[1..max_stud] of integer;
    studact2 : array[1..max_stud] of integer;
    studact3 : array[1..max_stud] of integer;
    num_act, num_stud, stud_index : integer;



function GetPWord : string;     (* A function for hiding
password *)
var
  S : string;
  C : Char;
begin
  S := '';
  repeat
    C := ReadKey;
    if (C <> #10) and (C <> #13) and (C <> #8) then
      begin
```

```
        S := S + C;
        write('*');
      end
    else if C = #8 then
      begin
        S[0] := Chr(Length(S) - 1);
        GotoXY(WhereX - 1, WhereY);
        write(' ');
        GotoXY(WhereX - 1, WhereY);
      end;
  until (C = #10) or (C = #13);
  GetPWord := S;
  writeLn;
end;



procedure read_students;
var
```

```
    i : integer;
    f : text;
    space : char;
begin
        i := 0;
        assign(f, 'students.txt');
        reset(f);
        while not eof(f) do
            begin
                i:=i+1;
                readln(f, studid[i], space, studpw[i], space,
studname[i], studdone[i], space, studact1[i], studact2[i],
studact3[i]);
            end;
        num_stud :=    i;
        close(f)
end;
```

```
procedure read_acts;
var
    i : integer;
    f : text;
begin
        assign(f, 'acts.txt');
        reset(f);
        i :=-1;
        while not eof(f) do
            begin
                i:=i+1;
                  readln(f, ea[i], quota[i]);
            end;

        num_act := i;
        close(f)
end;
```

```
procedure store_students;
var    i : integer;
         f : text;
begin
    assign(f, 'students.txt');
    rewrite(f);
    for i := 1 to num_stud do
        begin
            writeln(f, studid[i], ' ', studpw[i], ' ',studname[i],
studdone[i],' ', studact1[i], ' ', studact2[i], ' ', studact3[i]);
        end;
    close(f)
end;



procedure store_acts;
```

```
var
    i : integer;
    f : text;
begin
    assign(f, 'acts.txt');
    rewrite(f);
    for i := 0 to num_act do
        begin
            writeln(f, ea[i], quota[i]);
        end;
    close(f)
end;



procedure display_choices(stud_index : integer);
begin
    clrscr;
    writeln;
    writeln('                                        Your Extra Activities
Selection Results: ');
    writeln;

writeln('---------------------------------------------------------------------------
------- ');
    writeln;
    writeln('                    Student ID    : ', studid[stud_index]);
    writeln;
    writeln('                    Name               : ',
studname[stud_index]);
    writeln;
    writeln('                    Your choice(s) : ');
    textcolor(lightgreen);
    writeln;
    writeln('                                              Activity 1 : ',
ea[studact1[stud_index]]);
    writeln;
```

```
   writeln('                                        Activity 2 : ',
ea[studact2[stud_index]]);
   writeln;
   writeln('                                        Activity 3 : ',
ea[studact3[stud_index]]);
   writeln;
   textcolor(lightgray);
   writeln;
   writeln;
   writeln('                                     Press <Enter> to return');
   readln
end;


procedure display_acts;
var    i : integer;
begin
   clrscr;
   writeln;
   writeln('':10,'                    activity
quota');

writeln({'':10,}'-----------------------------------------------------------------
---------------');
   for i := 1 to max_ea do
      writeln('':10, i:10, ea[i]:20, quota[i]:8);
   writeln
end;



procedure choose_acts(stud_index : integer);
var
      i : integer;
      choice : array[1..3] of integer;
      choice_done : boolean;

begin
   quota[0] := 0;
```

```
    if studdone[stud_index] = 'Y' then
    begin
            quota[studact1[stud_index]] :=
quota[studact1[stud_index]] + 1;
            quota[studact2[stud_index]] :=
quota[studact2[stud_index]] + 1;
            quota[studact3[stud_index]] :=
quota[studact3[stud_index]] + 1;
            store_acts;
    end;
    display_acts;

    for i :=1 to 3 do
        begin
            choice_done := false;
            repeat
                writeln;
                write('Enter your choice of activity ', i, '    (0 for nil) :
```

```
');
                readln(choice[i]);
                if (choice[i] = 0) then
                    choice_done := true
                else
                    if (choice[i] > max_ea) then
                        writeln('Incorrect choice!')
                    else
                        if(quota[choice[i]] = 0) then
                            writeln('Not enough quota!')
                    else
                        if (choice[i] = choice[i - 1]) or (choice[i] = choice[i
- 2]) then
                            writeln('Repeated Choice!')
                        else
                            choice_done := true
                until choice_done;


        end;
```

```
    studact1[stud_index] := choice[1];
    studact2[stud_index] := choice[2];
    studact3[stud_index] := choice[3];


    quota[studact1[stud_index]] := quota[studact1[stud_index]] - 1;
    quota[studact2[stud_index]] := quota[studact2[stud_index]] - 1;
    quota[studact3[stud_index]] := quota[studact3[stud_index]] - 1;
    quota[0] := 0;

    studdone[stud_index] := 'Y';
    store_students;

    store_acts;


    display_acts;

end;




procedure login(var stud_index:integer);

var

    user_id, password:string;

    i:integer;

    found:boolean;

begin

    clrscr;

    writeln;

    writeln;

    textcolor(lightcyan);

    writeln('                                           Extra Curricular

Activities System                   ');
```

```
  writeln;
  writeln('* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
* * * * * * * * * *                 ');
  writeln;
  writeln('                                        ____
____       ___                             ____');
  writeln('                |           |      |                |              |
|                |      |       |\    /|       |        ');
  writeln('                |    /\    |       |----        |              |               |
|      |       | \/ |       |----');
  writeln('                 \/    \/        |____        |____       |____
|____       |___|       |         |       |____');
  writeln;
  writeln;
  write('                                          UserID : ');
  readln(user_id);
  writeln;
  write('                                       Password : ');
  password := GetPWord;
```

```
writeln;

writeln;

found:= false;

i:= 0;

while(i < num_stud) and (not found) do

    begin

        i := i+1;

        if (user_id = studid[i]) and (password = studpw[i]) then

        begin

            found:= true;

            stud_index := i ;

        end;

    end;



if not found then

begin

    stud_index :=0;

    textcolor(lightblue);
```

```
      writeln('INVALID UserID or Password!');

      readln;

   end;

end;




procedure main_menu(stud_index : integer);

var

   choice : integer;

begin

   repeat

      clrscr;

      writeln;

      writeln;

      writeln;

      writeln;

      textcolor(green);
```

```
        writeln('                What do you want to do ?
');
        textcolor(lightgray);
        writeln;
        writeln('======================================');
        writeln;
        writeln('                1. Select/Update Choices');
        writeln;
        writeln('                2. Display My Choices');
        writeln;
        writeln('                3. Logout');
        writeln;
        writeln;
        writeln('======================================');
        writeln;
        writeln;
        writeln;
        writeln('                              ');
         if studdone[stud_index] = 'N' then
```

```
      begin
        textcolor(yellow);
        writeln('                    You have not made
desicion!');
        textcolor(lightgray)
      end;
    writeln;
    write('                    Enter your choice: ');
    readln(Choice);
    writeln;

    case choice of
      1 : choose_acts(stud_index);
      2 : display_choices(stud_index);
    end;
  until choice = 3;
end;
```

```
begin
    read_students;
    read_acts;
    repeat
        login(stud_index);
        if stud_index <> 0 then
            main_menu(stud_index)
    until false;
    readln
end.
```