ព្រះរាជាណាចក្រកម្ពុជា

ជាតិ សាសនា ព្រះមហាក្សត្រ

Institute of technology of Cambodia

Department of Information and communication Engineering

The lesson taking about using structure.

TP10- Structure

TP: Algorithm and Programming

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Contents

Problem1:

Create a client structure. Data of a client has clientID, gender, name, and phone. Then write a program to
a- Create one variable for store info of a client. Then ask a user to input information.
b- Display client's info on screen.

Problem1 VENTHON,e20191250.c

```c
#include<stdio.h>
struct client{
    char ID[10];
    char name[20];
    char phone[20];
    char gender;
};
typedef struct client Client;
main()
{
    Client cl;
    printf("\tEnter your gender: ");scanf("%c",&cl.gender);
    printf("\tEnter your Id: ");scanf("%s",&cl.ID);
    printf("\tEnter your name: ");scanf("%s",&cl.name);
    printf("\tEnter your phone: ");scanf("%s",&cl.phone);
    printf("\n\n****Information of student****\n");
   // printf("%c\t%d\t%10s\t%d\n",cl.gender,cl.ID,cl.name,cl.phone);
    printf("ID: %s\n",cl.ID);
    printf("name: %s\n",cl.name);
    printf("phone: %s\n",cl.phone);
    printf("Gender: %c\n",cl.gender);
}
```

C:\Fuction array\TP10 structure\Problem1 VENTHON,e20191250.exe

```
        Enter your gender: M
        Enter your Id: e2019
        Enter your name: robert
        Enter your phone: 098765543


****Information of student****
ID: e2019
name: robert
phone: 098765543
Gender: M

--------------------------------
Process exited after 28.35 seconds with return value 10
Press any key to continue . . .
```

Problem2:

Create a structure for client structure as given in problem #1. Then
- Create an array that can store data of 10 clients.
- Using loop to get data of 10 clients and store in array.
- Diplay all data of clients

clientID gender Name Phone

Problem2 VENTHON,e20191250.c

```c
#include<stdio.h>
struct client{
    char ID[10];
    char name[20];
    char gender;
    char phone[20];
};
typedef struct client Client;
main()
{
    Client cl[10];
    int k;
    for(k=0; k<10; k++)
    {
        printf("\n\t**Information client:%d\n",k+1);
        printf("Enter your gender: ");scanf("%c",&cl[k].gender);scanf("%c",&cl[k].gender);
        printf("Enter your ID: ");scanf("%s",&cl[k].ID);
        printf("Enter your name: ");scanf("%s",&cl[k].name);
        printf("Enter your phone: ");scanf("%s",&cl[k].phone);
    }
    printf("Gender\tID\t\tName\tPhone_number\n");
    int p;
    for( p=0; p<10; p++)
    {
        printf("%c\t%s\t%11s\t%s\n",cl[p].gender,cl[p].ID,cl[p].name,cl[p].phone);
    }
}
```

Compile Log | Debug | Find Results | Close

```
Compilation results...
--------
```

C:\Fuction array\TP10 structure\Problem2 VENTHON,e20191250.exe

```
Enter your name: mariya
Enter your phone: 0345678

        **Information client:9
Enter your gender: F
Enter your ID: e2008
Enter your name: domlin
Enter your phone: 056789

        **Information client:10
Enter your gender: F
Enter your ID: e2009
Enter your name: bophaka
Enter your phone: 0345643
Gender  ID              Name    Phone_number

        e2000        povpin     098765
F       e2001        linlin     078965
M       e2002        binbin     067895
F       e2003         nikki     056789
M       e2004       rooming     089765
F       e2005         raksa     012345
M       e2006         kanha     056789
M       e2007        mariya     0345678
F       e2008        domlin     056789
F       e2009       bophaka     0345643

--------------------------------
Process exited after 300.6 seconds with return value 28
Press any key to continue . . .
```

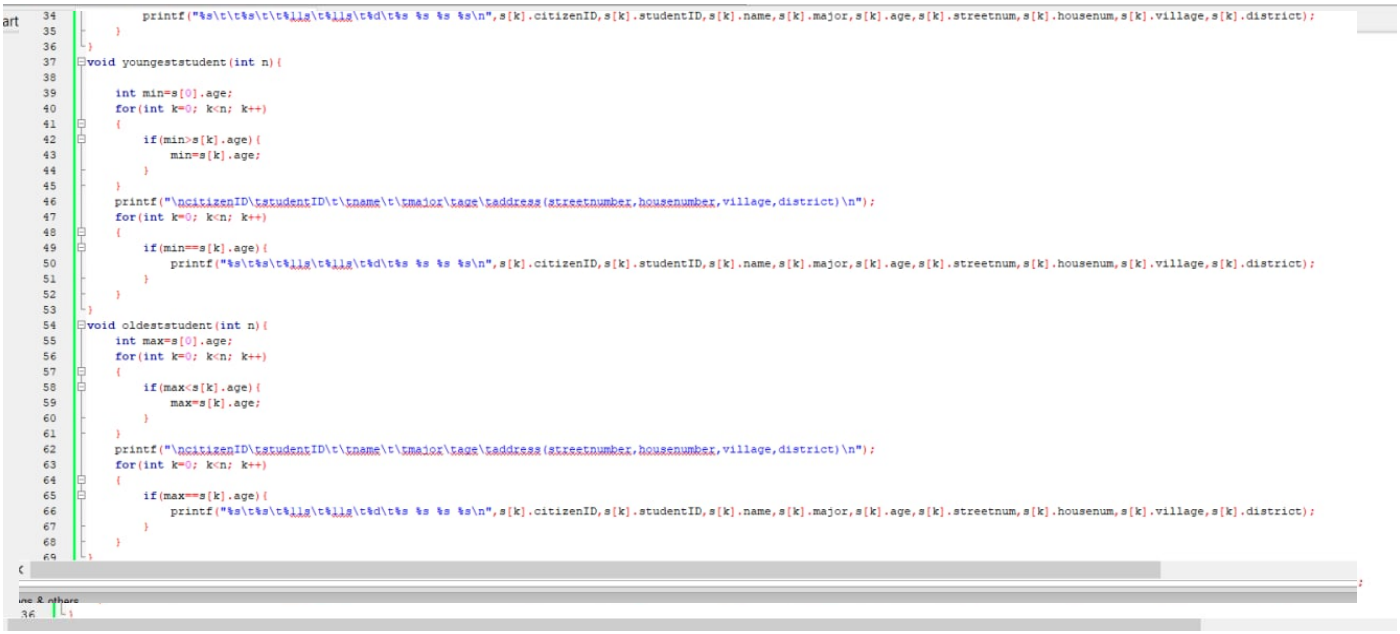
Problem3:

Create two structure address (street number, house number, village, district) and student (student ID, citizen ID, name, major, university name, address, age). Then create an array of type student. Write a program to

a- Get 6 student info and store in the array.

b- Display all data in the array.

c- Show who are the youngest and oldest students.



```
art
34          printf("%s\t\t%s\t\t%lls\t%lls\t%d\t%s %s %s %s\n",s[k].citizenID,s[k].studentID,s[k].name,s[k].major,s[k].age,s[k].streetnum,s[k].housenum,s[k].village,s[k].district);
35      }
36  }
37  void youngeststudent(int n){
38
39      int min=s[0].age;
40      for(int k=0; k<n; k++)
41      {
42          if(min>s[k].age){
43              min=s[k].age;
44          }
45      }
46      printf("\ncitizenID\tstudentID\t\tname\t\tmajor\tage\taddress(streetnumber,housenumber,village,district)\n");
47      for(int k=0; k<n; k++)
48      {
49          if(min==s[k].age){
50              printf("%s\t%s\t%lls\t%lls\t%d\t%s %s %s %s\n",s[k].citizenID,s[k].studentID,s[k].name,s[k].major,s[k].age,s[k].streetnum,s[k].housenum,s[k].village,s[k].district);
51          }
52      }
53  }
54  void oldeststudent(int n){
55      int max=s[0].age;
56      for(int k=0; k<n; k++)
57      {
58          if(max<s[k].age){
59              max=s[k].age;
60          }
61      }
62      printf("\ncitizenID\tstudentID\t\tname\t\tmajor\tage\taddress(streetnumber,housenumber,village,district)\n");
63      for(int k=0; k<n; k++)
64      {
65          if(max==s[k].age){
66              printf("%s\t%s\t%lls\t%lls\t%d\t%s %s %s %s\n",s[k].citizenID,s[k].studentID,s[k].name,s[k].major,s[k].age,s[k].streetnum,s[k].housenum,s[k].village,s[k].district);
67          }
68      }
69  }
```

Start here | 3Problem VENTHON,e20191250.c

```
        if(min==s[k].age){
            printf("%s\t%s\t%lls\t%lls\t%d\t%s %s %s %s\n",s[k].citizenID,s[k].studentID,s[k].name,s[k].major,s[k].age,s[k].streetnum,s[k].housenum,s[k].village,s[k].district);
        }
    }
}
void oldeststudent(int n){
    int max=s[0].age;
    for(int k=0; k<n; k++)
    {
        if(max<s[k].age){
            max=s[k].age;
        }
    }
    printf("\ncitizenID\tstudentID\t\tname\t\tmajor\tage\taddress(streetnumber,housenumber,village,district)\n");
    for(int k=0; k<n; k++)
    {
        if(max==s[k].age){
            printf("%s\t%s\t%lls\t%lls\t%d\t%s %s %s %s\n",s[k].citizenID,s[k].studentID,s[k].name,s[k].major,s[k].age,s[k].streetnum,s[k].housenum,s[k].village,s[k].district);
        }
    }
}
typedef struct student Student;
main()
{
    int n;
    Student s[n];
    printf("Enter of student: ");scanf("%d",&n);
    input(n);
    displayname(n);
    printf("\n******Information student youngest******\n");
    youngeststudent(n);
    printf("\n*******Information student oldest********\n");
    oldeststudent(n);
}
```

"C:\Fuction array\TP10 structure\3Problem VENTHON,e20191250.exe"

```
Enter student ID: r20190006
Enter your name: ponler
Enter major: GEE
Enter your age: 26
Enter address(streetnumber housenumber village district): A2000 E4657 Sensok Sensok


*****All information of student********

citizenID       studentID               name            major   age     address(streetnumber,housenumber,village,district)
e20190000               r20190000                       raksa                   IT      20      A2002 E808 Tekthla Aensok
e20190001               r20190001                       panha           marketing       40      A307 E706 chomcjai Sensok
e2019003                r2019003                      babylove            Teacher     34      A342 E321 Tekchhor Toulkok
e20190004               r20190004                       linbin                  GIC     54      A678 E708 Watphnom Toulkok
e20190005               r20190005                       povpov                  GCI     50      A2098 E3497 Bengkk chomchai
e20190006               r20190006                       ponler                  GEE     26      A2000 E4657 Sensok Sensok

******Information student youngest******

citizenID       studentID               name            major   age     address(streetnumber,housenumber,village,district)
e20190000       r20190000               raksa             IT    20      A2002 E808 Tekthla Aensok

*******Information student oldest********

citizenID       studentID               name            major   age     address(streetnumber,housenumber,village,district)
e20190004       r20190004             linbin            GIC     54      A678 E708 Watphnom Toulkok

Process returned 0 (0x0)   execution time : 545.924 s
Press any key to continue.
```

Problem4:

Write a C program to keep records and perform statistical analysis for a class of 20 students. The information of each student contains ID, Name, Sex, quizzes score (20), mid-term score (40), and final score (40), and total score. The program prompts the user to choose the operation of records from a menu as shown below:

```
====================
     Menu
====================
1. Add 2 students
2. View all student records
3. Show student who gets the max total score
4. Display student by ID (search by an ID)
5. Find min, max, and average scores for this class.
-------------
Choose your option 1-5:
```

t here X Problem4 VENTHON,e20191250.c X

```c
#include<stdio.h>
#include<string.h>
struct student{
    char name[20];
    char ID[20];
    char sex;
    float quiz;
    float midterm;
    float finalexam;
    float totalscore;
};
typedef struct student Student;
Student st[20];
void displaymenu(){
    printf("\n========================\n");
    printf("\tMenu");
    printf("\n========================\n");
    printf("1.Add 2 students\n");
    printf("2.Display information of all student\n");
    printf("3.Show student who get max total score\n");
    printf("4.Display Information student by Id\n");
    printf("5.Find min,max and average this classe\n");
}
int currentindex=0;
void add2students(){
    for(int k=currentindex; k<currentindex+2; k++)
    {
       printf("\n\nEnter student name: ");
       scanf("%s",&st[k].name);
       printf("Enter student ID: ");
```

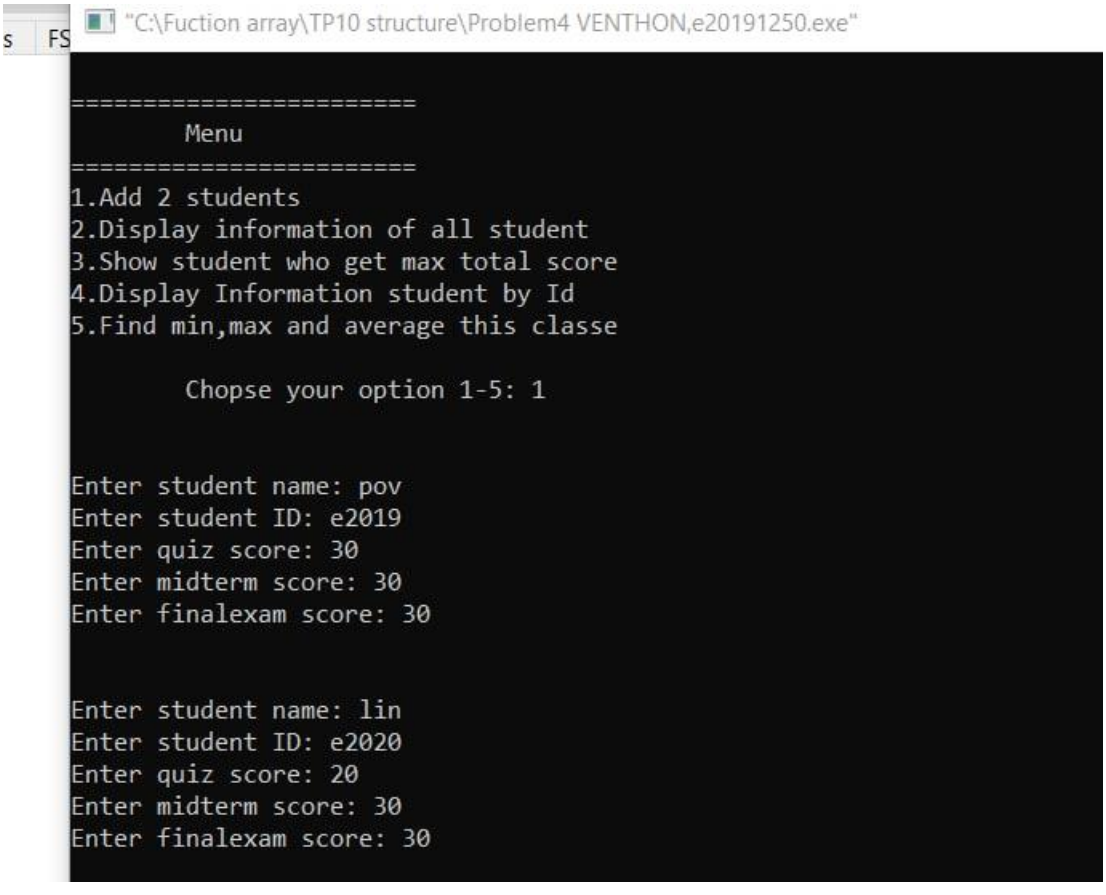
```c
int currentindex=0;
void add2students(){
    for(int k=currentindex; k<currentindex+2; k++)
    {
       printf("\n\nEnter student name: ");
       scanf("%s",&st[k].name);
       printf("Enter student ID: ");
       scanf("%s",&st[k].ID);
       printf("Enter quiz score: ");
       scanf("%f",&st[k].quiz);
       printf("Enter midterm score: ");
       scanf("%f",&st[k].midterm);
       printf("Enter finalexam score: ");
       scanf("%f",&st[k].finalexam);
       st[k].totalscore=st[k].quiz+st[k].midterm+st[k].finalexam;

    }
    currentindex=currentindex+2;
}
void displayallstudents(){
    for(int k=0; k<currentindex; k++)
    {
        printf("%s %s %1.f %.1f %.1f %.1f \n",st[k].name,st[k].ID,st[k].quiz,st[k].midterm,st[k].finalexam,st[k].totalscore);
    }
}
```

```c
void showstudentgotmaxscore(){
   float maxscore=st[0].totalscore;
   for(int k=0; k<currentindex; k++)
    {
    if(st[k].totalscore>maxscore)
    {
        maxscore=st[k].totalscore;
    }
   }
   for(int k=0; k<currentindex; k++)
   {
       if(st[k].totalscore==maxscore)
       {
         printf("%s %s %1.f %.1f %.1f %.1f \n",st[k].name,st[k].ID,st[k].quiz,st[k].midterm,st[k].finalexam,st[k].totalscore);
       }
   }
}
void displystudentbyID(char ID[]){
   for(int k=0; k<currentindex; k++){
    if(strcmp(st[k].ID,ID)==0){
       printf("%s %s %1.f %.1f %.1f %.1f \n",st[k].name,st[k].ID,st[k].quiz,st[k].midterm,st[k].finalexam,st[k].totalscore);
    }
   }
}
```

rt here X Problem4 VENTHON,e20191250.c X

```c
void findmaxminavg(){
    float minscore=st[0].totalscore;
    float avg,sum=0;
    float maxscore=st[0].totalscore;
   for(int k=0; k<currentindex; k++)
    {
    if(st[k].totalscore>maxscore)
    {
        maxscore=st[k].totalscore;
    }
   }
   for(int k=0; k<currentindex; k++)
   {
       if(st[k].totalscore==maxscore)
       {
         printf("%s %s %1.f %.1f %.1f %.1f \n",st[k].name,st[k].ID,st[k].quiz,st[k].midterm,st[k].finalexam,st[k].totalscore);
       }
   }
    for(int k=0; k<currentindex; k++)
    {
        if(st[k].totalscore<minscore)
        {
            minscore=st[k].totalscore;
        }
    }
    for(int k=0; k<currentindex; k++)
    {
        if(st[k].totalscore==minscore){
           printf("%s %s %1.f %.1f %.1f %.1f \n",st[k].name,st[k].ID,st[k].quiz,st[k].midterm,st[k].finalexam,st[k].totalscore);
        }
```

```c
main()
{
    int option;
    while(3>0)
    {
        displaymenu();
        printf("\n\tChopse your option 1-5: ");
        scanf("%d",&option);
        if(option==1)
        {
            add2students();
        }
        else if(option==2)
        {
            displayallstudents();
        }
        else if(option==3)
        {
            showstudentgotmaxscore();
        }
        else if(option==4)
        {
            char ID[20];
            printf("\nEnter student ID to search: ");
            scanf("%s",&ID);
           displystudentbyID(ID);
        }
        else if(option==5)
        {
          findmaxminavg();
```



```
        Menu
========================
1.Add 2 students
2.Display information of all student
3.Show student who get max total score
4.Display Information student by Id
5.Find min,max and average this classe

        Chopse your option 1-5: 2
pov e2019 30 30.0 30.0 90.0
lin e2020 20 30.0 30.0 80.0

========================
        Menu
========================
1.Add 2 students
2.Display information of all student
3.Show student who get max total score
4.Display Information student by Id
5.Find min,max and average this classe

        Chopse your option 1-5: 3
pov e2019 30 30.0 30.0 90.0
```

```
========================
        Menu
========================
1.Add 2 students
2.Display information of all student
3.Show student who get max total score
4.Display Information student by Id
5.Find min,max and average this classe

        Chopse your option 1-5: 4

Enter student ID to search: e2019
pov e2019 30 30.0 30.0 90.0

========================
        Menu
========================
1.Add 2 students
2.Display information of all student
3.Show student who get max total score
4.Display Information student by Id
5.Find min,max and average this classe

        Chopse your option 1-5: 5
pov e2019 30 30.0 30.0 90.0
lin e2020 20 30.0 30.0 80.0

========================
```