

ព្រះរាជាណាចក្រកម្ពុជា
ជាតិ សាសនា ព្រះមហាក្សត្រ

Institute of technology of Cambodia

Department of Information and communication Engineering



The lesson taking about using structure in c++

TP12 using c++

TP: Algorithm and Programming II

Lecturer: BOU CHANNA

Student: VEN THON

ID: e20191250

Group: I3-GIC-C

Year: 2022-2023

Contents

Problem1:.....	3
Problem2:.....	4
Proble3:	5
Problem4:.....	7
Problem5:.....	8
Problem6:.....	9
Problem7:.....	10
Problem8:.....	11
Problem9:.....	12
Problem10:.....	13

Problem1:

Write a C++ program to ask information from a student such as name, sex, major, age then display the greeting message on screen.
"Hi, Mr. name, your age is age year old and you learn major!": for male (M)
Hi, Mrs. name, you are age year old and you are majoring in major": for female (F)

```
rt here x TP12 pro1 venthon,e20191250.cpp x
1 #include<iostream>
2 using namespace std;
3 main()
4 {
5     while(2>0)
6     {
7         string name;
8         int age;
9         string major;
10        string sex;
11        cout<<"Enter your name: ";cin>>name;
12        cout<<"Enter your sex: ";cin>>sex;
13        cout<<"Enter your age: ";cin>>age;
14        cout<<"Enter your major: ";cin>>major;
15        if(sex=="M")
16        {
17            cout<<"Hi Mr, "<<name<<" your age is "<<age<<" years old and you learn "<<major<<"!"<<endl;
18        }
19        else if(sex=="F")
20        {
21            cout<<"Hi Mrs, "<<name<<" your age is "<<age<<" years old and you are majoring in "<<major<<"!"<<endl;
22        }
23    }
24 }
25
26
```

```
t here x TP12 pro1 venthon,e20191250.cpp x
1 #include<iostream>
2 using namespace std;
3 main()
4 {
5     while(2>0)
6     {
7         string name;
8         int age;
9         string major;
10        string sex;
11        cout<<"Enter your name: ";cin>>name;
12        cout<<"Enter your sex: ";cin>>sex;
13
14        "C:\Users\Admin\Desktop\code c++\TP12C++\TP12 pro1 venthon,e20191250.exe"
15        Enter your name: piseth
16        Enter your sex: M
17        Enter your age: 12
18        Enter your major: IT
19        Hi Mr, piseth your age is 12 years old and you learn IT!
20        Enter your name: kanha
21        Enter your sex: F
22        Enter your age: 20
23        Enter your major: GIC
24        Hi Mrs, kanha your age is 20 years old and you are majoring in GIC!
25        Enter your name:
26
```

Problem2:

Write a C++ program to check whether an input character is a vowel or a consonant. Hint: Use ASCII code to test condition.

```
rt here X TP12 pro1 venthon,e20191250.cpp X TP12 pro2 venthon,e20191250.cpp X
1  #include<iostream>
2  using namespace std;
3  main()
4  {
5      while(2>0)
6      {
7          char character;
8          cout<<"\n\tEnter character: ";cin>>character;
9          int check=(int)character;
10         if(check==97 || check==105 || check==101 || check==115 || check==117)
11         {
12             cout<<"\t"<<character<<" is a vowel.";
13         }
14         else
15         {
16             cout<<"\t"<<character<<" is a consanant";
17         }
18     }
19 }
20
21
```

```
rt here X TP12 pro1 venthon,e20191250.cpp X TP12 pro2 venthon,e20191250.cpp X
1  #include<iostream>
2  using namespace std;
3  main()
4  {
5      while(2>0)
6      {
7          char character;
8          cout<<"\n\tEnter character: ";cin>>character;
9          int check=(int)character;
10         if(check==97 || check==105 || check==101 || check==115 || check==117)
11         {
12             cout<<"\t"<<character<<" is a vowel.";
13         }
14     }
15 }
16
17
18
19
20
21
```

"C:\Users\Admin\Desktop\code c++\TP12C++\TP12 pro2 venthon,e20191250.exe"

```
Enter character: h
h is a consanant
Enter character: e
e is a vowel.
Enter character: o
o is a consanant
Enter character: i
i is a vowel.
Enter character: b
b is a consanant
Enter character:
```

Proble3:

A program to compute tax salary of a person. The program asks for name, gender and salary of a person and tell him/her how much tax he/she is required to pay. The tax is computed based on the rules below:

•For males

- Salary more than 1000 USD, pay tax 10%
- Salary 500 –1000 USD, pay tax 7%
- Salary less than 500 USD, pay tax 5%

Females

- Salary more than 1000 USD, pay tax 8%
- Salary 500 –1000 USD, pay tax 5%
- Salary less than 500 USD, pay tax 3%

```
rt here X TP12 pro1 venthon,e20191250.cpp X TP12 pro2 venthon,e20191250.cpp X TP12 pro3 venthon,e20191250.cpp X
1  #include<iostream>
2  using namespace std;
3  main()
4  {
5      while(2>0)
6      {
7          string name,gender;
8          int salary;
9          float tax;
10         cout<<"\n\tEnter your name: ";cin>>name;
11         cout<<"\n\tEnter your gender: ";cin>>gender;
12         cout<<"\n\tEnter salary($): ";cin>>salary;
13         if(gender=="M")
14         {
15             if(salary>1000)
16             {
17                 tax=salary*0.1;
18             }
19             else if(salary>=500 && salary<=1000)
20             {
21                 tax=salary*0.07;
22             }
23             else if(salary<500)
24             {
25                 tax=salary*0.05;
26             }
27         }
28         else if(gender=="F")
29         {
30             if(salary>1000)
31             {
32                 tax=salary*0.08;
33             }
34             else if(salary>=500 && salary<=1000)
35             {
36                 tax=salary*0.05;
37             }
38             else if(salary<500)
39             {
40                 tax=salary*0.03;
41             }
42         }
43         cout<<"\n\t"<<name<<" you need to pay is: "<<tax<<" .\n";
44     }
45 }
46
47
```

```

3  main()
4  {
5      while(2>0)
6      {
7          string name,gender;
8          int salary;
9          float tax;
10         cout<<"\n\tEnter your name: ";cin>>name;
11         cout<<"\n\tEnter your gender: ";cin>>gender;
12         cout<<"\n\tEnter salary($): ";cin>>salary;
13         if(gender=="M")

```

"C:\Users\Admin\Desktop\code c++\TP12C++\TP12 pro3 venthon,e20191250.exe"

```

17     Enter your name: meyhornng
18
19     Enter your gender: F
20
21     Enter salary($): 800
22
23     meyhornng you need to pay is: 40 .
24
25     Enter your name: phearum
26
27     Enter your gender: M
28
29     Enter salary($): 800
30
31     phearum you need to pay is: 56 .
32
33     Enter your name:

```

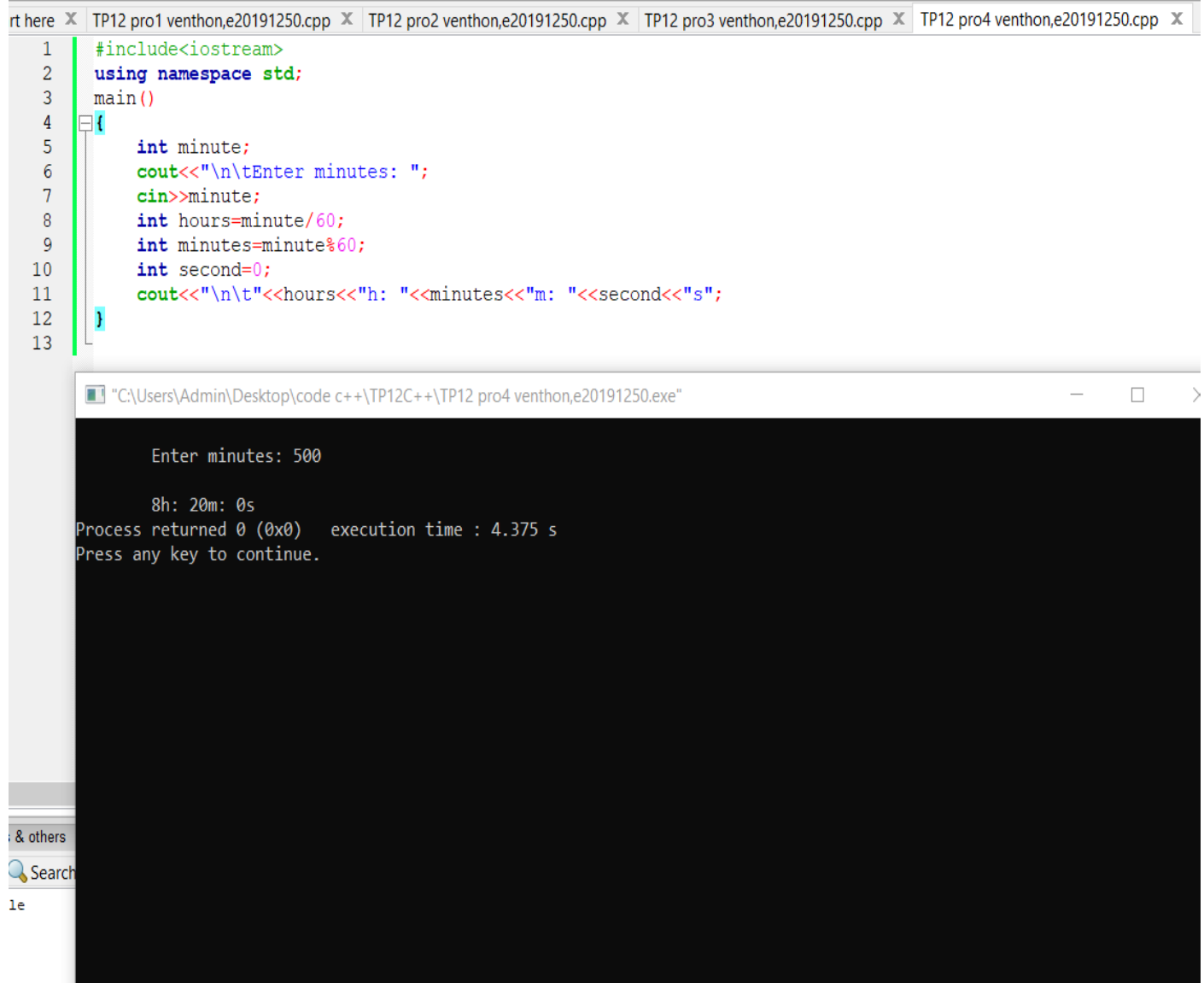
& others

Search

.e

Problem4:

Write a C++ program to convert a minute to a time format which consists of hour, minute, and second (h:m:s). A user is required to input a minute.



The screenshot shows a C++ IDE with a code editor and a console window. The code editor displays a C++ program that takes an input of 500 minutes and converts it to 8 hours, 20 minutes, and 0 seconds. The console window shows the execution output, including the input, the converted time, and the execution time of 4.375 seconds.

```
1  #include<iostream>
2  using namespace std;
3  main()
4  {
5      int minute;
6      cout<<"\n\tEnter minutes: ";
7      cin>>minute;
8      int hours=minute/60;
9      int minutes=minute%60;
10     int second=0;
11     cout<<"\n\t"<<hours<<"h: "<<minutes<<"m: "<<second<<"s";
12 }
13
```

Enter minutes: 500

8h: 20m: 0s

Process returned 0 (0x0) execution time : 4.375 s

Press any key to continue.

Problem5:

Write a C++ program to find the summation of numbers from 1 to n except number 10 and 30, where n is a number input by a user and n should be greater than 50.

```
Start here X TP12 pro5 venthon,e20191250.cpp X
1  #include<iostream>
2  using namespace std;
3  main()
4  {
5      int n;
6      int sum=0;
7      cout<<"\n\tEnter number: ";
8      cin>>n;
9      for(int k=1; k<=n; k++)
10     {
11         if(k!=10 && k!=30)
12         {
13             sum=sum+k;
14         }
15     }
16     cout<<"\n\tSummation number 1 to n is: "<<sum<<". ";
17 }
18
```

```
art here X TP12 pro5 venthon,e20191250.cpp X
1  #include<iostream>
2  using namespace std;
3  main()
4  {
5      int n;
6      int sum=0;
7      cout<<"\n\tEnter number: ";
8      cin>>n;
9      for(int k=1; k<=n; k++)
10     {
11         if(k!=10 && k!=30)
12         {
13             sum=sum+k;
14         }
15     }
16     cout<<"\n\tSummation number 1 to n is: "<<sum<<". ";
17 }
18
```

"C:\Users\Admin\Desktop\code c++\TP12C++\TP12 pro5 venthon,e20191250.exe"

```
Enter number: 50

Summation number 1 to n is: 1235.
Process returned 0 (0x0)   execution time : 4.672 s
Press any key to continue.
```


Problem6:

Write a C++ program to ask for an input character from a user and tell if that character is a number, an uppercase letter, or lowercase letter. If none of the above, display a message "It is neither a number nor a letter".

```
rt here X TP12 pro5 venthon,e20191250.cpp X TP12 pro6 venthon,e20191250.cpp X
1  #include<iostream>
2  using namespace std;
3  main()
4  {
5      int n=2;
6      while(n>0)
7      {
8          char c;
9          cout<<"\n\tEnter character: ";
10         cin>>c;
11         int check=(int)c;
12         if(check>=48 && check<=57)
13         {
14             cout<<"\n\t"<<c<<" is a number.";
15         }
16         else if(check>=65 && check<=90)
17         {
18             cout<<"\n\t"<<c<<" is an uppercase letter.";
19         }
20         else if(check>=97 && check<=122)
21         {
22             cout<<"\n\t"<<c<<" is a lowercase letter.";
23         }
24     }
25 }
26
```

"C:\Users\Admin\Desktop\code c++\TP12C++\TP12 pro6 venthon,e20191250.exe"

```
Enter character: d

d is a lowercase letter.
Enter character: H

H is an uppercase letter.
Enter character: i

i is a lowercase letter.
Enter character:
```

Problem7:

A program to display all integers divisible by 5 between 1 to 100 except 30, 60, and 90.

```
TP12 pro5 venthon,e20191250.cpp X TP12 pro6 venthon,e20191250.cpp X TP12 pro7 venthon,e20191250.cpp X
1 #include<iostream>
2 using namespace std;
3 main()
4 {
5     int n=1;
6     int m=100;
7     for(int k=n; k<=m; k++)
8     {
9         if(k%5==0 && k!=30 && k!=30 && k!=90)
10        {
11            cout<<k<<" ";
12        }
13    }
14 }
15
```

```
TP12 pro5 venthon,e20191250.cpp X TP12 pro6 venthon,e20191250.cpp X TP12 pro7 venthon,e20191250.cpp X
1 #include<iostream>
2 using namespace std;
3 main()
4 {
5     int n=1;
6     int m=100;
7     for(int k=n; k<=m; k++)
8     {
9         if(k%5==0 && k!=30 && k!=30 && k!=90)
10        {
11            cout<<k<<" ";
12        }
13    }
14 }
15
```

"C:\Users\Admin\Desktop\code c++\TP12C++\TP12 pro7 venthon,e20191250.exe"

```
5 10 15 20 25 35 40 45 50 55 60 65 70 75 80 85 95 100
Process returned 0 (0x0)   execution time : 0.031 s
Press any key to continue.
```

Problem8:

Read 7 input integer numbers from a user and find the minimum number as well as the maximum number. Then display them on screen.

here X TP12 pro5 venthon,e20191250.cpp X TP12 pro6 venthon,e20191250.cpp X TP12 pro7 venthon,e20191250.cpp X TP12 pro8 venthon,e20191250.cpp X

```
1  #include<iostream>
2  using namespace std;
3  main()
4  {
5      int array[50];
6      int max,min,size;
7      cout<<"Enter size of array: ";cin>>size;
8      cout<<"Enter array element\n";
9      for(int k=0; k<size; k++)
10     {
11         cin>>array[k];
12     }
13     max=array[0];
14     min=array[0];
15     for(int k=0; k<size; k++)
16     {
17         if(array[k]>max)
18         {
19             max=array[k];
20         }
21         if(array[k]<min)
22         {
23             min=array[k];
24         }
25     }
26 }
27 cout<<max<<" is the maximum number."<<endl;
28 cout<<min<<" is the minimum number."<<endl;
29 }
30
```

"C:\Users\Admin\Desktop\code c++\TP12C++\TP12 pro8 venthon,e20191250.exe"

Enter size of array: 7

Enter array element

20

30

40

50

9

65

79

79 is the maximum number.

9 is the minimum number.

Process returned 0 (0x0) execution time : 30.569 s

Press any key to continue.

Problem9:

Write a C++ program to add all the numbers input by a user until the user inputs zero. Notice that a number is input one by one until user inputs zero, then display the summation and stop the program.

TP12 pro9 venthon,e20191250.cpp

```
1  #include<iostream>
2  using namespace std;
3  main()
4  {
5      int number;
6      int result=0;
7      while(true)
8      {
9          cout<<"Enter number: ";cin>>number;
10         if(number!=0)
11         {
12             result+=number;
13         }
14         else{
15             break;
16         }
17     }
18     cout<<"summation: "<<result;
19 }
```

TP12 pro9 venthon,e20191250.cpp

C:\Users\Admin\Desktop\code c++\TP12C++\TP12 pro9 venthon,e20191250.exe

```
Enter number: 1
Enter number: 2
Enter number: 3
Enter number: 4
Enter number: 5
Enter number: 6
Enter number: 7
Enter number: 8
Enter number: 9
Enter number: 10
Enter number: 2
Enter number: 3
Enter number: 44
Enter number: 55
Enter number: 666
Enter number: 77
Enter number: 66
Enter number: 0
summation: 968
```

```
-----
Process exited after 28.28 seconds with return value 0
Press any key to continue . . .
```

Problem10:

Write a C++ program to create a new data structure for storing info of book (book ID, book ISBN, book title, published year, author name and price (\$)). Each book could have more than one author. To do:

- Create an array that can store 6 books' info.
- Create a function to display a book info based on ISBN. This function takes a parameter which is an ISBN of a book
- Create a function to display information of all books.

here X TP12 pro10 venthon,e20191250.cpp X

```
1  #include<iostream>
2  #include<iomanip>
3  using namespace std;
4
5  struct book{
6      int bookId;
7      string bookISBN;
8      string bookTitle;
9      int pub_year;
10     string aut_name;
11     float price;
12 };
13
14 void createArrayStore6bo (book bo[])
15 {
16
17     for(int k=0; k <= 5; k++) {
18         cout<<"\n\tEnter book Id: ";cin>>bo[k].bookId;
19         cout<<"\tEnter book title: ";cin>>bo[k].bookTitle;
20         cout<<"\tEnter book ISBN: ";cin>>bo[k].bookISBN;
21         cout<<"\tEnter public year: ";cin>>bo[k].pub_year;
22         cout<<"\tEnter Author name : ";cin>>bo[k].aut_name;
23         cout<<"\tEnter book price ($) : ";cin>>bo[k].price;
24         cout<<"\n";
25     }
26 }
27 void search(book bo[])
```

```
27 void search(book bo[])
28 {
29     string search;
30     cout<<"\n\tEnter ISBN want to search: ";    cin>>search;
31
32     cout<<"\n\tID\tTitle\tISBN\tPublicYear\tAuthor\tPrice\n"<<endl;
33     for(int k=0; k <= 5; k++){
34         cout<<setw(10)<<bo[k].bookId<<setw(10)<<bo[k].bookTitle<<setw(10)<<bo[k].bookISBN<<setw(10)<<bo[k].pub_year<<setw(10)<<bo[k].aut_name<<setw(10)<<bo[k].price<<endl;
35     }
36 }
37
38 void displayInfoAllBook(book bo[]){
39     cout<<"\n\tID\tTitle\tISBN\tPublicYear\tAuthor\tPrice\n"<<endl;
40     for(int k=0; k <= 5; k++){
41         cout<<setw(10)<<bo[k].bookId<<setw(10)<<bo[k].bookTitle<<setw(10)<<bo[k].bookISBN<<setw(10)<<bo[k].pub_year<<setw(10)<<bo[k].aut_name<<setw(10)<<bo[k].price<<endl;
42     }
43 }
44
45 main()
46 {
47     book bo[6];
48
49     createArrayStore6bo (bo);
50
51     search (bo);
52
53     displayInfoAllBook (bo);
54
55 }
56
57
```

With Snip & Sketch (or my life shortcut)
Windows logo key + Shift + S).

Try Snip & Sketch

```
Enter book Id: 123
Enter book title: khmer
Enter book ISBN: math
Enter public year: 2000
Enter Author name : book1
Enter book price ($) : 20
```

```
Enter book Id: 234
Enter book title: It
Enter book ISBN: english
Enter public year: 2001
Enter Author name : book2
Enter book price ($) : 25
```

```
Enter book Id: 345
Enter book title: biology
Enter book ISBN: csl
Enter public year: 2002
Enter Author name : book3
Enter book price ($) : 30
```

```
Enter book Id: 456
Enter book title: history
Enter book ISBN: marketing
Enter public year: 2003
Enter Author name : book4
Enter book price ($) : 40
```

```
Enter book Id: 567
Enter book title: algorethem
Enter book ISBN: mecanique
Enter public year: 2010
Enter Author name : book5
Enter book price ($) : 45
```

```
Enter book Id: 678
Enter book title: it2
Enter book ISBN: khmer2
Enter public year: 2022
Enter Author name : book6
Enter book price ($) : 50
```

Enter ISBN want to search: khmer2

ID	Title	ISBN	PublicYear	Author	Price
123	khmer	math	2000	book1	20
234	It	english	2001	book2	25
345	biology	cs1	2002	book3	30
456	history	marketing	2003	book4	40
567	algorithem	mecanique	2010	book5	45
678	it2	khmer2	2022	book6	50

ID	Title	ISBN	PublicYear	Author	Price
123	khmer	math	2000	book1	20
234	It	english	2001	book2	25
345	biology	cs1	2002	book3	30
456	history	marketing	2003	book4	40
567	algorithem	mecanique	2010	book5	45
678	it2	khmer2	2022	book6	50

Process returned 0 (0x0) execution time : 514.246 s
Press any key to continue.