ព្រះរាជាណាចក្រកម្ពុជា

ជាតិ សាសនា ព្រះមហាក្សត្រ

Institute of technology of Cambodia

Department of Information and communication Engineering

The lesson taking about using pointer in c++

TP13 pointer function

TP: Algorithm and Programming ll

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Year: 2022-2023

Contents

Problem1:

Write a C++ program to create threeinteger numbers n1,n2and n3.Assign values of 7, 3, 15to n1,n2andn3,respectively. Nextcreate threepointer variables p1, p2andp3, where p1points to n1,p2points to n2andp3 pointsto n3.

- Display the address andvalue of n1throughp1.
- Similarly, display the address and value of n2 through p2.

rt here | Pro1 VENTHON,e20191250.cpp

```cpp
#include<iostream>
using namespace std;
main()
{
    int n1=10;
    int n2=20;
    int n3=30;
    int *p1,*p2,*p3;
    p1=&n1;
    p2=&n2;
    p3=&n3;

    cout<<"1).Display the address and value of n1 through p1"<<endl;
    cout<<"\t\t"<<p1<<";"<<*p1<<endl;

    cout<<"2).Display the address and value of n2 through p2"<<endl;
    cout<<"\t\t"<<p2<<";"<<*p2<<endl;
}
```

```
"C:\Users\Admin\Desktop\code c++\TP14 pointers\Pro1 VENTHON,e20191250.exe"
1).Display the address and value of n1 through p1
                0x61fe04;10
2).Display the address and value of n2 through p2
                0x61fe00;20

Process returned 0 (0x0)   execution time : 0.026 s
Press any key to continue.
```

Problem2:

Write a C++ program to get a number, say n, from a user. Then modify the value of n to n+7using a pointer variable. Remark:You are not allowed to usen=n+7

rt here | Pro1 VENTHON,e20191250.cpp | Pro2 VENTHON,e20191250.cpp

```cpp
#include<iostream>
using namespace std;
main()
{
    int n;
    int *p;
    p=&n;
    cout<<"\n\tEnter a number: ";
    cin>>n;
    *p=*p+7;
    cout<<"\n\t The value of modify";
}
```

```
"C:\Users\Admin\Desktop\code c++\TP14 pointers\Pro2 VENTHON,e20191250.exe"

        Enter a number: 7

         The value of modify: 14
Process returned 0 (0x0)   execution time : 2.936 s
Press any key to continue.
```

Problem3:

Write a function in C++ program to exchangetwo numbers.These two variablesare passed through parameters of the functionusing pointer. void exchange(float*a, float*b)

t here | Pro1 VENTHON,e20191250.cpp | Pro2 VENTHON,e20191250.cpp | Pro3 VENTHON,e20191250.cpp

```cpp
#include<iostream>
using namespace std;
void exchange(float*a, float*b)
{
    float tem=*a;
    *a=*b;
    *b=tem;
}
main()
{
    float a=7.00, b=8.00;
    exchange(&a,&b);
    cout<<"\n\t Exchange two float number is: "<<a<<" , "<<b;

}
```

"C:\Users\Admin\Desktop\code c++\TP14 pointers\Pro3 VENTHON,e20191250.exe"

```
        Exchange two float number is: 8 , 7
Process returned 0 (0x0)   execution time : 0.027 s
Press any key to continue.
```

Problem4:

Write a function to calculate to solve thisquadratic equationax2+ bx + c = 0, where a is not equal to 0. Return x1, x2and deltathrough parameter of the function.The prototype of this function is defined by :void solveEquation(float*x1, float*x2, float *delta, inta, int b, int c);

art here | Pro1 VENTHON,e20191250.cpp | Pro2 VENTHON,e20191250.cpp | Pro3 VENTHON,e20191250.cpp | Pro4 VENTHON,e20191250.cpp

```cpp
#include<iostream>
#include<math.h>
using namespace std;
void solveEquation(float*x1,float*x2,float*Delta,int a,int b,int c)
{
    *Delta=b*b - 4*a*c;
    if(*Delta>0)
    {
        *x1=(-b+sqrt(*Delta))/(2*a);
        *x2=(-b-sqrt(*Delta))/(2*a);
    }
    else if(*Delta==0)
    {
        *x1=*x2=(-b/2*a);
    }
    else if(*Delta<0)
    {
        cout<<"\n\t No resuts";
    }
}

main()
{
    int a,b,c;
    float x1,x2,Delta;
    cout<<"\n\tFor example Ax^2+Bx+C=0"<<endl;
    cout<<"\n\tEntere value of a: ";cin>>a;
    cout<<"\n\tEntere value of b: ";cin>>b;
    cout<<"\n\tEntere value of c: ";cin>>c;
    solveEquation(&x1,&x2,&Delta,a,b,c);
    if(a>0)
    {
        if(Delta>0)
        {
            cout<<"\n\tx1= "<<x1<<endl;
            cout<<"\n\tx2= "<<x2<<endl;
        }else if(Delta==0)
        {
            cout<<"\n\tx1=x2= "<<x1<<endl;
        }
        else{
            cout<<"\n\tNo roots";
        }
    }
}
```

```
        For example Ax^2+Bx+C=0

        Entere value of a: 1

        Entere value of b: 5

        Entere value of c: 4

        x1= -1

        x2= -4

Process returned 0 (0x0)   execution time : 30.476 s
Press any key to continue.
```

Problem5:

Write a C++ program to ask a user for 5integer numbers and store in an array. Display all numbers stored in an array by using another pointer variable.Computethesummation and multiplication of all numbers in this array using pointer operation.REMARK: Don't use [ ] to access to data element. You are required touse pointer operation.

rt here | Pro4 VENTHON,e20191250.cpp | Pro5 VENTHON,e20191250.cpp

```cpp
#include<iostream>
using namespace std;
main()
{
    int a[5];
    int *p;
    int sum=0;
    int mul=1;
    p=a;
    for(int k=0; k<5; k++)
    {
        cout<<"Enter a number: ";
        cin>>*(p+k);
    }
    for(int k=0; k<5; k++)
    {
        cout<<*(p+k)<<" ";
        sum=sum + *(p+k);
        mul=mul**(p+k);
    }
    cout<<"\n\t Summation of all number is: "<<sum<<endl;
    cout<<"\n\t Multiplication of all number is: "<<mul<<endl;

}
```

```
"C:\Users\Admin\Desktop\code c++\TP14 pointers\Pro5 VENTHON,e20191250.exe"
Enter a number: 1
Enter a number: 2
Enter a number: 3
Enter a number: 4
Enter a number: 5
1 2 3 4 5
         Summation of all number is: 15

         Multiplication of all number is: 120

Process returned 0 (0x0)   execution time : 35.948 s
Press any key to continue.
```

Problem6:

Write a C++ program to ask a user for 7 integer numbers and store in an array. Then write a function that can return min and max values fromthisarray. The prototype of this function isdefined by: void findMaxMin(int number[ ], int *max, int *min);

art here | Pro4 VENTHON,e20191250.cpp | Pro5 VENTHON,e20191250.cpp | Pro6 VENTHON,e20191250.cpp

```cpp
#include<iostream>
using namespace std;
void findmaxmin(int a[], int*max, int*min)
{
    *max=a[0];
    *min=a[0];
    for(int k=0; k<7; k++)
    {
        if(*max<a[k])
        {
            *max=a[k];
        }
        if(*min>a[k])
        {
            *min=a[k];
        }
    }
}
main()
{
    int a[7],max,min;
    for(int k=0; k<7; k++)
    {
        cout<<"Enter of number: ";
        cin>>a[k];
    }
    findmaxmin(a,&max,&min);
    cout<<"\n\tMax of number is: "<<max<<endl;
    cout<<"\n\tMin of number is: "<<min<<endl;
}
```

```
Enter of number: 10
Enter of number: 40
Enter of number: 50
Enter of number: 9
Enter of number: 80
Enter of number: 18
Enter of number: 98

        Max of number is: 98

        Min of number is: 9

Process returned 0 (0x0)   execution time : 43.602 s
Press any key to continue.
```

Problem7:

Write a C++ program which calculates the sumof1/12+ 1/22+ 1/32+ ... + 1/n2, where nis a positive integer. The program hastwo functions which both calculate the sumabove. The prototypes of these two functions are:

here | Pro5 VENTHON,e20191250.cpp | Pro6 VENTHON,e20191250.cpp | Pro7 VENTHON,e20191250.cpp

```cpp
#include<iostream>
#include<math.h>
using namespace std;
void sum1(double*sum, int n)
{
    *sum=0;
    for(int k=1; k<n; k++)
    {
        *sum=*sum + (1/pow(k,2));
    }
}
double sum2(int n)
{
    double sum=0;
    for(int k=1; k<n; k++)
    {
        sum = sum + (1/pow(k,2));
    }
    return sum;
}
main()
{
    double result;
    sum1(&result,5) ;
    cout<<result<<endl;
    result=sum2(5);
    cout<<result;
}
```

```
"C:\Users\Admin\Desktop\code c++\TP14 pointers\Pro7 VENTHON,e20191250.exe"
1.42361
1.42361
Process returned 0 (0x0)   execution time : 0.038 s
Press any key to continue.
```