ASSIGNMENT # 01

Submitted to : Mam Yasmeen jana

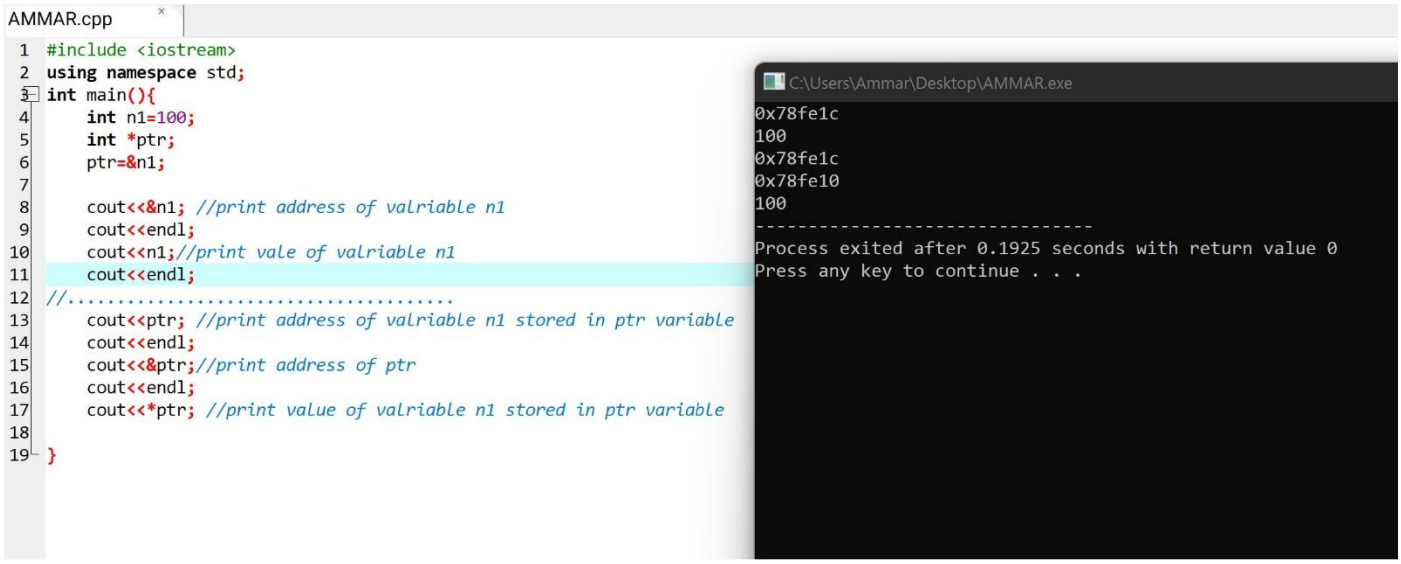
Submitted ty : Ammar Shafique

Roll no : FA21-BCS-008

Subject : DSA Lab

TASK 1:

```
#include <iostream>
using namespace std;
int main(){
int n1=100;
int *ptr;
ptr=&n1;

cout<<&n1; //print address of valriable n1
cout<<endl;
cout<<n1;//print vale of valriable n1
cout<<endl;
//.....
cout<<ptr; //print address of valriable n1 stored in ptr variable
cout<<endl;
cout<<&ptr;//print address of ptr
cout<<endl;
cout<<*ptr; //print value of valriable n1 stored in ptr variable

}
```



TASK 2 :

```
#include <iostream>
using namespace std;
int main(){
float n1;
n1=15.5;
float* ptr;
ptr=&n1;

cout<<&n1; //print address of valriable n1
cout<<endl;
cout<<n1;//print vale of valriable n1
cout<<endl;
//.....
cout<<ptr; //print address of valriable n1 stored in ptr variable
cout<<endl;
cout<<&ptr;//print address of ptr
cout<<endl;
```

cout<<*ptr; //print value of valriable n1 stored in ptr variable

}

```cpp
#include <iostream>
using namespace std;
int main(){
    float n1;
    n1=15.5;
    float* ptr;
    ptr=&n1;



    cout<<&n1; //print address of valriable n1
    cout<<endl;
    cout<<n1;//print vale of valriable n1
    cout<<endl;
//.....................................
    cout<<ptr; //print address of valriable n1 stored in ptr variable
    cout<<endl;
    cout<<&ptr;//print address of ptr
    cout<<endl;
    cout<<*ptr; //print value of valriable n1 stored in ptr variable

}
```

```
C:\Users\Ammar\Desktop\AMMAR - Copy.exe
0x78fe1c
15.5
0x78fe1c
0x78fe10
15.5
--------------------------------
Process exited after 0.2107 seconds with return value 0
Press any key to continue . . .
```

TASK 3:

#include <iostream>

using namespace std;

int main(){

string st;

st="AMMAR";

string* ptr;

ptr=&st;

cout<<&st; //print address of valriable n1

cout<<endl;

cout<<st;//print vale of valriable n1

cout<<endl;

//.....

cout<<ptr; //print address of valriable n1 stored in ptr variable

cout<<endl;

cout<<&ptr;//print address of ptr

cout<<endl;

cout<<*ptr; //print value of valriable n1 stored in ptr variable

}

```cpp
#include <iostream>
using namespace std;
int main(){
    string st;
    st="AMMAR";
    string* ptr;
    ptr=&st;



    cout<<&st; //print address of valriable n1
    cout<<endl;
    cout<<st;//print vale of valriable n1
    cout<<endl;
//.....
    cout<<ptr; //print address of valriable n1 stored in ptr variable
    cout<<endl;
    cout<<&ptr;//print address of ptr
    cout<<endl;
    cout<<*ptr; //print value of valriable n1 stored in ptr variable

}
```

```
C:\Users\Ammar\Desktop\AMMAR - Copy - Copy.exe
0x78fdf0
AMMAR
0x78fdf0
0x78fde8
AMMAR
--------------------------------
Process exited after 0.2908 seconds with return value 0
Press any key to continue . . .
```

TASK 4:

#include <iostream>

using namespace std;

int main(){

int n1=999;

int *ptr;

ptr=&n1;

cout<<&n1; //print address of valriable n1

cout<<endl;

cout<<n1;//print vale of valriable n1

cout<<endl;

//..... { MODIFY value through pointer }.....

***ptr=555;**

cout<<ptr; //print address of valriable n1 stored in ptr variable

cout<<endl;

cout<<&ptr;//print address of ptr

cout<<endl;

cout<<*ptr; //print value of valriable n1 stored in ptr variable

}

```cpp
#include <iostream>
using namespace std;
int main(){
    int n1=999;
    int *ptr;
    ptr=&n1;

    cout<<&n1; //print address of valriable n1
    cout<<endl;
    cout<<n1;//print vale of valriable n1
    cout<<endl;
//..... { MODIFY value through pointer }.....

    *ptr=555;
    cout<<ptr; //print address of valriable n1 stored in ptr variable
    cout<<endl;
    cout<<&ptr;//print address of ptr
    cout<<endl;
    cout<<*ptr; //print value of valriable n1 stored in ptr variable

}
```

```
C:\Users\Ammar\Desktop\AMMAR.exe
0x78fe1c
999
0x78fe1c
0x78fe10
555
--------------------------------
Process exited after 0.01937 seconds with return value 0
Press any key to continue . . .
```

TASK 5:

#include <iostream>

using namespace std;

int main(){

int a=10;

int* ptr1;

ptr1=&a; //ptr1 stores address of variable a

int** ptr2; //to store address of another variable

*ptr2=ptr1; //ptr2 stores value of ptr1 which is address of 'a'.

cout<<&a; //print address of a

cout<<endl;

cout<<*ptr1; //print value of address stores in ptr1

cout<<endl;

cout<<*ptr2; //print value of ptr2 which is address of ptr1

}

```
#include <iostream>
using namespace std;
int main(){

    int a=10;
    int* ptr1;
    ptr1=&a;    //ptr1 stores address of variable a
    int** ptr2;  //to store address of another variable
    *ptr2=ptr1;   //ptr2 stores value of ptr1 which is address of 'a'
    cout<<&a;  //print address of a
    cout<<endl;
    cout<<*ptr1;  //print value of address stores in ptr1
    cout<<endl;
    cout<<*ptr2; //print value of ptr2 which is address of ptr1



}
```

```
C:\Users\Ammar\Desktop\AMMAR - Copy - Copy - Copy - Copy.exe
0x78fe0c
10
0x78fe0c
--------------------------------
Process exited after 0.2027 seconds with return value 0
Press any key to continue . . .
```

TASK 6:

#include<iostream>

using namespace std;

int main(){

int a,b;

cout<<"Enter two numbers\n";

cin>>a>>b;

int* p1=&a; //stores address of a

int* p2=&b; //stores address of b

int sum;

sum=*p1+*p2; // *p1 means value of address in p1

cout<<"After Addition is "<<sum;

}

```
#include<iostream>
using namespace std;
int main(){

    int a,b;
    cout<<"Enter two numbers\n";
    cin>>a>>b;
    int* p1=&a; //stores address of a
    int* p2=&b;   //stores address of b
    int sum;
    sum=*p1+*p2;   // *p1 means value of address in p1

    cout<<"After Addition is "<<sum;
}
```

```
D:\CUI\C++\Add two numbers by pointer.exe
Enter two numbers
1
2
After Addition is 3
--------------------------------
Process exited after 5.213 seconds with return value 0
Press any key to continue . . .
```

TASK 7:

```
#include<iostream>
using namespace std;
int main()
{
int a,b;
cout<<"Enter 1st value...";
cin>>a;
cout<<"Enter 2nd value...";
cin>>b;
//.....{ Swap using pointer }....
int *p1,*p2;
int c;
p1=&a;  //stores address of a
p2=&b;    // stores address of b
c=*p1;    //stores value of a
*p1=*p2;      //transfer value of b to a address
```

***p2=c; //transfer value of c to b address**

cout<<"1st value after swap is "<<a<<endl;

cout<<"2nd value after swap is "<<b;

}

```
#include<iostream>
using namespace std;
int main()
{
    int a,b;
    cout<<"Enter 1st value...";
    cin>>a;
    cout<<"Enter 2nd value...";
    cin>>b;
    //......{ Swap using pointer }....
    int *p1,*p2;
    int c;
    p1=&a;  //stores address of a
    p2=&b;    // stores address of b
    c=*p1;    //stores value of a
    *p1=*p2;      //transfer value of b to a address
    *p2=c;     //transfer value of c to b address

    cout<<"1st value after swap is "<<a<<endl;
    cout<<"2nd value after swap is "<<b;


}
```

```
D:\CUI\C++\swap using pointer.exe
Enter 1st value...1
Enter 2nd value...2
1st value after swap is 2
2nd value after swap is 1
--------------------------------
Process exited after 1.536 seconds with return value 0
Press any key to continue . . .
```

TASK 8:

```
#include<iostream>
using namespace std;
int main(){


int size;
cout << "Enter Size of Array : ";
cin >> size;
int *arr = new int[size];
for (int i = 0; i < size; i++)
{
        cout << "Enter [" << i << "] index Element in Array  ";
        cin >> arr[i];
```

}

cout << "Array at Run-Time " << endl;

cout << "{ ";

for (int i = 0; i < size; i++)

{

cout << arr[i]<<" ";

}

cout << " }";

delete[]arr;

system("pause");

}

```
#include<iostream>
using namespace std;
int main(){

int size;
    cout << "Enter Size of Array : ";
    cin >> size;
    int *arr = new int[size];
    for (int i = 0; i < size; i++)
    {
        cout << "Enter [" << i << "] index Element in Array  ";
        cin >> arr[i];
    }
    cout << "Array at Run-Time " << endl;
    cout << "{  ";
    for (int i = 0; i < size; i++)
    {
        cout << arr[i]<<"  ";
    }
    cout << " }";
    delete[]arr;

    system("pause");
}
```

```
D:\CUI\C++\pointer rough.exe
Enter Size of Array : 3
Enter [0] index Element in Array  1
Enter [1] index Element in Array  2
Enter [2] index Element in Array  3
Array at Run-Time
{  1  2  3   }Press any key to continue . . .
```

TASK 9:

#include <iostream>

using namespace std;

int sum(int* ,int*);

```
int main(){
int n1,n2,s;
cout<<"Enter two numbers\n ";
cin >>n1>>n2;
// .....Sum using pointer with function...
s=sum(&n1,&n2);
cout<<"Sum = "<<s;
}
int sum(int * a,int *b){
int sum;
        sum = *a+*b;
        return sum;
}
```

```
#include <iostream>
using namespace std;
int sum(int* ,int*);

int main(){
    int n1,n2,s;
    cout<<"Enter two numbers\n ";
    cin >>n1>>n2;
    // .....Sum using pointer with function...
    s=sum(&n1,&n2);
    cout<<"Sum = "<<s;
}
int sum(int * a,int *b){
    int sum;
        sum = *a+*b;
        return sum;
}
```

```
C:\Users\Ammar\Desktop\AMMAR.exe
Enter two numbers
 1
2
Sum = 3
--------------------------------
Process exited after 1.181 seconds
Press any key to continue . . .
```

TASK 10:

```
        #include <iostream>
using namespace std;
int sum(int* ,int*);


int main(){
```

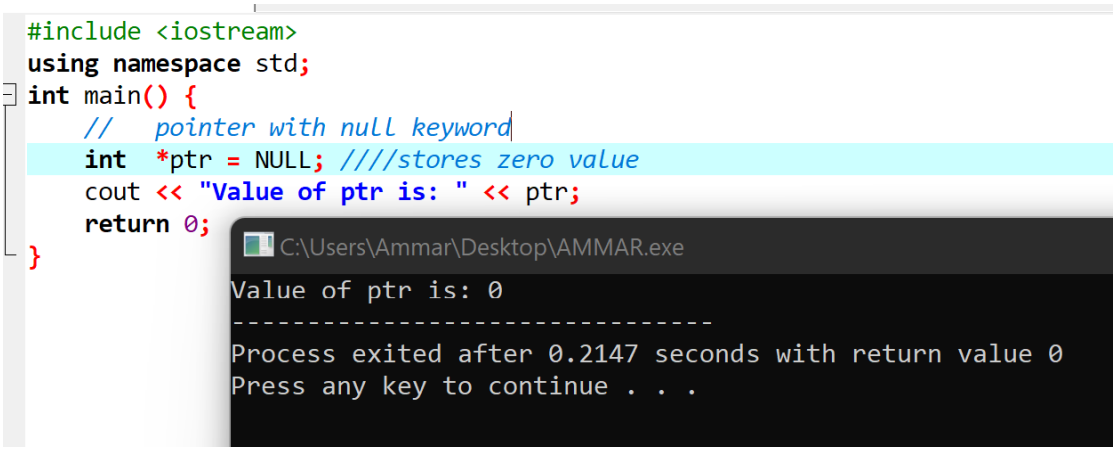
```
int n1,n2;
cout<<"Enter two numbers\n ";
cin >>n1>>n2;
// .....find large number using pointer ...

int *p1,*p2;
p1=&n1;
p2=&n2;

if(*p1>*p2)
cout<<"\n ==> First number is greater ";
if(*p1<*p2)
cout<<"\n ==> Second number is greater ";
else if(*p1==*p2)
cout<<"\n ==> Both are Equal ";
}
```

```
#include <iostream>
using namespace std;
int sum(int* ,int*);

int main(){
    int n1,n2;
    cout<<"Enter two numbers\n ";
    cin >>n1>>n2;
    // .....find large number using pointer ...

    int *p1,*p2;
    p1=&n1;
    p2=&n2;

    if(*p1>*p2)
    cout<<"\n ==> First number is greater ";
    if(*p1<*p2)
    cout<<"\n ==> Second number is greater ";
    else if(*p1==*p2)
    cout<<"\n ==> Both are Equal ";
    }
```

```
C:\Users\Ammar\Desktop\AMMAR.exe
Enter two numbers
 2
3

 ==> Second number is greater
--------------------------------
Process exited after 1.431 seconds with return value 0
Press any key to continue . . .
```

TASK 11:

```
#include <iostream>
using namespace std;
int main() {
//   pointer with null keyword
int  *ptr = NULL; ////stores zero value
cout << "Value of ptr is: " << ptr;
return 0;
}
```



TASK 12 :

```
#include<iostream>
using namespace std;
int main()
{
float a,b;
char choice;
float *p1,*p2;
p1=&a;
p2=&b;
cout<<"Enter two Numbers:"<<endl;
cin>>a>>b;
```

```
cout<<"Press + for Addition: \n";
cout<<"Press - for Subtraction: \n";
cout<<"Press * for Multiplication: \n";
cout<<"Press / for Division: \n";
cin>>choice;
switch(choice){
        case '+':
                cout<<"Addition = "<<*p1+*p2<<endl;
                break;

   case '-':
        cout<<"Subtraction = "<<*p1-*p2<<endl;
        break;
   case '*':
        cout<<"Multiplication = "<<*p1 * *p2<<endl;
        break;
   case '/':
        cout<<"Division = "<<*p1/ *p2<<endl;
        break;
        default:
                cout<<"Invalid Choice"<<endl;
}

cout<<"...END...";
}
```

```cpp
#include<iostream>
using namespace std;
int main()
{
    float a,b;
    char choice;
    float *p1,*p2;
    p1=&a;
    p2=&b;
    cout<<"Enter two Numbers:"<<endl;
    cin>>a>>b;
    cout<<"Press + for Addition: \n";
    cout<<"Press - for Subtraction: \n";
    cout<<"Press * for Multiplication: \n";
    cout<<"Press / for Division: \n";
    cin>>choice;
    switch(choice){
        case '+':
            cout<<"Addition = "<<*p1+*p2<<endl;
            break;

        case '-':
            cout<<"Subtraction = "<<*p1-*p2<<endl;
            break;
        case '*':
            cout<<"Multiplication = "<<*p1 * *p2<<endl;
            break;
        case '/':
            cout<<"Division = "<<*p1/ *p2<<endl;
            break;
            default:
                cout<<"Invalid Choice"<<endl;
    }

    cout<<"...END...";
}
```

```
C:\Users\Ammar\Desktop\AMMAR.exe
Enter two Numbers:
2
2
Press + for Addition:
Press - for Subtraction:
Press * for Multiplication:
Press / for Division:
/
Division = 1
...END...
--------------------------------
Process exited after 3.494 seconds wi
Press any key to continue . . .
```

TASK 13:

```
#include<iostream>
using namespace std;
string C_Name(string *);
int main()
{
string str;
getline(cin,str);
cout<<"I am writing this message to inform you that Rehan will be retiring from "<<C_Name(&str)<<",\n";
cout<<"effectice March 1,2022.Rehan has been a dedicated employee of "<<C_Name(&str)<<",serving more\n";
cout<<"than three decades with the company ("<<C_Name(&str)<<"),eight of them as vice president \nof sales.";
```

}

string C_Name(string* s)

{

*s="'C++ Software Developers'";

return *s;

}

```
#include<iostream>
using namespace std;
string C_Name(string *);
int main()
{
    string str;
    getline(cin,str);
cout<<"I am writing this message to inform you that Rehan will be retiring from "<<C_Name(&str)<<",\n";
cout<<"effectice March 1,2022.Rehan has been a dedicated employee of "<<C_Name(&str)<<",serving more\n";
cout<<"than three decades with the company ("<<C_Name(&str)<<"),eight of them as vice president \nof sales.";

}
string C_Name(string* s)
{
    *s="'C++ Software Developers'";
    return *s;
}
```

```
D:\CUI\C++\F Memo.exe
effectice March 1,2022.Rehan has been a dedicated employee of 'C++ Software Developers',serving more
than three decades with the company ('C++ Software Developers'),eight of them as vice president
of sales.
--------------------------------
Process exited after 0.03573 seconds with return value 0
Press any key to continue . . .
```

TASK 14:

#include <iostream>

using namespace std;

void test(int*, int*);

int main() {

int a = 5, b = 5;

cout << "Before changing:" << endl;

cout << "a = " << a << endl;

cout << "b = " << b << endl;

// ..... { Change value of variables with pointer using function }...

test(&a, &b);

cout << "\nAfter changing" << endl;

cout << "a = " << a << endl;

cout << "b = " << b << endl;

return 0;

}

void test(int* n1, int* n2) {

*n1 = 10;

*n2 = 11;

}

```
#include <iostream>

using namespace std;
void test(int*, int*);
int main() {
    int a = 5, b = 5;
    cout << "Before changing:" << endl;
    cout << "a = " << a << endl;
    cout << "b = " << b << endl;
//   ..... {  Change value of variables with pointer using function  }...
    test(&a, &b);

    cout << "\nAfter changing" << endl;
    cout << "a = " << a << endl;
    cout << "b = " << b << endl;
    return 0;
}

void test(int* n1, int* n2) {
    *n1 = 10;
    *n2 = 11;
}
```

```
C:\Users\Ammar\Desktop\AMMAR.exe
Before changing:
a = 5
b = 5

After changing
a = 10
b = 11

--------------------------------
Process exited after 0.2038 seconds with return value 0
Press any key to continue . . .
```

TASK 15 :

#include <iostream>

class MyClass {

public:

  int data;

```
    // Constructor
    MyClass(int value) {
        data = value;
    }

    // Member function to double the data using a pointer
    void doubleData() {
        int* ptr = &data;  // Pointer to the data member
        *ptr *= 2;       // Double the value through the pointer
    }
};

int main() {
    // Create an instance of MyClass
    MyClass myObject(10);

    // Print the initial value
    std::cout << "Initial data: " << myObject.data << std::endl;

    // Call the doubleData method to double the value
    myObject.doubleData();

    // Print the updated value
    std::cout << "Updated data: " << myObject.data << std::endl;

    return 0;
}
```

```cpp
#include <iostream>

class MyClass {
public:
    int data;

    // Constructor
    MyClass(int value) {
        data = value;
    }

    // Member function to double the data using a pointer
    void doubleData() {
        int* ptr = &data;  // Pointer to the data member
        *ptr *= 2;         // Double the value through the pointer
    }
};

int main() {
    // Create an instance of MyClass
    MyClass myObject(10);

    // Print the initial value
    std::cout << "Initial data: " << myObject.data << std::endl;

    // Call the doubleData method to double the value
    myObject.doubleData();

    // Print the updated value
    std::cout << "Updated data: " << myObject.data << std::endl;

    return 0;
}
```

```
C:\Users\Ammar\Desktop\AMMAR.exe
Initial data: 10
Updated data: 20

--------------------------------
Process exited after 0.2223 seconds with return value 0
Press any key to continue . . .
```