Hawassa University – IoT
Faculty of Informatics
Department of Information System
Fundamentals of Programming in C++
Lab Exercise 8: Pointer

1. Write a program in C++ to show the basic declaration and initialization of a pointer.
2. Write a program in C++ to demonstrate the use of the &(address of) and *(value at address) operators.
3. Write a program that asks the user to enter integers as inputs to be stored in the variables 'a' and 'b' respectively. There are also two integer pointers named **aPtr** and **bPtr**. Assign the values of 'a' and 'b' to aPtr and bPtr respectively, and display them.
4. Write a C++ program to read two numbers from user and add them by using Pointer (Static Memory Allocation)?
5. Write a C++ program to input and print array elements using pointer. The number of inputs should be determined by the user.
6. Write a C++ function using pointers to exchange the values stored in two locations in the memory?
7. What is the output of the following code?

```
#include<iostream>
using namespace std;
void increment(int i, int *pi);
int main()
{
        int a=1,b=2;
        cout<<"The value of a & b is:"<<a<<" "<<b<<endl;
        increment(a,&b);
        cout<<"The value of a & b is:"<<a<<" "<<b<<endl;
        return 0;
}
```

```
void increment(int i, int *pi)
{
        i=i+1;
        *pi=*pi+1;
        cout<<"The value of i & pi is:"<<i<<" "<<*pi<<endl;
}
```

8. What is the output of the following code?

```
#include<iostream>
using namespace std;
void increment(int i, int *pi);
int main()
{
    int a=1,b=2;
    int *p=&b;
    cout<<"The value of a & b is:"<<a<<" "<<b<<endl;
    increment(a,p);
    cout<<"The value of a & b is:"<<a<<" "<<b<<endl;
    return 0;
}
void increment(int i, int *pi)
{
    i=i+1;
    *pi=*pi+1;
    cout<<"The value of i & pi is:"<<i<<" "<<*pi<<endl;
}
```

9. What is the output of the following C++ code?

```
#include <iostream>
using namespace std;
```

```
const int MAX = 3;
int main ()
{
    int var[MAX] = {10, 100, 200};
    int *ptr;
    ptr = var;
    for (int i = 0; i < MAX; i++)
    {
            cout << "Address of var[" << i << "] = ";
            cout << ptr << endl;
            cout << "Value of var[" << i << "] = ";
            cout << *ptr << endl; // point to the next location
            ptr++;
    }
    return 0;
}
```

10. What is the output of the following C++ code?

```
#include<iostream>
using namespace std;
const int MAX = 3;
int main ()
{
    int var[MAX] = {10, 100, 200};
    int *ptr;
    ptr = &var[MAX-1];
    for (int i = MAX; i > 0; i--)
    {
            cout << "Address of var[" << i << "] = ";
```

```
            cout << ptr << endl;
            cout << "Value of var[" << i << "] = ";
            cout << *ptr << endl;
            ptr--;
        }
        return 0;
    }
```

11. What is the output of the following C++ code?

```
#include<iostream>
using namespace std;
const int MAX = 3;
int main ()
{
    int var[MAX] = {10, 100, 200};
    int *ptr;
    ptr = var;
    for (int i = 0; i < MAX; i++)
    {
            cout << "Address of var[" << i << "] = ";
            cout << ptr << endl;
            cout << "Value of var[" << i << "] = ";
            cout << *ptr << endl;
            ptr++;
    }
    return 0;
}
```

12. What is the output of the following C++ code?

```
#include<iostream>
using namespace std;
const int MAX = 3;
int main ()
{
    int var[MAX] = {10, 100, 200};
    int *ptr[MAX];
    for (int i = 0; i < MAX; i++)
    {
            ptr[i] = &var[i];
    }
    for (int i = 0; i < MAX; i++)
    {
            cout << "Value of var[" << i << "] = ";
            cout << *ptr[i] << endl;
    }
    return 0;
}
```