Pointers

**“ Pointers are variables that store the address of other variables. ”**

# Syntax

// syntx

// <data\_type> \*name\_of\_ptr

int \*myintpointer;

char \*mycharpointer;

**Getting started with the Pointers**

Every variable is stored in the memory and each memory location has its own memory address. It enables us to pass variables by reference.

**‘&’ Operator**: It gives the address of the variable.

**‘\*’ Operator:** It gives the value stored at the address, i.e dereferences the value stored at the address

# Working Demo

int a = 10;

int\* aptr = &a;

cout << \*aptr << endl;

\*aptr = 20;

cout << a << endl;

In the above example,

1. We declared an integer variable ‘a’, and an integer pointer ‘aptr’.
2. The address of ‘a’ (&a) is stored in aptr.
3. cout << \*aptr; gives the value stored at the memory address.
4. \*aptr = 20 changes the value at the memory address to 20. Value of ‘a’ gets changed to 20.

# Array Pointers

In C++, The name of the array is a pointer that points to the first element of the array.

int main(){

int arr[] = {10, 20, 30};

cout << \*arr << endl;

int \*ptr = arr;

for(int i=0; i<3; i++){

    cout << \*(arr+i) << endl;

}

\*(arr + i) is equivalent to arr[i].

(arr + i) is the address of the ith element of the array.

# Swapping 2 variables using the address

Address of ‘a’ and ‘b’ gets interchanged, thus their values get swapped.

// call by Reference using Pointer

void swap(int \*a, int \*b){

    int temp = \*a;

    \*a = \*b;

    \*b = temp;

}

int main(){

    int x = 2; int y = 4;

    swap(&x, &y);

    cout<<x<<" "<<y<<endl;

}// value will change x and y from a and b.

1st Method //call by Reference using Reference Variable.

void swap(int \*a, int \*b){

    int temp = \*a;

    \*a = \*b;

    \*b = temp;

}

int main(){

    int x = 2; int y = 4;

    swap(x, y);

    cout<<x<<" "<<y<<endl;

}// value will change x and y from a and b.

2nd Method // call by Reference using Reference Variable.

void swap(int &a, int &b){

    int temp = a;

    a = b;

    b = temp;

}

int main(){

    int x = 2; int y = 4;

    swap(x, y);

    cout<<x<<" "<<y<<endl;

}// value will change x and y from a and b.

// call by Value and call by reference.( Value not Change )

void swap(int a, int b){

    int temp = a;

    a = b;

    b = temp;

}

int main(){

    int x = 2; int y = 4;

    swap(x, y);

    cout<<x<<" "<<y<<endl;

} // value not change.