**ASSIGNMENT** 6

**PROBLEM STATEMENT:**

Create a class template to represent a generic vector. Include following member functions:

1. To create the vector.
2. To modify the value of a given element.
3. To multiply by a scalar value.
4. To display the vector in the form (10,20,30…)

**AIM OF ASSIGNMENT:**

C++ Program to implement and understand the concepts of vector container. Include the vector class, to use its member function.

**DESCRIPTION:**

In this program, firstly we included the vector class. We defined a function to display the vector. By creating an object of the vector class, we used member functions like v.insert(), v.erase(). We also created an iterator to point to the elements of the vector. We performed operations on vector like modifying it and multiplying it by a scalar quantity.

**OOP CONCEPT USED:**

* vector class
* member functions of vector class
* user defined functions.

**Sourcecode:**

#include <iostream>

#include<vector> //function to include vector class

using namespace std;

/\* run this program using the console pauser or add your own getch, system("pause") or input loop \*/

void display(vector<int> &v) //function to display the vector

{

int i;

cout<<"(";

for( i=0; i<v.size()-1; i++)

{

cout<<v[i]<<",";

}

cout<<v[i]<<")";

}

int main()

{

//create a vector

vector<int> v; //vector object 'v' is created

cout<<"Initial size of vector :"<<v.size()<<"\n";

cout<<"\nLet us create a vector";

int v\_elements, v\_size, v\_ins\_pos, v\_mod\_position, v\_scalar, b, a;

cout<<"\nEnter size of vector : ";

cin>>v\_size;

cout<<"\nEnter "<<v\_size<<" elements :\n";

for(int i=0; i<v\_size; i++)

{

cin>>v\_elements;

v.push\_back(v\_elements); //function to add elements in the vector

}

cout<<"\nVector is created and the elements in the vector are : ";

display(v);

cout<<" \n\nIterator created : ";

vector<int>::iterator itr1=v.begin(); //iterator pointing to the first element is created

cout<<"\n\nNow, Let us insert an element in the vector";

cout<<"\nEnter the position you want to insert element at : ";

cin>>v\_ins\_pos;

itr1=itr1+v\_ins\_pos-1; //iterator now points to the specific position as given by the user

cout<<"\nEnter element to be inserted : ";

cin>>b;

v.insert(itr1,1,b); //function to insert an element in vector

cout<<"\nAfter inserting "<<b<<" ,the new vector is : ";

display(v);

//modify the value of a given element

cout<<"\n\nNext is to modify an element in the vector";

cout<<"\nEnter position you want to modify : ";

cin>>v\_mod\_position;

vector<int>::iterator itr2=v.begin();

itr2=itr2+v\_mod\_position-1;

v.erase(itr2); //function to delete an element from vector

cout<<"\nEnter modified element : ";

cin>>a;

v.insert(itr2,1,a);

cout<<"\nAfter modifying "<<a<<" ,the new vector is : ";

display(v);

//multiply the vector by a scalar quantity

cout<<"\n\nlet us multiply the vector by a scalar quantity";

cout<<"\nEnter scalar quantity : ";

cin>>v\_scalar;

vector<int>::iterator itr3=v.begin();

for(int i=0; i<=v\_size;i++)

{

v[i]=v[i]\*v\_scalar;

}

cout<<"\nAfter multiplying by "<<v\_scalar<<" ,the new vector is : ";

display(v);

return 0;

}

**Output:**

Initial size of vector :0

Let us create a vector

Enter size of vector : 4

Enter 4 elements :

12

32

71

11

Vector is created and the elements in the vector are : (12,32,71,11)

Iterator created :

Now, Let us insert an element in the vector

Enter the position you want to insert element at : 2

Enter element to be inserted : 23

After inserting 23 ,the new vector is : (12,23,32,71,11)

Next is to modify an element in the vector

Enter position you want to modify : 3

Enter modified element : 43

After modifying 43 ,the new vector is : (12,23,43,71,11)

let us multiply the vector by a scalar quantity

Enter scalar quantity : 3

After multiplying by 3 ,the new vector is : (36,69,129,213,33)

**CONCLUSION:**

Hence, we learnt the concept of vector for storing the data. It flows random access to data which was not in the case of array.