==

Roll Number: SYCOC303   Division: C

PRN Number: 122B2B303   Batch: C4

Name: VINAYAK MADAN SHETE

==

Problem Statement:

⇨ **Write a class template to represent a generic vector. Include member functions to perform the following tasks:**

a To create the vector.

b To modify the value of a given element.

c To multiply the vector by a scalar value.

d To display the vector in the form (10, 20, 30)

==

INPUT:

```cpp
/*
 *    ====================================
 *          Program Name: GenericVector.cpp
 *    Created on: December 20, 2022
 *     Author: Vinayak Shete
 *   ====================================
 */

#include<iostream>
using namespace std;

template<class T>
class Vector
{
    T v[20];
    int size;
    public:
```

```cpp
        void create();

        void modify();

        void mult();

        void display();
};


template<class T>
void Vector<T>::create()
{
    int i;
    T value;
    int ch;
    size=0;
    do
      {
        cout<<"\nEnter the index of the vector & value of any type to be stored:";
        cin>>i>>value;
        v[i]=value;
        size++;
        cout<<"\nDo you want to enter more elements?[1 for YES | 0 for NO]";
        cin>>ch;
    }while(ch==1);
}


template<class T>
void Vector<T>::modify()
{
    int key;
    T newval;
    cout<<"\nEnter index value for modificaion:";
    cin>>key;
    cout<<"\nEnter new value:";
    cin>>newval;
    v[key]=newval;
}


template<class T>
```

SYCOC303

```cpp
void Vector<T>::mult()
{
    int i;
    int scalarval;
    cout<<"\nEnter scalar value for multiplication-->";
    cin>>scalarval;
    for(i=0;i<size;i++)
    {
      v[i]=v[i]*scalarval;
      }
}


template<class T>
void Vector<T>::display()
{
    int i;
    cout<<"\nSize of vector is:"<<size;
    cout<<"\nElements in vector are:";
    cout<<"(";
    for(i=0;i<size;i++)
    {
        cout<<v[i]<<",";
    }
    cout<<")";
}


int main()
{
    int ch;
    Vector<int>obj;
    cout<<"\n=======WELCOME=========";
    do
    {
        cout<<"\n1.Create Vector(Add elements into Vector)\n2.Display elements from
the Vector\n3.Multiply Vector eith Scalar Value\n4.Modify the elements in the
Vector\n5.EXIT";
        cout<<"\nEnter your choice:";
```

SYCOC303

```
        cin>>ch;
        switch(ch)
        {
            case 1:
                obj.create();
                break;

            case 2:
                obj.display();
                break;

            case 3:
                obj.mult();
                break;

            case 4:
                obj.modify();
                break;

            case 5:
                goto exit;
                break;

            default:
                cout<<"\nPlease enter correct choice!";
                break;
        }
    }while(ch!=0);

    exit:
        cout<<"\n======THANK YOU!=======";
    return 0;
}
```

==

SYCOC303

OUTPUT:

1) Adding Elements in the Vector:

```
=======WELCOME==========
=======================
1.Create Vector(Add elements into Vector)
2.Display elements from the Vector
3.Multiply Vector eith Scalar Value
4.Modify the elements in the Vector
5.EXIT
Enter your choice:1

Enter the index of the vector & value of any type to be stored:1 20

Do you want to enter more elements?[1 for YES | 0 for NO]1

Enter the index of the vector & value of any type to be stored:0 10

Do you want to enter more elements?[1 for YES | 0 for NO]1

Enter the index of the vector & value of any type to be stored:3 40

Do you want to enter more elements?[1 for YES | 0 for NO]1

Enter the index of the vector & value of any type to be stored:2 30

Do you want to enter more elements?[1 for YES | 0 for NO]1

Enter the index of the vector & value of any type to be stored:4 50

Do you want to enter more elements?[1 for YES | 0 for NO]0

=======================
```

2) Displaying the elements in the vector:

```
=======================
1.Create Vector(Add elements into Vector)
2.Display elements from the Vector
3.Multiply Vector eith Scalar Value
4.Modify the elements in the Vector
5.EXIT
Enter your choice:2

Size of vector is:5
Elements in vector are:(10,20,30,40,50,)
=======================
```

SYCOC303

3) Multiplying the vector values by scalar value 3:

```
========================
1.Create Vector(Add elements into Vector)
2.Display elements from the Vector
3.Multiply Vector eith Scalar Value
4.Modify the elements in the Vector
5.EXIT
Enter your choice:3

Enter scalar value for multiplication-->3

========================
1.Create Vector(Add elements into Vector)
2.Display elements from the Vector
3.Multiply Vector eith Scalar Value
4.Modify the elements in the Vector
5.EXIT
Enter your choice:2

Size of vector is:5
Elements in vector are:(30,60,90,120,150,)
========================
```

4) Modifying an element from the Vector:

```
1.Create Vector(Add elements into Vector)
2.Display elements from the Vector
3.Multiply Vector eith Scalar Value
4.Modify the elements in the Vector
5.EXIT
Enter your choice:4

Enter index value for modificaion:2

Enter new value:100

========================
1.Create Vector(Add elements into Vector)
2.Display elements from the Vector
3.Multiply Vector eith Scalar Value
4.Modify the elements in the Vector
5.EXIT
Enter your choice:2

Size of vector is:5
Elements in vector are:(30,60,100,120,150,)
========================
```

==

SYCOC303