

```

#include <iostream>
using namespace std;

template<class u>
class Sentinel
{
    //template<class u>
    struct Node
    {
        Node<u> *prev;
        u value;
        Node<u> *next;
        Node(u value)
        {
            this->prev=nullptr;
            this->value=value;
            this->next=nullptr;
        }
    };

    Node<u> *head;
    Node<u> *tail;
public:
    Sentinel()
    {
        head=new Node<u>(0);
        tail=new Node<u>(0);
        head->next=tail;
        tail->prev=head;
    }
    void insert(Node<u> *current,u value)
    {
        Node<u> *newnode=new Node<u>(value);
        newnode->next=current;
        newnode->prev=current->prev;
        //current->prev=current->prev->next=newnode;
        newnode->next->prev=newnode->prev->next=newnode;
    }

    void addToBack(u value)
    {
        insert(tail,value);
    }

    void addToFront(u value)
    {
        insert(head->next,value);
    }

    int insertAfter(u search,u value)
    {
        for(Node<u> *p=head->next;p!=tail;p=p->next)
        {
            if(search==p->value)
            {
                insert(p->next,value);
                return 1;
            }
        }
        return 0;
    }

    int insertBefore(u search,u value)
    {
        for(Node<u> *p=tail->prev;p!=head;p=p->prev)

```

```

        {
            if(search==p->value)
            {
                insert(p,value);
                return 1;
            }
        }
        return 0;
    }
    void printForward()
    {
        for(Node<u> *p=head->next;p!=tail;p=p->next)
        {
            cout<<p->value<<" ";
        }
    }
};

int main()
{
    Sentinel<double> s;
    double num;
    double search;
    while(cout<<"Enter the elements : ",
        cin>>num,
        num)
    {
        s.addToBack(num);
    }

    cout<<"\n Original List "<<endl;
    s.printForward();

    while(cout<<"\n search element inserting Before " ,
        cin>>search>>num,
        num)
    {
        s.insertBefore(search,num);
    }

    cout<<"\n After Inserting"<<endl;
    s.printForward();

    while(cout<<"\n search element inserting After " ,
        cin>>search>>num,
        num)
    {
        s.insertAfter(search,num);
    }

    cout<<"\n After Inserting"<<endl;
    s.printForward();

    return 0;
}

```

```
Enter the elements : 9.6
Enter the elements : 9.5
Enter the elements : 8.6
Enter the elements : 0

Original List
9.6 9.5 8.6
search element inserting Before 9.6
100

search element inserting Before 0
0

After Inserting
100 9.6 9.5 8.6
search element inserting After 8.6
99.0

search element inserting After 0
0

After Inserting
100 9.6 9.5 8.6 99 Press any key to continue . . .
```