Q: Write a program to implement a class Stack using Linked List.

Answer:

Source code:

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

class Stak_Node {
private:
	int data;
	Stak_Node* next;
public:
   Stak_Node* newNode(int);
   void push(Stak_Node**, int);
   int pop(Stak_Node**);
   int isempty(Stak_Node*);
   int front(Stak_Node*);
   void print(Stak_Node*);
```

```
};

Stak_Node* Stak_Node::newNode(int data){
	Stak_Node* stackNode = new Stak_Node();
	stackNode->data = data;
	stackNode->next = NULL;
	return stackNode;
}


void Stak_Node::push(Stak_Node** root, int data){
	Stak_Node* stackNode = newNode(data);
	stackNode->next = *root;
	*root = stackNode;
   cout<<data<<" pushed to the stack";
}

int Stak_Node::pop(Stak_Node** root){
	if (isempty(*root))
```

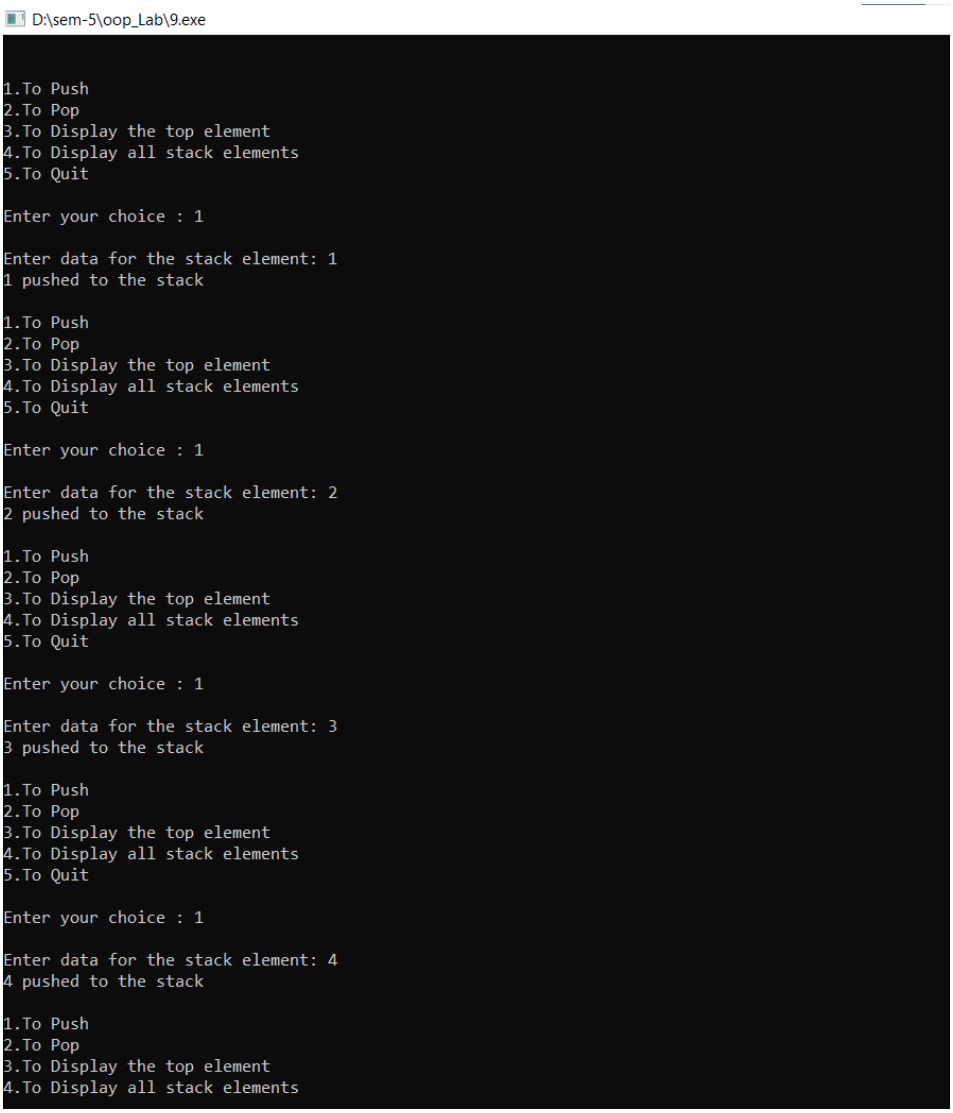
```
        return INT_MIN;

    Stak_Node* temp = *root;
    *root = (*root)->next;
    int popped = temp->data;
    return popped;
}

int Stak_Node::isempty(Stak_Node* root){
    return !root;
}

int Stak_Node::front(Stak_Node* root){
    if (isempty(root))
        return INT_MIN;
    return root->data;
}

void Stak_Node::print(Stak_Node* root){
```

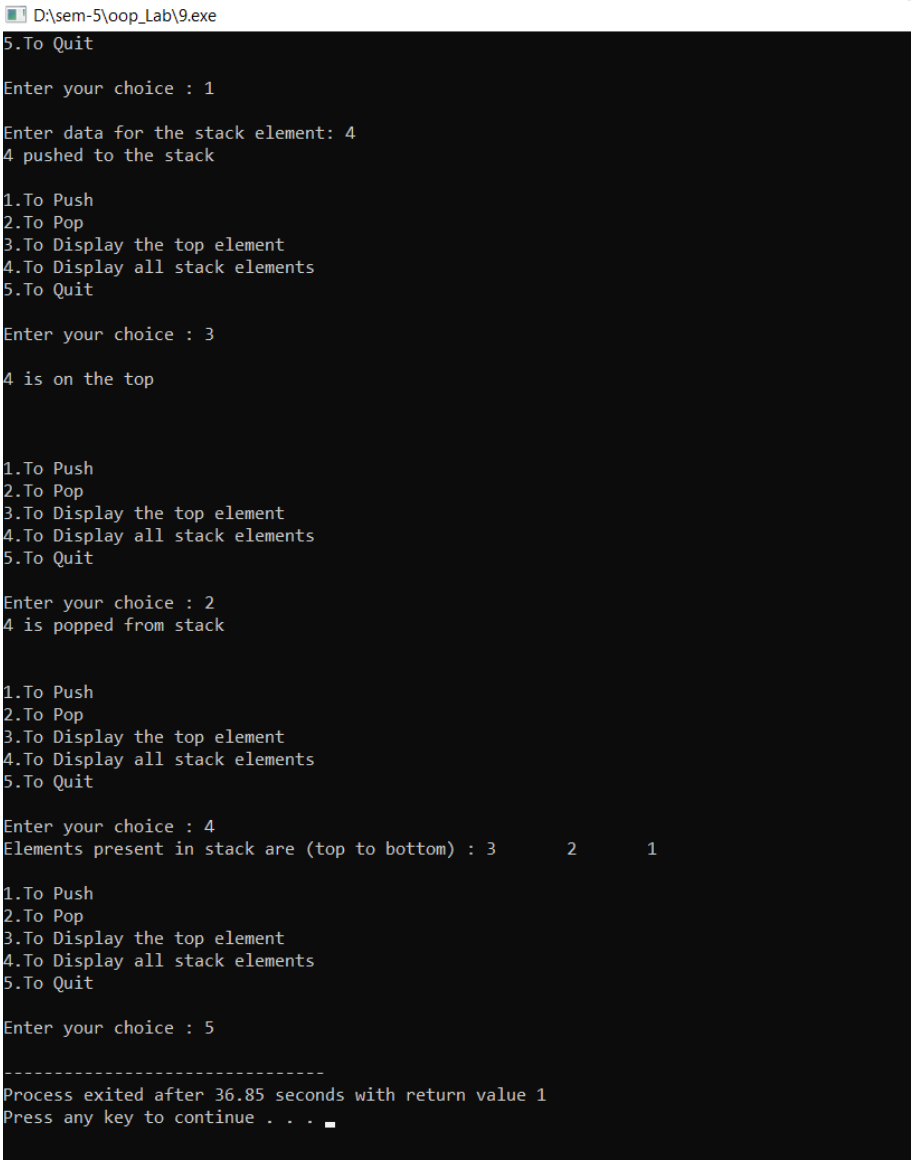
```
   cout<<"Elements present in stack are (top to bottom) :
";
   while(!isempty(root)) {
      cout<<front(root)<<"\t";
            pop(&root);
      }
}

int main(){
      Stak_Node* root = NULL;
   int choice,item;

   while(1){
      cout<<"\n\n1.To Push\n2.To Pop\n3.To Display the
top element\n4.To Display all stack elements\n5.To
Quit\n\nEnter your choice : ";
      cin>>choice;
      switch(choice){
       case 1 :
```

```
            cout<<"\nEnter data for the stack element: ";
            cin>>item;
            root->push(&root, item);
            break;
        case 2:
            cout<<root->pop(&root)<<" is popped from
stack\n";
            break;
        case 3:
            cout<<"\n"<<root->front(root)<<" is on the
top\n"<<endl;
            break;
        case 4:
            root->print(root);
            break;
        case 5:
            exit(1);
        default:
            cout<<"\nINCORRECT INPUT\n";
```

```
        }
    }

        return 0;
}
```

Output:




D:\sem-5\oop_Lab\9.exe
5.To Quit
Enter your choice : 1
Enter data for the stack element: 4
4 pushed to the stack
1.To Push
2.To Pop
3.To Display the top element
4.To Display all stack elements
5.To Quit
Enter your choice : 3
4 is on the top
1.To Push
2.To Pop
3.To Display the top element
4.To Display all stack elements
5.To Quit
Enter your choice : 2
4 is popped from stack
1.To Push
2.To Pop
3.To Display the top element
4.To Display all stack elements
5.To Quit
Enter your choice : 4
Elements present in stack are (top to bottom) : 3 2 1
1.To Push
2.To Pop
3.To Display the top element
4.To Display all stack elements
5.To Quit
Enter your choice : 5
Process exited after 36.85 seconds with return value 1
Press any key to continue . . .