

BÀI TẬP THỰC HÀNH CẤU TRÚC DỮ LIỆU VÀ GIẢI THUẬT

LAB MANUAL

Academic Year : 2022 - 2023

Semester : III Semester

Prepared by

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S. No.	Experiment
1	SEARCHING TECHNIQUES
2	SORTING TECHNIQUES
3	SORTING TECHNIQUES
4	IMPLEMENTATION OF STACK AND QUEUE
5	APPLICATIONS OF STACK
6	IMPLEMENTATION OF SINGLE LINKED LIST
7	IMPLEMENTATION OF DOUBLE LINKED LIST
8	IMPLEMENTATION OF STACK USING LINKED LIST
9	IMPLEMENTATION OF QUEUE USING LINKED LIST
10	IMPLEMENTATION OF BINARY SEARCH TREE

WEEK-8

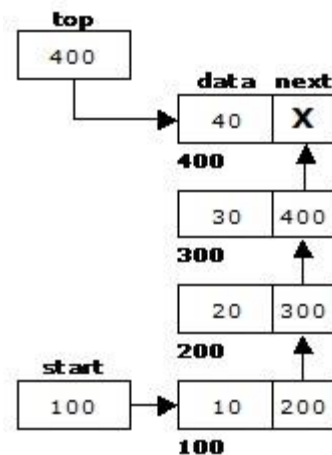
IMPLEMENTATION OF STACK USING LINKED LIST

8.1 OBJECTIVE:

Write a C script to implement stack using linked list.

8.2 PROGRAM LOGIC:

1. **STACK:** Stack is a linear data structure which works under the principle of last in first out. Basic operations: push, pop, display.
2. **PUSH:** if (newnode==NULL), display Stack overflow. if(start == NULL) then start = newnode. Otherwise use loop and copy address of new node in to old node by creating link.
3. **Pop:** if (top == NULL), display Stack underflow. Otherwise printing the element at the top of the stack and decrementing the top value by doing the top.
4. **DISPLAY:** if (top == NULL), display Stack is empty. Otherwise printing the elements in the stack from top.



8.3 IMPLEMENTATION:

Output:

```
*****Stack*****
1.Push
2.Pop
3.Traverse
4.Number of nodes
5.Exit
Enter choice:1
Enter data:10
Node pushed to stack 10
1.Push
2.Pop
3.Traverse
4.Number of nodes
5.Exit
Enter choice:1
Enter data:20
Node pushed to stack 20
1.Push
2.Pop
3.Traverse
4.Number of nodes
5.Exit
Enter choice:1
Enter data:30
Node pushed to stack 30
1.Push
2.Pop
3.Traverse
4.Number of nodes
5.Exit
Enter choice:3
10
20
30
1.Push
2.Pop
3.Traverse
4.Number of nodes
5.Exit
Enter choice:4
Number of nodes 3
1.Push
2.Pop
3.Traverse
4.Number of nodes
5.Exit
Enter choice:2
Deleted from Stack 30
```

```
1.Push
2.Pop
3.Traverse
4.Number of nodes
5.Exit
Enter choice:2
Deleted from Stack 20
1.Push
2.Pop
3.Traverse
4.Number of nodes
5.Exit
Enter choice:2
Deleted from Stack 10
1.Push
2.Pop
3.Traverse
4.Number of nodes
5.Exit
Enter choice:2
Stack Underflow
1.Push
2.Pop
3.Traverse
4.Number of nodes
5.Exit
Enter choice:3
No Nodes exist
1.Push
2.Pop
3.Traverse
4.Number of nodes
5.Exit
Enter choice:5
Quit
```

8.4 LAB ASSIGNMENT:

1. Formulate a program to reverse a list of numbers using stack.
2. Develop a program to check a given expression is balanced or not using stack

8.5 POST-LAB VIVA QUESTIONS:

1. How to remove an element from stack?
2. How to insert an element using a stack?
3. Is it possible to store any number of data elements in stack?
4. What are the demerits of stack?