231501058 CS23231 – D a t a S t r u c t u r e s

**Ex. No.: 4**

**Implementation of Stack using Array and**

**Linked List Implementation**

**Date: 15/3/24**

**Write a C prog ram to imple me n t a stack using Array an d linked List impleme ntation and e xe cute the following operation on stack .**

1. **Push an element into a stack**
2. **Pop an element from a stack**
3. **Return the Top most element from a stack**
4. **Display the elements in a stack**

**Algorithm:**

#include <stdio.h>

#include <malloc.h>

struct node {

int data;

struct node\* next;

};

struct node\* top = NULL;

void push(int ele) {

struct node\* newnode = (struct node\*)malloc(sizeof(struct node)); if (newnode != NULL) {

newnode->data = ele;

newnode->next = top;

top = newnode;

}

}

int pop() {

if (top == NULL) {

printf("\nStack Underflow\n");

return -1;

} else {

int popped = top->data;

struct node\* temp = top;

top = top->next;

free(temp);

return popped;

}

}

int peek() {

if (top != NULL) {

return top->data;

} else {



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printf("\nStack is empty\n");

return -1;

}

}

int isEmpty() {

return top == NULL;

}

void display() {

struct node\* t = top;

while (t != NULL) {

printf("%d\t", t->data);

1. = t->next;

}

printf("\n");

}

int main() {

push(10);

push(20);

push(30);

display();

printf("Top element is %d\n", peek());

printf("Popped element is %d\n", pop());

display();

printf("Popped element is %d\n", pop());

display();

printf("Is stack empty? %s\n", isEmpty() ? "Yes" : "No");

printf("Popped element is %d\n", pop());

display();

printf("Is stack empty? %s\n", isEmpty() ? "Yes" : "No");

return 0;

}

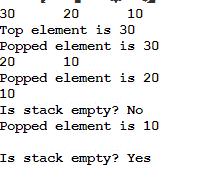


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**OUTPUT**



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