Program 8

STACK:

```
#include <stdio.h>
#include <malloc.h>
#include <stdlib.h>
struct stack {
    int data;
    struct stack * next;
};
struct stack * top = NULL;
struct stack * push(struct stack *, int);
struct stack * pop(struct stack*);
struct stack * display(struct stack*);
int main() {
    int val, opt;
    do {
        printf("\n1.PUSH \n2.POP \n3.DISPLAY \n4.Exit");
        printf("\nEnter your option:");
        scanf("%d", &opt);
        switch(opt) {
            case 1: printf("\nEnter the number to be added:");
            scanf("%d", &val);
            top = push(top, val);
            break;
            case 2: top = pop(top);
            break;
            case 3: top = display(top);
            break;
        }
```

```
} while (opt != 4);
return 0;
}
struct stack * push(struct stack *top, int val){
struct stack *ptr;
ptr = (struct stack*) malloc (sizeof(struct stack));
ptr->data = val;
if (top == NULL){
ptr->next = NULL;
top = ptr;
} else {
ptr->next = top;
top = ptr;
}
return top;
}
struct stack * pop (struct stack * top){
struct stack *ptr;
ptr = top;
if (top == NULL)
printf ("\nSTACK UNDERFLOW");
else {
top = top->next;
printf ("Deleted value: %d", ptr->data);
free (ptr);
}
return top;
}
struct stack * display (struct stack *top){
struct stack *ptr;
ptr = top;
```

```
if (top == NULL)
    printf ("\n Stack is Empty : ");
else {
    while (ptr != NULL) {
        printf ("\n %d ", ptr -> data);
        ptr = ptr -> next;
    }
}
return top;
}
```

QUEUE

```
#include <stdio.h>
#include <stdlib.h>
struct node {
    int data;
    struct node * next;
};
struct node * front;
struct node * rear;
void insert();
void delete();
void display();
void main()
{
    int choice;
    while (choice != 4)
    {
    printf ("\n1. Insert an element \n2. Delete \n3. Display
    \n4. Exit \n");
```

```
printf ("\n Enter your choice: ");
scanf ("%d", &choice);
switch (choice) {
    case 1: insert();
        break;
    case 2: delete();
        break;
    case 3: display();
        break;
    case 4: exit(0);
        break;
    default: printf("\n enter valid choice!!\n");
    }
}
}
void insert() {
    struct node *ptr;
    int item;
    ptr = (struct node *) malloc (sizeof(struct node));
    if (ptr == NULL) {
        printf("\n OVERFLOW\n");
        return;
    }
    else {
        printf("\n Enter value: ");
        scanf("%d", &item);
        ptr -> data = item;
        if (front == NULL) {
            front = ptr;
            rear = ptr;
            front -> next = NULL;
```

```
        rear -> next = NULL;
    }
    else {
        rear -> next = ptr;
        rear = ptr;
        rear -> next = NULL;
    }
  }
}
void delete() {
    struct node *ptr;
    if (front == NULL) {
        printf("\n UNDERFLOW \n");
        return;
    }
    else {
        ptr = front;
        printf("Deleted element : %d", ptr -> data);
        front = front -> next;
        free(ptr);
    }
}
void display() {
    struct node *ptr;
    ptr = front;
    if (front == NULL) {
        printf("\n Empty queue \n");
    }
    else {
        while (ptr != NULL) {
            printf("\n %d \n", ptr -> data);
            ptr = ptr -> next;
        }
    }
}
```