



Department of Electronics & Telecommunication

ASSESMENT YEAR: 2020-2021 CLASS: SE V

SUBJECT: Data Structure and Algorithm

Assg No:3 Roll No:22119 Date:13/11/2020

Programmer Name: Param Chordiya

Batch: E5

Problem Statement:

- 1. Implement stack and queue using struct and perform push, pop operations on it.
- 2. Implement queue using arrays and perform insert/enque, delete/deque operations on it.
- 1) Stack using array.

Input:

```
#include <stdio.h>
    #define MAXSIZE 100
    struct stack
      int stk[MAXSIZE];
      int top;
    typedef struct stack STACK;
    STACK s;
    void push(void);
    void pop(void);
    void display(void);
    void main ()
                       printf("\n**********************\n\t
                                                                                ROLL
NO:22119\n*******************************n"):
      int choice:
      int option = 1;
      s.top = -1;
      printf ("STACK OPERATION\n");
      while (option)
```



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```
printf ("-----\n");
    printf ("1)PUSH\n");
    printf ("2)POP\n");
    printf ("3)DISPLAY\n");
    printf ("4)EXIT\n");
    printf ("-----\n");
    printf ("Enter your choice\n");
    scanf ("%d", &choice);
    switch (choice)
    case 1:
      push();
      break;
    case 2:
      pop();
      break;
    case 3:
      display();
      break;
    case 4:
      return;
    fflush (stdin);
    printf ("Do you want to continue(Type 0 or 1)?\n");
    scanf ("%d", &option);
void push ()
  int num;
  if (s.top == (MAXSIZE - 1))
    printf ("Stack is Full\n");
    return;
```



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```
else
     printf ("Enter the element to be pushed\n");
     scanf ("%d", &num);
     s.top = s.top + 1;
     s.stk[s.top] = num;
  }
  return;
void pop ()
  int num;
  if (s.top == -1)
     printf ("Stack is Empty\n");
     return (s.top);
  }
  else
     num = s.stk[s.top];
     printf ("poped element is = %dn", s.stk[s.top]);
     s.top = s.top - 1;
  return(num);
void display ()
  int i;
  if (s.top == -1)
     printf ("Stack is empty\n");
     return;
  }
  else
```

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```
printf ("\n The status of the stack is \n");
for (i = s.top; i >= 0; i--)
{
    printf ("%d\n", s.stk[i]);
}
printf ("\n");
```



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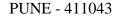
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Output:

```
***********
         ROLL NO:22119
************
STACK OPERATION
1)PUSH
2)P0P
3)DISPLAY
4)EXIT
Enter your choice
Enter the element to be pushed
Do you want to continue(Type 0 or 1)?
1)PUSH
2)POP
3)DISPLAY
4)EXIT
Enter your choice
Enter the element to be pushed
Do you want to continue(Type 0 or 1)?
1)PUSH
2)POP
3)DISPLAY
4)EXIT
Enter your choice
Enter the element to be pushed
Do you want to continue(Type 0 or 1)?
```





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```
1)PUSH
2)POP
3)DISPLAY
4)EXIT
Enter your choice
 The status of the stack is
Do you want to continue(Type 0 or 1)?
1)PUSH
2)POP
3)DISPLAY
4)EXIT
Enter your choice
poped element is = 7
Do you want to continue(Type 0 or 1)?
1)PUSH
2)POP
3)DISPLAY
4)EXIT
Enter your choice
 The status of the stack is
Do you want to continue(Type 0 or 1)?
```



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2) Queue using array:

```
INPUT:
#include<stdio.h>
#define max 5
struct queue
                  int arr[max];
                  int front;
                  int rear;
} s;
void enque(struct queue *s);
void deque(struct queue *s);
void display(struct queue *s);
void main()
                  printf("\n***********************************\n\t
QUEUE USING STRUCT");
                  printf("\n***********\n\t\t
s.front = -1;
                  s.rear = -1;
                  int c,choice;
                  do
                    printf("1.Insert/EnQueue\n2.Delete/DeQueue\n3.Display\n");
                  ");
                    printf("\nEnter your choice:");
                    scanf("%d",&c);
```

switch(c)



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```
{
                                case 1:
                                        enque(&s);
                                        break;
                                case 2:
                                        deque(&s);
                                        break;
                                case 3:
                                        display(&s);
                                        break;
                                default:
                                        printf("\nEnter valid choice.");
                            }
                                printf("\nPress 1 to continue and 0 to stop. \n");
                                scanf("%d",&choice);
                            }
                                while(choice==1);
                                getch();
void enque(struct queue *s)
                            if(s->rear == (max-1))
                                printf("Overflow");
                            else if(s->front == -1 \&\& s->rear == -1)
                                s->front = s->rear = 0;
                               printf("\nEnter the value which you want to insert:");
                                scanf("%d",&x);
                                s \rightarrow arr[s \rightarrow rear] = x;
                            }
                            else
                                s->rear++;
```



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```
printf("\nEnter the value which you want to insert : ");
                               scanf("%d",&x);
                               s->arr[s->rear]=x;
                           }
}
void deque(struct queue *s)
                           if(s->front == -1 \&\& s->rear == -1)
                               printf("Underflow");
                           else if(s->front == s->rear)
                               s->front = s->rear = -1;
                           }
                           else
                               s->front++;
void display(struct queue *s)
                           int i;
                           if(s->front == -1 \&\& s->rear == -1)
                               printf("Underflow");
                           else
                               printf("The elements in the queue are :\n");
                               for(i=s->front;i< s->rear+1;i++)
                                      printf("\%d\n",s->arr[i]);
```

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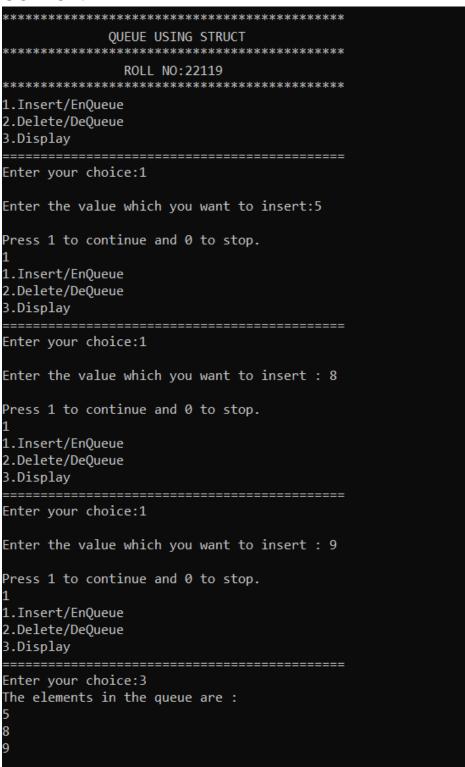
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OUTPUT:





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