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OST Lab 4 (Week 4)

Q1)

stack.h

```
#include<stdbool.h>
#define MAX 4

typedef struct {
    char data[MAX];
    int top;
} stack;

bool isFull(stack* s);
void push(stack *s, char c);
bool isEmpty(stack* s);
char pop(stack *s);
void display(stack* s);
```

push.c

```
#include<stdio.h>
#include<stdbool.h>
#include "stack.h"

bool isFull(stack* s){
    if(s->top == MAX-1){
        return true;
    }
    else
        return false;
}

void push(stack *s,char c)
{
    if(isFull(s)){
        printf("Stack is Full\n");
        return;
    }
    s->top++;
    s->data[s->top] = c;
}
```

pop.c

```
#include<stdio.h>
#include<stdbool.h>
#include "stack.h"

bool isEmpty(stack* s){
```

```

        if(s->top == -1){
            return true;
        }
        else
            return false;
    }

char pop(stack *s)
{
    if(!isEmpty(s)){
        return(s->data[s->top--]);
    }
}

```

display.c

```

#include<stdio.h>
#include "stack.h"

void display(stack* s){
    if(isEmpty(s)){
        printf("Stack is empty\n");
        return;
    }
    int count = s->top;
    while(count>-1){
        printf("%c\n",s->data[count--]);
    }
}

```

program.c

```

#include<stdio.h>
#include<stdbool.h>
#include "stack.h"

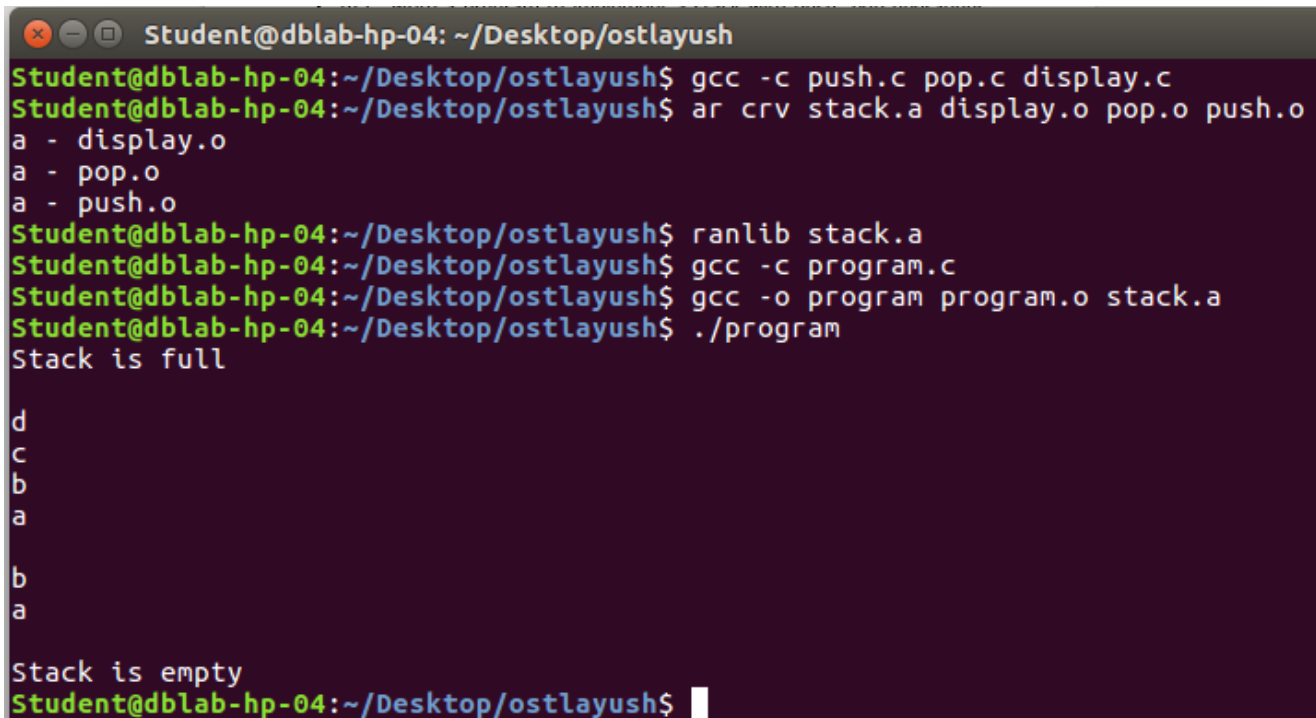
void main(){
    stack st;
    stack* s = &st;
    s->top = -1;
    push(s,'a');
    push(s,'b');
    push(s,'c');
    push(s,'d');
    push(s,'e');
    printf("\n");
    display(s);
    pop(s);
    pop(s);
    printf("\n");
    display(s);
    pop(s);
}

```

```
    pop(s);  
    pop(s);  
    printf("\n");  
    display(s);  
}
```

Terminal commands

```
gcc -c push.c pop.c display.c  
ar crv stack.a display.o pop.o push.o  
ranlib stack.a  
gcc -c program.c  
gcc -o program program.o stack.a  
./program
```



```
Student@dblab-hp-04: ~/Desktop/ostlayush  
Student@dblab-hp-04:~/Desktop/ostlayush$ gcc -c push.c pop.c display.c  
Student@dblab-hp-04:~/Desktop/ostlayush$ ar crv stack.a display.o pop.o push.o  
a - display.o  
a - pop.o  
a - push.o  
Student@dblab-hp-04:~/Desktop/ostlayush$ ranlib stack.a  
Student@dblab-hp-04:~/Desktop/ostlayush$ gcc -c program.c  
Student@dblab-hp-04:~/Desktop/ostlayush$ gcc -o program program.o stack.a  
Student@dblab-hp-04:~/Desktop/ostlayush$ ./program  
Stack is full  
  
d  
c  
b  
a  
  
b  
a  
  
Stack is empty  
Student@dblab-hp-04:~/Desktop/ostlayush$
```