

OST Lab

Week-4 Assignment Submission

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200905044

Batch B1

10

Experiment Question:

In C, write a program to implement a stack with push, pop operations using suitable functions. Create static libraries for various operations on stack. Create a header file for function declarations.

Code:

“program2.c”

```
#include <stdio.h>
#include <stdlib.h>
#include "stack.h"
#define MAX_STACK_SIZE 10
int main()
{
    push(2);
    push(3);
    push(4);
    int it = pop();
    display();
    it = pop();
    display();
```

```
// printf("\n");
```

```
return 0;
```

```
}
```

“stack.c”

```
#include <stdio.h>
```

```
#include <stdlib.h>
```

```
#include "stack.h"
```

```
#define MAX_STACK_SIZE 10
```

```
int top = -1;
```

```
int stack[MAX_STACK_SIZE];
```

```
void push(int item)
```

```
{
```

```
if (top >= MAX_STACK_SIZE - 1)
```

```
{
```

```
stackFull();
```

```
}
```

```
stack[++top] = item;
```

```
display();
```

```
}
```

```
int pop()
```

```
{
```

```
if(top == -1){
```

```
stackEmpty();
```

```
exit(0);
```

```
}
```

```
return stack[top--];
```

```
}  
void stackFull()  
{  
printf("Stack Full\n");}  
void stackEmpty()  
{  
printf("Stack Empty\n");  
}  
void display()  
{  
for(int i =0; i<=top; i++)  
{  
printf("%d\t", stack[i]);  
}  
printf("\n");  
}
```

“stack.h” :

```
void push(int);  
int pop();  
void stackFull();  
void stackEmpty();  
void display();
```

OUTPUT AND COMMANDS:

```
Student@prg19: ~/200905044/Week4
File Edit View Search Terminal Help
bill.c      fred.c  hello  libfoo.a  program  program.o  w4-2.png
Student@prg19:~/200905044/Week4$ vi program2.c
Student@prg19:~/200905044/Week4$ cat program2.c
#include <stdio.h>
#include <stdlib.h>
#include "stack.h"
#define MAX_STACK_SIZE 10
int main()
{
    push(2);
    push(3);
    push(4);
    int it = pop();
    display();
    it = pop();
    display();
    // printf("\n");
    return 0;
}
Student@prg19:~/200905044/Week4$ vi stack.c
Student@prg19:~/200905044/Week4$ cat stack.c
#include <stdio.h>
#include <stdlib.h>
#include "stack.h"
#define MAX_STACK_SIZE 10
int top = -1;
int stack[MAX_STACK_SIZE];
void push(int item)
{
    if (top >= MAX_STACK_SIZE - 1)
    {
        stackFull();
    }
    stack[++top] = item;
    display();
}
int pop()
{

```

```
Activities  Terminal  Mon 3:18 PM
Student@prg19: ~/200905044/Week4
{
    printf("Stack Empty\n");
}
void display()
{
    for(int i =0; i<=top; i++)
    {
        printf("%d\t", stack[i]);
    }
    printf("\n");
}
Student@prg19:~/200905044/Week4$ vi stack.h
Student@prg19:~/200905044/Week4$ cat stack.h
void push(int);
int pop();
void stackFull();
void stackEmpty();
void display();
Student@prg19:~/200905044/Week4$ gcc -c stack.c program2.c
Student@prg19:~/200905044/Week4$ gcc -o program2 program2.o stack.o
Student@prg19:~/200905044/Week4$ ./program2
2
2      3
2      3      4
2      3
2
Student@prg19:~/200905044/Week4$ ar crv libstack.a stack.o program2.o
a - stack.o
a - program2.o
Student@prg19:~/200905044/Week4$ ranlib libstack.a
Student@prg19:~/200905044/Week4$ gcc -o program2 libstack.a
Student@prg19:~/200905044/Week4$ ./program2
2
2      3
2      3      4
2      3
2
Student@prg19:~/200905044/Week4$
```

THANK YOU!