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LAB 4

Packages/stack.c

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

#define SIZE 10

int top = -1, inp_array[SIZE];

void push()
{
   int x;

   if (top == SIZE - 1)
   {
      printf("\nOverflow!!");
   }
   else
   {
      printf("\nEnter the element to be added onto the stack: ");
      scanf("%d", &x);
      top = top + 1;
      inp_array[top] = x;
   }
}

void pop()
{
   if (top == -1)
   {
      printf("\nUnderflow!!");
   }
   else
   {
      printf("\nPopped element: %d", inp_array[top]);
```

```
        top = top - 1;
    }
}

void show()
{
    if (top == -1)
    {
        printf("\nUnderflow!!");
    }
    else
    {
        printf("\nElements present in the stack: \n");
        for (int i = top; i >= 0; --i)
            printf("%d\n", inp_array[i]);
    }
}
```

Header/Lib.h

```
void push();
void pop();
void show();
```

Main.c

```
#include <stdio.h>
#include <stdlib.h>
#include "lib.h"

int main(){
    int choice;

    while (1)
    {
        printf("\nPerform operations on the stack:");
        printf("\n1.Push the element\n2.Pop the element\n3.Show\n4.End");
        printf("\n\nEnter the choice: ");
        scanf("%d", &choice);
```

```
        switch (choice)
        {
        case 1:
            push();
            break;
        case 2:
            pop();
            break;
        case 3:
            show();
            break;
        case 4:
            exit(0);

        default:
            printf("\nInvalid choice!!");
        }
    }
    return 0;
}
```

Execution steps:

1) cd packages
2) gcc -c stack.c [Compiling stack package into object file]
3) ar crv stack.a stack.o [Convert stack object into library]
4) cd ..
5) gcc -c main.c -I header [Compiling main program and searching in header folder additionally for header files]
6) gcc -o main main.o packages/stack.a [Compiling main object into executable]

Makefile

```
all: stack.o stack main

CC=gcc
INC=header
```

```
PAC=packages

stack.o: $(PAC)/stack.c
	$(CC) -c $(PAC)/stack.c

stack: $(PAC)/stack.o
	ar crv $(PAC)/stack.a $(PAC)/stack.o && ranlib $(PAC)/stack.a

main: main.c
	gcc -o main main.c -I $(INC) $(PAC)/stack.a
```

```
student@selab-01:~/Desktop/210905318/OSTL/L4$ make
gcc -c packages/stack.c
gcc    -c -o packages/stack.o packages/stack.c
ar crv packages/stack.a packages/stack.o && ranlib packages/stack.a
a - packages/stack.o
```

```
student@selab-01:~/Desktop/210905318/OSTL/L4$ ./main

Perform operations on the stack:
1.Push the element
2.Pop the element
3.Show
4.End

Enter the choice:
```

```
Enter the choice: 1

Enter the element to be added onto the stack: 5

Perform operations on the stack:
1.Push the element
2.Pop the element
3.Show
4.End

Enter the choice: 3

Elements present in the stack:
5

Perform operations on the stack:
1.Push the element
2.Pop the element
3.Show
4.End

Enter the choice:
```