K. J. Somaiya College of Engineering, Mumbai
(A Constituent College of Somaiya Vidyavihar University)
Department of Computer Engineering

Batch: B-2 Roll No.:16010122151
Experiment / assignment / tutorial No. 04
Grade: AA / AB / BB / BC / CC / CD /DD
Signature of the Staff In-charge with date

Title: Implementation of Stack applications.

Objective: To implement applications of stack

Expected Outcome of Experiment:

CO	Outcome
1	Explain the different data structures used in problem solving

Books/ Journals/ Websites referred:

1. *Fundamentals Of Data Structures In C* – Ellis Horowitz, Satraj Sahni, Susan Anderson-Fred
2. *An Introduction to data structures with applications* – Jean Paul Tremblay, Paul G. Sorenson
3. *Data Structures A Pseudo Approach with C* – Richard F. Gilberg & Behrouz A. Forouzan
4. *https://www.cprogramming.com/tutorial/computersciencetheory/stack.html*
5. *https://www.geeksforgeeks.org/stack-data-structure-introduction-program/*
6. *https://www.thecrazyprogrammer.com/2013/12/c-program-for-array-representation-of-stack-push-pop-display.html*

Assigned Stack application:

Algorithm:

- Start
- Initialize two stacks, say Stack and Backup-stack.
- Traverse the array of strings, Q, and perform the following operations:
- If Add data is selected then, push the character to Undo stack
- If Undo data is selected then, pop the top element from main stack and push it to backup stack.
- If Redo data is selected then, pop the top element of backup stack and push it into the main stack.
- If display data is selected then, print all the elements of the main stack.

Example:

- Perform Write P in the data. Therefore, the data contains only "P".
- Perform Write A on the data. Therefore, the data contains "PA".
- Perform Write R on the data. Therefore, the data contains "PAR".
- Perform Undo on the data. Therefore, the data contains "PA".
- Print the contents of the data, i.e. "PA"
- Perform Redo on the data. Therefore, the data contains "PAR".
- Print the contents of the data, i.e. "PAR"

Sourcecode:

```
#include<stdio.h>

#include<ctype.h>



char stack[100];

int top = -1;
```

```
void push(char x)

{

    stack[++top] = x;

}
```

```
char pop()

{

    if(top == -1)

        return -1;

    else

        return stack[top--];

}
```

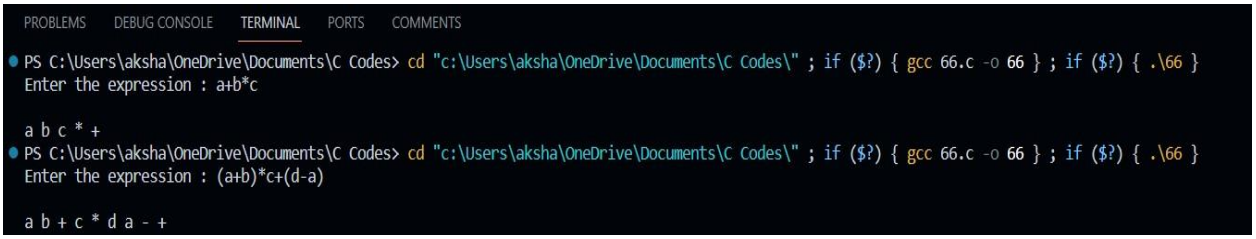
```
int priority(char x)

{

    if(x == '(')

        return 0;

    if(x == '+' || x == '-')

        return 1;

    if(x == '*' || x == '/')

        return 2;

    return 0;
```

```
}
```

```
int main()

{

    char exp[100];

    char *e, x;

    printf("Enter the expression : ");

    scanf("%s",exp);

    printf("\n");

    e = exp;



    while(*e != '\0')

    {

        if(isalnum(*e))

            printf("%c ",*e);

        else if(*e == '(')

            push(*e);

        else if(*e == ')')

        {

            while((x = pop()) != '(')

                printf("%c ", x);

        }

        else

        {

            while(priority(stack[top]) >= priority(*e))

                printf("%c ",pop());

            push(*e);

        }

        e++;

    }
```

```
    while(top != -1)
    {
        printf("%c ",pop());
    }return 0;
}
```

Output Screenshots:



Conclusion: Successfully implemented Undo-Redo operation implementation using static stack.