

## EXPERIMENT NO.3

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roll no. : 18

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

```
#define SIZE 100
char stack[SIZE];
int top = -1;
```

```
/* == push operation == */
```

```
void push(char item)
{
    if(top >= SIZE-1)
    {
        printf("\n Stack Overflow.");
    }
    else
    {
        top = top+1;
        stack[top] = item;
    }
}
```

```
/* == pop operation == */
```

```
char pop()
{
    char item ;

    if(top <0)
    {
        printf("stack under flow: invalid infix expression");
        getchar();
        /* underflow may occur for invalid expression */
        /* where ( and ) are not matched */
        exit(1);
    }
    else
    {
        item = stack[top];
        top = top-1;
        return(item);
    }
}
```

```
/* === define function that is used to determine whether any symbol is operator or not */
```

```

int is_operator(char symbol)
{
    if(symbol == '^' || symbol == '*' || symbol == '/' || symbol == '+' || symbol == '-')
    {
        return 1;
    }
    else
    {
        return 0;
    }
}

```

/\* === define function that is used to assign precedence to operator. \*/

```

int precedence(char symbol)
{
    if(symbol == '^')
    {
        return(3);
    }
    else if(symbol == '*' || symbol == '/')
    {
        return(2);
    }
    else if(symbol == '+' || symbol == '-')
    {
        return(1);
    }
    else
    {
        return(0);
    }
}

```

```

void InfixToPostfix(char infix_exp[], char postfix_exp[])
{
    int i, j;
    char item;
    char x;

    push('(');          /* push '(' onto stack */
    strcat(infix_exp, ""); /* add ')' to infix expression */

    i=0;
    j=0;
    item=infix_exp[i];

    while(item != '\0')
    {
        if(item == '(')
        {

```

```

        push(item);
    }
    else if( isdigit(item) || isalpha(item))
    {
        postfix_exp[j] = item;      /* add operand symbol to postfix expr */
        j++;
    }
    else if(is_operator(item) == 1) /* means symbol is operator */
    {
        x=pop();
        while(is_operator(x) == 1 && precedence(x)>= precedence(item))
        {
            postfix_exp[j] = x;      /* so pop all higher precedence
operator and */
            j++;
            x = pop();              /* add them to postfix expresion */
        }
        push(x);

        push(item);                /* push current operator symbol onto stack */
    }
    else if(item == ')')            /* if current symbol is ')' then */
    {
        x = pop();                  /* pop and keep popping until */
        while(x != '(')             /* '(' encountered */
        {
            postfix_exp[j] = x;
            j++;
            x = pop();
        }
    }
    else
    { /* if current symbol is neither operand not '(' nor ')' and nor operator */
        printf("\nInvalid infix Expression.\n");
        getchar();
        exit(1);
    }
    i++;

    item = infix_exp[i];
}
if(top>0)
{
    printf("\nInvalid infix Expression.\n");
    getchar();
    exit(1);
}

postfix_exp[j] = '\0'; /* add sentinel else puts() fuction */

```

```
}
```

```
/* === main function begins === */
```

```
int main()
```

```
{
```

```
    char infix[SIZE], postfix[SIZE];
```

```
    printf("\n Enter Infix expression : ");
```

```
    gets (infix);
```

```
    InfixToPostfix(infix,postfix);
```

```
    printf(" Postfix Expression: ");
```

```
    puts(postfix);
```

```
    return 0;
```

```
}
```

OUTPUT:

```
Activities Terminal Aug 4 12:39 PM dl0415@tadmn: ~
dl0415@tadmn:~$ gcc anogh.c
anogh.c: In function 'main':
anogh.c:158:2: warning: implicit declaration of function 'gets'; did you mean 'fgets'? [-Wimplicit-function-declaration]
158 |     gets (infix);
    |     ^
    |     fgets
/usr/bin/ld: /tmp/cc4sZ3eY.o: in function 'main':
anogh.c:(.text+0x3a1): warning: the 'gets' function is dangerous and should not be used.
dl0415@tadmn:~$ ./a.out
Enter Infix expression : 7*8
Postfix Expression: 78*
dl0415@tadmn:~$ ./a.out
Enter Infix expression : 7*9
Postfix Expression: 79*
dl0415@tadmn:~$ 8+8
8+8: command not found
dl0415@tadmn:~$ ./a.out
Enter Infix expression : 7*8/9
Postfix Expression: 78*9/
dl0415@tadmn:~$ 789*8078*98/8
bash: 789*8078*98/8: No such file or directory
dl0415@tadmn:~$ ./a.out
Enter Infix expression : ^C
dl0415@tadmn:~$ ./a.out
Enter Infix expression : 77*627/66*7
Postfix Expression: 77627*66/7*
dl0415@tadmn:~$
```