Apex College

BCIS Program

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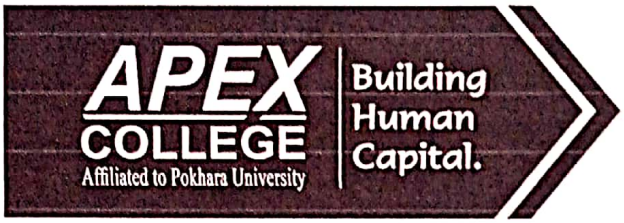

Data Structure & Algorithms
Lab Report

6. Evaluation of prefix and Prefix Expressions

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Lab 6 Objectives

- To evaluate the postfix expression
- To evaluate the prefix expression

Introduction

An evaluation of prostfix expression is the process that operator appears in the expression after the operands.

An evaluation of prefix expression is the process that operator appears in the expresson before the operands.

A program to evaluate postfix expression

```
#include <stdio.h>
#include <stdlib.h>
#include <ctype.h>
int stack [20]
int top = -1;
void push (int x) {
   stack [++top] = x;
}
int pop () {
   return stack [top--];
}
int main () {
  char exp[10];
  char *e;
  int n1, n2, n3, num;
  scan ("%s", exp);
```

```
while (*e != '\0') {
    if (isdigit(*e)) {
        num = *e - 48;
        push(num);
    }
    else {
        n2 = pop();
        n1 = pop();
        switch (*e) {
            case '+':
                n3 = n1 + n2;
                break;

            case '-':
                n3 = n1 - n2;
                break;

            case '*':
                n3 = n1 * n2;
                break;

            case '/':
                n3 = n1 / n2;
                break;
        }
        push(n3);
    }
    e++;
}
printf("Result of %s = %d", exp, pop());
return 0;
}
```

A program to evaluate prefix expression:

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

int stack[20];
int top = -1;

void push(int x){
   stack[++top] = x;
}

void pop(){
   return stack[top--];
}

int main(){
   char *e;
   int n1, n2, n3, num;
   scanf("%s", exp);
   e = strrev(exp);
   while(*e != '\0'){
      if(isdigit(*e)){
         num = *e - 48;
         push(num);
      }
      else{
         n1 = pop();
         n2 = pop();
         switch(*e){
            case '+':
               n3 = n1+n2;
               break;
            case '*':
               n3 = n1-n2;
               break;
```

```
        case '*':
            n3 = n1 * n2;
            break;
        case '/';
            n3 = n1 / n2;
            break;
        }
    push(n3);
    }
    e++;
}
printf("Result of %s = %d", exp, pop());
return 0;
}
```

Activities

We performed activities to evaluate an equation or expressions (i.e. prefix & postfix).

Conclusion

I learned about using prefix & postfix expression to understand about how a computer calculate a expression with value in different forms.