231501058 CS23231 – D a t a S t r u c t u r e s

**Ex. No.: 6**

**Evaluating Arithmetic Expression**

**Date: 12/4/24**

**Write a C prog ram to ev aluate Arithmetic expression using stack .**

**Algorithm:**

#include <stdio.h>

#include <stdlib.h>

#include <ctype.h>

struct node {

int data;

struct node\* next;

};

struct node\* top = NULL;

void push(int ele) {

struct node\* newnode = (struct node\*)malloc(sizeof(struct node)); if (newnode != NULL) {

newnode->data = ele;

newnode->next = top;

top = newnode;

}

}

int pop() {

if (top == NULL) {

printf("\nStack Underflow\n");

return -1;

} else {

int popped = top->data;

struct node\* temp = top;

top = top->next;

free(temp);

return popped;

}

}

int isEmpty() {

return top == NULL;

}

int evaluatePostfix(char\* expression) {

int i = 0;

while (expression[i] != '\0') {

if (isdigit(expression[i])) {

push(expression[i] - '0');



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| } else { |  |
| int val1 | = pop(); |
| int val2 | = pop(); |
| switch (expression[i]) { | |
| case | '+': push(val2 + val1); break; |
| case | '-': push(val2 - val1); break; |
| case | '\*': push(val2 \* val1); break; |
| case | '/': push(val2 / val1); break; |
| } |  |
| } |  |

i++;

}

return pop();

}

int main() {

char postfix[100] = "53+62/\*35\*+";

printf("Postfix expression: %s\n", postfix); int result = evaluatePostfix(postfix); printf("Evaluation result: %d\n", result);

return 0;

}

**OUTPUT**



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