

Data Structures and Algorithms

Objective: Understanding How Calculators Evaluate an Infix Expression Using Stack

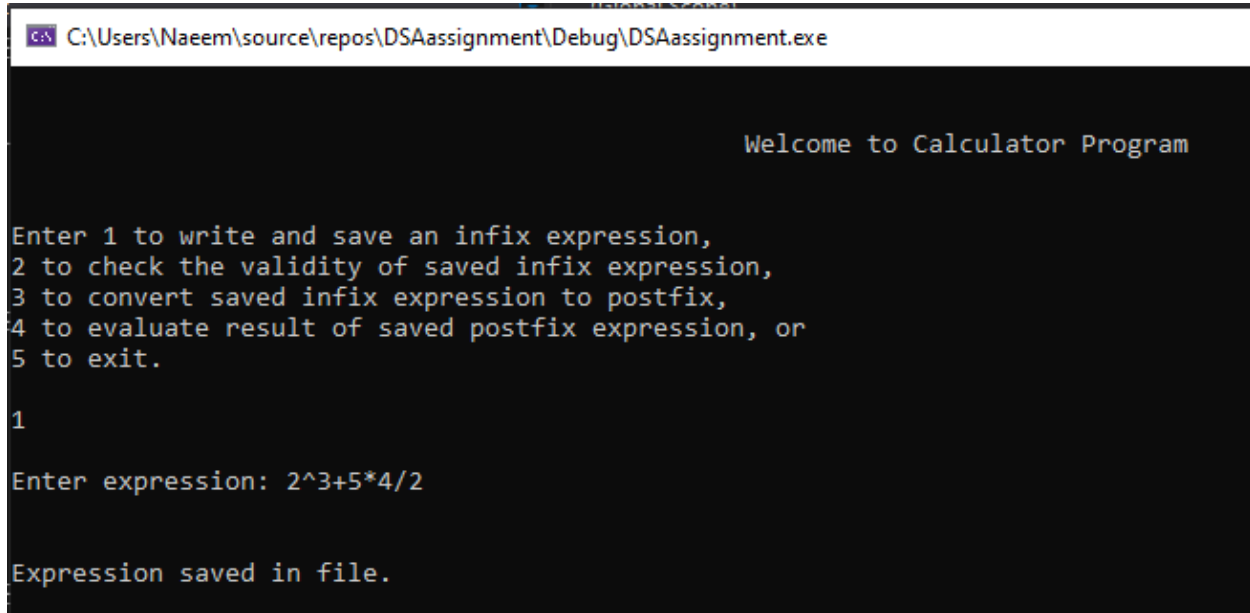
Problem Description:

- a) Create a Stack class (or use an existing class Template) to perform the following (No need to include the code for class ADT):
- b) Write a driver program which gives users the following options by means of a menu() function:
 - i. To write an expression (infix/postfix) in an output file.
 - ii. To read an infix expression from a file and check its validity (balanced/unbalanced).
 - iii. To read a valid infix expression from a file and convert it into a postfix expression and write it in an output file.
 - iv. To read a postfix expression from a file and evaluate it and display its value on console.

+++++

Output screenshots:

Function to write an infix expression and save it in file:



```
C:\Users\Naeem\source\repos\DSAassignment\Debug\DSAassignment.exe

Welcome to Calculator Program

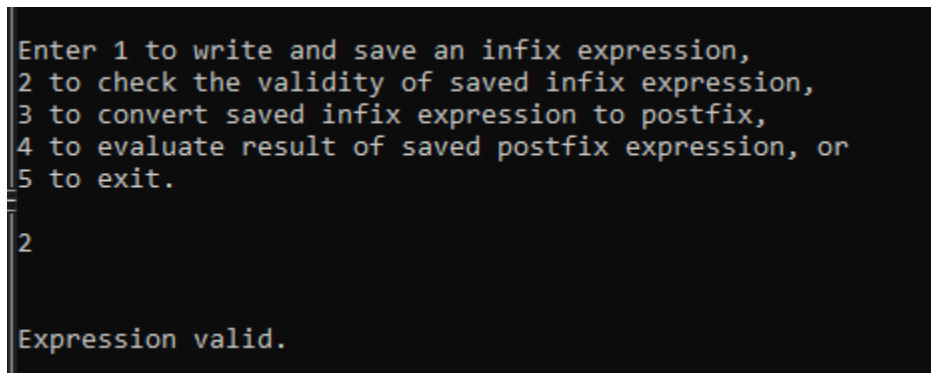
Enter 1 to write and save an infix expression,
2 to check the validity of saved infix expression,
3 to convert saved infix expression to postfix,
4 to evaluate result of saved postfix expression, or
5 to exit.

1

Enter expression: 2^3+5*4/2

Expression saved in file.
```

Function to check the validity of a saved infix expression:



```
Enter 1 to write and save an infix expression,
2 to check the validity of saved infix expression,
3 to convert saved infix expression to postfix,
4 to evaluate result of saved postfix expression, or
5 to exit.

2

Expression valid.
```

Function to convert a saved and valid infix expression to postfix and save it in another file:

```
Enter 1 to write and save an infix expression,  
2 to check the validity of saved infix expression,  
3 to convert saved infix expression to postfix,  
4 to evaluate result of saved postfix expression, or  
5 to exit.  
3  
Postfix expression generated and saved in file.
```

Function to evaluate the result of the saved postfix expression:

```
Enter 1 to write and save an infix expression,  
2 to check the validity of saved infix expression,  
3 to convert saved infix expression to postfix,  
4 to evaluate result of saved postfix expression, or  
5 to exit.  
4  
Final result: 18
```

Exit:

```
Enter 1 to write and save an infix expression,  
2 to check the validity of saved infix expression,  
3 to convert saved infix expression to postfix,  
4 to evaluate result of saved postfix expression, or  
5 to exit.  
5  
Goodbye!  
C:\Users\Naeem\source\repos\DSAassignment\Debug\DSAassignment.exe  
Press any key to close this window . . .
```