Practical Assignment 4

Source Code

```
#include <iostream>
#include <cctype>
#include <algorithm>
#include <stack>
using namespace std;

struct node{
 char data;

  node* left;
  node* right;
};


node* createNode(char input){
    node* node = (struct node*)malloc(sizeof(struct node));
    node->data = input;
    node->left = NULL;
    node->right=NULL;

    return node;
}

node* buildtree(string input){
  stack<node*> stack;
  for(int i=0;i<input.length();i++){
    if(isdigit(input[i])||isalpha(input[i])){
      node* new_node = createNode(input[i]);
```

```
      stack.push(new_node);
    }else if(input[i]=='+'||input[i]=='-'||input[i]=='*'||input[i]=='/'){
      struct node* new_node =createNode(input[i]);
      new_node->left=(stack.top());
      stack.pop();
      new_node->right= (stack.top());
      stack.pop();
      stack.push(new_node);

    }

  }
  return stack.top();

}

void inorder(struct node* root) {
    if (root) {
        inorder(root->left);
        cout<<(root->data);
        inorder(root->right);
    }
}

void preorder(struct node* root){
  if(root){
    cout<<(root->data);
    preorder(root->left);
    preorder(root->right);
  }
}
```

```
void postorder(struct node* root){
  if(root){
    postorder(root->left);
    postorder(root->right);
    cout<<(root->data);
  }
}

int main(){
   int choice;
   cout<<"Please enter whether string is postfix or prefix"<<endl;
   cin>>choice;
   string input;
   cout<<"Enter input \n";
   cin>>input;
   node* tree;
   switch(choice){
    case 1:
    tree = buildtree(input);
    break;
    case 2:
    reverse(input.begin(),input.end());
    tree = buildtree(input);
    break;
    default:
    cout<<"Invalid choice of input"<<endl;
    break;
   }

   cout<<"Enter choice of traversal"<<endl;
```

```
  cout<<"1.Inorder\n2.Postorder\n3.Preorder\n";
  cin>>choice;
  switch(choice){
   case 1:
   inorder(tree);
   break;
   case 2:
   postorder(tree);
   break;
   case 3:
   preorder(tree);
   break;
   default:
   cout<<"Invalid choice"<<endl;
   break;
  }



   return 0;
}
```

Output

```
Please enter whether string is postfix or prefix
1
Enter input
AB+C*
Enter choice of traversal
1.Inorder
2.Postorder
3.Preorder
1
```

C*B+A

neevsr@DESKTOP-VQKL5KK:/mnt/c/Users/AR/Documents/Assignments/DSA/Assignments/Assignment4$ ./ExTree

Please enter whether string is postfix or prefix

1

Enter input

AB+C*

Enter choice of traversal

1.Inorder

2.Postorder

3.Preorder

3

*C+BA

neevsr@DESKTOP-VQKL5KK:/mnt/c/Users/AR/Documents/Assignments/DSA/Assignments/Assignment4$ ./ExTree

Please enter whether string is postfix or prefix

2

Enter input

*C+BA

Enter choice of traversal

1.Inorder

2.Postorder

3.Preorder

2

CBA+*