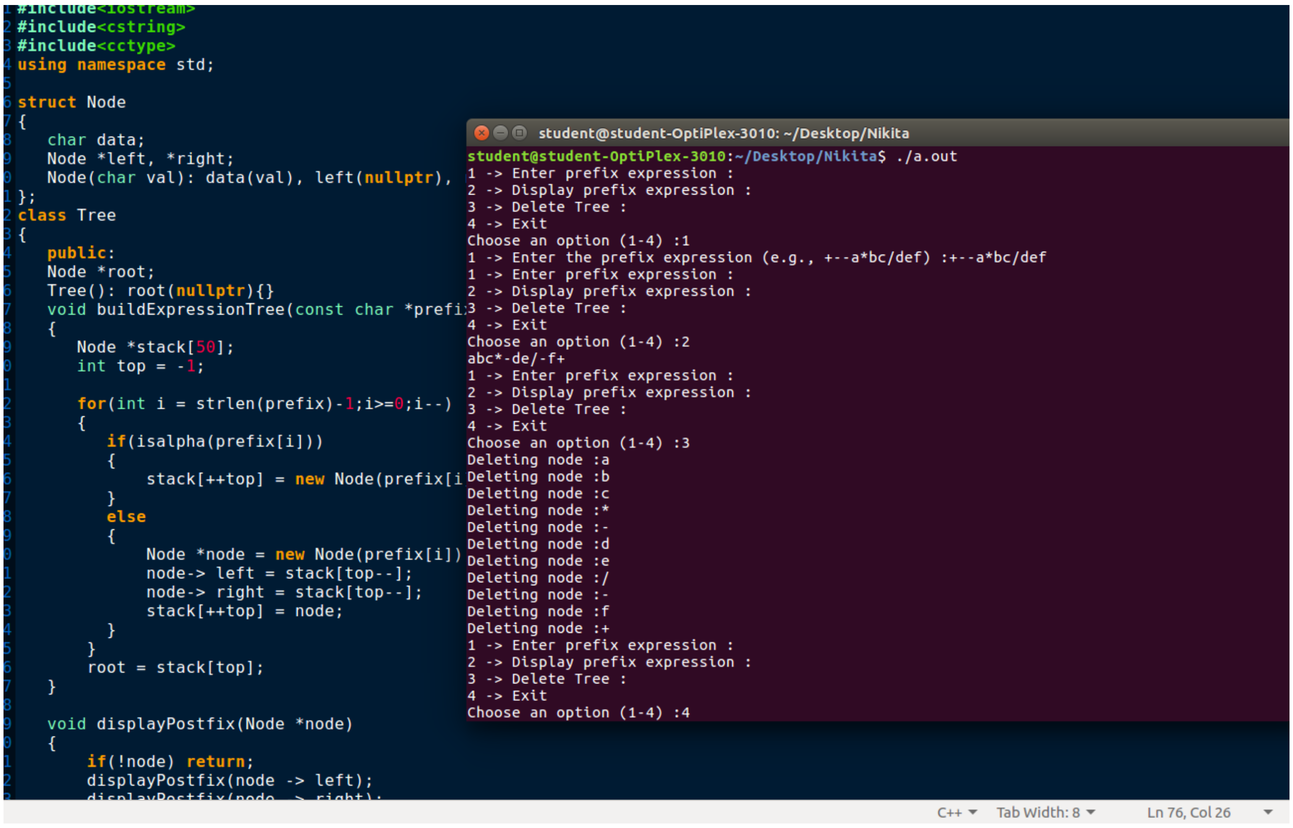
Assignment 5

```
#include<iostream>
#include<cstring>
#include<cctype>
using namespace std;

struct Node
{
   char data;
   Node *left, *right;
   Node(char val): data(val), left(nullptr), right(nullptr){}
};
class Tree
{
   public:
   Node *root;
   Tree(): root(nullptr){}
   void buildExpressionTree(const char *prefix)
   {
      Node *stack[50];
      int top = -1;

      for(int i = strlen(prefix)-1;i>=0;i--)
      {
         if(isalpha(prefix[i]))
         {
             stack[++top] = new Node(prefix[i]);
         }
         else
         {
             Node *node = new Node(prefix[i]);
             node-> left = stack[top--];
             node-> right = stack[top--];
             stack[++top] = node;
         }
       }
       root = stack[top];
   }

   void displayPostfix(Node *node)
   {
       if(!node) return;
       displayPostfix(node -> left);
       displayPostfix(node -> right);
       cout<< node -> data;
   }
   void deleteTree(Node *node)
   {
       if(!node) return;
       deleteTree(node -> left);
       deleteTree(node -> right);
       cout<<"Deleting node :"<<node -> data<<endl;
       delete node;
   }
};
```

```
int main()
{
    Tree tree;
    char expression[50];
    int choice;

    do
    {
       cout<<"1 -> Enter prefix expression :\n";
       cout<<"2 -> Display prefix expression :\n";
       cout<<"3 -> Delete Tree :\n";
       cout<<"4 -> Exit\n";
       cout<<"Choose an option (1-4) :";
       cin>>choice;

       switch (choice)
       {
           case 1:
               cout<<"1 -> Enter the prefix expression (e.g., +--a*bc/def) :";
               cin>> expression;
               tree.buildExpressionTree(expression);
               break;
           case 2:
               if(tree.root)
               {
                  tree.displayPostfix(tree.root);
                  cout<< endl;
               }
               else
               {
                  cout<<"Tree is empty..\n";
               }
               break;
           case 3:
               if(tree.root)
               {
                   tree.deleteTree(tree.root);
                   tree.root = nullptr;
               }
               else
               {
                   cout<<"Tree is already empty !!\n";
               }
               break;
           case 4:
               cout<<"\n//END OF CODE\n";
               break;
           default:
               cout<<"Choose a valid option(1-4).\n";
       }
    }
    while(choice!=4);
        return 0;
}
```



```cpp
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#include<cstring>
#include<cctype>
using namespace std;

struct Node
{
   char data;
   Node *left, *right;
   Node(char val): data(val), left(nullptr),
};
class Tree
{
   public:
   Node *root;
   Tree(): root(nullptr){}
   void buildExpressionTree(const char *prefi
   {
      Node *stack[50];
      int top = -1;

      for(int i = strlen(prefix)-1;i>=0;i--)
      {
         if(isalpha(prefix[i]))
         {
             stack[++top] = new Node(prefix[i
         }
         else
         {
             Node *node = new Node(prefix[i])
             node-> left = stack[top--];
             node-> right = stack[top--];
             stack[++top] = node;
         }
       }
       root = stack[top];
   }

   void displayPostfix(Node *node)
   {
       if(!node) return;
       displayPostfix(node -> left);
       displayPostfix(node -> right);
```

student@student-OptiPlex-3010: ~/Desktop/Nikita

```
student@student-OptiPlex-3010:~/Desktop/Nikita$ ./a.out
1 -> Enter prefix expression :
2 -> Display prefix expression :
3 -> Delete Tree :
4 -> Exit
Choose an option (1-4) :1
1 -> Enter the prefix expression (e.g., +--a*bc/def) :+--a*bc/def
1 -> Enter prefix expression :
2 -> Display prefix expression :
3 -> Delete Tree :
4 -> Exit
Choose an option (1-4) :2
abc*-de/-f+
1 -> Enter prefix expression :
2 -> Display prefix expression :
3 -> Delete Tree :
4 -> Exit
Choose an option (1-4) :3
Deleting node :a
Deleting node :b
Deleting node :c
Deleting node :*
Deleting node :-
Deleting node :d
Deleting node :e
Deleting node :/
Deleting node :-
Deleting node :f
Deleting node :+
1 -> Enter prefix expression :
2 -> Display prefix expression :
3 -> Delete Tree :
4 -> Exit
Choose an option (1-4) :4
```

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