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Course Code and Name: Compiler Construction (2CS701)

Practical No.: 6

Aim:

Intermediate Code Generation: To generate Three Address code for assignment statement

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Input Files:

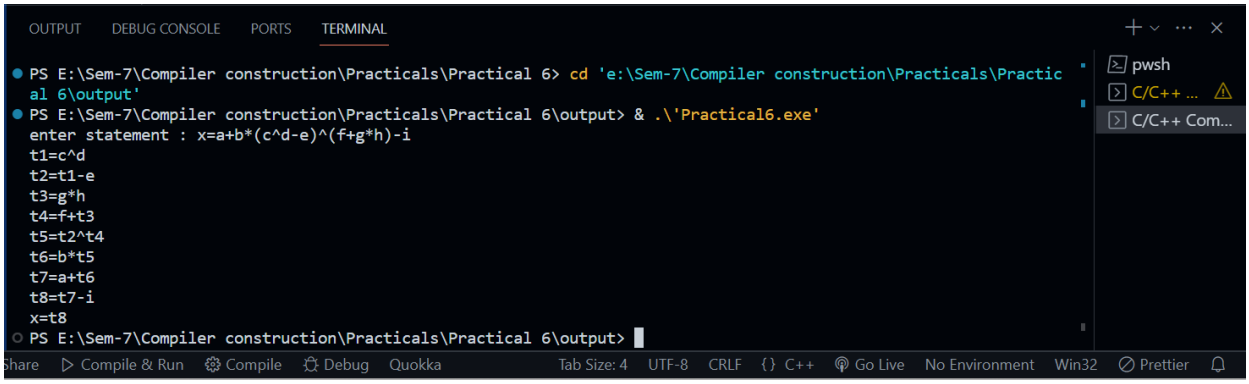
- **Practical6.cpp**

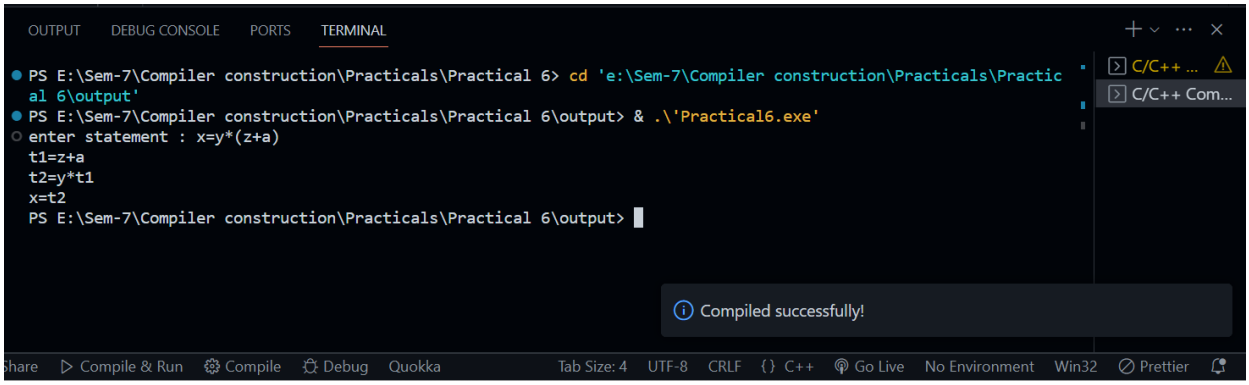
```
#include <bits/stdc++.h>
using namespace std;

int prec(char c)
{
    if (c == '^')
        return 3;
    else if (c == '/' || c == '*')
        return 2;
    else if (c == '+' || c == '-')
        return 1;
    else
        return -1;
}
string infixToPostfix(string s)
{
    stack<char> st;
    string result;

    for (int i = 0; i < s.length(); i++) {
        char c = s[i];

        if ((c >= 'a' && c <= 'z') || (c >= 'A' && c <= 'Z')
            || (c >= '0' && c <= '9'))
            result += c;

        else if (c == '(')
            st.push('(');

        else if (c == ')') {
```

```
            while (st.top() != '(') {
                result += st.top();
                st.pop();
            }
            st.pop();
        }

        else {
            while (!st.empty()
                && prec(s[i]) <= prec(st.top())) {
                result += st.top();
                st.pop();
            }
            st.push(c);
        }
    }
    while (!st.empty()) {
        result += st.top();
        st.pop();
    }

    return result;
}

int main()
{
//  string s = "x=a+b*(c^d-e)^(f+g*h)-i";

    // string s = "x=y*(z+a)";
    string s;
    cout<<"enter statement : ";
    cin>>s;

    string var = "";
    int i = 0;
    while(i<s.size()){
        if(s[i] == '=') break;
        else var.push_back(s[i++]);
    }
    s.erase(s.begin(),s.begin()+i+1);

    string res = infixToPostfix(s);
//  cout<<res<<endl<<endl;

    stack<string> st;
```

```
    int ind = 0;
    vector<string> ans;
    int cnt = 1;
    while(ind<res.size()){
        if(res[ind] == '+' || res[ind] == '-' || res[ind] == '*' ||
res[ind] == '/' || res[ind] == '^'){
            string t1 = st.top();
            st.pop();
            string t2 = st.top();
            st.pop();
            string temp = "t" + to_string(cnt) + "=" + t2 + res[ind] +
t1;
            ans.push_back(temp);
            st.push("t" + to_string(cnt));
            cnt++;
        }
        else{
            string zuzu = "";
            zuzu.push_back(res[ind]);
            st.push(zuzu);
        }
        ind++;
    }
    string str = var;
    str += "=t" + to_string(--cnt);
    ans.push_back(str);
    for(auto it:ans){
        cout<<it<<endl;
    }
    return 0;
}
```

Output:





Conclusion:

After performing this practical, I learn how to generate Intermediate Code Generation To generate Three Address code for assignment statement.
