Program-9

Q) Write a program to generate three address code of an expression.

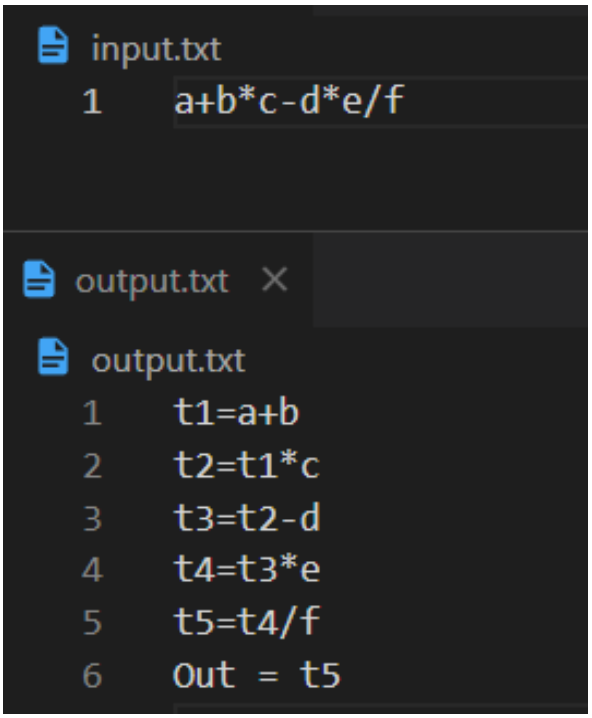
Code:-

```
#include<bits/stdc++.h>
using namespace std;
inline void debugMode() {
    #ifndef ONLINE_JUDGE
    freopen("input.txt", "r", stdin);
    freopen("output.txt", "w", stdout);
    #endif
}
bool isLetter(char ch) {
    return ((ch>='A' && ch<='Z') || (ch>='a' && ch<='z'));
}
bool isDigit(char ch) {
    return (ch>='0' && ch<='9');
}
bool isOperator(char ch) {
    return (ch=='+' || ch=='-' || ch=='*' || ch=='/');
}
int main() {
    debugMode();
    string str;
    cin>>str;
    stack<string> st1;
    stack<char> st2;
    vector<string> vec;
    int n = str.size();
    int cnt=1;

    string s;
```

```
vector<string> ans;
string finalOut;
for(int i=0; i<n; i++) {
    if(str[i] == ' ') continue;

    if(isLetter(str[i])) {
        if(vec.size() == 0) {
            string s1;
            s1.push_back(str[i]);
            vec.push_back(s1);
        }
        else if(vec.size() == 2) {
            string s1;
            s1.push_back(str[i]);
            vec.push_back(s1);

            string temp;
            string tempVar;

            tempVar.push_back('t');
            string tempVarNum = to_string(cnt);
            cnt++;
            for(auto it : tempVarNum) {
                tempVar.push_back(it);
            }
            finalOut = tempVar;
            for(auto it : tempVar) {
                temp.push_back(it);
            }
            temp.push_back('=');
            for(auto it : vec) {
                for(auto it1:it)
                    temp.push_back(it1);
            }
```

```
            vec.clear();
            ans.push_back(temp);
            vec.push_back(tempVar);
            st1.push(tempVar);
        }
    }
    else if(isOperator(str[i])) {
        if(vec.size() == 1) {
            string s1;
            s1.push_back(str[i]);
            vec.push_back(s1);
        }
    }
}
for(auto it : ans) {
    cout<<it<<"\n";
}
cout<<"Out = "<<finalOut<<"\n";
return 0;
}
```

Output:-



Program-10

Q) Write a program to check whether a string belongs to given grammer or not.

Code:-

```
#include<bits/stdc++.h>
using namespace std;
inline void debugMode() {
    #ifndef ONLINE_JUDGE
    freopen("input.txt", "r", stdin);
    freopen("output.txt", "w", stdout);
    #endif
}
int main() {
    debugMode();
    // S->aS
    // S->Sb
    // S->ab
    string str;
    cin>>str;
    int fl=0;
    int cnt1=0, cnt2=0;
    for(auto it : str) {
        if(it == 'a') {
            if(cnt2 != 0) {
                fl=1;
                break;
            }
            cnt1++;
        }
        else if(it == 'b') {
            if(cnt1 == 0) {
```

```
            fl=1;
            break;
        }
        cnt2++;
    }
    else {
        fl=1;
        break;
    }
  }
  if(fl) {
    cout<<"Given string doesn't satisfy the grammer\n";
  }
  else {
    cout<<"Given string satisfies the grammer\n";
  }
  return 0;
}
```

Output:-