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//-----  
//File mcr.cpp processes command line arguments and invokes lex (yylex)  
//to find tokens in the input file.  
//-----  
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//Date: September, 2018  
//-----  
//C++ include files  
//-----  
#include <iostream>  
#include <fstream>  
#include <cstdio>  
#include <string>  
#include <iomanip>  
#include <cstring>  
#include <cstdlib>  
using namespace std;  
//-----  
//Application include files  
//-----  
#include "mcrlex.h"  
//-----  
//FileException is thrown when a file whose name is given on the command line  
//cannot be opened.  
//-----  
struct FileException {  
    FileException(const char* fn)  
    {    cout << endl;  
        cout << "File " << fn << " cannot be opened.";  
    }  
};
```

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//-----  
//Commandlineerror is thrown when too many arguments are put on the  
//command line  
//-----  
struct CommandLineException {  
    CommandLineException(int m,int a)  
    {   cout << endl;  
        cout << "Too many command line arguments";  
        cout << endl;  
        cout << "A maximum of " << m;  
        cout << " command line arguments can appear on the command line.";  
        cout << endl;  
        cout << a << " arguments were entered.";  
        cout << endl;  
        cout << "p01 (<input file name> (<output file name>))";  
    }  
};  
//-----  
//Function Title prints a title  
//-----  
void Title(ostream& o)  
{   o << endl;  
    o << setw(15) << "Token Code";  
    o << " ";  
    o << setw(15) << "Token Name";  
    o << " ";  
    o << "Token Spelling";  
}
```

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//-----  
//Function LexMgr processes the input file, calls yylex, the scanner, and  
//produces the output file.  
//-----  
void LexMgr(FILE* i,ostream& o)  
{ static const char* TokenName[]={  
    {"EOF"      ,"ID"      ,"BEGIN"     ,"END"  
    ,"READ"     ,"WRITE"   ,"INTLIT"   ,"COMMA"  
    ,"SEMICOLON","ASSIGN"  ,"PLUS"     ,"MINUS"  
    ,"SLASH"    ,"STAR"   ,"LPAREN"   ,"RPAREN"  
    ,"ERROR"  
};  
    Lexer L(i);          //Redirect yylex to read file i instead of the command line  
    Title(o);  
    for (int t=yylex();t>0;t=yylex()){  
        o << endl;  
        o << setw(15) << t;  
        o << " ";  
        o << setw(15) ;  
        o << TokenName[t];  
        o << " ";  
        o << L.FetchSpelling();  
    }  
    o << endl;  
}
```

```
//-----  
//Function main processes command line arguments  
//-----  
int main(int argc, char* argv[])  
{ try {  
    char ifn[255],ofn[255];  
    switch (argc) {  
    case 1://no files on the command line  
        cout << "Enter the input file name. ";  
        cin >> ifn;  
        cout << "Enter the output file name. ";  
        cin >> ofn;  
        break;  
    case 2://input file on the command line/prompt for output file  
        strcpy(ifn,argv[1]);  
        cout << "Enter the output file name. ";  
        cin >> ofn;  
        break;  
    case 3://Both files on the input line  
        strcpy(ifn,argv[1]);  
        strcpy(ofn,argv[2]);  
        break;  
    default:  
        throw CommandLineException(2,argc-1);  
        break;  
    }  
    FILE* i=fopen(ifn,"r"); if (!i) throw FileException(ifn);  
    ofstream o(ofn); if (!o) throw FileException(ofn);  
  
    LexMgr(i,o);  
  
    fclose(i);  
    o.close();  
} catch ( ... ) {  
    cout << endl;  
    cout << "Program Terminated";  
    cout << endl;  
    exit(EXIT_FAILURE);  
}  
return 0;  
}
```