21MIS1048

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SWE-4001

System Programming

Lab-8

Write a C program to Implement pass two of a direct-linking loader. Sample three input files are given. Sample output files are given.

Code:

#include<bits/stdc++.h>

using namespace std;

class Pass2{

int PROGADDR;

int CSADDR;

string PROGRAM\_NAME;

int LENGTH;

vector<string> files;

map<string,int> controlSection;

map<string,int> ESTAB;

string WHITESPACE = " \n\r\t\f\v";

string ltrim(const string &s)

{

size\_t start = s.find\_first\_not\_of(WHITESPACE);

return (start == string::npos) ? "" : s.substr(start);

}

string rtrim(const string &s)

{

size\_t end = s.find\_last\_not\_of(WHITESPACE);

return (end == string::npos) ? "" : s.substr(0, end + 1);

}

string trim(const string &s) {

return rtrim(ltrim(s));

}

void writeLine(vector<string> line,bool isPass1=true){

string record = line[0];

if(isPass1)

{ fstream outputFile("output.txt",ios::app);

if(record=="H"){

CSADDR = PROGADDR;

outputFile<<line[1]<<"\t\t\t"<<hex<<PROGADDR<<"\t"<<line[3]<<endl;

// add ControlSection in memory;

controlSection.insert({line[1],PROGADDR});

PROGRAM\_NAME = line[1];

LENGTH = stoi(line[3],nullptr,16);

PROGADDR+=stoi(line[3],nullptr,16);

}

else if(record=="D"){

for(int i=1;i<line.size()-1;i+=2){

ESTAB.insert({line[i],CSADDR+stoi(line[i+1],nullptr,16)});

outputFile<<"\t\t"<<line[i]<<"\t"<<hex<<CSADDR+stoi(line[i+1],

nullptr,16)<<endl;

}

}}else{

fstream out("pass2Out.txt", ios::app);

int index = 1;

if(record =="H"){

out<<index++<<"\t"<<line[1]<<"\t"<<hex<<controlSection[line[1]

]<<endl;

}

else if(record=="R"){

for(int i=1; i<line.size();i++){

cout<<line[i]<<"===="<<ESTAB[trim(line[i])]<<endl;

out<<index++<<"\t"<<line[i]<<"\t"<<hex<<ESTAB[trim(line[i])]<<endl;

}

out<<"\n\n\n\n";

}

}

}

public:

Pass2(int proAddr, vector<string> f){

PROGADDR = proAddr;

CSADDR = proAddr;

files = f;

}

void generatePass2(){

for(int i=0;i<files.size();i++){

fstream inputFile(files[i],ios::in);

if(inputFile.is\_open()){

string lineBuffer;

while(getline(inputFile,lineBuffer)){

stringstream ss(lineBuffer);

string pointerBuffer;

vector<string> line;

while(getline(ss, pointerBuffer,'^')){

line.push\_back(pointerBuffer);

}

writeLine(line,false);

}

}}

}

void doPass1(){

for(int i=0;i<files.size();i++){

fstream inputFile(files[i],ios::in);

if(inputFile.is\_open()){

string lineBuffer;

while(getline(inputFile,lineBuffer)){

stringstream ss(lineBuffer);

string pointerBuffer;

vector<string> line;

while(getline(ss, pointerBuffer,'^')){

line.push\_back(pointerBuffer);

}

writeLine(line);

}

}}

}

};

int main(){

vector<string> files = {"proga.txt","progb.txt","progc.txt"};

Pass2 p2(16384, files);

p2.doPass1();

p2.generatePass2();

}

Output:



