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/*************************************************************************
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Project: CS530 Assignment 1
File: functions.cpp
Notes: This file holds all the functions we use in our main.
*************************************************************************
**********/



#include "functions.h"  //Include the header file
#include <iostream>
#include <fstream>
#include <string>
#include <vector>
#include <bitset>   //Incude to be able to do the conersion of binary
#include <cctype>
#include <iomanip>


using namespace std;

/*************************************************************************
***********
Function: Filength
Notes: This function reads in a file,goes through,and returns the length of
it.
I/O:
Input:A string of the file name.
Output: It is a int of the length of the file.
*************************************************************************
**********/
int functions::filelengthf(const string& filename){
    int length;
    ifstream file;
    file.open(filename.c_str());
    file.seekg(0,ios::end);      //go through the file from beginning to end
    length = file.tellg();
    return length;
}

/*************************************************************************
**********
Function: filetovectorbinary

Notes:This function reads in a file.Then is saves every 6 bytes into a
string,then stores
it in a vector.It does this till the filelength is read.

I/O:
Input:A string of the file name.
Output: It is a vector of strings.
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```
vector<string> functions::filetovectorbinary(const string& filename){
    vector<string> filecontents;
    int filelength = filelengthf(filename) ;          //Get length of file
    char c;
    string stringtov;

    ifstream file;
    file.open(filename.c_str());                      //Open the file

    int i=0;
    int j=0;
    int s;
    while(j<filelength){       //Go trhough the file till it ends
        stringtov.clear();     //Clear the string each time to put in vector
        s =j+5;                //Get only 6 bytes for the binary conversion
        while (i<=(s) && j<filelength){
//get the next character till you have 6 bytes and its less than filelength
            file.get(c);
            stringtov +=c;
            i++;
            j++;
        }
    filecontents.push_back(stringtov);
//push back on the string of 6 characters onto the vector
    }
    return filecontents;                      //return the vector

}
/**************************************************************************
**********
Function: filetovectorhex

Notes: This function reads in a file.Then is saves every 16 bits into a
dtring,then stores
it in a vector.This is done till the filelength is reached.
I/O:
Input:A string of the file name.
Output: It is a vector of strings.
**************************************************************************
*********/
vector<string> functions::filetovectorhex(const string& filename){
    vector<string> filecontents;
    int filelength = filelengthf(filename) ; // get the length of the file
    char c;
    string stringtov;

    ifstream file;
    file.open(filename.c_str());      // open the file

    int i=0;
    int j=0;
    int s;
    while(j<filelength){       // go through the file untill it ends
        stringtov.clear();// clear the string each time to put into vector
        s =j+15;       // get only 16 bytes for the hex conversion
        while (i<=(s) && j<filelength){
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// get the next character untill you have 16 bytes and its less than
filelength
            file.get(c);
            stringtov +=c;
            i++;
            j++;
        }
    filecontents.push_back(stringtov);
// push back onto the string of 16 characters onto the vector
    }
    return filecontents;              // return the vector

}
/*****************************************************************************
**********
Funtion: printhex

Notes: This function takes in a vector of strings.Then it goes through each
index in the
vector and converts each character to hex.It also makes all non printing
characters into a
(.).It also properly spaces out the bytes,prints the address and human
readable string properly.

I/O -:
 Input:Vector string
OutPut: Printed out conversion,address,and human readable content.
*****************************************************************************
*********/


void functions::printhex(vector<string> contents){
        string string;
        int printcount = 0;
        int othercount =0;
        int counter;
        int addr =0;
        int stringl;
        for(int i =0; (unsigned)i !=contents.size();i++){
// goes through each index of the vector
            string = contents[i];     // makes the index into a string
            stringl = string.length();
            othercount = 0;
            cout<<setfill('0')<< setw(8)<< addr << ": ";
// print out the address with leading zeros if applicable
            for(int j=0;j<stringl;j++){
// goes through each character of the string saved
                addr = addr+1;
                cout<<setfill('0')<<setw(2)<< hex<< (int)string[j];
// the conversion of hex, with leading zeros if applicable
              if(isprint(string[j])==0){
// prints the nonprinting charcters into periods
                    string[j] = '.';
                }
                printcount++;
                if(printcount == 2){  // puts a space between every two bytes
                    cout<< " " ;
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                    printcount = 0;
                   othercount++;
                }
            }
           if(stringl != 16){
               counter = stringl *2;          // if string is less than 16
               counter = counter + othercount;
// counter to keep track of spacing
               while(counter <=39){
// while spacing is less than 39 fill with space if applicable
                       cout<<" ";
                       counter++;
               }
           }
            cout<<string<<endl;
// prints out human readable string
        }

}

/*************************************************************************
*******
Funtion: printbinary

Notes: This function takes in a vector of strings.Then it goes through each
index in the
vector and converts each character to binary.It also makes all non printing
characters into a
(.).It also properly spaces out       the bytes,prints the address and human
readable string properly.

I/O -:
 Input:Vector string
OutPut: Printed out conversion,address,and human readable content.
*************************************************************************
******/
void functions::printbinary(vector<string> contents){
        string string;
        int length;
        int addr=0;
        int counter =0;
        for(int i =0; (unsigned)i !=contents.size();i++){
 //goes through each character of our saved vector
               string = contents[i];
// save index into a string
               length = string.length();
               cout<<setfill('0')<< setw(8)<<hex<< addr << ": ";
// prints out address with leading zeros if applicable
               for(int j=0;j<length;j++){
// goes through each character in the string
                       addr = addr+1;
                       cout<< bitset<8>(string[j])<<" ";
// conversion to binary of each byte
                       if(isprint(string[j])==0){
// converts any nonprintable character into periods
                               string[j] = '.';
                       }
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                        counter++;
                }
                if(length != 8){       // if the string is less than 8
                        counter = length *9;// counter to keep track of spacing
                        while(counter <=53){
// while spacing is less than 53 fill with space if applicable
                                cout<<" ";
                                counter++;
                        }
                }
                cout<<" "<<string<<endl;   // prints out human readble string
        }
}
```