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CSC 317 – Prog2 – B_17
5/1/2015

b17.cpp

// description of program

This program is a simulation of a b17 assembly processor. It will read in a file and perform the necessary action. It will recognize improper addressing modes and halt the program.

// description of the algorithms and libraries used

<iostream>	**//**Used for output to the console
<string>	**//**Used to handle and process inputs from file.
<vector>	//Used to simulate memory.
<fstream>	//To handle input files.
<stdio.h>	//Used for printf
<sstream>	//Used to convert decimal to hex string.
<iomanip>	**//Used for hex format print out**
<climits>	**//Call INT_MAX from this library**

// description of functions and program structure

Int main(int argc, char argv)**

Handles necessary function calls

string parse_file(ifstream &fin, vector<string> &mem);

Reads through input file one line at a time and places information into a vector used to simulate memory.

string hex_to_bin(string hex);
Changes a hex number string to a binary number string.

string bin_to_hex(string bin);
Changes a binary number string to a hex number string.

void split_instruction(string instruction, string &hex, string &lastThree);
Takes a string and splits it into two separate strings.

void get_op_and_am(string lastThree, string &opcode, string &addressMode);
Changes three digit hex opcode to binary then splits it into the operator and address mode.

void print_line(string address, string instruction, string op_name, string address_mode, string accumulator_hex);
Prints a properly formatted line to the screen.

void action(vector<string> &memory, stirng op, string &op_name, string address_mode, string &accumulator, string operand_address, string &address, string mem_address);
This function will the actual simulation of the b17 assembly processor. It will read each opcode and execute them appropriately and use whatever information that is stored in memory.

// how to compile and use the program
Compile:

g++ -std=c++11 –c -Wall

Usage:

Typing ./b17 and a input file will invoke the program. No other input is necessary to simulate the assembly processor.

// description of the testing and verification process
Used all test files that was provide by Dr. Karlsson to simulate the b17 assembly processor to make sure it matches the output.

// description of Makefile
The makefile provides the basic routine to create an executable for b17.cpp.