Project 2 milestone Design Document

Overview:

The UVSim is a program designed to simulate a virtual machine. The main purpose is to educate computer science students on machine language and computer architecture. The simulator will interpret lines of machine language in BasicML. Instructions are read from a file into the program.

User Stories:

As a computer science student

I want to learn computer architecture

and get an understanding of machine language

As a computer science teacher

I want to educate my students

on machine language

Use Cases:

Student enters BasicML codes into a notepad

then they execute the program

instructions given are done.

A user wants to load data from a point in memory

they enter the LOAD code 20 with the location in memory

program is executed and the data is loaded into the accumulator

John needs to add a number with one stored in memory location 21

he adds his new number to memory with read 1043

after loading that number into the accumulator with 2043

the numbers are added with code 3021

A teacher wants to demonstrate writing words from memory to screen

first they read a word from the keyboard to memory with 1002

then they write it to screen with 1102

Emily needs to divide from a number stored at 08

she enters the number to divide with 1009

then loads it into accumulator with 2009

using code 3208 she divides them

A student wants to read keyboard input to memory

they give the sim code 1001 and execute

the input is stored in memory

A tester wants to ensure the code stops properly

they enter code 4300 at the end of their program

it halts and exits.

A programmer wants to branch to a different section in memory

they input the code 4026 into the UVSim

the program executes and goes to memory location 26

David wants to store a word into memory

they input the code 1001 to store it into 01 in memory

after executing the word is stored

Sarah wants to subtract two numbers with the program

the first she reads into memory slot 01 with 1001

the second she puts into 02 with 1002

then she loads up the second number with 2002

finally she uses 3101 to subtract the first number from the second