Mid-Project Report

Progress to date:

To date, our main progress has been our research into the architecture of the Nintendo Gameboy and the development of core CPU functions. Our research mainly focused on the instruction set, which resembles that of the Zilog Z80, the memory map detailing internal RAM, VRAM, ROM banks etc., and the video system.

We have currently developed some of the fundamental functions of the system: the register file, memory map, memory allocation, CPU timers, and many instructions. The instructions implemented so far are most variants of load, store, add, subtract, and various logical instructions. Work continues on I/O, graphics, and the bulk of the instruction set.

Problems encountered:

One issue with handling I/O is the adjustment to a new language and API, namely C++ and SDL2, respectively. Another challenge is working with the layout of graphics in memory with its tile system, background tile map and so on. The major challenge with implementing the CPU is simply implementing the large number of instructions. Finally, there is the larger group challenge of integrating our code and coordinating between ourselves.

Proposed changes:

Due to the ratio of work-to-do to time remaining, we propose eliminating the additional requirement of designing a version of the architecture with a two-stage pipeline. Given what work remains, we believe we cannot feasibly complete this along with the emulator.