

SYSC 4001 Assignment 1: Report

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Introduction

The goal of the Assignment was to design a simulation that models the behavior of Interrupts. Using the data found during the assignment, the effects of different parameters of the system can be observed. This report will focus on the effects of the following parameters.

Context Save/Restore speed (10ms, 20ms, 30ms)

Context save/restore times refer to the amount of time the CPU takes to save the context of the program currently running to memory. Because of how common this action is when trying to simulate Interrupts, as this parameters duration increases, the total execution time of the system increases linearly.

ISR Activity time

ISR activity time refers to the amount of time the CPU takes to deal with interrupts. Keeping ISR's quick is extremely important to the performance of the CPU. With ISR times being too high the CPU keeps processing the same ISRs instead of programs causing massive downtime of effective processing.

Interrupt Speed

Keeping the previous two parameters fast is extremely important to the overall effectiveness of the processor. The less time the processor can spend on these tasks, the more it has to process actual programs.

CPU Speed

In the context of this assignment the speed of the CPU is not as important as the other parameters already mentioned. Of course, increasing the speed of the CPU would increase the overall speed of the system, however, I/O devices would not see that benefit. The speed of other parameters allows for a higher percentage of processing power to be spent on programs. A balance between CPU speed and Interrupt duration is needed for a fast system.

Address Size (2 to 4 bytes)

Larger address sizes would allow for more ISRs in exchange for a slightly slower access speed. This change would be beneficial for systems that use more I/O but as good practice Address sizes should be as small as they can to open up memory for other processes.