Lesson project: computer Architecture and microprocessor

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The first part - project definition

Using an 8051 processor and a number of other auxiliary tools (such as 7-segment and keyboard, etc.), build a processor simulator system. Your system should load the user's desired code in a desired space of the memory - which he enters with the help of the keyboard - and then start reading and executing the code.

All communication between the user and this system must be done using the keyboard. This system is known as MicroProfessor, for more information about it, you can refer to the address below 1. In this section, first, provide a formal description of the design of this system.

Then carefully mention the technical dimensions of the project and examine its three possible challenges. Solutions to solve this

Present challenges and explore these solutions together.

Part II - A potential challenge

In simulating the instructions of a processor on the same processor, it is possible that the instructions that are in the standard state without nothing or jumps (in the case of each of the JMPs) were executed incorrectly (one of these cases is to check the order of the conventional instructions discussed in the class) and see if the commands can be executed in the old form or if changes need to be made? If the answer is yes, explain the necessary changes and mention them. Make sure that your emulator must run any code that can be executed on the processor.

Part III - implementation

Implement the system you described in the previous sections in the Proteus software. Pay attention that if you stop in a part of the implementation, you can give up the explanation in the report and skip the continuation of that part and continue your work with the loss of a fraction of the mark.

Part IV - system testing

In this section, we test the designed system:

User testing:

Write a program code in assembly language that, upon receiving two numbers n, m, and numbers 1 to n, writes in the memory locations starting from n, if this writing interval intersects with the loaded code for simulation until reaching the first line of the code. The program performs write operations.

Part V - Conclusion

In this section, describe the challenges you have faced in the implementation and simulation. Describe the reason for your success or failure in them and explain how you can do what you want by removing the least number of existing constraints.