

Parallel I/O

Objective

To check an input pin and set up a one-digit counter to display it on the seven-segment display connected to a parallel port.

Tasks

1. Write a function that will be passed a value through the A register. It should check if this value is the ASCII equivalent of any of the numbers 0-9. If it is, it should set the carry bit, otherwise clear it.
2. Write a function that will wait for the user to press a key. This function should return the ASCII equivalent of the user's input in Register A.
3. Write a function that will keep looping until PA0 (input pin) is High.
4. Write a function that sets Pins 2-5 of PORT D as output pins, by changing DDRD.
5. Write a function that will increment a counter and output through port D to a seven-segment display.
6. Write a function that keeps looping for around 1 second, or 2 million cycles.
7. Write a main program that will wait for a user input from the keyboard and checks if the input is a number. If so, and if PA0 is high, it should increment a counter and display it on the SSD every 1 second, until the counter reaches the user's input. This function should have minimal code, and should use the functions written for the previous tasks.

For example, say PA0 is high by connecting it to +5 volts. The user presses the number 5, then the seven segment display should show (0-1-2-3-4-5) with a 1 second interval in between.

Documentation and what to turn in:

You should turn in the signed listing (*.lst) file for your code along with a cover page and the program flowchart. The flowchart may be hand-drawn and the documentation for each function should be in the following format

Name	...
Purpose	...
Entry conditions	...
Exit conditions	...
Registers modified	...
Additional comments	Write down any relevant information that you feel is important when

	grading the lab. For example, if you used a method that was not covered in the lectures, this is where you will document it.
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NOTE:

The seven-segment display units cannot handle the hex values a-f, so the counter may only count in decimal.