GPIO SPEED

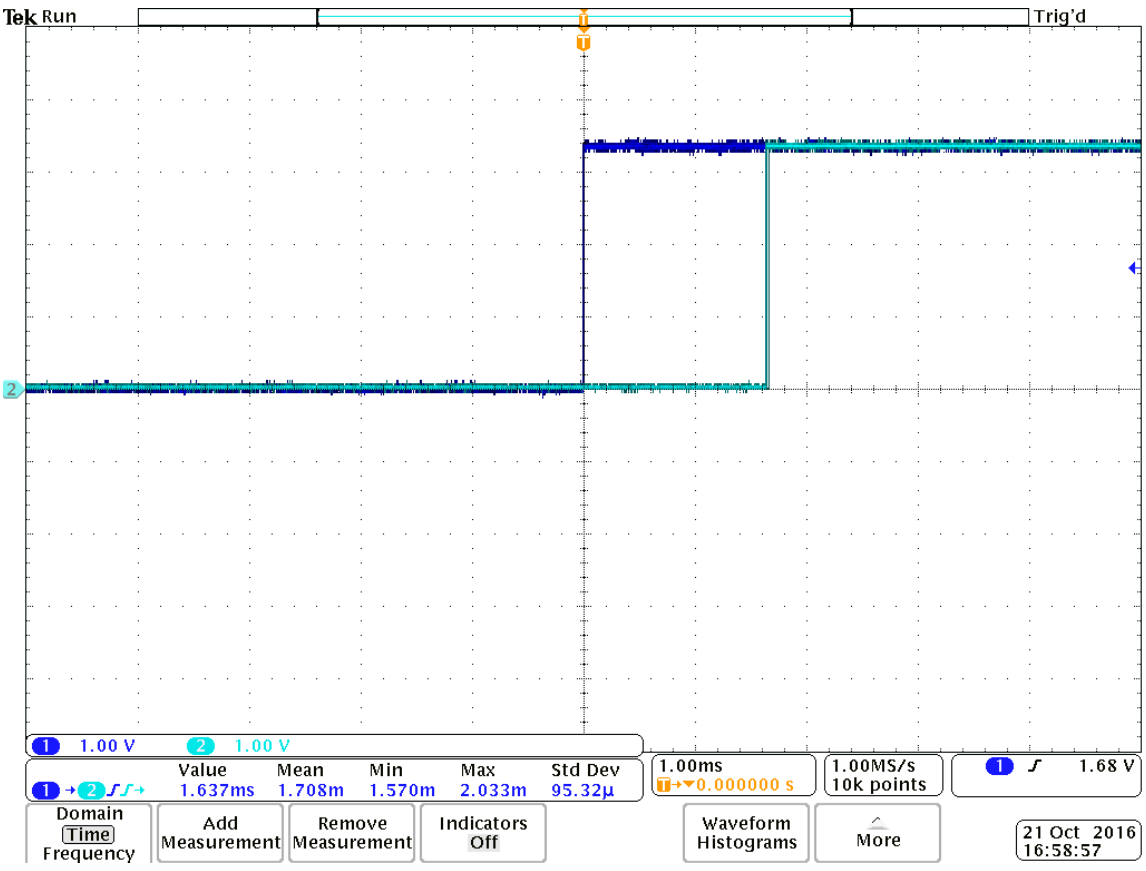
In this homework, I wrote codes in JavaScript, mmap via C, modified kernel and PRU program to copy the input of pin P9_28 to the output of pin P9_27, in order to investigate speeds of copying and CPU loads of these methods.

Results:

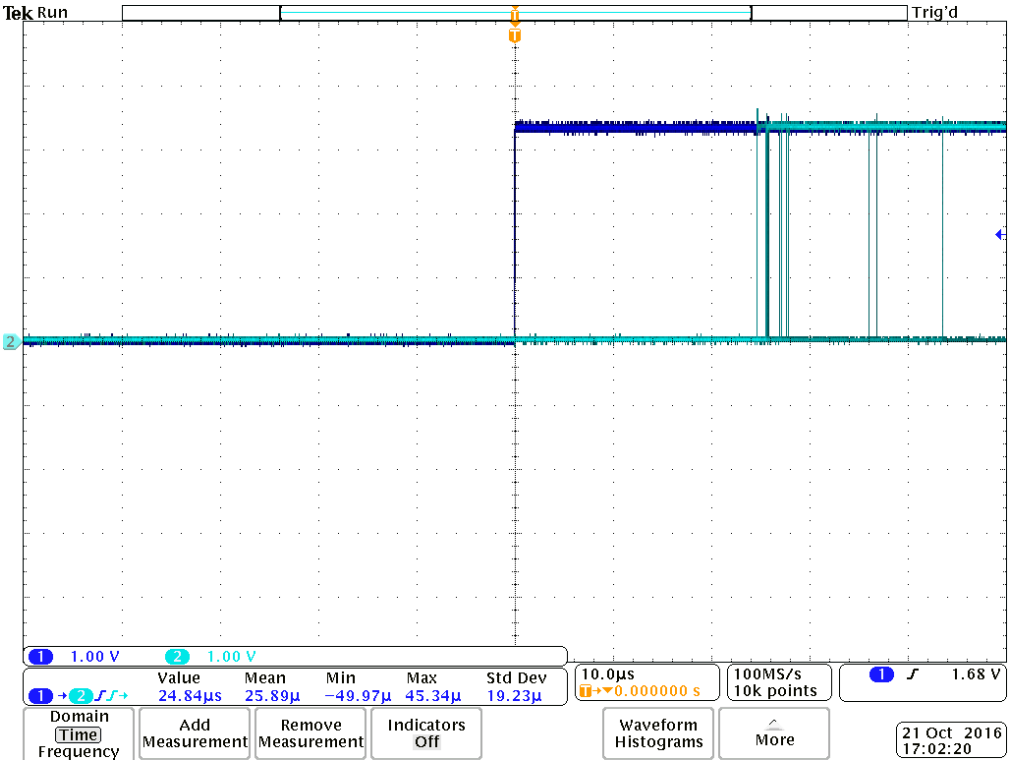
	Respond Delay			CPU Load
	Min	Max	Average	
JavaScript	1.57ms	2.033ms	1.708ms	15.5%
mmap via C		45.34us	25.89us	89.9%
Kernel		978.2us	331.2us	9.1%
PRU	25.52ns	36.3ns	30.11ns	5.3%

Screen shots:

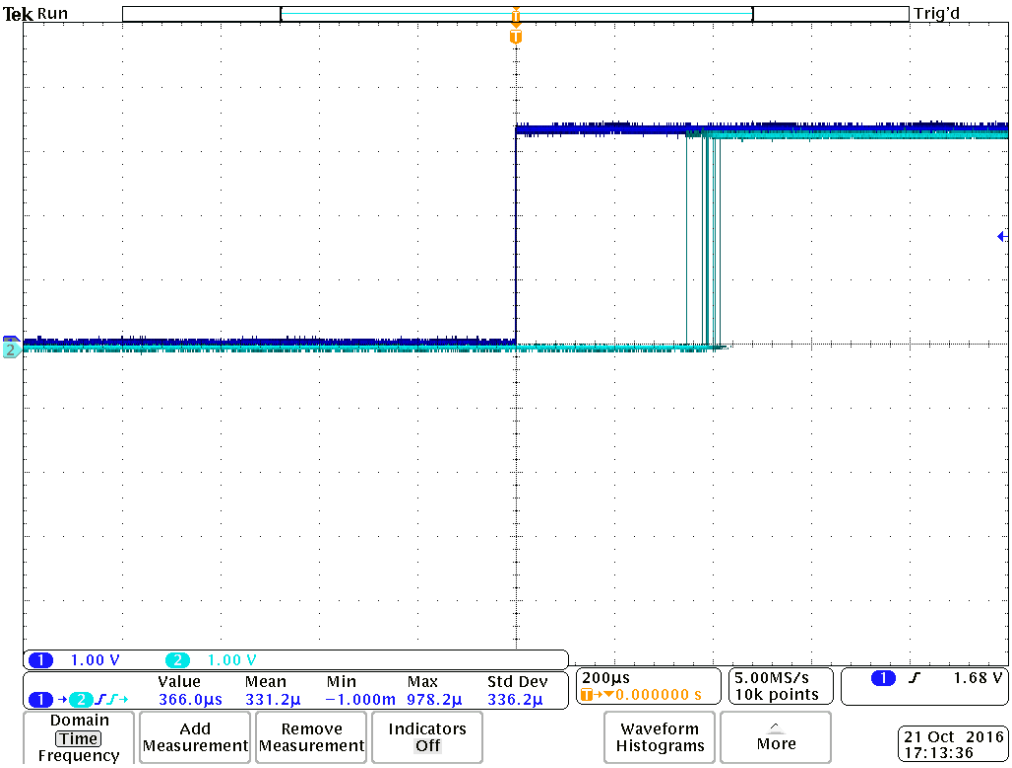
JavaScript:



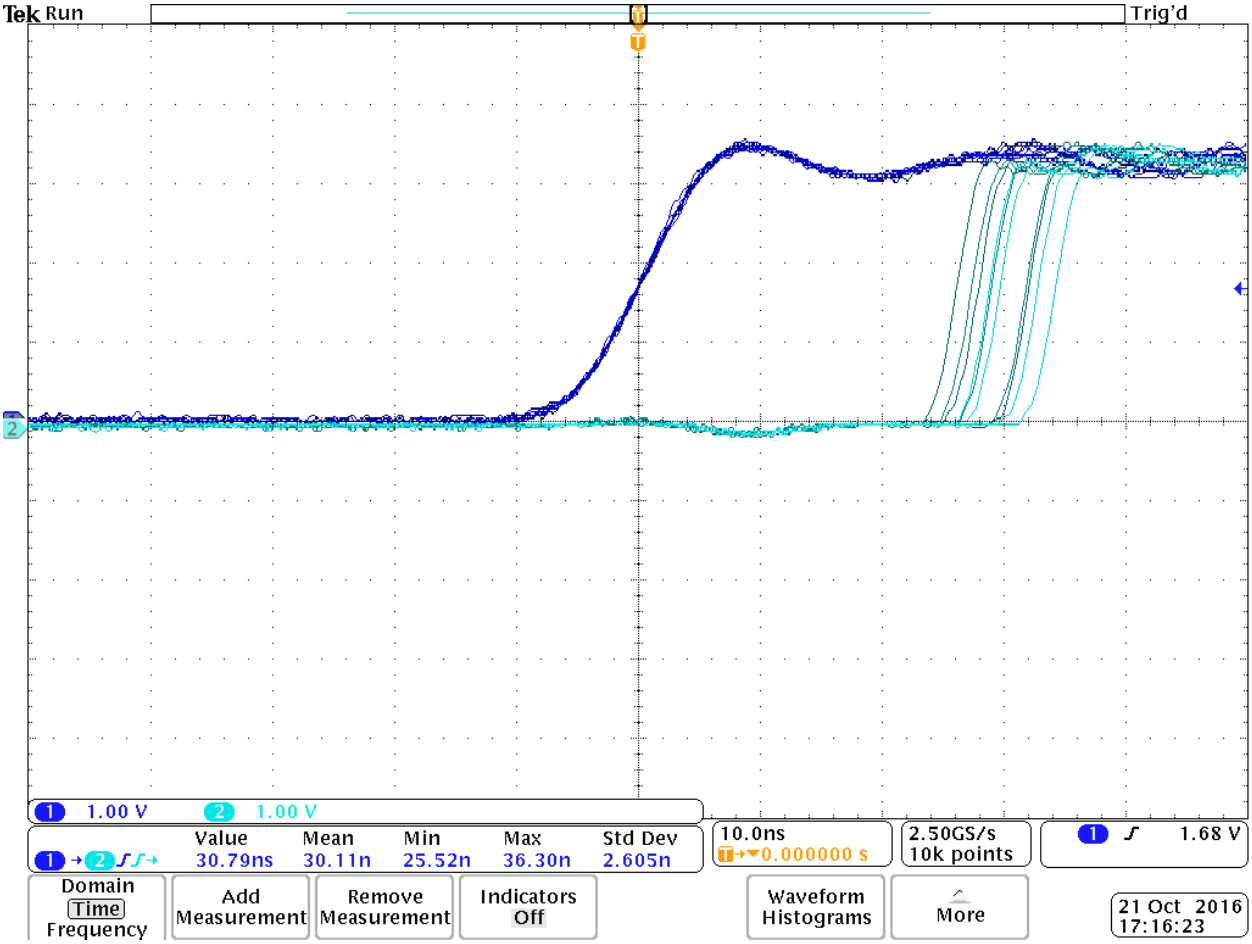
mmap via C:



Kernel:



PRU:



Discussion:

From the table above, we can see that JavaScript code is the slowest, but takes reasonable amount of CPU load. mmap via C is much faster than JavaScript, but takes nearly 90% of the CPU load. The modified kernel drivel is a little bit slower than mmap, but only takes 10% of the CPU load. Using the PRU to copy the pin value is the fastest, and because there is no use of main CPU, the CPU load is also the lowest.