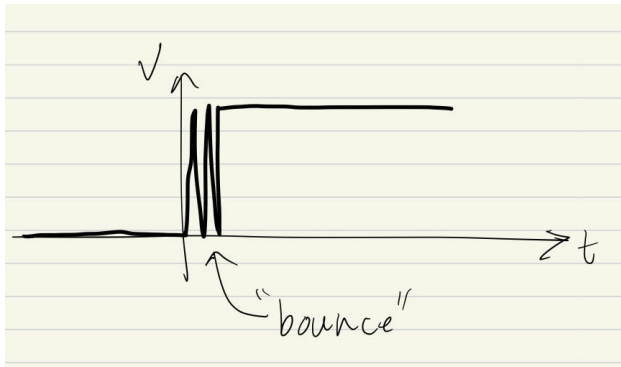


1. Draw the voltage that is generated by a "bouncy" push button, and describe a method for debouncing it using code in an interrupt.



We can add a delay to the pin logic to wait out the "bounce".
Or add a resistor to the pin the button is attached to.

2. What are each of the IFSx, IECx, and IPCx registers used for?

IFSx: interrupt flag status. When set to 0, it means the interrupt has been serviced.

IECx: interrupt enable control. When set to 1, it means the interrupt is enabled.

IPCx: sets the priority and subpriority of the interrupt

3. What is "context save and restore", and how do you avoid using it?

Context save and restore is the copying of register data back and forth between the registers and RAM. When setting the priority level, to not use context save and restore, avoid using the priority level IPLnSOFT

4. For the SFR SPI1CON, demonstrate two different SFR manipulation techniques that would turn on bit MODE16 and make the value of FRMCNT equal to 5.

Register Name	Bit Range	Bits																All Resets
		31/15	30/14	29/13	28/12	27/11	26/10	25/9	24/8	23/7	22/6	21/5	20/4	19/3	18/2	17/1	16/0	
SPI1CON	31:16	FRMEN	FRMSYNC	FRMPOL	MSSEN	FRMSYPW	FRMCNT<2:0>			---	---	---	---	---	---	SPIFE	ENHBLF	0000
	15:0	ON	---	SIDL	DISSDO	MODE32	MODE16	SMP	OKE	SSEN	CKP	MTEN	---	STXSEL<1:0>		SRXSEL<1:0>		0000

SPI1CON = 0x00F0

5. The following methods of calculating velocity produce about the same results. What is the advantage of the second method, and how could you use the .dis file to prove it? ...

```
//method 1
float distance_F=3.0, time_F=2.0, speed_F; //units are in m and s
speed_F = distance_F / time_F; //units are m/s
//method 2
int distance_I=3, time_I=2, speed_I; //units are in m and s
speed_I = (distance_I*1000) / time_I; //units are mm/s
...
```

Ints use less memory than floats and therefore would be faster to process.

The disassembly file will show up how many lines of assembly code it takes to execute method 1 and method 2 of calculating the speeds. Generally, assembly instructions take 1 clock cycle each to execute so a larger number of assembly instructions to calculate the same speed will imply that one method is slower than the other.