

question

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moving on from lab 10 for now unless anyone has any more recommendations on what is wrong?

Hi,

Does anyone have any final recommendations on lab 10? I re-attempted to debug it yesterday but did not find my error. I will paste my code below. I know most people are already done with this class and I was one of those grateful for the extension until May 21st! I'm moving on now to finish up labs 11-14, and lab 15 too, although I know there is no grader for that I can attempt it even after May 21st if I find the time. I was able to catch up and finish every lecture video and quiz, so now I will just do the best I can to finish up the rest of your labs before May 21st. This has been a great review of somewhat similar things I've done before in past lives, and I thought it was well done and was unaware the MOOCs did things like this, since of course when I did these types of courses it was in person.

Anyway, here is a cut and paste of my fsm code, in case anyone has any recommendations on what I've done wrong. Would adding more states help here? I did also watch the extra lecture posted yesterday to help with those having trouble with lab 10. I'm moving on to finish up the rest of the labs now before this online MOOC ends on May 21st! Thanks. Here is my lab 10 code - any help / recommendations appreciated! It passed tests 1-3, but on test 4 it said the south state did not finish all tests before time was up. There was not enough information given in the test window to give a clue as to what was wrong.

```
struct State {
    unsigned long Out;
    unsigned long Time;
    unsigned long Next[8];};

typedef const struct State STyp;

#define goWest 0
#define waitWest 1
#define goSouth 2
#define waitSouth 3
#define goWalk 4
#define dontWalk1 5
#define walkOff1 6
#define dontWalk2 7
#define walkOff2 8

STyp FSM[9]={
    {0x31,50,{goWest, waitWest, goWest, waitWest, waitWest, waitWest, waitWest, waitWest }}, //0
    {0x51,50,{goSouth, goSouth, goSouth, goSouth, goWalk, goSouth, goWalk, goSouth }}, //1
    {0x85,50,{goSouth, goSouth, waitSouth, waitSouth, waitSouth, waitSouth, waitSouth, waitSouth }}, //2
    {0x89,50,{goWest, goWalk, goWest, goWest, goWalk, goWalk, goWalk, goWalk }}, //3
    {0x92,50,{goWest, dontWalk1, dontWalk1, dontWalk1, goWalk, dontWalk1, dontWalk1, dontWalk1 }}, //4
    {0x91,50,{walkOff1, walkOff1, walkOff1, walkOff1, walkOff1, walkOff1, walkOff1, walkOff1 }}, //5
    {0x90,50,{dontWalk2, dontWalk2, dontWalk2, dontWalk2, dontWalk2, dontWalk2, dontWalk2, dontWalk2 }}, //6
    {0x91,50,{walkOff2, walkOff2, walkOff2, walkOff2, walkOff2, walkOff2, walkOff2, walkOff2 }}, //7
    {0x90,50,{goWest, goWest, goWest, goWest, goWest, goWest, goWest, goWest }}, //8

    unsigned long S; // index to the current state
    unsigned long Input;

int main(void){
    volatile unsigned long delay;

    TExaS_Init(SW_PIN_PE210, LED_PIN_PB543210); // activate grader and set system clock to 80 MHz
    PLL_Init(); // 80 MHz, Program 10.1
    SysTick_Init(); // Program 10.2
    SYSCTL_RCGC2_R |= 0x32; // 1) F B E
    delay = SYSCTL_RCGC2_R; // 2) no need to unlock
    GPIO_PORTE_AMSEL_R &= ~0x07; // 3) disable analog function on PE2-0
    GPIO_PORTE_PCTL_R &= ~0x000000FF; // 4) enable regular GPIO
    GPIO_PORTE_DIR_R &= ~0x07; // 5) inputs on PE2-0
    GPIO_PORTE_AFSEL_R &= ~0x07; // 6) regular function on PE2-0
    GPIO_PORTE_DEN_R |= 0x07; // 7) enable digital on PE2-0
    GPIO_PORTB_AMSEL_R &= ~0x3F; // 3) disable analog function on PB5-0
    GPIO_PORTB_PCTL_R &= ~0x00FFFFFF; // 4) enable regular GPIO
    GPIO_PORTB_DIR_R |= 0x3F; // 5) outputs on PB5-0
    GPIO_PORTB_AFSEL_R &= ~0x3F; // 6) regular function on PB5-0
    GPIO_PORTB_DEN_R |= 0x3F; // 7) enable digital on PB5-0

    GPIO_PORTF_LOCK_R = 0x4C4F434B; // 8) unlock GPIO Port F
    GPIO_PORTF_CR_R = 0x0A; // allow changes to PF3 and PF1
```

```

// only PF0 needs to be unlocked, other bits can't be locked
GPIO_PORTF_AMSEL_R &= ~0x0A; // 9) disable analog function on PF3 abd PF1
GPIO_PORTF_PCTL_R = 0x00000000; // 10) PCTL GPIO on PF4-0
GPIO_PORTF_DIR_R |= 0x0A; // 11) PF3 and PF1 outputs
GPIO_PORTF_AFSEL_R &= ~0x0A; // 12) regular function on PF3 and PF1
//GPIO_PORTF_PUR_R = 0x11; // enable pull-up on PF0 and PF4
GPIO_PORTF_DEN_R |= 0x0A; // 13) enable digital on PF3 and PF1

S = goWest; //initial state
EnableInterrupts();
while(1){
    //Moore machine - output based on current state
    LIGHT = FSM[S].Out >> 2; // set west and south road traffic LED lights (PB5-0)
    GPIO_PORTF_DATA_R = ((FSM[S].Out & 0x2) | ((FSM[S].Out & 0x1) << 1); // set walk/don't walk leds (PF3 and PF1)
    //wait for time relevant to state
    SysTick_Wait10ms(FSM[S].Time);
    //get input sensors for cars (one for west rd, one for south rd) and one for pedestrian
    Input = SENSOR; // read sensors (SENSOR defines to read bits PE2-0 ---no need to shift right 2 bits defined this way)
    //Moore machine - next state based on Input and current state
    S = FSM[S].Next[Input];
}

}

void SysTick_Init(void){
    NVIC_ST_CTRL_R = 0; // disable SysTick during setup
    NVIC_ST_CTRL_R = 0x00000005; // enable SysTick with core clock
}
// The delay parameter is in units of the 80 MHz core clock. (12.5 ns)
void SysTick_Wait(unsigned long delay){
    NVIC_ST_RELOAD_R = delay-1; // number of counts to wait
    NVIC_ST_CURRENT_R = 0; // any value written to CURRENT clears
    while((NVIC_ST_CTRL_R&0x00010000)==0){ // wait for count flag
    }
}
// 10000us equals 10ms
void SysTick_Wait10ms(unsigned long delay){
    unsigned long i;
    for(i=0; i<delay; i++){
        SysTick_Wait(800000); // wait 10ms
    }
}

```

lab10

9 hours ago by Karen West

the students' answer, where students collectively construct a single answer

hello karen

you need to have 2 separate outputs one for PB ports and other for PF.

i have not gone through your state transition okay so 1st implement the outputs properly then if more errors come to my notice i will tell

4 hours ago by Sourav Das

followup discussions for lingering questions and comments
 Resolved


 Unresolved
**zinc** 3 hours ago


It is wise indeed to postpone lab 10 for the moment.

I ran your data through my setup and the grader first gave 80 and then dropped it to 65 reporting that South times out.

Perhaps my post @5092 could help.

Your column ordering is a little suspect.

 Resolved

 Unresolved



John Long 2 hours ago

ok got your lab to grade a 100 with a few state changes but still im not happy with it as it dose things it should not do will post details shortly after i take another look at it



John Long 2 hours ago here is what i used to get 100marks ... with some changes to your states

```
{0x31,50,{goWest, goWest, waitWest, waitWest, waitWest, waitWest, waitWest, waitWest}}, //0
{0x51,10,{goSouth, goSouth, goSouth, goSouth, goWalk, goSouth, goWalk, goSouth}}, //1
{0x85,50,{goSouth, waitSouth, goSouth, waitSouth, waitSouth, waitSouth, waitSouth, waitSouth}}, //2
{0x89,10,{goWest, goWest, goWest, goWest, goWalk, goWalk, goWalk, goWalk}}, //3
{0x92,50,{dontWalk1, dontWalk1, dontWalk1, dontWalk1, dontWalk1, dontWalk1, dontWalk1, dontWalk1}}, //4
{0x91,10,{walkOff1, walkOff1, walkOff1, walkOff1, walkOff1, walkOff1, walkOff1, walkOff1}}, //5
{0x90,10,{dontWalk2, dontWalk2, dontWalk2, dontWalk2, dontWalk2, dontWalk2, dontWalk2, dontWalk2}}, //6
{0x91,10,{walkOff2, walkOff2, walkOff2, walkOff2, walkOff2, walkOff2, walkOff2, walkOff2}}, //7
{0x90,10,{goWest, goWest, goWest, goWest, goWest, goWest, goWest, goWest}}; //8
```

just go through them and change your ones that are different in the middle of making the family dinner at the moment so have to check out the other areas im not happy about but this passes grader must be a little easy on this test i think



John Long 1 hour ago ok heres a better one as you have states also in walk section wrong

```
{0x31,50,{goWest, goWest, waitWest, waitWest, waitWest, waitWest, waitWest, waitWest}}, //0
{0x51,10,{goSouth, goSouth, goSouth, goSouth, goWalk, goSouth, goWalk, goSouth}}, //1
{0x85,50,{goSouth, waitSouth, goSouth, waitSouth, waitSouth, waitSouth, waitSouth, waitSouth}}, //2
{0x89,10,{goWest, goWest, goWest, goWest, goWalk, goWalk, goWalk, goWalk}}, //3
{0x92,50,{goWalk, dontWalk1, dontWalk1, dontWalk1, goWalk, dontWalk1, dontWalk1, dontWalk1}}, //4
{0x91,10,{walkOff1, walkOff1, walkOff1, walkOff1, walkOff1, walkOff1, walkOff1, walkOff1}}, //5
{0x90,10,{dontWalk2, dontWalk2, dontWalk2, dontWalk2, dontWalk2, dontWalk2, dontWalk2, dontWalk2}}, //6
{0x91,10,{walkOff2, walkOff2, walkOff2, walkOff2, walkOff2, walkOff2, walkOff2, walkOff2}}, //7
{0x90,10,{goWest, goWest, goWest, goWest, goWest, goWest, goWest, goWest}}; //8
```

only thing now i dont like is on two button presses is it cycles through all three to cover the two pressed also it dosent go properly when walk and south pressed as it cycles walk and west

if i have time might look further but busy at the moment but it still passes grader ... so have a look at it as well and you might learn more



John Long 1 hour ago ok found another fix for the two button press walk and south that goes to walk and west instead ...

change last line {0x90,10,{goWest, goWest, goSouth, goWest, goWest, goWest, **goSouth**, goWest}}; //8

you had no goSouth in line so on two button press walk and south it couldnt get to south as all line reads goWest ...

ok found last problem your goSouth here made it cycle from walk to west to south to walk on two button press now it works properly

```
{0x51,10,{goSouth, goSouth, goSouth, goSouth, goWalk, goWalk, goWalk, goSouth}}, //1
```

add those changes to what i posted in last and it works perfect.



Karen West Just now I just saw that you changed the next states for states 1, 4 and 8.

I will try those either later tonight or tomorrow and see if they work for me too.

I don't have my FSM in front of me to see exactly what I did wrong at the moment but I'm sure it will become clear when I do.

Thank you all for your responses, and for John for finding my specific errors!!