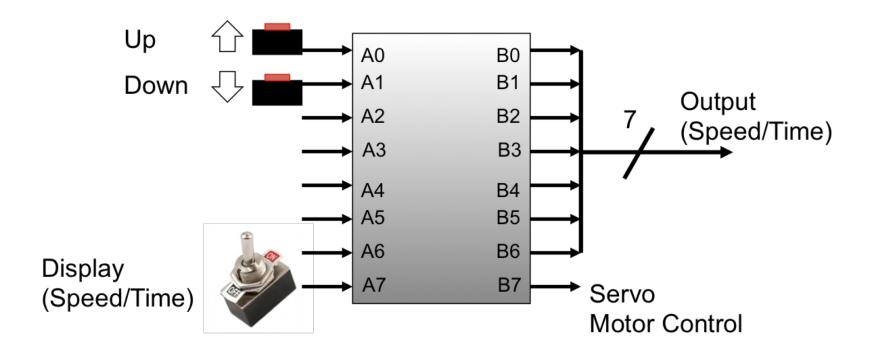
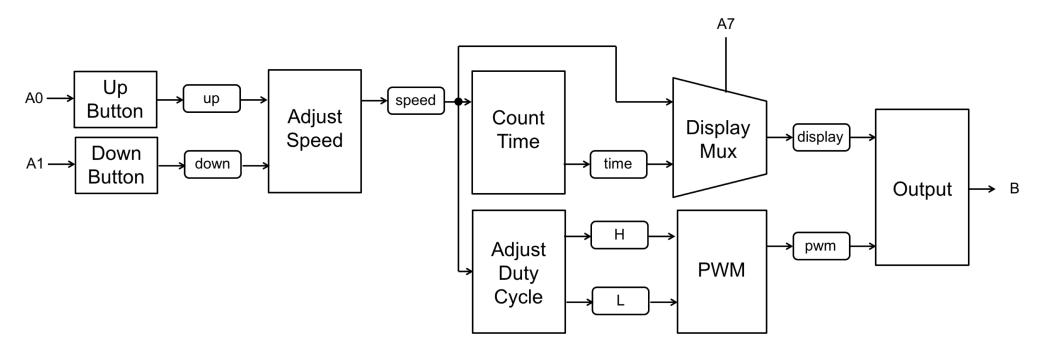
Treadmill Controller Design Problem Solution



System Setup



Task Diagram



Up Button Task

Period = 50ms unsigned char up_cnt; A0 && up_cnt <= 4 A0 **A0** up_cnt++; A0 && up_cnt > 4 Α0 Α0 up = 1; UP Wait **PRESS** A0 $up_cnt = 0;$ up = 0;A0

Down Button Task

Period = 50msunsigned char down_cnt; A1 && up_cnt <= 4 <u>A1</u> down_cnt++; A1 A1 && down_cnt > 4 **A1** down = 1;**A1** DOWN Wait PRESS <u>A1</u> $down_cnt = 0;$ down = 0;A1

Adjust Speed Task

```
Period = 50ms
           if( up && !down && speed < 100 )
                speed++;
           else if( !up && down && speed > 0 )
                speed --;
   speed = 0;
                  ADJ
```

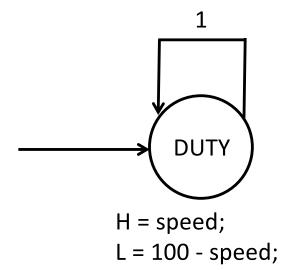
Count Time Task

```
Period = 50ms
unsigned char ms_cnt = 0;
                 if( speed == 0 )
                      time = ms_cnt = 0;
                 else if( ++ms_cnt == 20 ) {
                      time++;
                      ms_cnt = 0;
   time = 0;
                  CNT
```

TIME

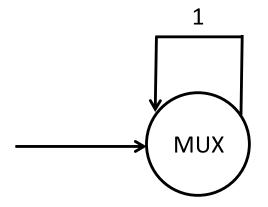
Adjust Duty Cycle Task

Period = 50ms



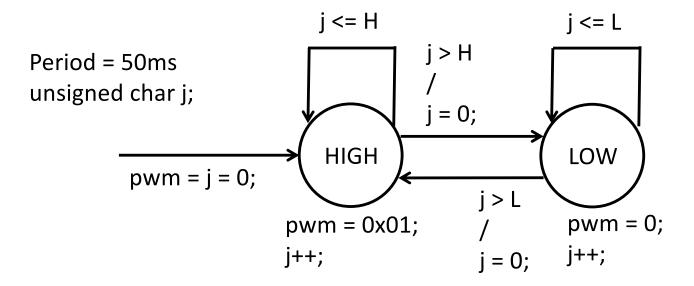
Display Mux Task

Period = 50ms



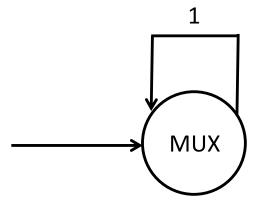
display = A7 ? time : speed;

PWM Signal Task



Output Task

Period = 50ms



B = (display & 0x7F) | (pwm << 7);