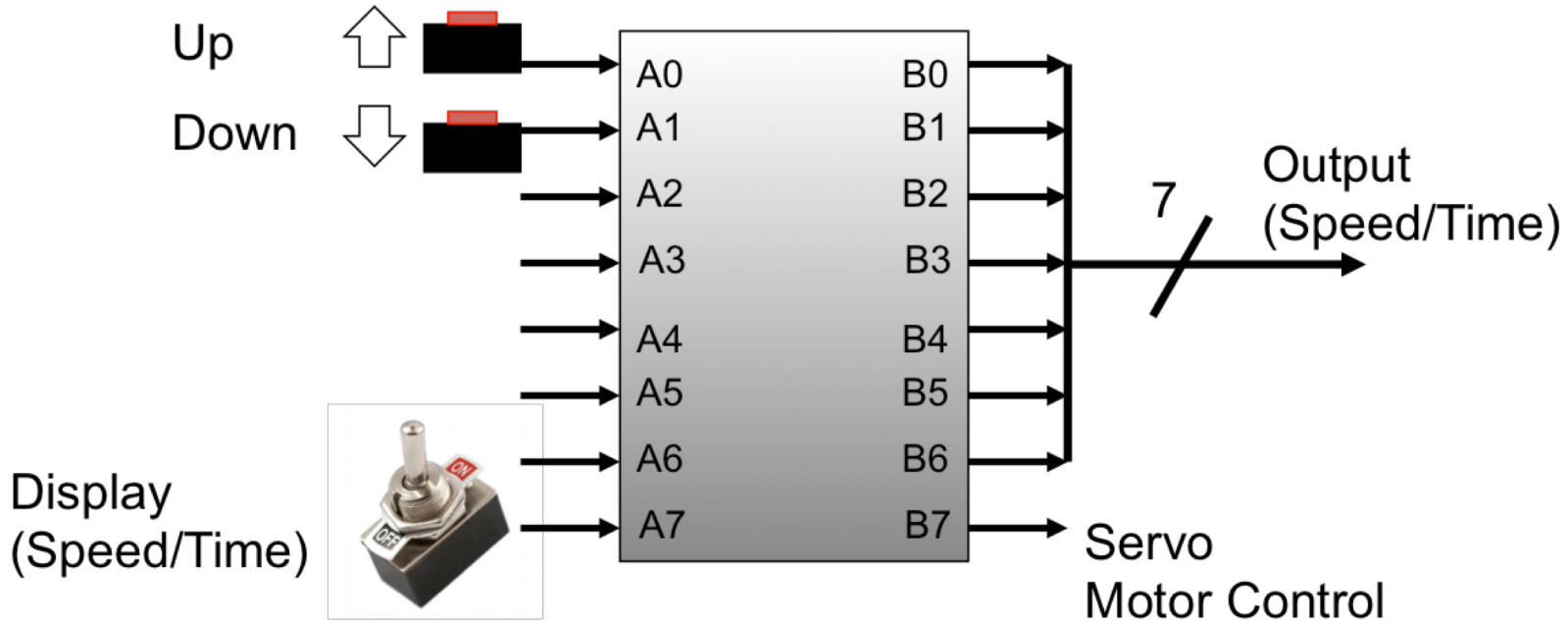
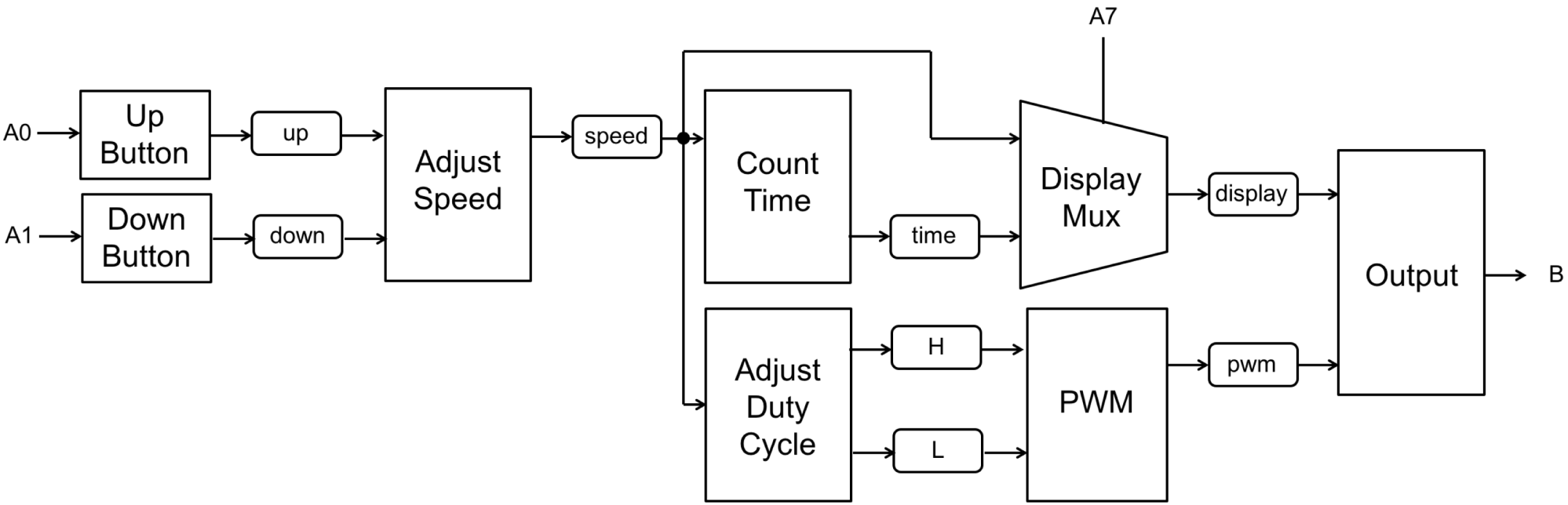
Treadmill Controller Design Problem Solution

System Setup

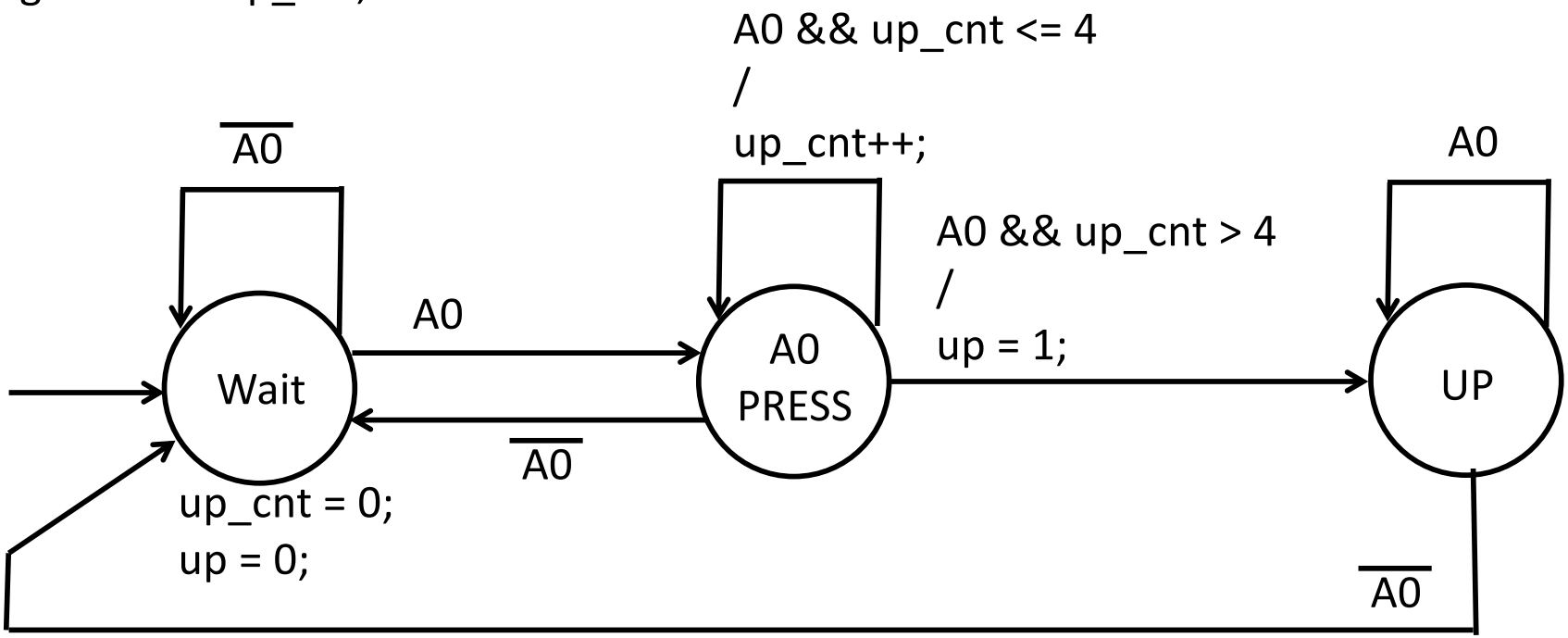


Task Diagram



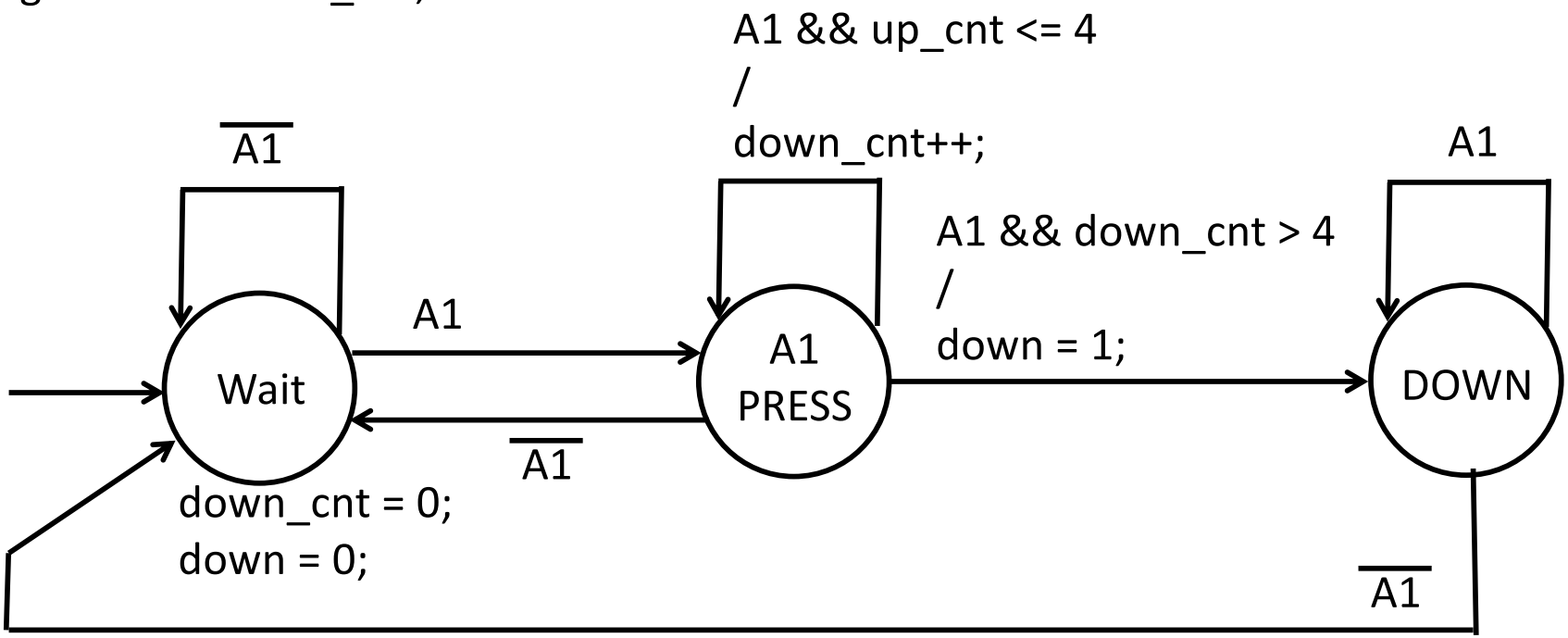
Up Button Task

Period = 50ms
unsigned char up_cnt;



Down Button Task

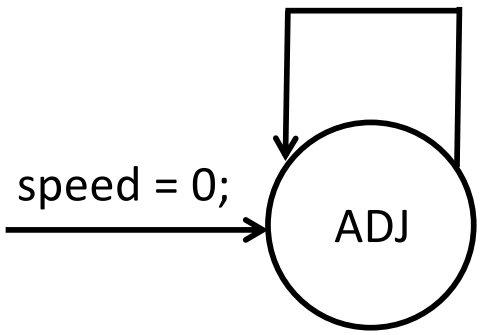
Period = 50ms
unsigned char down_cnt;



Adjust Speed Task

Period = 50ms

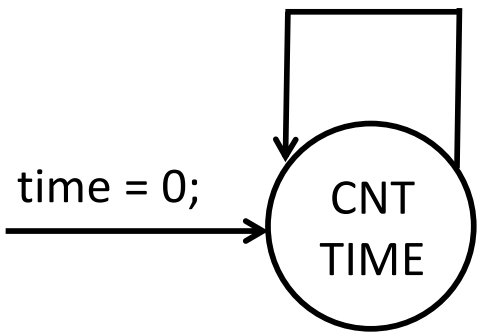
```
1
/
if( up && !down && speed < 100 )
        speed++;
else if( !up && down && speed > 0 )
        speed --;
```



Count Time Task

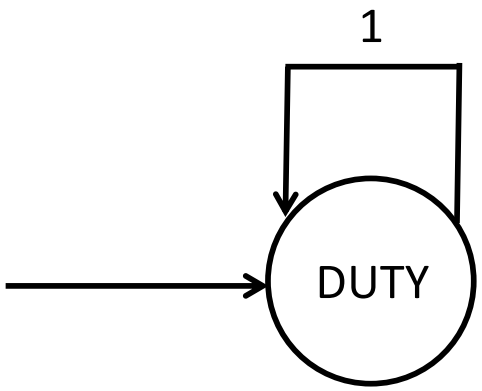
Period = 50ms
unsigned char ms_cnt = 0;

```
1
/
if( speed == 0 )
        time = ms_cnt = 0;
else if( ++ms_cnt == 20 ) {
        time++;
        ms_cnt = 0;
}
```



Adjust Duty Cycle Task

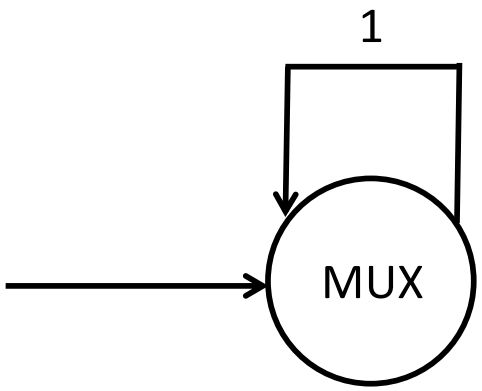
Period = 50ms



H = speed;
L = 100 - speed;

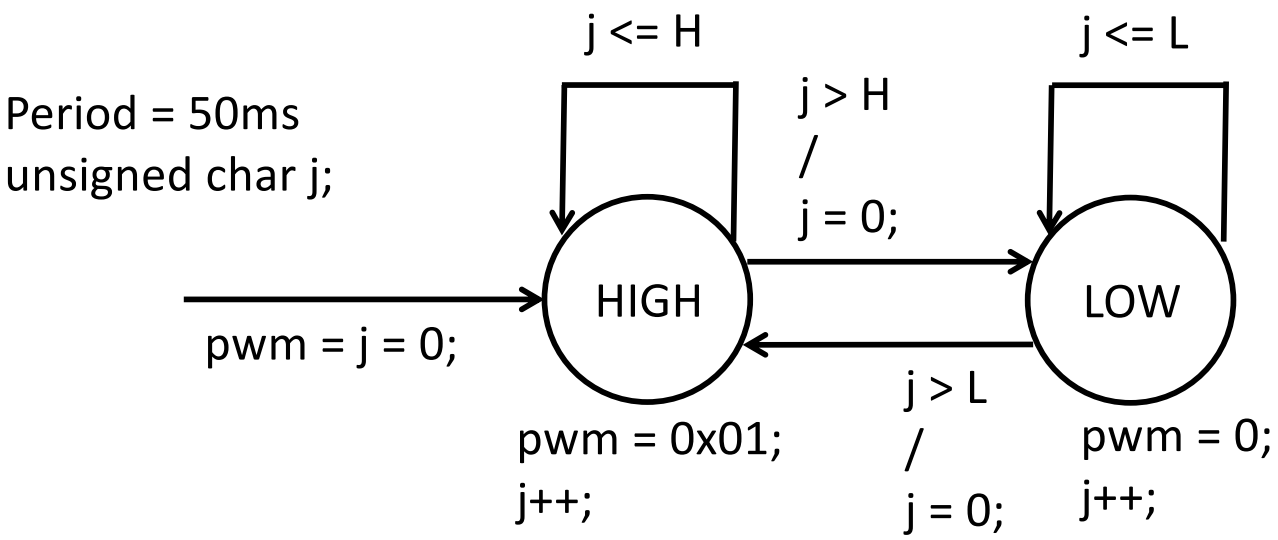
Display Mux Task

Period = 50ms



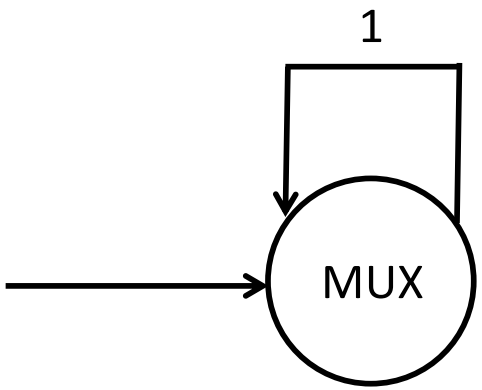
display = A7 ? time : speed;

PWM Signal Task



Output Task

Period = 50ms



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