ESS 2023 Lab 2 Solutions

```c
while(1) {
    led_on(&led_green);
    delay_msec(on_time);
    led_off(&green);
    delay_msec(total_time-on_time);
}
```

```c
while(1) {
    led_on(&led_green);
    delay_msec(on_time);
    led_off(&led_green);
    delay_msec(total_time-on_time);

    if ((loop_counter++) >= cycle_time)
    {
        loop_counter = 0;
        on_time++;
        if (on_time > total_time)
        {
            on_time = 0;
        }
    }
}
```

```c
struct pwm_state
{
    uint32_t counter;
    uint32_t ch0_compare;
    uint32_t ch1_compare;
    uint32_t ch2_compare;
    uint32_t ch3_compare;

    LED_t * ch0;
    LED_t * ch1;
    LED_t * ch2;
    LED_t * ch3;
};

static struct pwm_state state;
```

```c
void pwm_driver_init(LED_t * ch0, LED_t * ch1, LED_t * ch2, LED_t * ch3)
{
    state.counter = 0;

    state.ch0_compare = 0;
    state.ch1_compare = 0;
    state.ch2_compare = 0;
    state.ch3_compare = 0;

    state.ch0 = ch0;
    state.ch1 = ch1;
    state.ch2 = ch2;
    state.ch3 = ch3;
}
```

```c
void pwm_driver_set(uint32_t channel, uint32_t value)
{
    if (value > PWM_MAX)
    {
        value = PWM_MAX;
    }

    switch (channel)
    {
        case(0):
            state.ch0_compare = value;
            break;
        case(1):
            state.ch1_compare = value;
            break;
        case(2):
            state.ch2_compare = value;
            break;
        case(3):
            state.ch3_compare = value;
            break;
    }
}
```