University of Texas at El Paso
Electrical and Computer Engineering Department

EE4178/EE5190 Laboratory for Microprocessors II

LAB 04

DAC Peripheral

Goals:

- Using the DAC peripheral create a task to output a triangular wave on GPIO 25.
- Using the DAC peripheral create a task to output a sine wave in GPIO 26.
- Use the code in listing 1 to start your project.

Bonus:

Make the sine wave have a 10 hz frequency. **+10**

Pre-Lab Questions:

- What is a DAC?
- How does a DAC work?
- What are the two functions needed to use the esp32's DAC?

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```
#include <stdio.h>
#include <math.h>
#include "sdkconfig.h"
#include <driver/dac.h>
#include "freertos/FreeRTOS.h"
#include "freertos/task.h"

void createTriangleWave(void *pvParameter)
{
        dac_output_enable(DAC_CHANNEL_1);
        static int i = 0;
        while(1) {
                dac_output_voltage(DAC_CHANNEL_1, i);

                // compute trialgular waveform value

    vTaskDelay(10/portTICK_PERIOD_MS);
  }
}

void createSineWave(void *pvParameter)
{
        dac_output_enable(DAC_CHANNEL_2);
        static int i = 0;
        float val;
        int n;
        while(1) {

                // compute sine waveform value

                dac_output_voltage(DAC_CHANNEL_2, n);

    vTaskDelay(10/portTICK_PERIOD_MS);
  }
}

void app_main()
{
  xTaskCreate(&createTriangleWave,"createTriangleWave",4096,NULL,5,NULL);
  xTaskCreate(&createSineWave,"createSineWave",4096,NULL,5,NULL);


}
```

Listing 1. Program template for Lab 4.