# Introduction

The project is to create a signal generator for sine, square and triangle waves, alongside a frequency meter for the same. This will be done in a combination of hardware and software, using an ARM processor from ST Microelectronics, the STM32F407VGT6 fitted to a carrier board with various peripherals.

The project will be split into two parts, software and hardware. From the combination of these two parts, the maximum possible frequency range for the waveforms needs to be achieved, and again for the frequency meter. Further work on the product may include using the LCD screen, I2C connector, USB connector, and Direct Digital Sythensis (DDS) using a AD9850 chip.

# Specification

## Level 2 Requirements

* Generate a sine wave from 0.01Hz to ?HZ with a maximum amplitude of +/- 12V.
* Generate a square wave from 0.01Hz to ?Hz with a maximum amplitude of +/- 12V.
* Generate a triangle wave from 0.01Hz to ?Hz with a maximum amplitude of +/- 12V.
* Measure the frequency of sine, square and triangle waves from 0.01Hz to ?Hz with a minimum signal of 0.1V rms.
* Control the amplitude of sine, square and triangle waves by sending control signals to a digital potentiometer, which will control the gain of the amplifier circuit.
* Create a pulse generator from ?Hz to ?Hz with a maximum amplitude of +12V.
* Measure the duty cycle for digital waveforms.
* Vary the duty cycle for digital waveforms.
* Amplitude modulate an input signal by using a sine wave to send control signals to a digital potentiometer, which will control the gain of the amplifier circuit.
* Frequency modulate an input signal by feeding it into the ADC and using the resulting values to vary the frequency of the output signal, based on a sine wave with a fixed frequency.

## Further Requirements

* Generate square waves using DDS on the AD9850 chip.
* Generate sine waves using DDS on the AD9850 chip.
* Create a random noise generator using the internal PR sequence generator.

# Software Design/Implementation

## Tasks so Far

## Tasks Still to Complete

# Hardware Design/Implementation

## Tasks so Far

## Tasks Still to Complete

# Gannt Chart