# Problem Definition

In this assignment we are asked to create a data transmission system using pwm. Instead of using arduino’s built in pwm system we have written our pwm transmission system. In this project I used 8 bits. So the maximum value that we can send is 255. PWM system used in analog signal transmissions. Because it doesn’t send only 1’s and 0’s it sends actual number up to 255 in this case. How PWM does this?

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# PWM

Pulse with modulation (PWM) is a way of creating anolog output with binary numbers. In PWM we choose a sending interval called delta T. In this time interval if we don’t send any 1 signal that means a 0. If we send 1 all the time that interval takes this means 255. And we can send shorter 1 pulse for each interval and based on the time we send 1 signal divided by time interval gives a relation between our analog sended signal divided by 255. And we can send 127 by sending 1 for half of the time interval. This protocol called pulse with modulation because of that. We send a pulse in that delta T time interval.

# Receiver

I used interrputs in this project to check wether received signal wave is in rising state or falling state. If it is in rising state then I have started a counter that counts time that is passed until the wave’s state goes falling. In falling state I divided the time a counted by time interval delta T. And multiply it by 255 to get the actual decimal number that sender sended. Using this in high speed machines may give better results but in my arduino it isn’t good. Because I cant send a signal of pulse 12.75 micro seconds I either can send 12 or 13. And this changed the result when receiving the data.