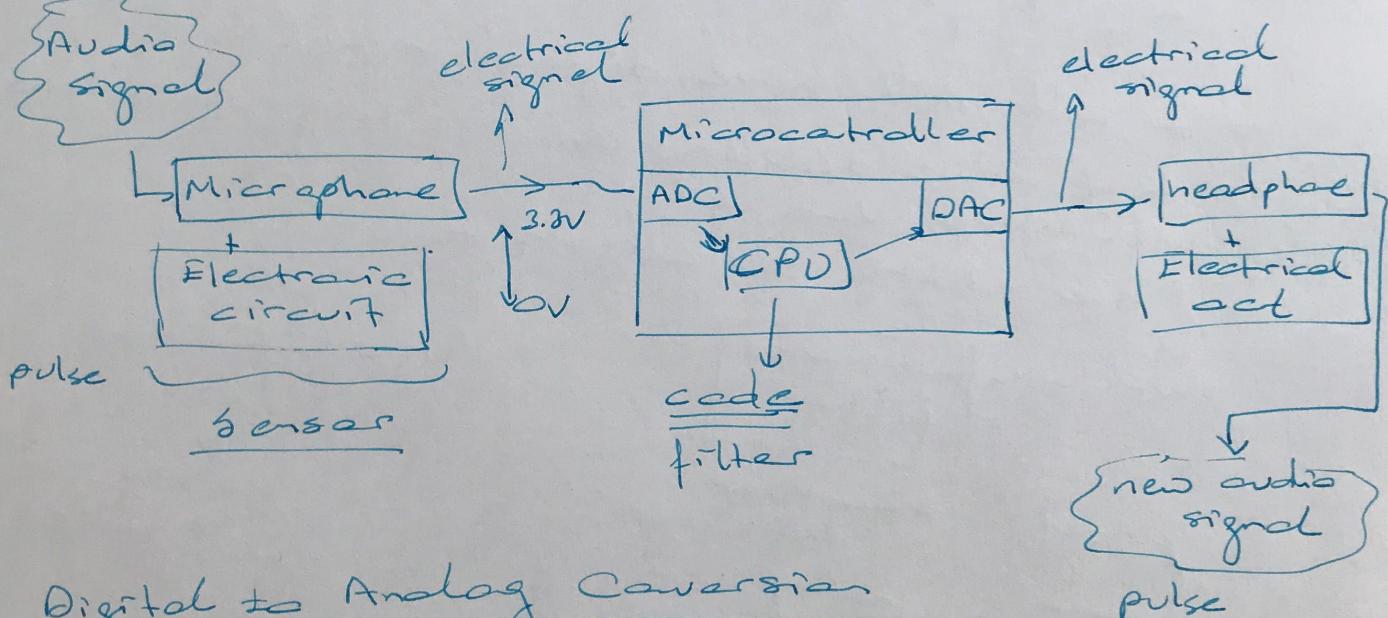


- Review of ADC
- DAC
- Volt setup
- Pulse width Modulation
- Sample codes ADC, DAC
- Answer questions written on the chat screen
- Abort the final.

### Audio Processing in Embedded System

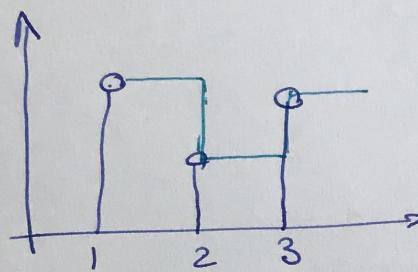


### Digital to Analog Conversion

- zero order Hold circuitry  $\Rightarrow$  DAC Module
- Pulse Width Modulation

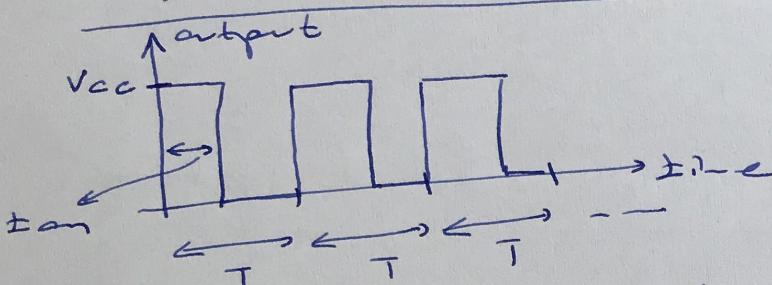
## Zero order Hold Operation

w14, 2

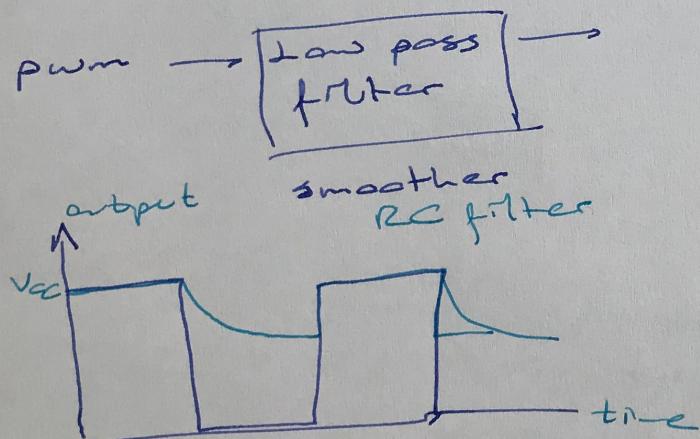


→ staircase like signal  
at output  
⇒ voltage, analog

## Pulse Width Modulation (PWM)



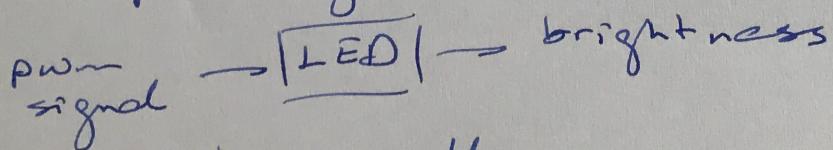
- I will still have digital signal.
- $t_{on}$  value decides on how long the output will have  $V_{cc}$  value.
- Pulse width  $\Rightarrow$  adjust  $t_{on}$ .



$$V_{avg} = \left( \frac{t_{on}}{T} \right) V_{cc}$$

duty cycle

- A simple usage example

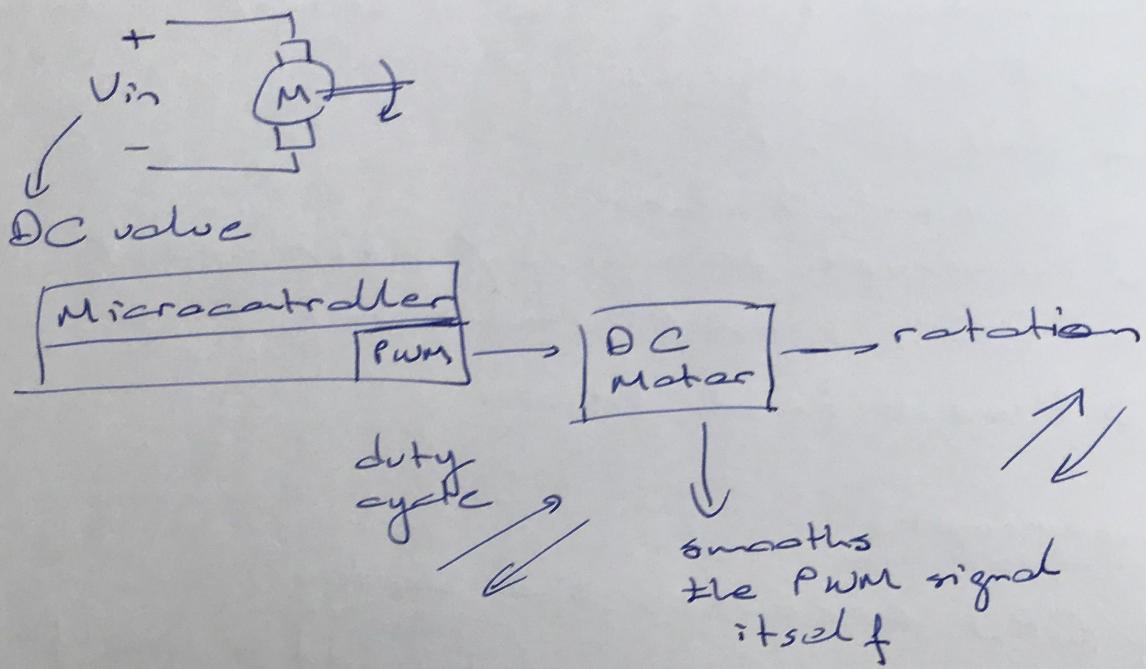


$T \rightarrow$  should be small

human eye cannot detect changes higher than frequencies of 60 Hz.  $T < \frac{1}{60}$  sec.

# Driving DC motor by a PWM signal

wk 3



## General Questions

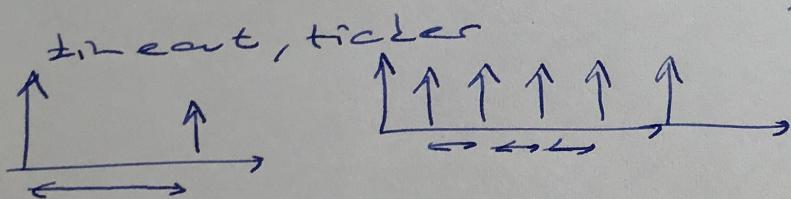
w13, 4

- button, fall, .rise "usage", "usage"
  - PWM, torque
  - extern int
  - timer, ticker
  - interrupt priority / interrupt \*
  - ADC, page 6. Last week
- ⇒ About Final Exam

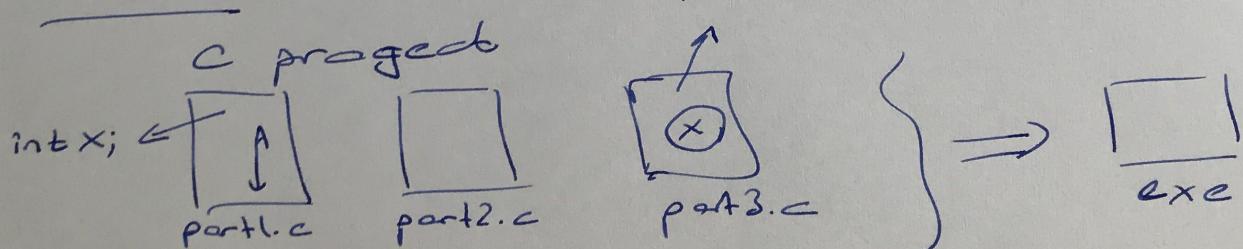
### interrupts

only CPU executes the code

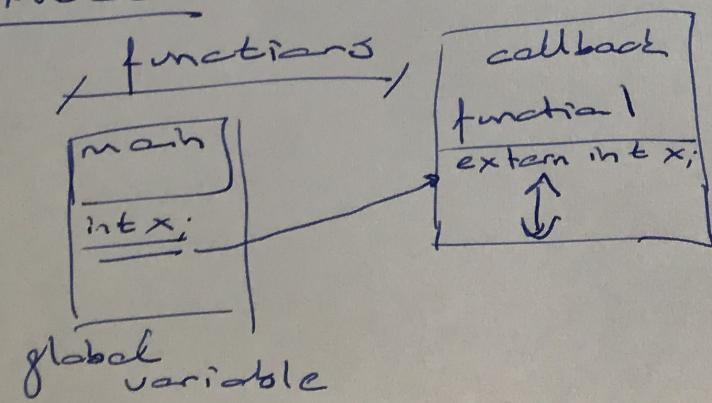
↳ add a new fn to be executed.  
↳ continue with the existing code.



### extern

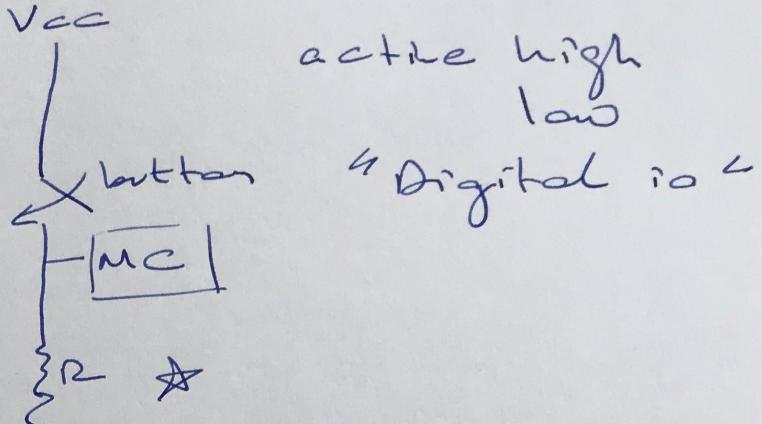
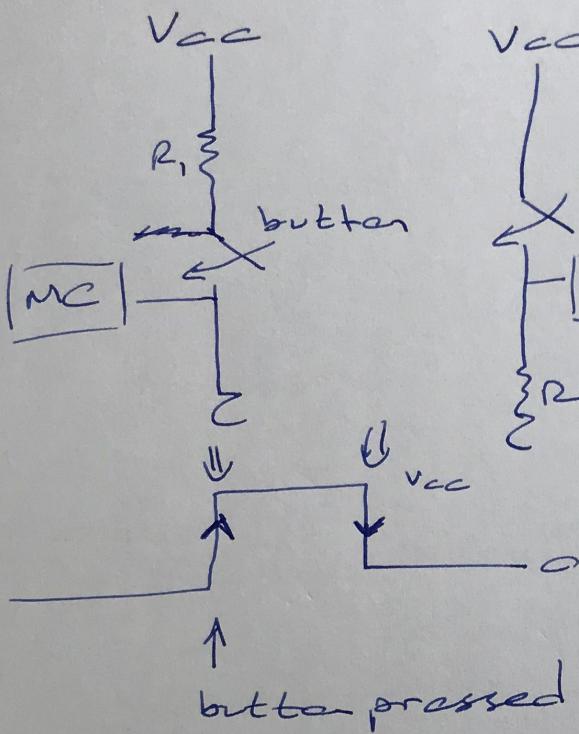


### Mbed



button.fall, button.rise

w14, 5



active high  
low  
"Digital io"  
mbed.simulator  
"active high"