Task 6.2

Software Practical Low Pass Filter [LPF]

WALL-E specifications:

- Encoder has 540 pulses per revolution
- The wheel has 40 cm diameter
- Maximum speed is 0.5 m/s

To calculate cutoff frequency fc :

1. Distance of one revolution = $2\pi r$ = $2 * \pi * 0.2$ = $1.256m$
2. now, we need to calculate the time of one revolution

$$TIME = DISTANCE/SPEED = 1.256/0.5 = 2.5132s$$

3. 1 revolution per 2.5132 sec $\simeq 0.3978$ rev/sec
4. now, we need to calculate number of pulses per second

$$540 * 0.3978 = 214.86$$

$$fc = 214.86 \text{ pulse/sec} = 0.3978 \text{ rev/sec}$$