Code Explanation (Ultrasonic Sensor with Arduino) :

$Velocity\ of\ sound\ =\ 343\ m/s \cong 0.034\ cm/\mu s$

We know the relation for velocity,

$$v\ =\ \frac{d}{t}$$

$$d =\ v\ \times t$$

*The pulseIn() function returns the time in microseconds (μs)

*We need our distance (d) value in centimetres (cm)

$$Distance\ (d) = \frac{1}{2} \times (0.034\ \times time)$$

Important Note :

- The time recorded in the 'time' variable is for the whole journey i.e. from emission to reception. Due to which the corresponding distance recorded will be '2d'.

But since we are only interested in 'd' → Distance between sensor and obstacle, we introduce a factor of $\frac{1}{2}$