1.

CPU	active	15 mA	5%
	sleep	0.01 mA	95%
Radio module	transmiting	100 mA	1%
	receiving	10 mA	15%
	idle	5 mA	84%
Sensor	active	30 mA	5%
	Inactive	0 mA	95%

Ex: Consider Avg power Consumption of 20 mA
- If the device is powered by a 11,000 mAh battery how long will the device last without charging.

11000 mAh / 20 mA	550 hours

Sol

1. Avg current CPU

= (15 * 0.05) + (0.01 * 0.95)

= 0.7595 mA

2. Avg current Radio module

= (100 + (10 * 15) + (5 * 84)/100

= 6.7 mA

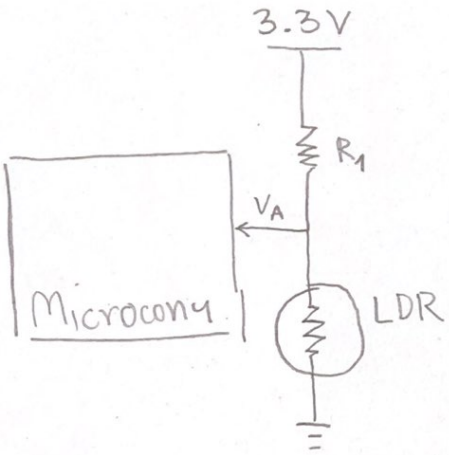
3. Avg current Sensor

= (30 * 0.05) + (0 * 0.95)

= ——

4 Avg power consumption of the device

0.7595 + 6.7 + ...



$$V_A = \frac{3.3 \times R_{LDR}}{R_1 + R_{LDR}}$$

0V → 0

1.1V → 4095

So $\frac{1.1}{4095} = \frac{V_A}{1000}$

$\therefore V_A = 0.2686203$

$$0.27 = \frac{3.3 \times R_{LDR}}{33000 + R_{LDR}}$$

$0.27 \cdot 33000 + (0.27) \cdot R_{LDR} = 3.3 (R_{LDR})$

$0.27 \cdot 33000 = (3.3 - 0.27) R_{LDR}$

$$R_{LDR} = \frac{0.27(33000)}{3.3 - 0.27}$$

$= 2940.594$

2940 Ω => LUX

2.9 kΩ = 100 Lux

1. Input Voltage

$$V_A = \frac{Adc\,Value \times Adc\,Votage}{Max\,Input\,Level} = \frac{108 \times 3.3}{4095}$$

$= 0.087$

2. current = $I = \frac{Adc\,Votage - In\,Vota}{R}$

$= \frac{3.3 - 0.087}{10^4} = 0.3$ mA

3. $R_{LDR} = \frac{V}{I} = \frac{Input\,Votage}{current} = \frac{0.087}{3.2 \times 10}$

$= 271.9$ Ω

4.