Calculation of voltage values on pin PC0[A0] if one button is pressed at each time.

$$U_{PC0_{Right}} = U\frac{0}{R2} = 5 \cdot \frac{0\ \text{k}\Omega}{3\ \text{k}\Omega} = 0\ \text{V}$$

$$U_{PC0_{Up}} = U\frac{R3}{R2+R3} = 5 \cdot \frac{0.33\ \text{k}\Omega}{3.33\ \text{k}\Omega} = 0.495\ \text{V}$$

$$U_{PC0_{Down}} = U\frac{R3+R4}{R2+R3+R4} = 5 \cdot \frac{0.95\ \text{k}\Omega}{3.95\ \text{k}\Omega} = 1.203\ \text{V}$$

$$U_{PC0_{Left}} = U\frac{R3+R4+R5}{R2+R3+R4+R5} = 5 \cdot \frac{1.95\ \text{k}\Omega}{4.95\ \text{k}\Omega} = 1.970\ \text{V}$$

$$U_{PC0_{Select}} = U\frac{R3+R4+R5+R6}{R2+R3+R4+R5+R6} = 5 \cdot \frac{5.25\ \text{k}\Omega}{8.25\ \text{k}\Omega} = 3.182\ \text{V}$$

Calculation when no button is pressed

$$U_{PC0_{Right}} = U\frac{Inf}{R2+Inf} = 5 \cdot \frac{Inf\ \text{k}\Omega}{Inf\ \text{k}\Omega} \approx 5 \cdot \frac{1}{1} = 5\ \text{V}$$

Calculation of ADC values for given voltage.

$$\begin{aligned} V_{Ref} &= 5\text{V} \\ n &= 10\text{bit} \\ ADC &= \frac{U_{PC0}}{V_{Ref}} \cdot (2^n - 1) = \frac{0.495}{5} \cdot (2^{10} - 1) = 101[\text{-}] \end{aligned}$$