ENCM511 Midterm Report
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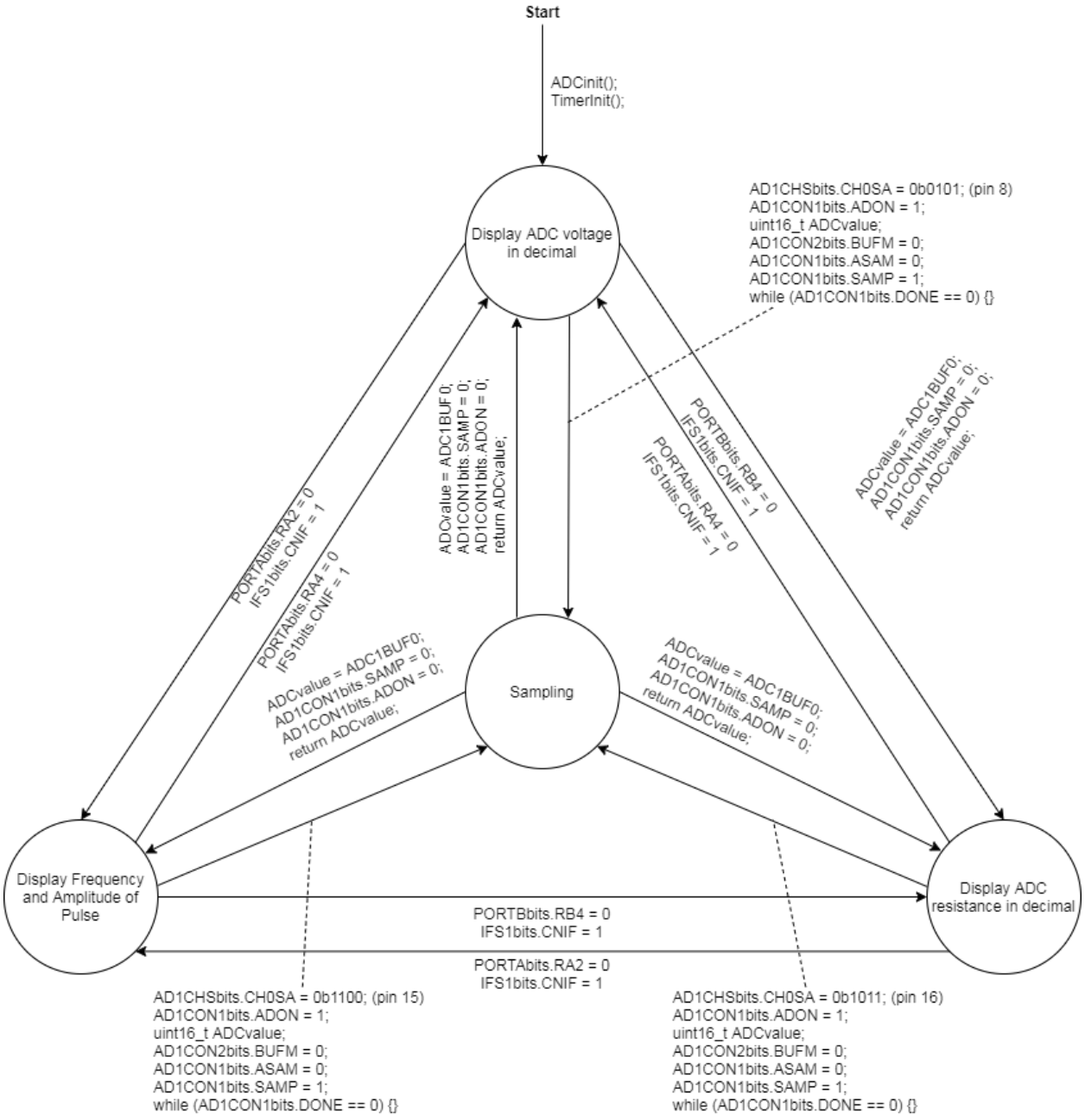

Formulas used

Voltage

$V = (V_{in} * V_{ref})/(V_{in,max})$

The max voltage the app project can measure is 3.00V.

Resistance

$R = (R_o * V_{in})/(V_{ref} - V_{in})$

The max resistance the app project can measure is 51344 Ohms

Frequency

$T = 2 * (t_2 - t_1)$

Number of clock cycles over a period of time. Multiplied by 2 because TMR2 updates every second tick

$f = (3 * base)/T = (3 * base)/(2 * (t_2 - t_1))$

Where base is the scalar proportional to the clock (500khz, 8Mhz). Multiplied by 3 because the sample is taken over 4 rising clock edges, which is equivalent to 3 periods.

Amplitude

$A = \frac{(max + min)}{2} * \frac{V_{DD}}{1024}$

Where V_{DD} is 3.25V, so

$A = \frac{3.25 * (max + min)}{2048}$