ADC Example

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For an ADC with $V_{ref} = 4.0\,V$ & 4-bit resolution, complete the table for the successive approximation method.

$$\text{step size} = \frac{V_{ref}}{2^n} \Rightarrow \frac{4}{16} = 0.25 \qquad V_{DAC} = (SAR) \times (ss)$$

SAR	V_{DAC}	Comment	Index	Index - 1
1000	2V	$V_{in} > V_{DAC}$	3	2
1100	3V	$V_{in} < V_{DAC}$	2	1
1010	2.5V	$V_{in} > V_{DAC}$	1	0
1011	2.75V	$V_{in} < V_{DAC}$	0	-1
1010	2.5V			

final SAR value

V_{in} aralığı

$8 \cdot (0.25) = 2$ $\qquad (8+2) \cdot (0.25) = 2.5$

$12 \cdot (0.25) = 3$ $\qquad (11) \cdot (0.25) = 2.75$

10 | 4
8 | 2,5
20
20
0

4.7 = 28
4.6 = 24

11 | 4
8 | 2,75
30
28
20
20
0