Mentimeter

Kretsene som driver koden

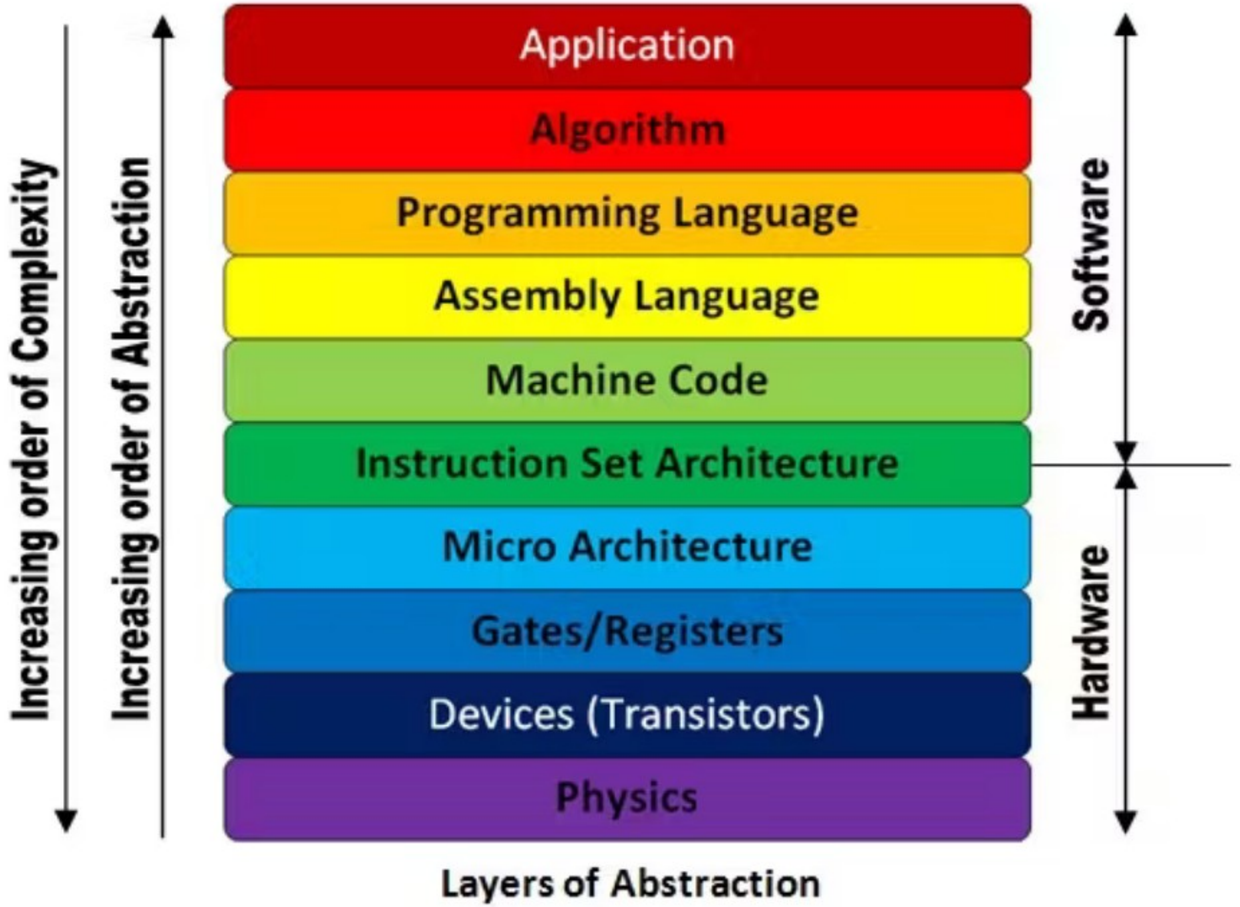
En reise gjennom arkitektur og ALU

Mentimeter

Dagens forelesning

- Hva består en instruksjon av?
- Arkitekturen til LMC
- Lære å kjenne hjernen og hjertet av en datamaskin :)
- Introduksjon til binær addisjon

Mentimeter



Abstraksjonsnivåer for datamaskin

Mentimeter

Datamaskinarkitektur

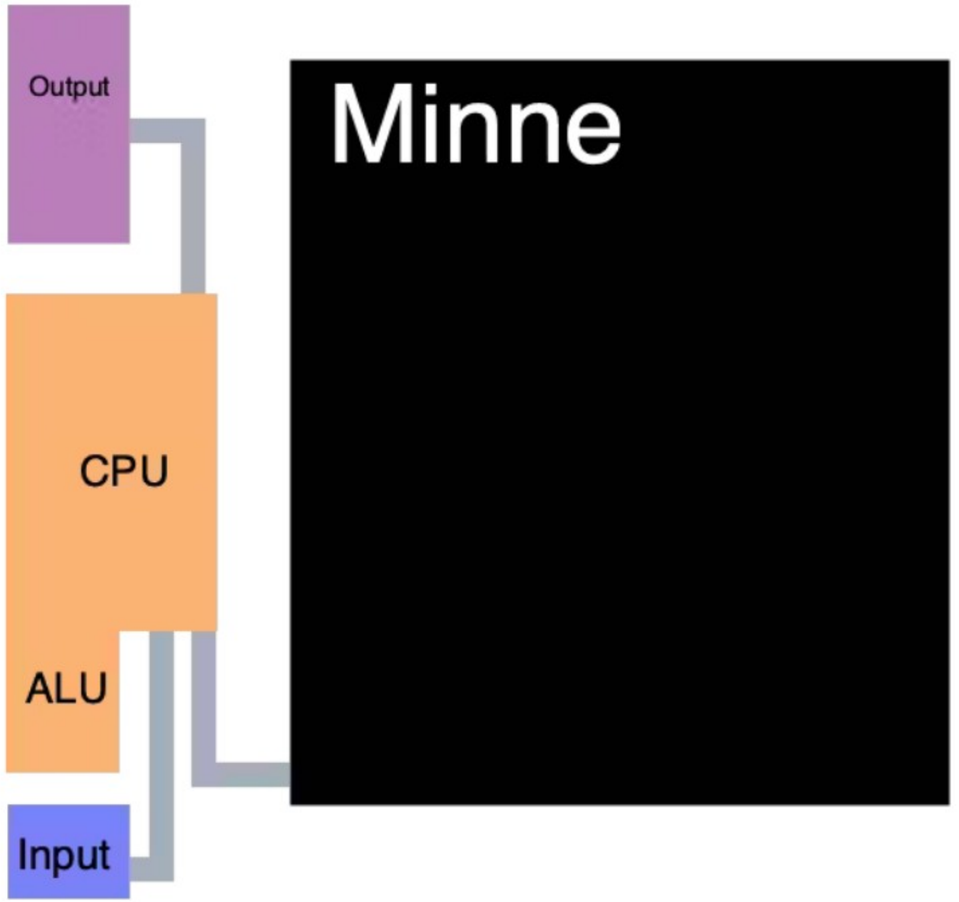
- CPU
- ALU
- ADDER
- Logiske Porter
- Transistor

Mentimeter

Utførelse av addisjon (instruksjon 199)

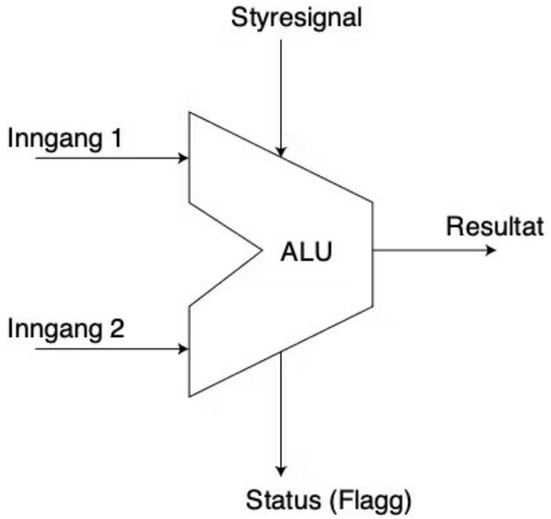
- Hent instruksjonen og øk programtelleren (FETCH)
- Splitt instruksjonen og hent fra minne (DECODE)
- Utfør instruksjonen (EXECUTE)
- Lagre data (WRITE-BACK)

Mentimeter



LMC - forenklet

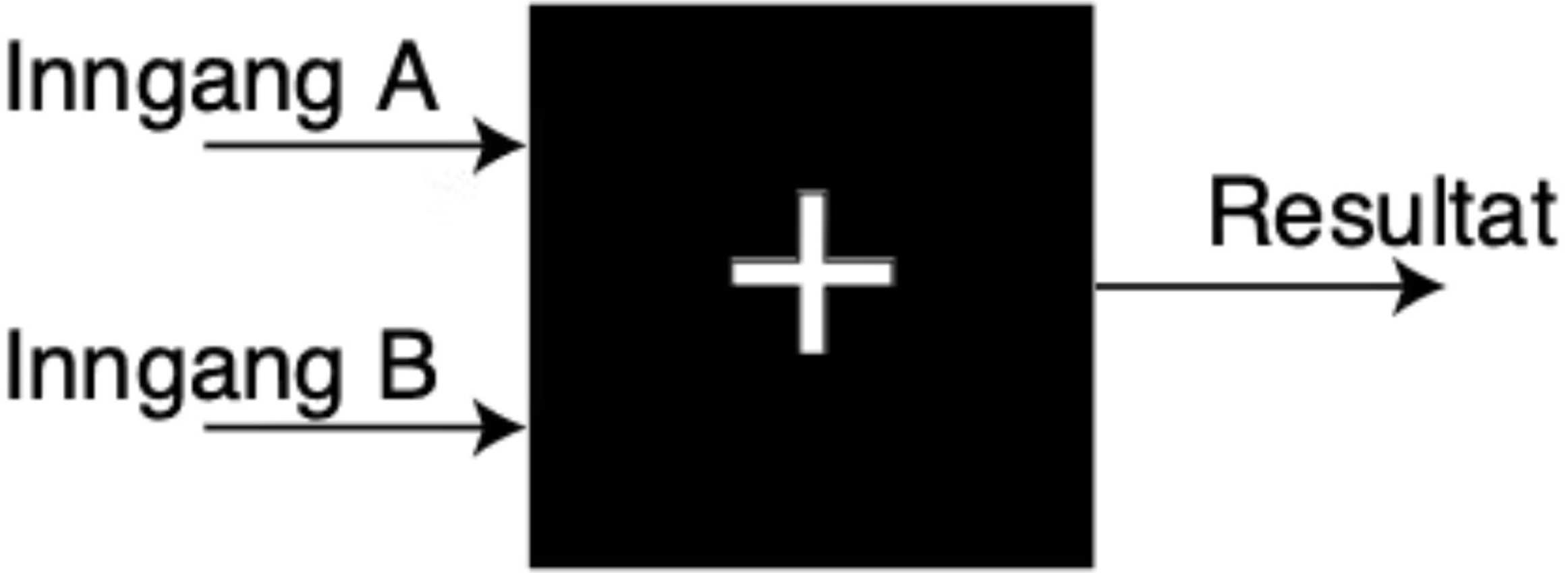
Mentimeter



ALU

- Aritmetriske funksjoner
- Logiske funksjoner
- Styresignal som velger operasjon
- Resultat
- Status (flagg)

Mentimeter

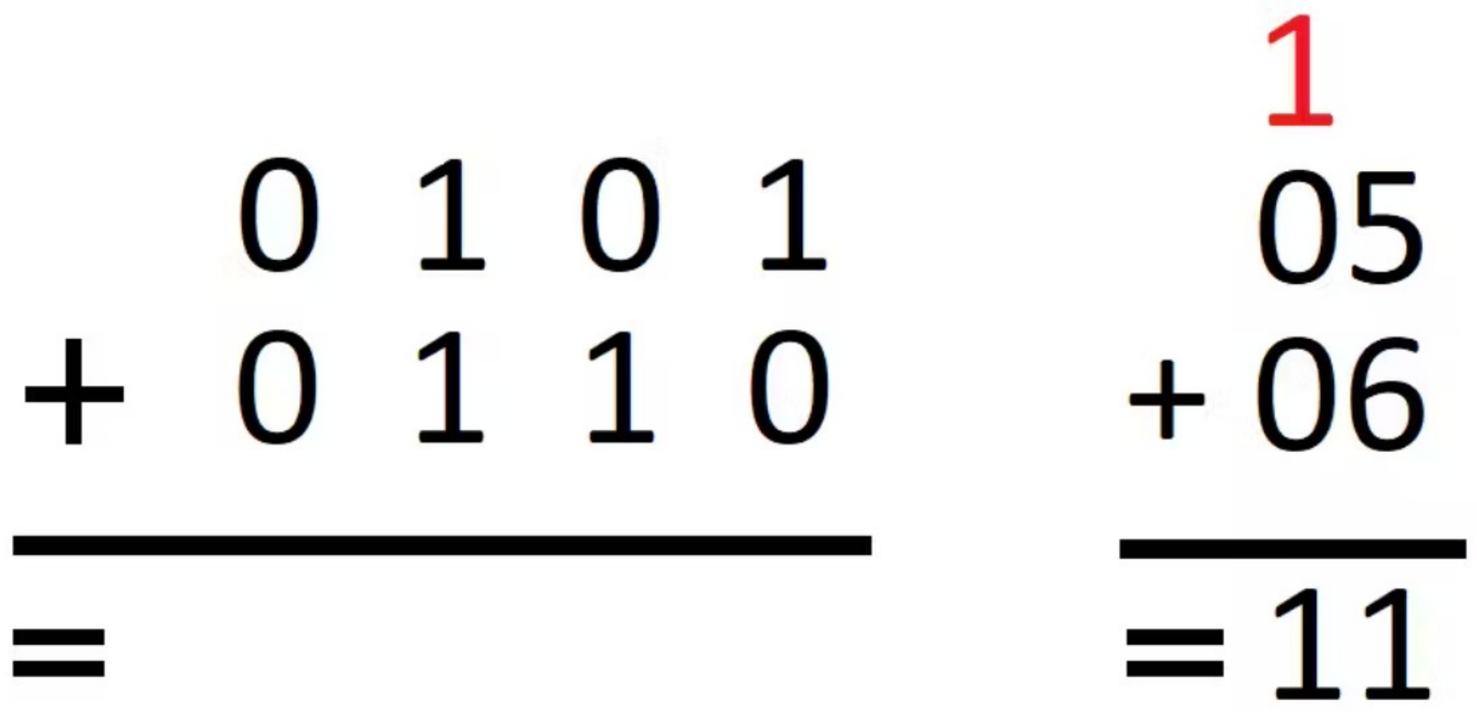


Binær addisjon

Mentimeter

Hvor blir det av mente?

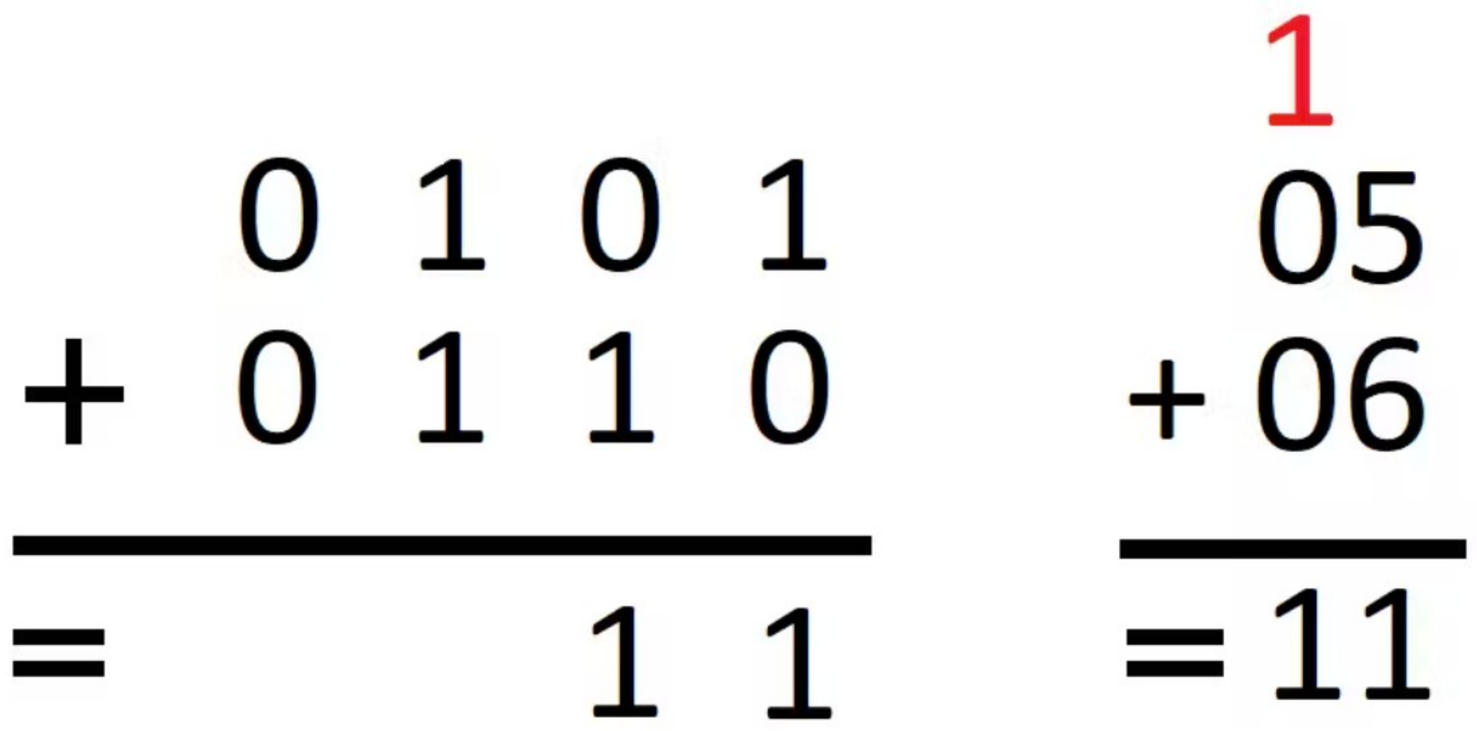
Mentimeter



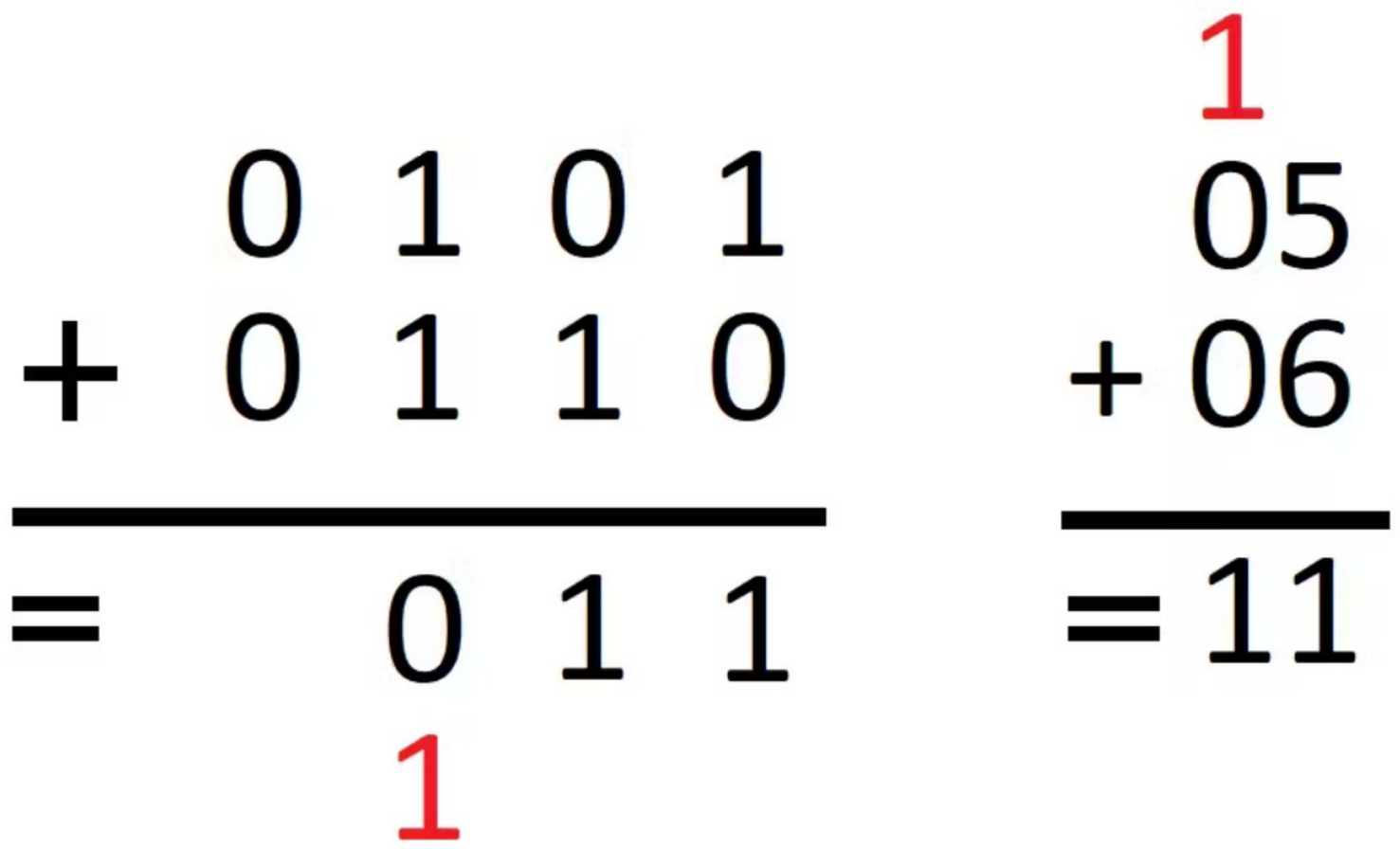
Mentimeter

					1	
	0	1	0	1	0	5
+	0	1	1	0	+ 0	6
=				1	= 1	1

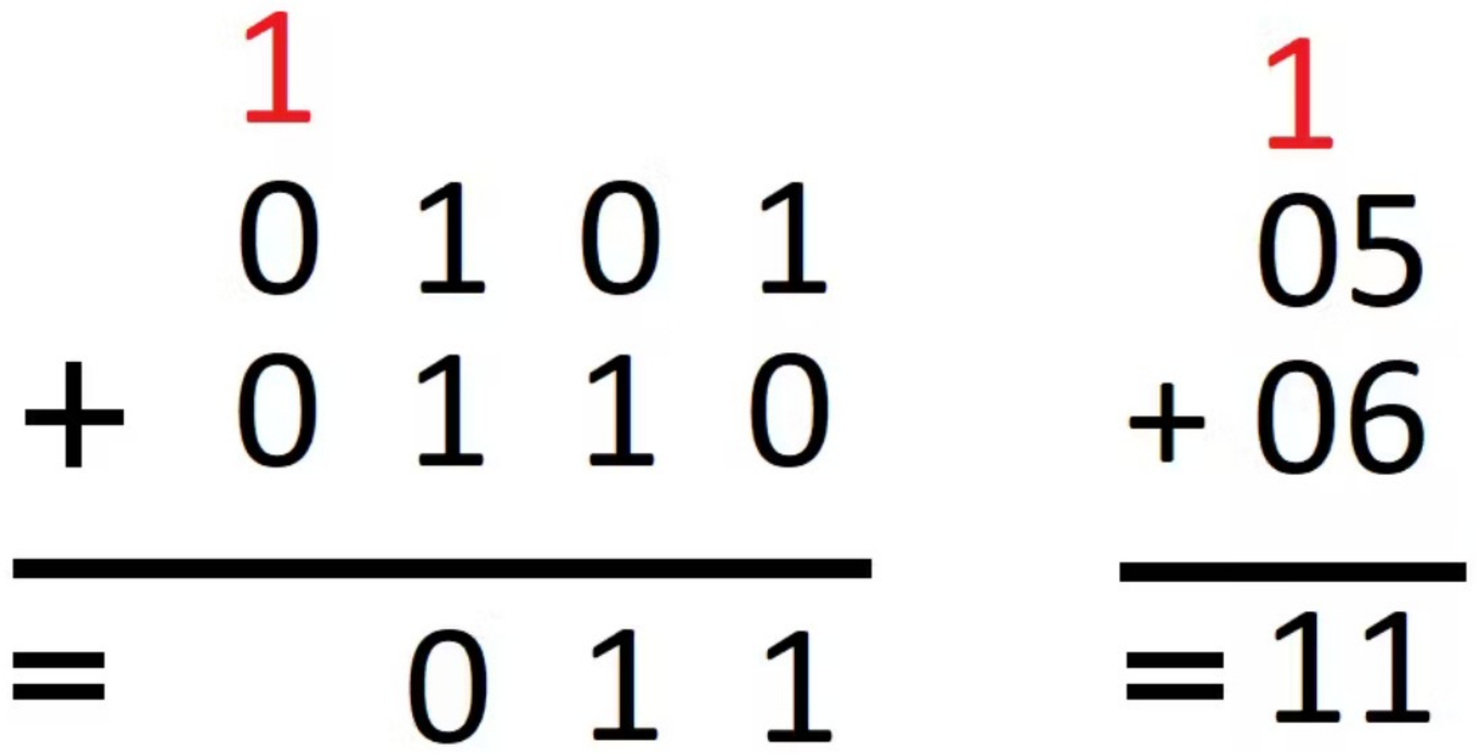
Mentimeter



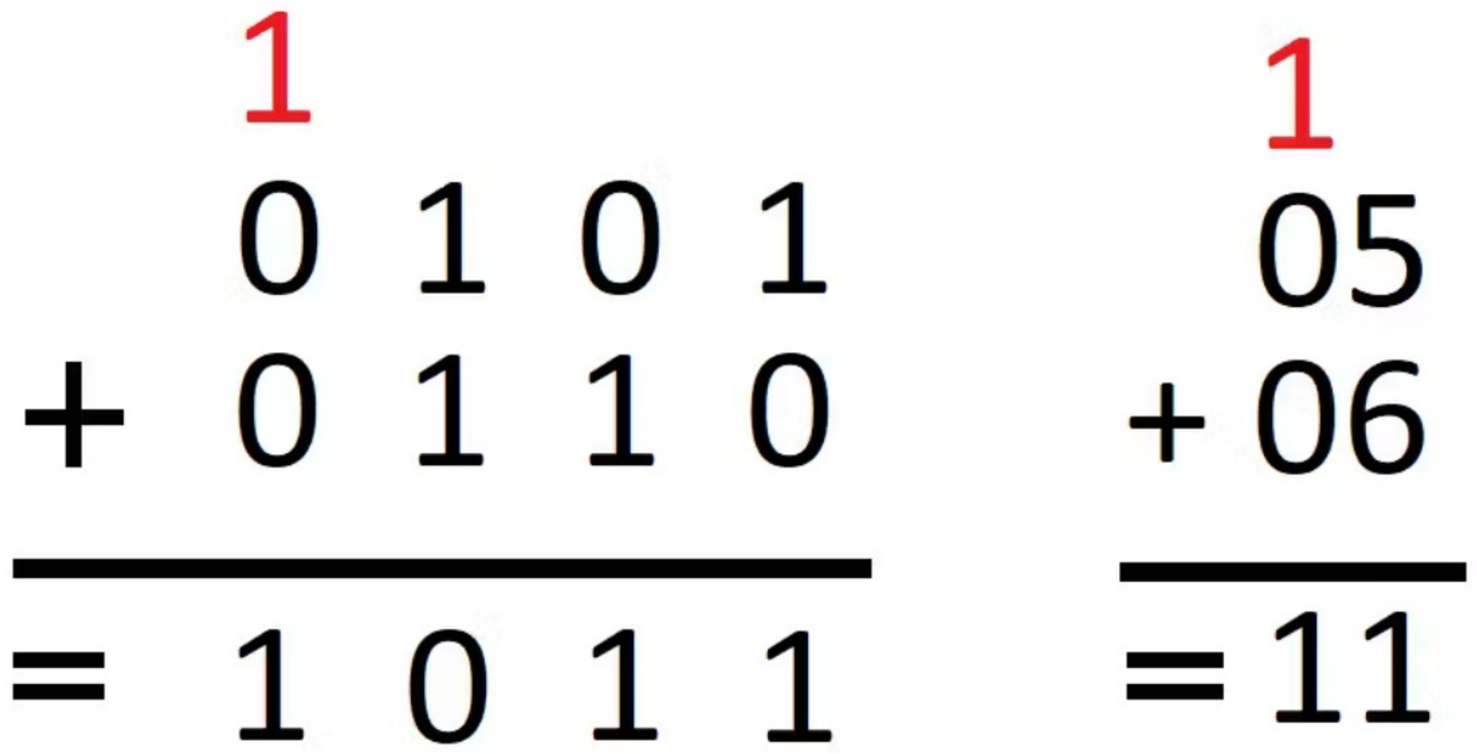
Mentimeter



Mentimeter



Mentimeter



Mentimeter

Hvordan koble sammen 0´ere og 1´ere?

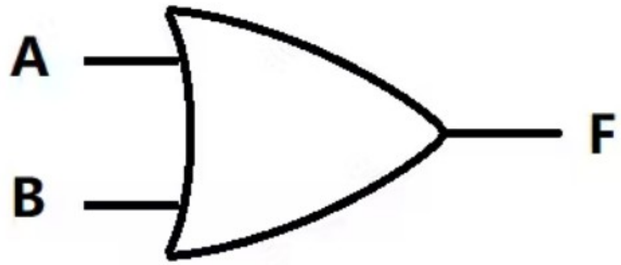
det må litt logikk og matematikk til....
Boolsk Algebra :)

Mentimeter

OR - port

$$F = A+B$$

A	B	F
0	0	0
0	1	1
1	0	1
1	1	1



Mentimeter

A	B	F
0	0	
0	1	
1	0	
1	1	

Sannhetsverditabell

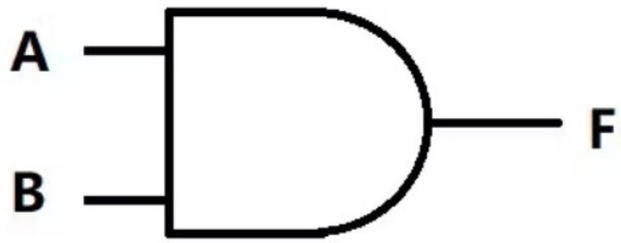
- Funksjonsbeskrivelse
- Innholder alle mulige kombinasjoner av innganger
- Én sannhetsverditabell kan ha mange funksjonsbeskrivelser
- Én funksjon har bare én sannhetsverditabell

Mentimeter

AND - port

$$F = AB$$

A	B	F
0	0	0
0	1	0
1	0	0
1	1	1

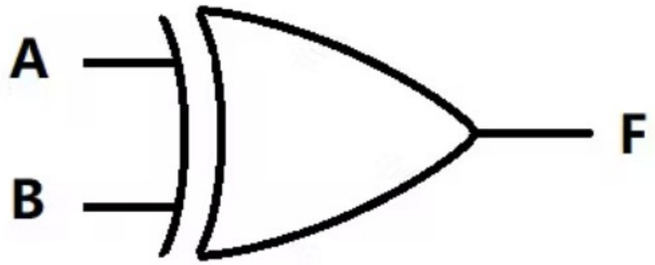


Mentimeter

XOR - port

$$F = A \oplus B$$

A	B	F
0	0	0
0	1	1
1	0	1
1	1	0

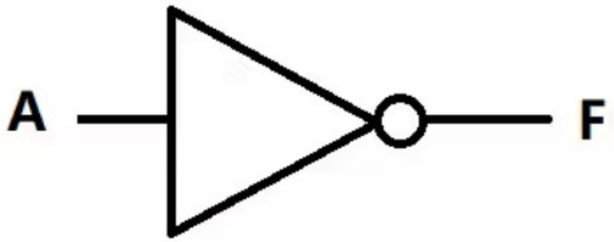


Mentimeter

INV - port

$F = A`$

A	F
0	1
1	0

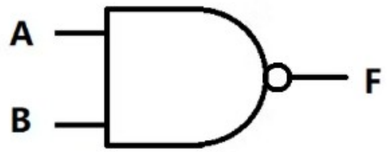


Mentimeter

NAND - port

$F = (AB)`$

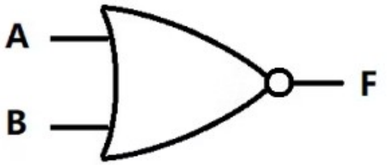
A	B	F
0	0	1
0	1	1
1	0	1
1	1	0



NOR - port

$F = (A+B)`$

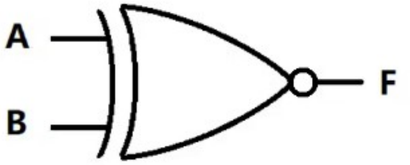
A	B	F
0	0	1
0	1	0
1	0	0
1	1	0



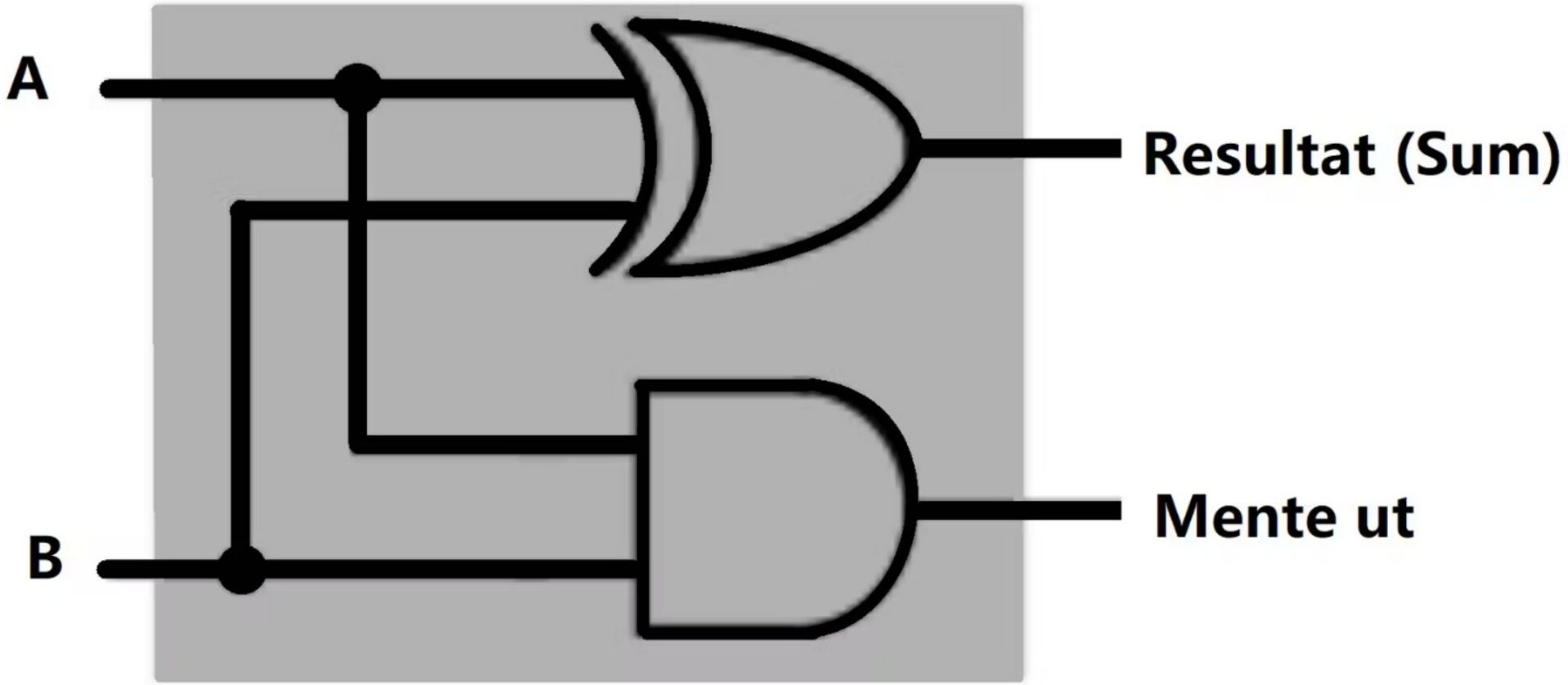
XNOR - port

$F = (A \oplus B)`$

A	B	F
0	0	1
0	1	0
1	0	0
1	1	1

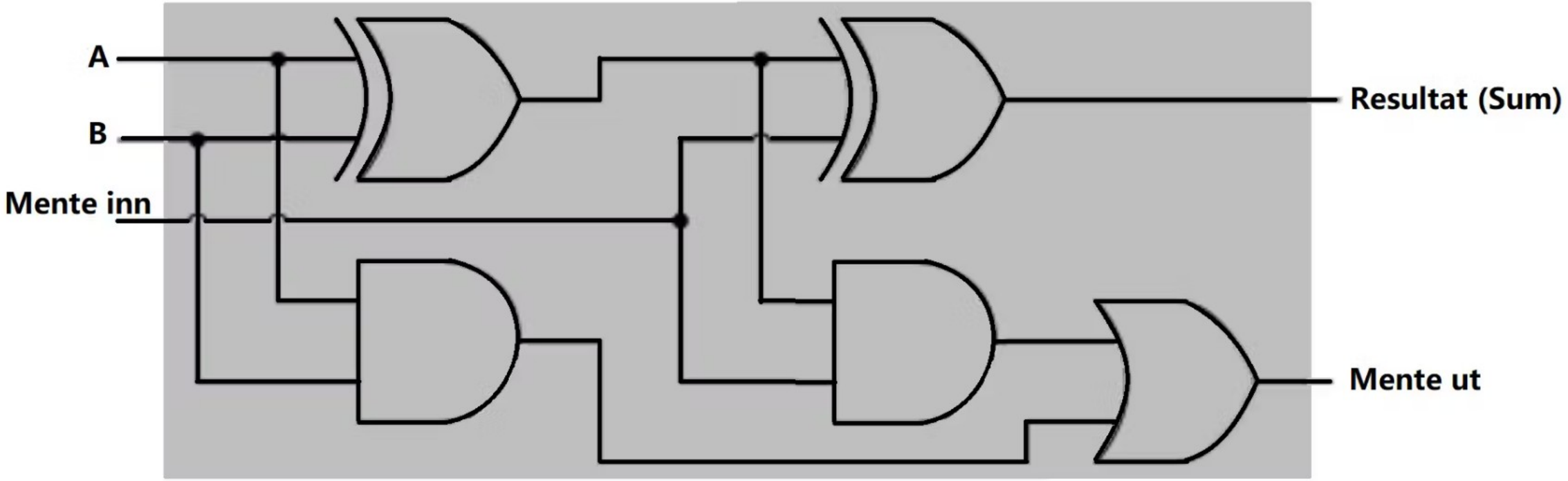


Mentimeter



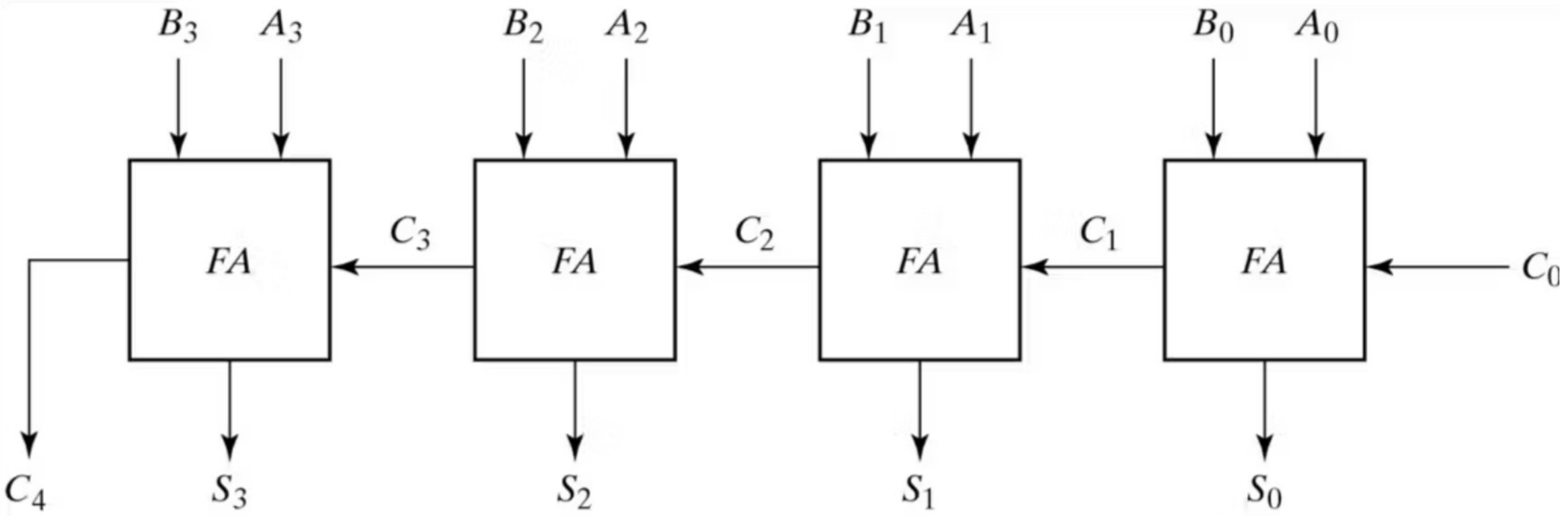
HALV-ADDER (HA)

Mentimeter



FULL-ADDER (FA)

Mentimeter



SERIELL ADDER?

Mentimeter

Spørsmål?

0 questions
0 upvotes