

Lær Kidsa Koding

Kurs og verktøy



“Hva slags kurs og verktøy som passer til barn i forskjellige aldersgrupper”

Olve Maudal, Kunnskapsminister, Cisco Systems

2.April 2013

Min bakgrunn

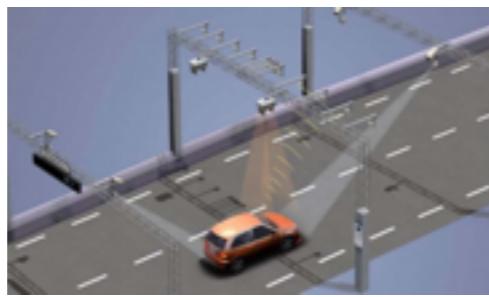
Studied microelectronics and software engineering (UMIST Manchester 1992-1995)

Studied artificial intelligence and robotics (DAI University of Edinburgh 1995-1996)

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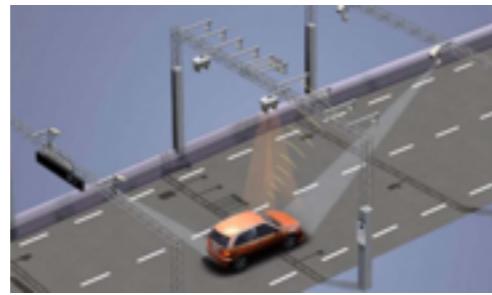
Developing systems for electronically moving money (BBS, Oslo 2000-2004)

Developing systems for telepresence (Tandberg/Cisco, Oslo 2004-now)



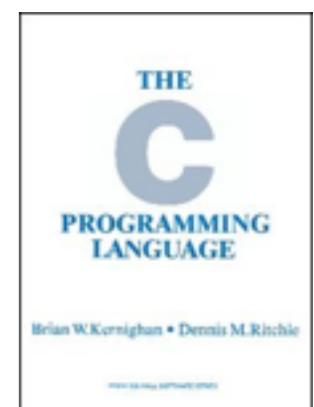
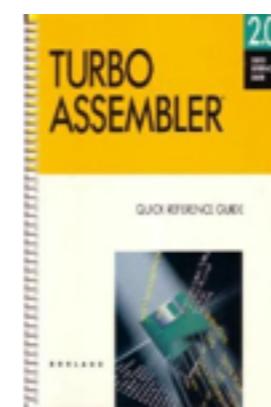
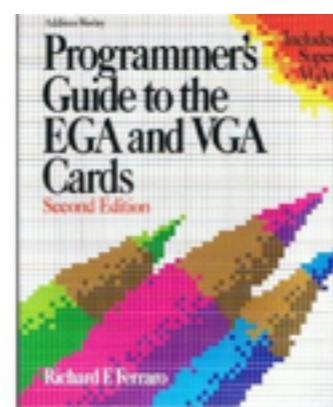
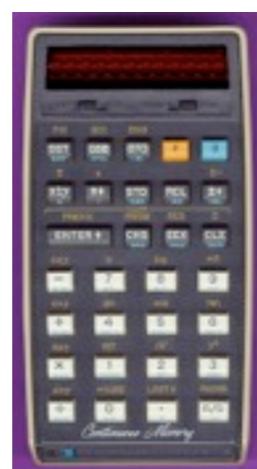
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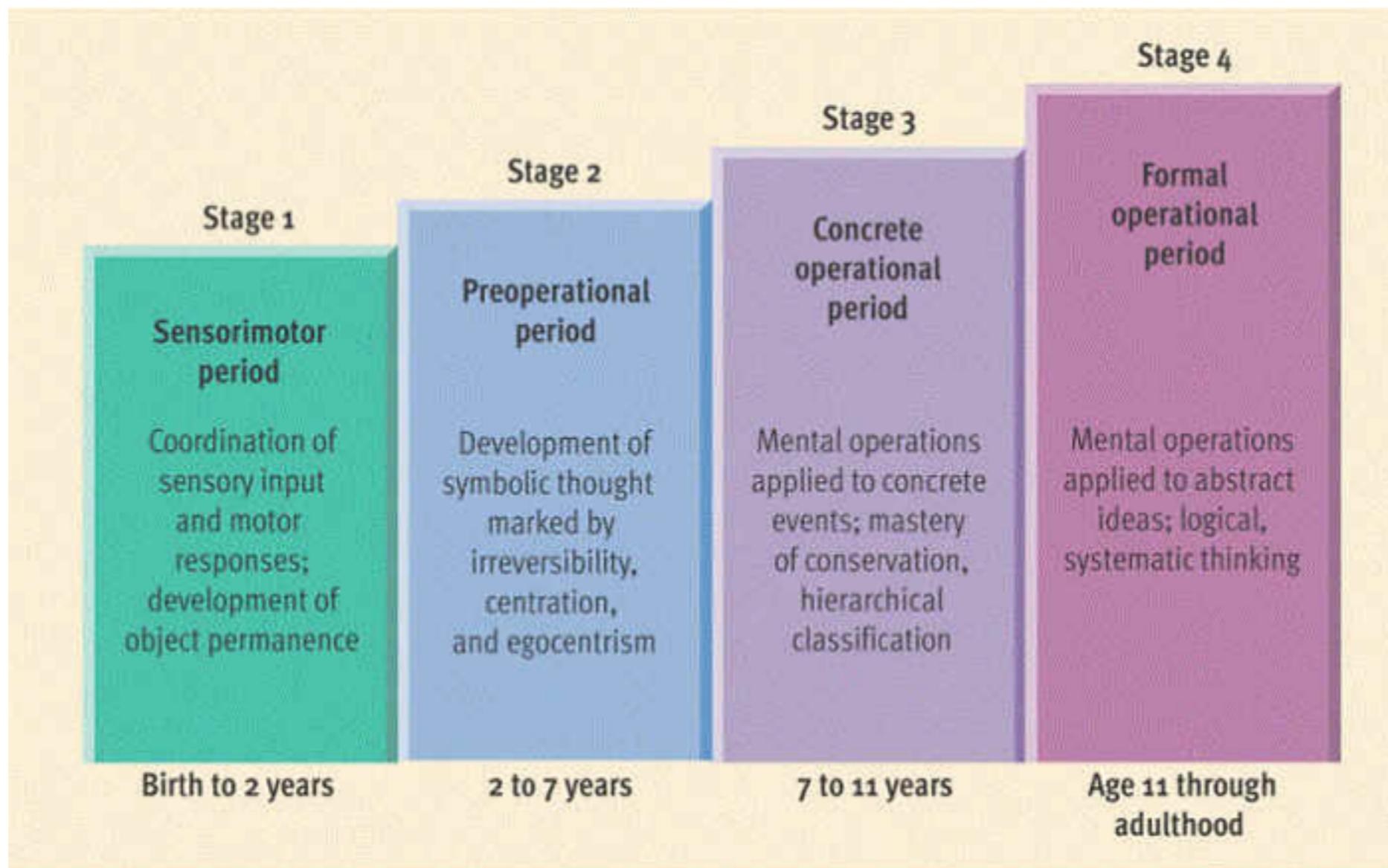


Far til to barn: 7 og 11

Min oppvekst (6-18 år, dvs ca 1978-1989)



Piaget læringsteori



Sensormotorisk periode (0-2)

- læring gjennom bevegelse og sansene
- veldig egosentrisk oppfatning av verden

Preoperasjonell periode (2-7)

- begynner å bruke språk og symboler
- mangler evnen til å forstå og bruke logisk tenkning

Konkret-operasjonell periode (7-11)

- kan forstå og tenke logisk med konkrete eksempler
- kan bruke andre perspektiver

Formelt-operasjonell periode (11+)

- kan tenke abstrakt, trenger ikke lenger konkrete eksempler
- kan forstå og bruke logisk tenkning

Eksempler på aktiviteter som jeg har tro på...

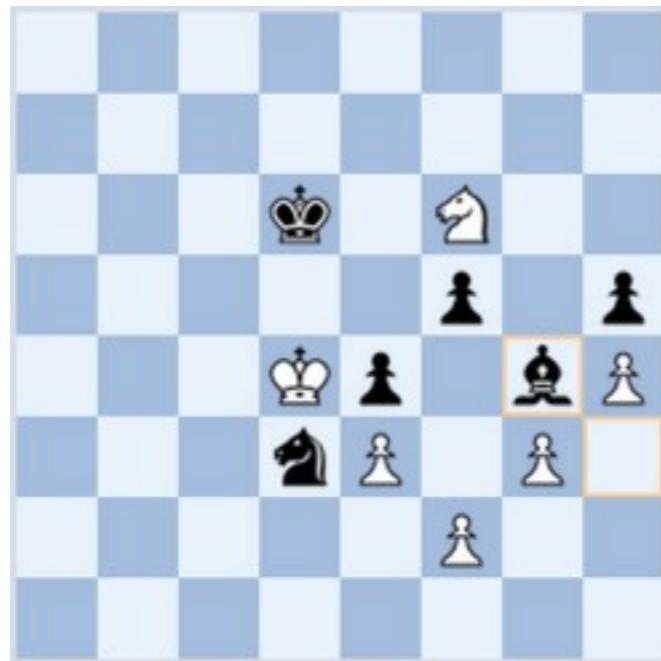
Preoperasjonell periode (2-7)

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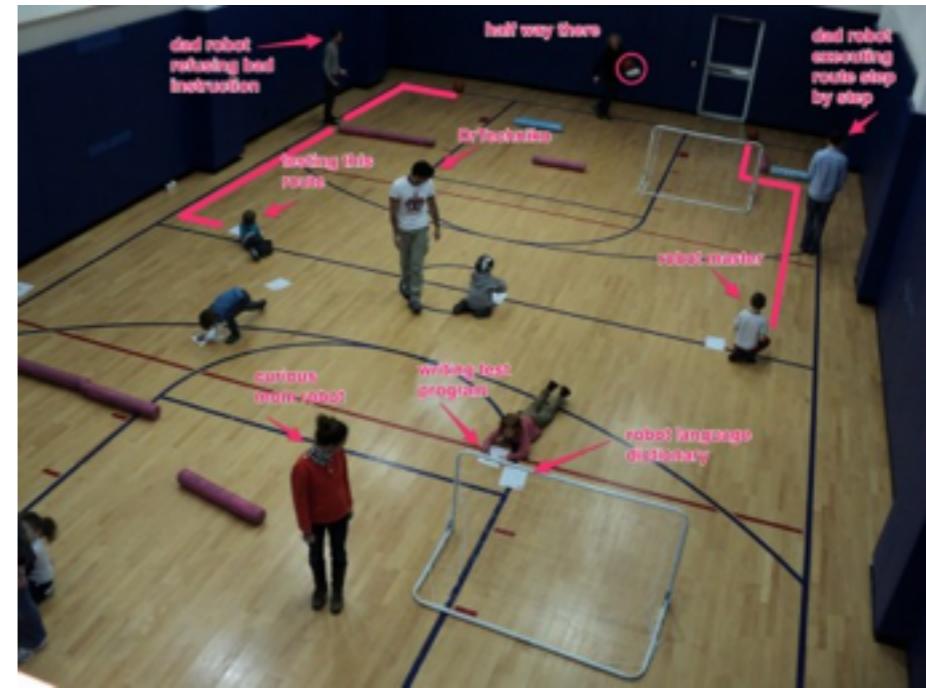


Datasjakk

Preoperasjonell periode (2-7)

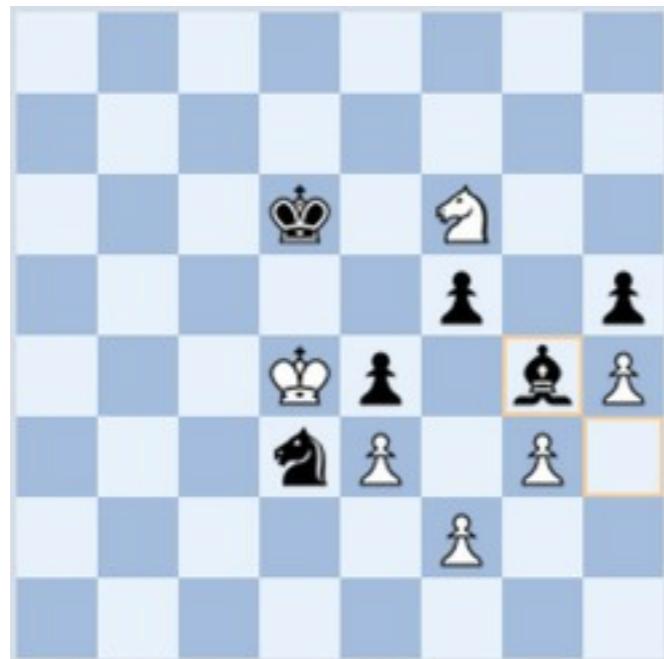


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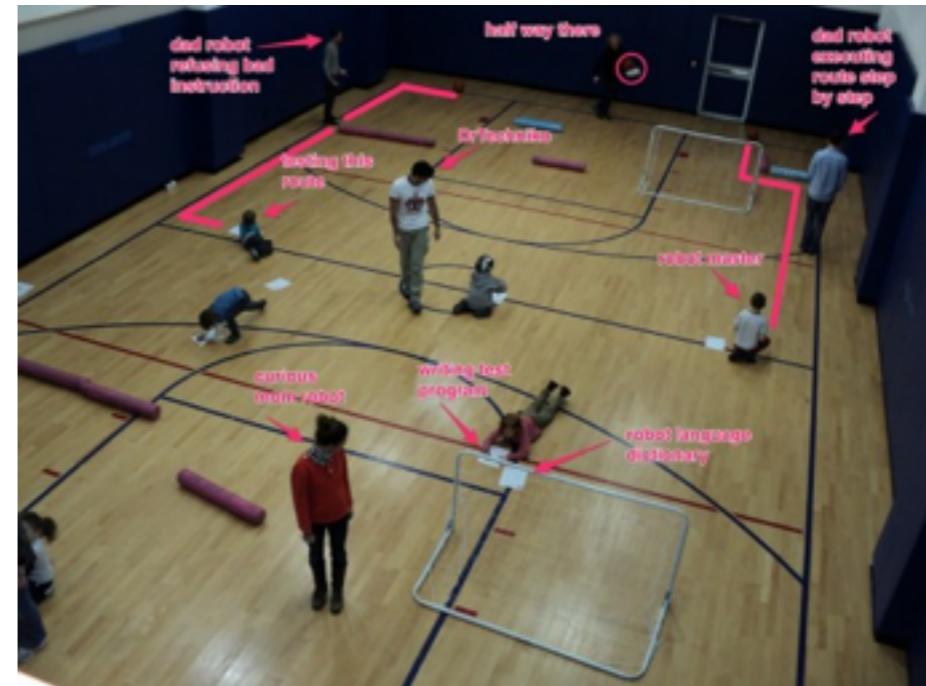


“Onkel Robot / Tante Robot”

Preoperasjonell periode (2-7)



Datasjakk



“Onkel Robot / Tante Robot”

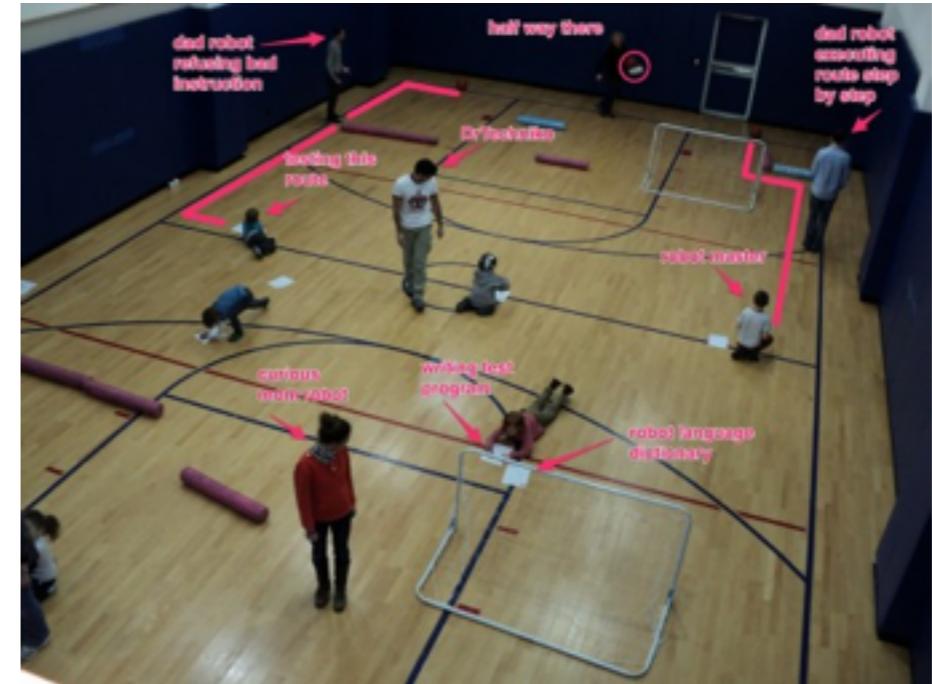


Talking Tom

Preoperasjonell periode (2-7)



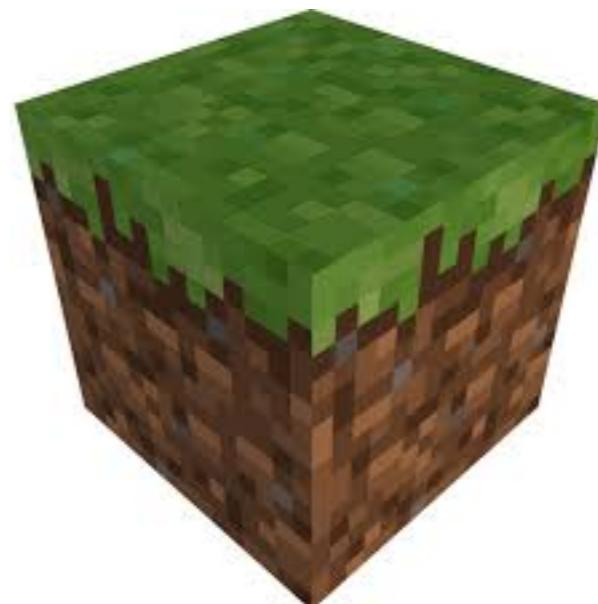
Datasjakk



“Onkel Robot / Tante Robot”



Talking Tom



Minecraft

Konkret-operasjonell periode (7-11)

Konkret-operasjonell periode (7-II)



Scratch

Konkret-operasjonell periode (7-II)



Scratch



Lego NXT

Konkret-operasjonell periode (7-II)



Scratch



Lego NXT



ComputerCraft
Minecraft mods

Konkret-operasjonell periode (7-II)



Scratch



Lego NXT



ComputerCraft
Minecraft mods



Rubiks kube

Formelt-operasjonell periode (II+)

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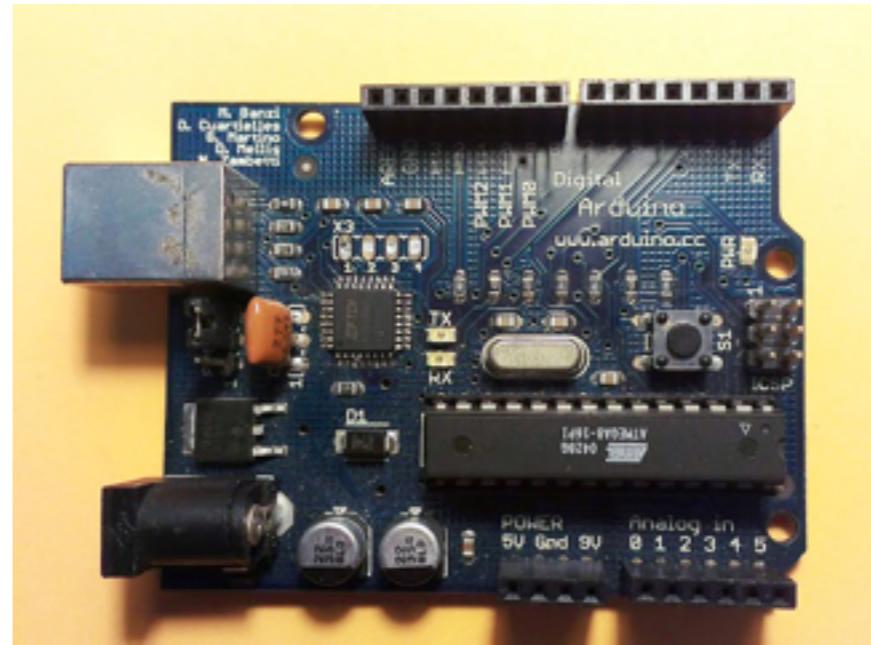


Lego NXT (replace OS)

Formelt-operasjonell periode (II+)



Lego NXT (replace OS)

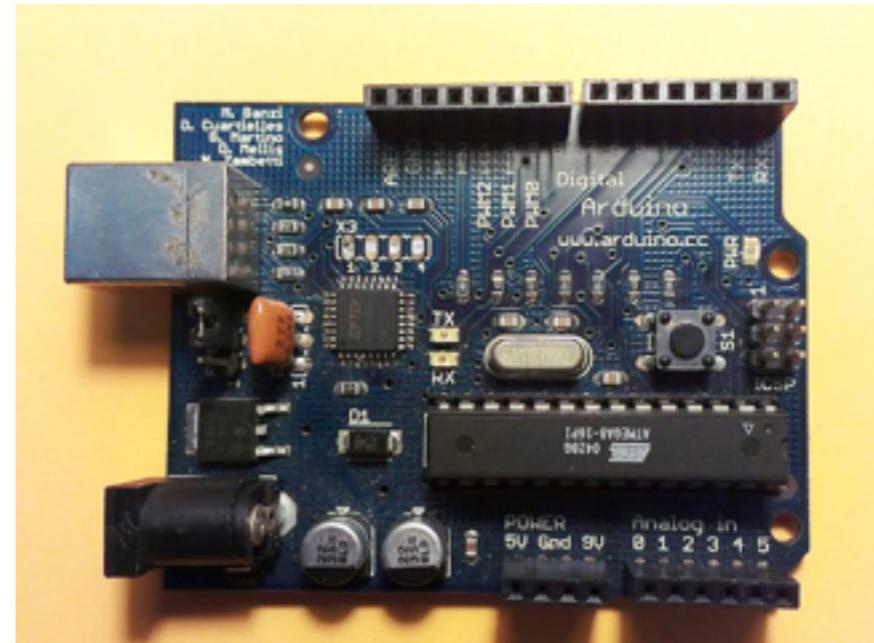


Arduino

Formelt-operasjonell periode (II+)



Lego NXT (replace OS)



Arduino

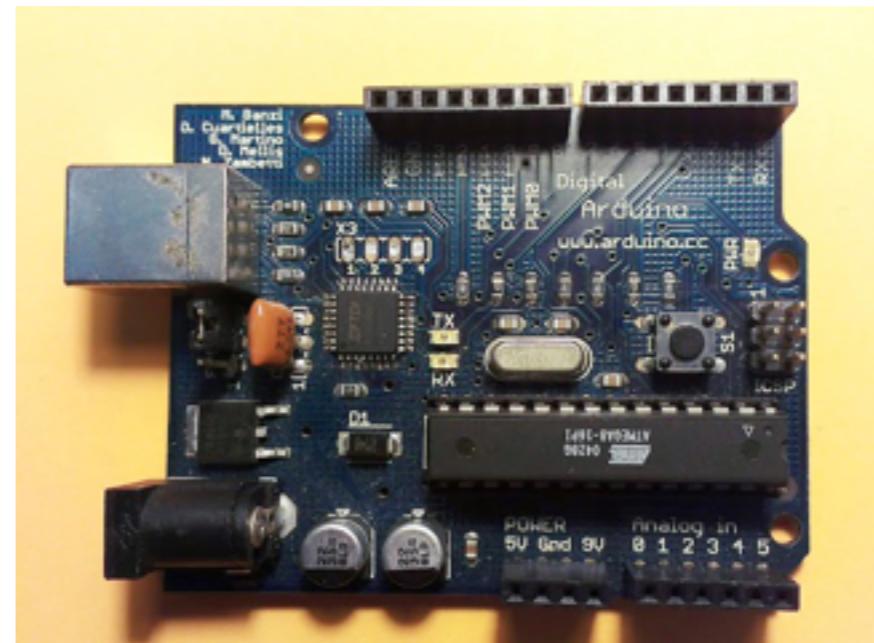


Raspberry Pi

Formelt-operasjonell periode (II+)



Lego NXT (replace OS)



Arduino



Raspberry Pi

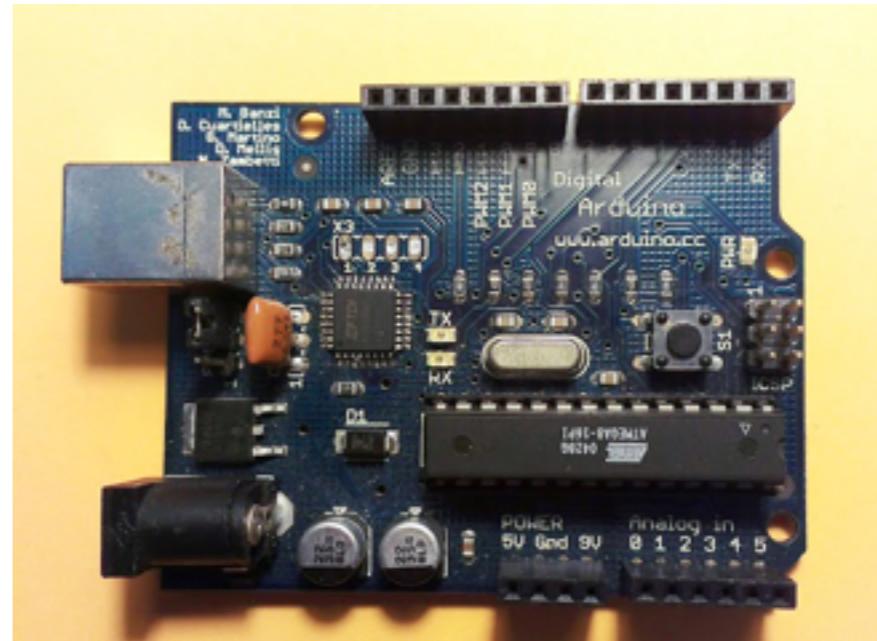


Commodore 64

Formelt-operasjonell periode (II+)



Lego NXT (replace OS)



Arduino



Raspberry Pi

Python, Ruby, C, C++, Basic



Commodore 64

Se også

<http://www.kidsakoder.no/wiki/kidsa-koder-wiki/ressurser/>

!

imperativ vs deklarativ

```
for i ← 1 to i ← length(A)-1
{
    valueToInsert ← A[i]
    holePos ← i
    while holePos > 0 and valueToInsert < A[holePos - 1]
    {
        A[holePos] ← A[holePos - 1]
        holePos ← holePos - 1
    }
    A[holePos] ← valueToInsert
}
```

```
isort :: [Int] -> [Int]
isort [] = []
isort (x:xs) = insert x (isort xs)

insert :: Int -> [Int] -> [Int]
insert x [] = [x]
insert x (y:ys)
| x <= y = x:y:ys
| otherwise = y:(insert x ys)
```

Boolsk algebra

$a \vee (b \vee c) = (a \vee b) \vee c$	$a \wedge (b \wedge c) = (a \wedge b) \wedge c$	assosiativitet
$a \vee b = b \vee a$	$a \wedge b = b \wedge a$	kommutativitet
$a \vee (a \wedge b) = a$	$a \wedge (a \vee b) = a$	absorpsjon
$a \vee (b \wedge c) = (a \vee b) \wedge (a \vee c)$	$a \wedge (b \vee c) = (a \wedge b) \vee (a \wedge c)$	distributivitet
$a \vee \neg a = 1$	$a \wedge \neg a = 0$	kompliment

Binært tallsystem

$$| + | = 10$$

$$100 - | = 11$$

$$1011 \times 1010 = 110110$$

$$42_{10} = 101010_2$$