

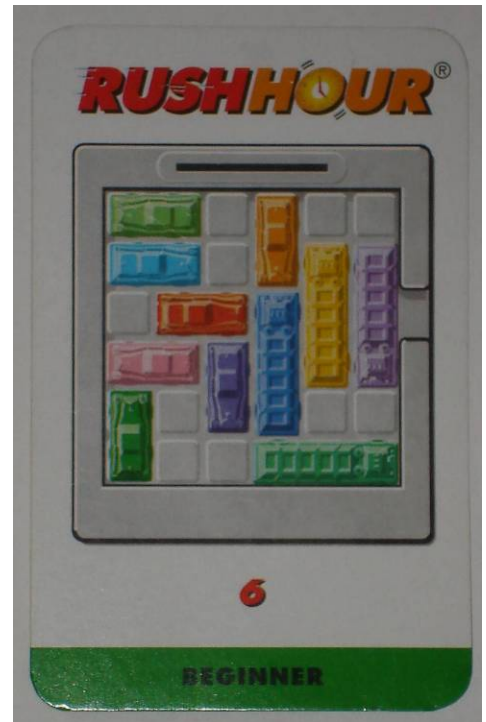
# Algoritmer og Datastrukturer 1

”Rush Hour”



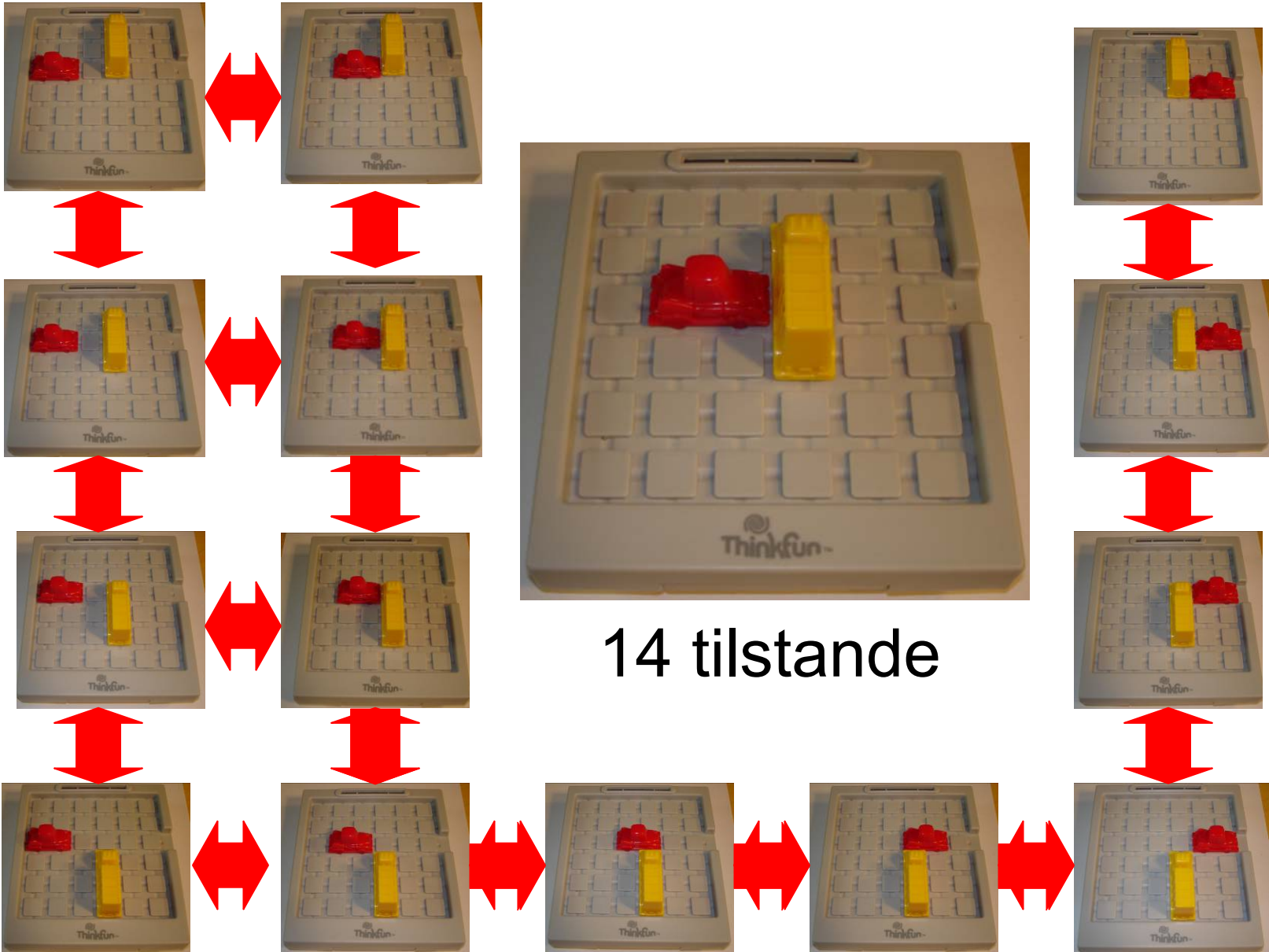
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**Aarhus Universitet**





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# Løsning af RushHour

**procedure** RushHour(Startopstilling  $c$ )

$S = \{ c \}$

$Q = \{ c \}$

**while**  $|Q| > 0$

$c = \text{delete}(Q)$

**for** alle mulige træk  $c \rightarrow c'$

**if**  $c'$  ikke er i  $S$  **then**

**if**  $c' \rightarrow$  rød exit **then**

    rapporter fundet en løsning

$\text{insert}(S, c')$

$\text{insert}(Q, c')$

Hvilken  
rækkefølge ?

# Datastrukturer

**S** = (balanceret) søgetræ

**Q** = stak eller kø

**Bemærk:** Hvis **Q** = kø så findes tilstandene efter stigende afstand fra starttilstanden

**RUSH HOUR**



1

BEGINNER

**RUSH HOUR**



2

BEGINNER

**RUSH HOUR**



3

BEGINNER

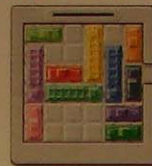
**RUSH HOUR**



4

BEGINNER

**RUSH HOUR**



5

BEGINNER

**RUSH HOUR**



6

BEGINNER

**RUSH HOUR**



7

BEGINNER

**RUSH HOUR**



8

BEGINNER

**RUSH HOUR**



9

BEGINNER

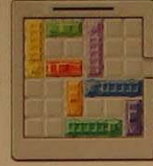
**RUSH HOUR**



10

BEGINNER

**RUSH HOUR**



11

INTERMEDIATE

**RUSH HOUR**



12

INTERMEDIATE

**RUSH HOUR**



13

INTERMEDIATE

**RUSH HOUR**



14

INTERMEDIATE

**RUSH HOUR**



15

INTERMEDIATE

**RUSH HOUR**



16

INTERMEDIATE

**RUSH HOUR**



17

INTERMEDIATE

**RUSH HOUR**



18

INTERMEDIATE

**RUSH HOUR**



19

INTERMEDIATE

**RUSH HOUR**



20

INTERMEDIATE

**RUSH HOUR**



21

ADVANCED

**RUSH HOUR**



22

ADVANCED

**RUSH HOUR**



23

ADVANCED

**RUSH HOUR**



24

ADVANCED

**RUSH HOUR**



25

ADVANCED

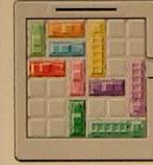
**RUSH HOUR**



26

ADVANCED

**RUSH HOUR**



27

ADVANCED

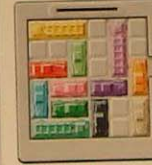
**RUSH HOUR**



28

ADVANCED

**RUSH HOUR**



29

ADVANCED

**RUSH HOUR**



30

ADVANCED

**RUSH HOUR**



31

EXPERT

**RUSH HOUR**



32

EXPERT

**RUSH HOUR**



33

EXPERT

**RUSH HOUR**



34

EXPERT

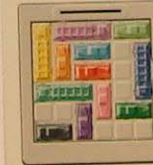
**RUSH HOUR**



35

EXPERT

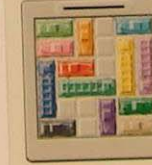
**RUSH HOUR**



36

EXPERT

**RUSH HOUR**



37

EXPERT

**RUSH HOUR**



38

EXPERT

**RUSH HOUR**



39

EXPERT

**RUSH HOUR**



40

EXPERT

# Eksempler på løsninger

Kort	Korte ste vej	Antal tilstan de	"Kø" S	"Kø" Max Q	"Stak" S	"Stak" Max Q	"Stak" Stilæn gde	Random Walk Stilængde min-gnst-max
1	7	1075	1057	297	1029	735	163	15-691-4443
2	7	21055	2267	769	596	499	97	58-770-3300
3	13	830	774	175	412	273	88	120-1518-7147
4	8	451	350	137	443	200	61	46-534-2650
5	8	2784	2251	556	1868	1466	385	35-831-3398
6	8	2954	1556	351	1016	773	230	31-505-2663
7	12	7273	4947	1207	1483	1184	289	74-635-3078
8	11	950	950	191	787	536	236	64-4881-24365
9	11	6759	680	191	148	109	39	26-170-683
10	16	4466	1817	252	1072	803	205	169-1387-6965
13	15	13119	8201	1270	6540	4828	1443	165-1707-6398
14	16	61712	8928	2550	5114	4255	819	262-1789-5610
15	22	540	524	56	443	284	148	256-11282-55409
32	36	690	574	37	279	189	75	546-7787-36859
33	39	4273	4066	440	2942	2233	668	4959-44873-143358
37	46	1955	1941	222	1627	1157	418	1051-5407-20537
38	47	4405	3710	254	1768	1207	402	1824-10966-40450
39	49	4533	3581	159	3310	1723	618	3701-26707-81966
40	50	3493	3024	283	2285	1273	461	2237-15823-51870



# Kort 33: 100 x Random Walk

