Zadání 1. úkolu do předmětu IZU

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Pomocí metody UCS určete **nejkratší** dobu, za kterou čtyři lidé přejdou most. Máme most, přes který mohou jít jen dva lidé zaráz a přitom musí nést pochodeň. Každý jde jinou rychlostí, pokud jsou dva lidé spolu, jdou rychlostí pomalejšího. Doba přechodu mostu pro jednotlivé osoby viz tabulka, rychlosti u operátorů doplňte. Operátory používejte podle jejich pořadí. V jednotlivých krocích uvádějte obsahy zásobníků Open a Closed. Jako cestu vypište pořadí použitých operátorů.

Pochodeň je označena „*", číslo udává dobu cesty, osoby (A, B, C, D) nalevo od čísla jsou na jedné straně mostu, osoby napravo od čísla jsou na druhé straně mostu. „X" značí dobu, za kterou se všichni lidé dostanou na druhou stranu.

Start: [*ABCD0]

Cíl: [18ABCD*]

Časy:

A : 1

B : 3

C : 6

D : 8

Operátory:

1.	A <- 1	5.	AB -> 3	9.	BD -> 8
2.	B <- 3	6.	AC -> 6	10.	CD -> 8
3.	C <- 6	7.	AD -> 8		
4.	D <- 8	8.	BC -> 6		

Cesta:	5.	1.	10.	2.	5.			
Suma:18	3	1	8	3	3			

README: Vsechny uzly v Open, které mají hodnotu větší než doteď nejmenši nalezený finální uzel, jsou vyškrtnuty. (Optimalizace)

Legenda: Právě expandovaný uzel | Jeho následníci | Finální uzel

Open:	[*ABCD0]							

Closed:								

Open:	[CD3AB*]	[BD6AC*]	[BC8AD*]	[AD6BC*]	[AC8BD*]	[AB8CD*]		

Closed:	[*ABCD0]							

Open:	[BD6AC*]	[BC8AD*]	[AD6BC*]	[AC8BD*]	[AB8CD*]	[*ACD4B]	[*BCD6A]	

Closed:	[*ABCD0]	[CD3AB*]						

Open:	[BD6AC*]	[BC8AD*]	[AD6BC*]	[AC8BD*]	[AB8CD*]	[*BCD6A]	[D10ABC*]	[C12ABD*]
	[A12BCD*]							

Closed:	[*ABCD0]	[CD3AB*]	[*ACD4B]					

Open:

[BC8AD*]	[AD6BC*]	[AC8BD*]	[AB8CD*]	[*BCD6A]	[D10ABC*]	[C12ABD*]	[A12BCD*]
[*ABD7C]	[*BCD12A]						

Closed:

[*ABCD0]	[CD3AB*]	[*ACD4B]	[BD6AC*]				

Open:

[BC8AD*]	[AC8BD*]	[AB8CD*]	[*BCD6A]	[D10ABC*]	[C12ABD*]	[A12BCD*]	[*ABD7C]
[*ABD9C]	[*ACD12B]						

Closed:

[*ABCD0]	[CD3AB*]	[*ACD4B]	[BD6AC*]	[AD6BC*]			

Open:

[BC8AD*]	[AC8BD*]	[AB8CD*]	[D10ABC*]	[C12ABD*]	[A12BCD*]	[*ABD7C]	[*ABD9C]
[D12ABC*]	[C14ABD*]	[B14ACD*]					

Closed:

[*ABCD0]	[CD3AB*]	[*ACD4B]	[BD6AC*]	[AD6BC*]	[*BCD6A]		

Open:

[BC8AD*]	[AC8BD*]	[AB8CD*]	[D10ABC*]	[C12ABD*]	[A12BCD*]	[*ABD9C]	[B14ACD*]
[D10ABC*]	[B15ACD*]	[A15BCD*]					

Closed:

[*ABCD0]	[CD3AB*]	[*ACD4B]	[BD6AC*]	[AD6BC*]	[*BCD6A]	[*ABD7C]	

Open:

[AC8BD*]	[AB8CD*]	[D10ABC*]	[C12ABD*]	[A12BCD*]	[*ABD9C]	[B14ACD*]	[*ABC9D]
[*BCD16A]							

Closed:

[*ABCD0]	[CD3AB*]	[*ACD4B]	[BD6AC*]	[AD6BC*]	[*BCD6A]	[*ABD7C]	[BC8AD*]

Open:

[AB8CD*]	[D10ABC*]	[C12ABD*]	[A12BCD*]	[*ABD9C]	[B14ACD*]	[*ABC9D]	[*ABC11D]
[*ACD16B]							

Closed:

[*ABCD0]	[CD3AB*]	[*ACD4B]	[BD6AC*]	[AD6BC*]	[*BCD6A]	[*ABD7C]	[BC8AD*]
[AC8BD*]							

Open:

[D10ABC*]	[C12ABD*]	[*ABD9C]	[A12BCD*]	[B14ACD*]	[*ABC9D]	[*ABC14D]	[*ABD16C]

Closed:

[*ABCD0]	[CD3AB*]	[*ACD4B]	[BD6AC*]	[AD6BC*]	[*BCD6A]	[*ABD7C]	[BC8AD*]
[AC8BD*]	[AB8CD*]						

Open:

[D10ABC*]	[C12ABD*]	[A12BCD*]	[B14ACD*]	[*ABC9D]	[D12ABC*]	[B17ACD*]	[A17BCD*]

Closed:

[*ABCD0]	[CD3AB*]	[*ACD4B]	[BD6AC*]	[AD6BC*]	[*BCD6A]	[*ABD7C]	[BC8AD*]
[AC8BD*]	[AB8CD*]	[*ABD9C]					

Open:	[D10ABC*]	[C12ABD*]	[A12BCD*]	[B14ACD*]	~~[C12ABD*]~~	~~[B15ACD*]~~	~~[A15BCD*]~~	

Closed:	[*ABCD0]	[CD3AB*]	[*ACD4B]	[BD6AC*]	[AD6BC*]	[*BCD6A]	[*ABD7C]	[BC8AD*]
	[AC8BD*]	[AB8CD*]	[*ABD9C]	[*ABC9D]				

Open:	[C12ABD*]	[A12BCD*]	[B14ACD*]	[*AD11BC]	[*BD13AC]	[*CD16AB]		

Closed:	[*ABCD0]	[CD3AB*]	[*ACD4B]	[BD6AC*]	[AD6BC*]	[*BCD6A]	[*ABD7C]	[BC8AD*]
	[AC8BD*]	[AB8CD*]	[*ABD9C]	[*ABC9D]	[D10ABC*]			

Open:	[C12ABD*]	[A12BCD*]	[B14ACD*]	[*BD13AC]	[*CD16AB]	[19ABCD*]		

Closed:	[*ABCD0]	[CD3AB*]	[*ACD4B]	[BD6AC*]	[AD6BC*]	[*BCD6A]	[*ABD7C]	[BC8AD*]
	[AC8BD*]	[AB8CD*]	[*ABD9C]	[*ABC9D]	[D10ABC*]	[*AD11BC]		

Open:	[A12BCD*]	[B14ACD*]	[*BD13AC]	[*CD16AB]	[*AC13BD]	[*BC15AD]	~~[*CD20AB]~~	
	[19ABCD*]							

Closed:	[*ABCD0]	[CD3AB*]	[*ACD4B]	[BD6AC*]	[AD6BC*]	[*BCD6A]	[*ABD7C]	[BC8AD*]
	[AC8BD*]	[AB8CD*]	[*ABD9C]	[*ABC9D]	[D10ABC*]	[*AD11BC]	[C12ABD*]	

Open:

Open:	[B14ACD*]	[*BD13AC]	[*CD16AB]	[*AC13BD]	[*BC15AD]	[*AB15CD]	[*AC18BD]	[*AD20CD]
	[19ABCD*]							

Closed:

Closed:	[*ABCD0]	[CD3AB*]	[*ACD4B]	[BD6AC*]	[AD6BC*]	[*BCD6A]	[*ABD7C]	[BC8AD*]
	[AC8BD*]	[AB8CD*]	[*ABD9C]	[*ABC9D]	[D10ABC*]	[*AD11BC]	[C12ABD*]	[A12BCD*]

Open:

Open:	[B14ACD*]	[*CD16AB]	[*AC13BD]	[*BC15AD]	[*AB15CD]	[*AC18BD]	[21ABCD*]
	[19ABCD*]						

Closed:

Closed:	[*ABCD0]	[CD3AB*]	[*ACD4B]	[BD6AC*]	[AD6BC*]	[*BCD6A]	[*ABD7C]	[BC8AD*]
	[AC8BD*]	[AB8CD*]	[*ABD9C]	[*ABC9D]	[D10ABC*]	[*AD11BC]	[C12ABD*]	[A12BCD*]
	[*BD13AC]							

Open:

Open:	[B14ACD*]	[*CD16AB]	[*BC15AD]	[*AB15CD]	[*AC18BD]	[19ABCD*]
	[19ABCD*]					

Closed:

Closed:	[*ABCD0]	[CD3AB*]	[*ACD4B]	[BD6AC*]	[AD6BC*]	[*BCD6A]	[*ABD7C]	[BC8AD*]
	[AC8BD*]	[AB8CD*]	[*ABD9C]	[*ABC9D]	[D10ABC*]	[*AD11BC]	[C12ABD*]	[A12BCD*]
	[*BD13AC]	[*AC13BD]						

Open:

Open:	[*CD16AB]	[*BC15AD]	[*AB15CD]	[*AC18BD]	[*AB15CD]	[*BC20AD]	[*BD22AC]
	[19ABCD*]						

Closed:

Closed:	[*ABCD0]	[CD3AB*]	[*ACD4B]	[BD6AC*]	[AD6BC*]	[*BCD6A]	[*ABD7C]	[BC8AD*]
	[AC8BD*]	[AB8CD*]	[*ABD9C]	[*ABC9D]	[D10ABC*]	[*AD11BC]	[C12ABD*]	[A12BCD*]
	[*BD13AC]	[*AC13BD]	[B14ACD*]					

Open:	[*CD16AB]	[*AB15CD]	[*AC18BD]	[21ABCD*]				
	[19ABCD*]							

Closed:	[*ABCD0]	[CD3AB*]	[*ACD4B]	[BD6AC*]	[AD6BC*]	[*BCD6A]	[*ABD7C]	[BC8AD*]
	[AC8BD*]	[AB8CD*]	[*ABD9C]	[*ABC9D]	[D10ABC*]	[*AD11BC]	[C12ABD*]	[A12BCD*]
	[*BD13AC]	[*AC13BD]	[B14ACD*]	[*BC15AD]				

Open:	[*CD16AB]	[*AC18BD]	[18ABCD*]					
	[19ABCD*]							

Closed:	[*ABCD0]	[CD3AB*]	[*ACD4B]	[BD6AC*]	[AD6BC*]	[*BCD6A]	[*ABD7C]	[BC8AD*]
	[AC8BD*]	[AB8CD*]	[*ABD9C]	[*ABC9D]	[D10ABC*]	[*AD11BC]	[C12ABD*]	[A12BCD*]
	[*BD13AC]	[*AC13BD]	[B14ACD*]	[*BC15AD]	[*AB15CD]			

Open:	[24ABCD*]							
	[18ABCD*]							

Closed:	[*ABCD0]	[CD3AB*]	[*ACD4B]	[BD6AC*]	[AD6BC*]	[*BCD6A]	[*ABD7C]	[BC8AD*]
	[AC8BD*]	[AB8CD*]	[*ABD9C]	[*ABC9D]	[D10ABC*]	[*AD11BC]	[C12ABD*]	[A12BCD*]
	[*BD13AC]	[*AC13BD]	[B14ACD*]	[*BC15AD]	[*AB15CD]	[*CD16AB]		

Open:								
	[18ABCD*]							

Closed:	[*ABCD0]	[CD3AB*]	[*ACD4B]	[BD6AC*]	[AD6BC*]	[*BCD6A]	[*ABD7C]	[BC8AD*]
	[AC8BD*]	[AB8CD*]	[*ABD9C]	[*ABC9D]	[D10ABC*]	[*AD11BC]	[C12ABD*]	[A12BCD*]
	[*BD13AC]	[*AC13BD]	[B14ACD*]	[*BC15AD]	[*AB15CD]	[*CD16AB]		

[18ABCD*] -> [*AB15CD] -> [A12BCD*] -> [*ACD4B] -> [CD3AB*] -> [*ABCD0]