**Zadání 1. úkolu do předmětu IZU**

Jméno: Lukáš

Příjmení: Baštýř

Login: xbasty00

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: [25ABCD\*]

Časy:

A : 1

B : 5

C : 8

D : 10

Operátory:

1. A <- ….. 1 5. AB -> ….. 5 9. BD -> ….. 10

2. B <- ….. 5 6. AC -> ….. 8 10. CD -> ….. 10

3. C <- ….. 8 7. AD -> ….. 10

4. D <- ….. 10 8. BC -> ….. 8

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| Cesta: | AB -> | A <- | AC -> | A <- | AD -> |  |  |  |
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Legenda:   
Podle čeho expandujeme  
Uzel s nejnižším ohodnocením  
Cíl (zůstávají v open pro přehlednost)

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| Open: | [\*ABCD0] |  |  |  |  |  |  |  |
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| Open: | [CD5AB\*] | [BD8AC\*] | [BC10AD\*] | [AD8BC\*] | [AC10BD\*] | [AB10CD\*] |  |  |
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| Closed: | [\*ABCD0] |  |  |  |  |  |  |  |
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| Open: | [BD8AC\*] | [BC10AD\*] | [AD8BC\*] | [AC10BD\*] | [AB10CD\*] | [\*ACD6B] | [\*BCD10A] |  |
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| Closed: | [\*ABCD0] | [CD5AB\*] |  |  |  |  |  |  |
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| Open: | [BD8AC\*] | [BC10AD\*] | [AD8BC\*] | [AC10BD\*] | [AB10CD\*] | [\*BCD10A] | [D14ABC\*] | [C16ABD\*] |
| [A16BCD\*] |  |  |  |  |  |  |  |  |
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| Closed: | [\*ABCD0] | [CD5AB\*] | [\*ACD6B] |  |  |  |  |  |
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| Open: | [BC10AD\*] | [AD8BC\*] | [AC10BD\*] | [AB10CD\*] | [\*BCD10A] | [D14ABC\*] | [C16ABD\*] | [\*ABD9C] |
| [\*BCD16A] | [A16BCD\*] |  |  |  |  |  |  |  |
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| Closed: | [\*ABCD0] | [CD5AB\*] | [\*ACD6B] | [BD8AC\*] |  |  |  |  |
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| Open: | [BC10AD\*] | [AC10BD\*] | [AB10CD\*] | [\*BCD10A] | [D14ABC\*] | [C16ABD\*] | [\*ABD9C] | [A16BCD\*] |
| [\*ABD13C] | [\*ACD16B] |  |  |  |  |  |  |  |
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| Closed: | [\*ABCD0] | [CD5AB\*] | [\*ACD6B] | [BD8AC\*] | [AD8BC\*] |  |  |  |
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| Open: | [BC10AD\*] | [AC10BD\*] | [AB10CD\*] | [\*BCD10A] | [D14ABC\*] | [C16ABD\*] | [A16BCD\*] | [\*ABD13C] |
| [D14ABC\*] | [B19ACD\*] | [A19BCD\*] |  |  |  |  |  |  |
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| Closed: | [\*ABCD0] | [CD5AB\*] | [\*ACD6B] | [BD8AC\*] | [AD8BC\*] | [\*ABD9C] |  |  |
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| Open: | [AC10BD\*] | [AB10CD\*] | [\*BCD10A] | [D14ABC\*] | [C16ABD\*] |  | [\*ABD13C] | [B19ACD\*] |
| [A16BCD\*] | [\*ABC11D] | [\*BCD20A] |  |  |  |  |  |  |
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| Closed: | [\*ABCD0] | [CD5AB\*] | [\*ACD6B] | [BD8AC\*] | [AD8BC\*] | [\*ABD9C] | [BC10AD\*] |  |
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| Open: | [AB10CD\*] | [\*BCD10A] | [D14ABC\*] | [C16ABD\*] |  | [B19ACD\*] | [A16BCD\*] | [\*ABC11D] |
| [\*ACB15D] | [\*ACD20B] |  |  |  |  |  |  |  |
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| Closed: | [\*ABCD0] | [CD5AB\*] | [\*ACD6B] | [BD8AC\*] | [AD8BC\*] | [\*ABD9C] | [BC10AD\*] | [AC10BD\*] |
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| Open: | [\*BCD10A] | [D14ABC\*] | [C16ABD\*] |  | [B19ACD\*] | [A16BCD\*] | [\*ABC11D] | [\*ABC15D] |
| [\*ABD20C] |  |  |  |  |  |  |  |  |
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| Closed: | [\*ABCD0] | [CD5AB\*] | [\*ACD6B] | [BD8AC\*] | [AD8BC\*] | [\*ABD9C] | [BC10AD\*] | [AC10BD\*] |
| [AB10CD\*] |  |  |  |  |  |  |  |  |
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| Open: | [D14ABC\*] | [C16ABD\*] |  | [B19ACD\*] | [A16BCD\*] | [\*ABC11D] | [D18ABC\*] | [C20ABD\*] |
| [B20ACD\*] |  |  |  |  |  |  |  |  |
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| Closed: | [\*ABCD0] | [CD5AB\*] | [\*ACD6B] | [BD8AC\*] | [AD8BC\*] | [\*ABD9C] | [BC10AD\*] | [AC10BD\*] |
| [AB10CD\*] | [\*BCD10A] |  |  |  |  |  |  |  |
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| Open: | [D14ABC\*] | [C16ABD\*] |  | [B19ACD\*] | [A16BCD\*] | [C16ABD\*] | [B19ACD\*] | [A19BCD\*] |
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| Closed: | [\*ABCD0] | [CD5AB\*] | [\*ACD6B] | [BD8AC\*] | [AD8BC\*] | [\*ABD9C] | [BC10AD\*] | [AC10BD\*] |
| [AB10CD\*] | [\*BCD10A] | [\*ABC11D] |  |  |  |  |  |  |
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| Open: | [C16ABD\*] |  | [B19ACD\*] | [A16BCD\*] | [\*AD15BC] | [\*BD19AC] | [\*CD22AB] |  |
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| Closed: | [\*ABCD0] | [CD5AB\*] | [\*ACD6B] | [BD8AC\*] | [AD8BC\*] | [\*ABD9C] | [BC10AD\*] | [AC10BD\*] |
| [AB10CD\*] | [\*BCD10A] | [\*ABC11D] | [D14ABC\*] |  |  |  |  |  |
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| Open: | [C16ABD\*] |  | [B19ACD\*] | [A16BCD\*] | [\*BD19AC] | [\*CD22AB] | [25ABCD\*] |  |
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| Closed: | [\*ABCD0] | [CD5AB\*] | [\*ACD6B] | [BD8AC\*] | [AD8BC\*] | [\*ABD9C] | [BC10AD\*] | [AC10BD\*] |
| [AB10CD\*] | [\*BCD10A] | [\*ABC11D] | [D14ABC\*] | [\*AD15BC] |  |  |  |  |
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Cesta 1: \*ABCD0 -> CD5AB\* -> \*ACD6B -> D14ABC\* -> \*AD15BC -> 25ABCD\*

Cesta 2: \*ABCD0 -> BD8AC\* -> \*ABD9C -> D14ABC\* -> \*AD15BC -> 25ABCD\*

Našli jsme cestu, můžeme končit.

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| Open: |  | [B19ACD\*] | [A16BCD\*] | [\*BD19AC] | [\*CD22AB] | [25ABCD\*] | [\*AC17BD] | [\*BC21AD] |
| [\*CD26AB] |  |  |  |  |  |  |  |  |
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| Closed: | [\*ABCD0] | [CD5AB\*] | [\*ACD6B] | [BD8AC\*] | [AD8BC\*] | [\*ABD9C] | [BC10AD\*] | [AC10BD\*] |
| [AB10CD\*] | [\*BCD10A] | [\*ABC11D] | [D14ABC\*] | [\*AD15BC] | [C16ABD\*] |  |  |  |
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| Open: |  | [B19ACD\*] |  | [\*BD19AC] | [\*CD22AB] | [25ABCD\*] | [\*AC17BD] | [\*BC21AD] |
| [\*AB21CD] | [\*AC24BD] | [\*AD26BC] |  |  |  |  |  |  |
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| Closed: | [\*ABCD0] | [CD5AB\*] | [\*ACD6B] | [BD8AC\*] | [AD8BC\*] | [\*ABD9C] | [BC10AD\*] | [AC10BD\*] |
| [AB10CD\*] | [\*BCD10A] | [\*ABC11D] | [D14ABC\*] | [\*AD15BC] | [C16ABD\*] | [A16BCD\*] |  |  |
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| Open: | [B19ACD\*] |  | [\*BD19AC] | [\*CD22AB] | [25ABCD\*] | [\*BC21AD] | [25ABCD\*] |  |
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| Closed: | [\*ABCD0] | [CD5AB\*] | [\*ACD6B] | [BD8AC\*] | [AD8BC\*] | [\*ABD9C] | [BC10AD\*] | [AC10BD\*] |
| [AB10CD\*] | [\*BCD10A] | [\*ABC11D] | [D14ABC\*] | [\*AD15BC] | [C16ABD\*] | [A16BCD\*] | [\*AC17BD] |  |
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Cesta 3: \*ABCD0 -> CD5AB\* -> \*ACD6B -> C16ABD\* -> \*AC17BD -> 25ABCD\*

Cesta 4: \*ABCD0 -> CB10AD\* -> \*ABC11D -> C16ABD\* -> \*AC17BD -> 25ABCD\*

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| Open: |  | [\*BD19AC] | [\*CD22AB] | [25ABCD\*] | [\*BC21AD] | [25ABCD\*] | [\*AB20CD] | [\*BC27AD] |
| [\*BD29AC] |  |  |  |  |  |  |  |  |
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| Closed: | [\*ABCD0] | [CD5AB\*] | [\*ACD6B] | [BD8AC\*] | [AD8BC\*] | [\*ABD9C] | [BC10AD\*] | [AC10BD\*] |
| [AB10CD\*] | [\*BCD10A] | [\*ABC11D] | [D14ABC\*] | [\*AD15BC] | [C16ABD\*] | [A16BCD\*] | [\*AC17BD] | [B19ACD\*] |
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| Open: | [\*CD22AB] | [25ABCD\*] | [\*BC21AD] | [25ABCD\*] | [\*AB20CD] | [29ABCD\*] |  |  |
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| Closed: | [\*ABCD0] | [CD5AB\*] | [\*ACD6B] | [BD8AC\*] | [AD8BC\*] | [\*ABD9C] | [BC10AD\*] | [AC10BD\*] |
| [AB10CD\*] | [\*BCD10A] | [\*ABC11D] | [D14ABC\*] | [\*AD15BC] | [C16ABD\*] | [A16BCD\*] | [\*AC17BD] | [B19ACD\*] |
|  | [\*BD19AC] |  |  |  |  |  |  |  |

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| Open: | [\*CD22AB] | [25ABCD\*] | [\*BC21AD] | [25ABCD\*] | [25ABCD\*] |  |  |  |
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| Closed: | [\*ABCD0] | [CD5AB\*] | [\*ACD6B] | [BD8AC\*] | [AD8BC\*] | [\*ABD9C] | [BC10AD\*] | [AC10BD\*] |
| [AB10CD\*] | [\*BCD10A] | [\*ABC11D] | [D14ABC\*] | [\*AD15BC] | [C16ABD\*] | [A16BCD\*] | [\*AC17BD] | [B19ACD\*] |
|  | [\*BD19AC] | [\*AB20CD] |  |  |  |  |  |  |

Cesta 5: \*ABCD0 -> BD8AC\* -> \*ABD9C -> B19ACD\* -> \*AB20CD -> 25ABCD\*  
Cesta 6: \*ABCD0 -> BC10AD\* -> \*ABC11D -> B19ACD\* -> \*AB20CD -> 25ABCD\*

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| Open: | [\*CD22AB] | [25ABCD\*] | [25ABCD\*] | [25ABCD\*] | [29ABCD\*] |  |  |  |
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| Closed: | [\*ABCD0] | [CD5AB\*] | [\*ACD6B] | [BD8AC\*] | [AD8BC\*] | [\*ABD9C] | [BC10AD\*] | [AC10BD\*] |
| [AB10CD\*] | [\*BCD10A] | [\*ABC11D] | [D14ABC\*] | [\*AD15BC] | [C16ABD\*] | [A16BCD\*] | [\*AC17BD] | [B19ACD\*] |
|  | [\*BD19AC] | [\*AB20CD] | [\*BC21AD] |  |  |  |  |  |

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| Open: | [25ABCD\*] | [25ABCD\*] | [25ABCD\*] | [32ABCD\*] |  |  |  |  |
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| Closed: | [\*ABCD0] | [CD5AB\*] | [\*ACD6B] | [BD8AC\*] | [AD8BC\*] | [\*ABD9C] | [BC10AD\*] | [AC10BD\*] |
| [AB10CD\*] | [\*BCD10A] | [\*ABC11D] | [D14ABC\*] | [\*AD15BC] | [C16ABD\*] | [A16BCD\*] | [\*AC17BD] | [B19ACD\*] |
|  | [\*BD19AC] | [\*AB20CD] | [\*BC21AD] | [\*CD22AB] |  |  |  |  |

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