**Zadání 1. úkolu do předmětu IZU**

Jméno: Ondřej

Příjmení: Ondryáš

login: xondry02

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: [XABCD\*]

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: | AB -> | A <- | CD -> | B <- | AB -> |  |  |  |
|  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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] |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Closed: | [\*ABCD0] | [CD3AB\*] | [\*ACD4B] | [BD6AC\*] |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Open: | [BC8AD\*] | [AC8BD\*] | [AB8CD\*] | [\*BCD6A] | [D10ABC\*] | [C12ABD\*] | [A12BCD\*] | [\*ABD7C] |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Closed: | [\*ABCD0] | [CD3AB\*] | [\*ACD4B] | [BD6AC\*] | [AD6BC\*] |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Open: | [BC8AD\*] | [AC8BD\*] | [AB8CD\*] | [D10ABC\*] | [C12ABD\*] | [A12BCD\*] | [\*ABD7C] | [B14ACD\*] |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Closed: | [\*ABCD0] | [CD3AB\*] | [\*ACD4B] | [BD6AC\*] | [AD6BC\*] | [\*BCD6A] |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Open: | [BC8AD\*] | [AC8BD\*] | [AB8CD\*] | [D10ABC\*] | [C12ABD\*] | [A12BCD\*] | [B14ACD\*] |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Closed: | [\*ABCD0] | [CD3AB\*] | [\*ACD4B] | [BD6AC\*] | [AD6BC\*] | [\*BCD6A] | [\*ABD7C] |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Open: | [AC8BD\*] | [AB8CD\*] | [D10ABC\*] | [C12ABD\*] | [A12BCD\*] | [B14ACD\*] | [\*ABC9D] |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Closed: | [\*ABCD0] | [CD3AB\*] | [\*ACD4B] | [BD6AC\*] | [AD6BC\*] | [\*BCD6A] | [\*ABD7C] | [BC8AD\*] |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Open: | [AB8CD\*] | [D10ABC\*] | [C12ABD\*] | [A12BCD\*] | [B14ACD\*] | [\*ABC9D] |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Closed: | [\*ABCD0] | [CD3AB\*] | [\*ACD4B] | [BD6AC\*] | [AD6BC\*] | [\*BCD6A] | [\*ABD7C] | [BC8AD\*] |
| [AC8BD\*] |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Open: | [D10ABC\*] | [C12ABD\*] | [A12BCD\*] | [B14ACD\*] | [\*ABC9D] |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Closed: | [\*ABCD0] | [CD3AB\*] | [\*ACD4B] | [BD6AC\*] | [AD6BC\*] | [\*BCD6A] | [\*ABD7C] | [BC8AD\*] |
| [AC8BD\*] | [AB8CD\*] |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Open: | [D10ABC\*] | [C12ABD\*] | [A12BCD\*] | [B14ACD\*] |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Closed: | [\*ABCD0] | [CD3AB\*] | [\*ACD4B] | [BD6AC\*] | [AD6BC\*] | [\*BCD6A] | [\*ABD7C] | [BC8AD\*] |
| [AC8BD\*] | [AB8CD\*] | [\*ABC9D] |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Open: | [C12ABD\*] | [A12BCD\*] | [B14ACD\*] | [\*AD11BC] | [\*BD13AC] | [\*CD16AB] |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Closed: | [\*ABCD0] | [CD3AB\*] | [\*ACD4B] | [BD6AC\*] | [AD6BC\*] | [\*BCD6A] | [\*ABD7C] | [BC8AD\*] |
| [AC8BD\*] | [AB8CD\*] | [\*ABC9D] | [D10ABC\*] |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Open: | [C12ABD\*] | [A12BCD\*] | [B14ACD\*] | [\*BD13AC] | [\*CD16AB] | [19ABCD\*] |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Closed: | [\*ABCD0] | [CD3AB\*] | [\*ACD4B] | [BD6AC\*] | [AD6BC\*] | [\*BCD6A] | [\*ABD7C] | [BC8AD\*] |
| [AC8BD\*] | [AB8CD\*] | [\*ABC9D] | [D10ABC\*] | [\*AD11BC] |  |  |  |  |
|  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Open: | [A12BCD\*] | [B14ACD\*] | [\*BD13AC] | [\*CD16AB] | [19ABCD\*] | [\*AC13BD] | [\*BC15AD] |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Closed: | [\*ABCD0] | [CD3AB\*] | [\*ACD4B] | [BD6AC\*] | [AD6BC\*] | [\*BCD6A] | [\*ABD7C] | [BC8AD\*] |
| [AC8BD\*] | [AB8CD\*] | [\*ABC9D] | [D10ABC\*] | [\*AD11BC] | [C12ABD\*] |  |  |  |
|  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Open: | [B14ACD\*] | [\*BD13AC] | [\*CD16AB] | [19ABCD\*] | [\*AC13BD] | [\*BC15AD] | [\*AB15CD] |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Closed: | [\*ABCD0] | [CD3AB\*] | [\*ACD4B] | [BD6AC\*] | [AD6BC\*] | [\*BCD6A] | [\*ABD7C] | [BC8AD\*] |
| [AC8BD\*] | [AB8CD\*] | [\*ABC9D] | [D10ABC\*] | [\*AD11BC] | [C12ABD\*] | [A12BCD\*] |  |  |
|  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Open: | [B14ACD\*] | [\*CD16AB] | [19ABCD\*] | [\*AC13BD] | [\*BC15AD] | [\*AB15CD] |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Closed: | [\*ABCD0] | [CD3AB\*] | [\*ACD4B] | [BD6AC\*] | [AD6BC\*] | [\*BCD6A] | [\*ABD7C] | [BC8AD\*] |
| [AC8BD\*] | [AB8CD\*] | [\*ABC9D] | [D10ABC\*] | [\*AD11BC] | [C12ABD\*] | [A12BCD\*] | [\*BD13AC] |  |
|  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Open: | [B14ACD\*] | [\*CD16AB] | [19ABCD\*] | [\*BC15AD] | [\*AB15CD] |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Closed: | [\*ABCD0] | [CD3AB\*] | [\*ACD4B] | [BD6AC\*] | [AD6BC\*] | [\*BCD6A] | [\*ABD7C] | [BC8AD\*] |
| [AC8BD\*] | [AB8CD\*] | [\*ABC9D] | [D10ABC\*] | [\*AD11BC] | [C12ABD\*] | [A12BCD\*] | [\*BD13AC] | [\*AC13BD] |
|  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Open: | [\*CD16AB] | [19ABCD\*] | [\*BC15AD] | [\*AB15CD] |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Closed: | [\*ABCD0] | [CD3AB\*] | [\*ACD4B] | [BD6AC\*] | [AD6BC\*] | [\*BCD6A] | [\*ABD7C] | [BC8AD\*] |
| [AC8BD\*] | [AB8CD\*] | [\*ABC9D] | [D10ABC\*] | [\*AD11BC] | [C12ABD\*] | [A12BCD\*] | [\*BD13AC] | [\*AC13BD] |
| [B14ACD\*] |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Open: | [\*CD16AB] | [19ABCD\*] | [\*AB15CD] |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Closed: | [\*ABCD0] | [CD3AB\*] | [\*ACD4B] | [BD6AC\*] | [AD6BC\*] | [\*BCD6A] | [\*ABD7C] | [BC8AD\*] |
| [AC8BD\*] | [AB8CD\*] | [\*ABC9D] | [D10ABC\*] | [\*AD11BC] | [C12ABD\*] | [A12BCD\*] | [\*BD13AC] | [\*AC13BD] |
| [B14ACD\*] | [\*BC15AD] |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Open: | [\*CD16AB] | [18ABCD\*] |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Closed: | [\*ABCD0] | [CD3AB\*] | [\*ACD4B] | [BD6AC\*] | [AD6BC\*] | [\*BCD6A] | [\*ABD7C] | [BC8AD\*] |
| [AC8BD\*] | [AB8CD\*] | [\*ABC9D] | [D10ABC\*] | [\*AD11BC] | [C12ABD\*] | [A12BCD\*] | [\*BD13AC] | [\*AC13BD] |
| [B14ACD\*] | [\*BC15AD] | [\*AB15CD] |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Open: | [18ABCD\*] |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Closed: | [\*ABCD0] | [CD3AB\*] | [\*ACD4B] | [BD6AC\*] | [AD6BC\*] | [\*BCD6A] | [\*ABD7C] | [BC8AD\*] |
| [AC8BD\*] | [AB8CD\*] | [\*ABC9D] | [D10ABC\*] | [\*AD11BC] | [C12ABD\*] | [A12BCD\*] | [\*BD13AC] | [\*AC13BD] |
| [B14ACD\*] | [\*BC15AD] | [\*AB15CD] | [\*CD16AB] |  |  |  |  |  |