EX72:

Makespan:60

machine: 1

(7 1) (7 2) (7 3) (1 1) (2 2)

machine: 2

(8 1) (8 2) (4 1) (3 1) (4 2) (1 2)

machine: 3

(6 1) (6 2) (6 3)

machine: 4

(5 1) (5 2) (2 1) (8 3) (3 2)

AGV1:

(8 1) (6 1) (2 1) (1 1) (3 2)

AGV2:

(5 1) (7 1) (4 1) (8 3) (3 1) (2 2) (1 2)

EX84:

Makespan:101

machine: 1

(2 1) (1 1) (3 1) (3 2) (2 3) (6 4)

machine: 2

(6 1) (6 2) (6 3) (5 3) (5 4)

machine: 3

(5 1) (5 2) (2 2) (4 1) (4 2) (4 3)

machine: 4

(1 2) (1 3) (3 3)

AGV1:

(2 1) (1 1) (2 2) (3 1) (1 2) (5 3) (6 4)

AGV2:

(5 1) (6 1) (4 1) (2 3) (3 3)

MFJST09:

Makespan:1075

machine: 1

(5 1) (2 1) (1 1)

machine: 2

(3 1) (9 1) (4 1) (6 1) (11 1) (1 2)

machine: 3

(7 1) (7 2) (9 2) (6 2) (2 2) (11 2)

machine: 4

(10 1) (8 1) (4 3) (1 3) (6 4)

machine: 5

(5 2) (3 3) (4 2) (7 4) (6 3) (8 3) (2 4)

machine: 6

(5 3) (10 2) (8 2) (4 4) (11 4)

machine: 7

(3 2) (7 3) (9 3) (10 3) (2 3) (11 3) (8 4)

machine: 8

(5 4) (3 4) (9 4) (10 4) (1 4)

AGV1:

(5 1) (3 1) (2 1) (1 1) (3 2) (5 2) (9 2) (10 2) (6 2) (7 4) (10 3) (4 3) (9 4) (6 3) (1 2) (10 4) (11 3) (2 4) (11 4) (1 4)

AGV2:

(7 1) (10 1) (9 1) (4 1) (8 1) (6 1) (11 1) (5 3) (3 3) (5 4) (7 3) (4 2) (3 4) (2 2) (9 3) (8 2) (11 2) (2 3) (4 4) (1 3) (8 3) (6 4) (8 4)

MkT03:

Makespan:313

machine: 1

(9 1) (9 2) (7 1) (7 2) (8 2) (10 1) (2 2) (12 4) (12 5) (7 4) (4 3) (4 4) (8 5) (8 6) (6 5) (1 8) (11 6) (15 6) (3 9) (4 9) (14 9) (14 10)

machine: 2

(11 1) (2 3) (2 4) (2 5) (1 4) (14 3) (14 4) (5 5) (5 6) (9 8) (9 9) (1 9) (11 9) (11 10) (3 10) (12 10)

machine: 3

(2 1) (4 1) (4 2) (3 1) (3 2) (3 3) (8 10)

machine: 4

(12 1) (12 2) (6 1) (7 3) (1 1) (1 2) (9 6) (6 3) (8 3) (10 3) (10 4) (10 5) (14 2) (15 4) (10 6) (13 3) (11 4) (8 7) (8 8) (3 7) (3 8) (14 6) (13 7) (8 9) (13 8) (7 8) (7 9) (15 7) (15 8) (15 9) (12 9) (13 10)

machine: 5

(15 1) (15 2) (13 1) (13 2) (1 5) (1 6) (3 4) (1 7) (5 3) (5 4) (11 5) (9 7) (14 5) (4 7) (5 7) (10 7) (11 7) (7 7) (5 8) (11 8) (5 9) (5 10) (13 9) (14 8) (12 7) (12 8) (4 10) (6 9) (6 10)

machine: 6

(5 1) (5 2) (1 10)

machine: 7

(8 1) (9 3) (9 4) (9 5) (12 3) (6 2) (10 2) (1 3) (15 3) (14 1) (8 4) (6 4) (2 6) (15 5) (4 5) (13 4) (4 6) (13 5) (13 6) (7 5) (7 6) (2 7) (4 8) (2 8) (14 7) (9 10) (7 10) (15 10)

machine: 8

(11 2) (11 3) (3 5) (3 6) (12 6) (6 6) (6 7) (6 8) (10 8) (2 9) (2 10) (10 9) (10 10)

AGV1:

(9 1) (10 1) (7 1) (2 1) (15 1) (1 1) (12 3) (9 6) (6 2) (12 4) (11 1) (13 1) (15 3) (10 3) (8 4) (1 4) (11 2) (3 4) (2 6) (8 5) (7 5) (15 5) (6 5) (4 5) (15 6) (8 7) (13 4) (11 5) (5 5) (14 5) (3 7) (4 7) (9 8) (5 7) (14 6) (3 9) (11 7) (10 8) (1 9) (9 10) (2 9) (14 8) (14 9) (3 10) (12 9) (8 10) (15 10)

AGV2:

(12 1) (8 1) (6 1) (9 3) (8 2) (7 3) (4 1) (2 2) (8 3) (7 4) (3 1) (4 3) (10 2) (6 3) (1 3) (2 3) (5 1) (14 1) (15 4) (6 4) (14 2) (1 5) (13 3) (14 3) (5 3) (3 5) (11 4) (9 7) (1 8) (12 6) (11 6) (6 6) (13 7) (10 7) (4 8) (7 7) (7 8) (14 7) (4 9) (15 7) (13 9) (11 9) (1 10) (12 7) (13 10) (7 10) (4 10) (6 9) (12 10)

MKT05:

Makespan:286

machine: 1

(11 1) (11 2) (11 3) (10 1) (10 2) (10 3) (5 1) (14 1) (14 2) (14 3) (3 3) (14 4) (3 4) (3 5) (14 5) (1 2) (1 3) (6 7) (13 5) (6 8) (13 6) (6 9) (13 7) (8 8)

machine: 2

(5 2) (9 4) (2 2) (10 5) (1 1) (12 4) (4 5) (4 6) (7 3) (7 4) (15 5) (3 7) (15 6) (9 8) (15 7) (2 5) (5 6)

machine: 3

(9 1) (6 3) (6 4) (15 1) (11 4) (3 1) (3 2) (2 1) (10 4) (8 1) (8 2) (8 3) (5 3) (12 2) (12 3) (15 4) (8 5) (7 1) (10 6) (7 2) (10 7) (5 4) (11 6) (12 5) (1 4) (5 5) (7 5) (3 8) (11 7) (9 9)

machine: 4

(6 1) (6 2) (13 1) (4 1) (4 2) (4 3) (9 2) (9 3) (13 2) (6 5) (6 6) (15 2) (13 3) (13 4) (15 3) (12 1) (4 4) (8 4) (9 5) (9 6) (11 5) (9 7) (2 3) (2 4) (8 6) (8 7) (3 6) (14 6) (10 8) (14 7) (4 7) (12 6) (10 9) (1 5) (1 6)

AGV1:

(11 1) (6 1) (10 1) (11 4) (9 2) (3 1) (2 1) (6 5) (14 1) (5 2) (12 1) (9 4) (5 3) (8 4) (12 2) (10 5) (1 1) (10 6) (8 6) (6 7) (3 6) (13 5) (1 4) (15 5) (4 7) (9 8) (3 8) (1 5) (8 8)

AGV2:

(9 1) (13 1) (4 1) (6 3) (15 1) (5 1) (10 4) (15 2) (8 1) (3 3) (7 1) (2 2) (9 5) (15 4) (11 5) (8 5) (12 4) (2 3) (4 5) (1 2) (14 6) (11 6) (7 3) (12 5) (10 8) (3 7) (7 5) (12 6) (2 5) (9 9) (5 6)

MKT06:

Makespan:288.5

machine: 1

(3 1) (10 1) (4 1) (4 2) (4 3) (4 4) (5 2) (5 3) (5 4) (7 1) (2 1) (2 2) (2 3) (8 4) (8 5) (3 5) (3 6) (3 7) (2 4) (6 7) (6 8) (1 4) (6 9) (7 4) (7 5) (7 6) (8 6) (7 7) (1 6) (1 7) (1 8) (1 9) (4 12) (10 11) (10 12) (10 13) (4 13) (7 11) (8 11) (1 12) (5 13) (2 13) (5 14) (6 13) (6 14) (9 14) (9 15)

machine: 2

(10 2) (9 4) (9 5) (2 14) (2 15)

machine: 3

(9 3) (6 1) (6 2)

machine: 4

machine: 5

(6 3) (6 4) (6 5) (5 5) (5 6) (5 7) (4 14) (3 13) (3 14) (8 14) (3 15) (8 15)

machine: 6

machine: 7

(3 2) (8 1) (8 2) (10 4) (8 3) (10 5) (3 4) (4 5) (6 6) (9 6) (7 3) (4 7) (3 8) (3 9) (2 5) (3 10) (1 5) (10 7) (5 8) (5 9) (2 8) (2 9) (2 10) (6 10) (1 10) (1 11) (5 12) (9 13) (7 12) (10 14) (7 13) (7 14) (8 12) (5 15)

machine: 8

(6 11)

machine: 9

(9 1) (9 2) (1 1) (1 2) (1 3) (9 7) (4 8) (4 9) (4 10) (4 11) (10 8) (10 9) (10 10) (9 11) (8 8) (9 12) (8 9) (7 8) (7 9) (7 10) (8 10) (6 12) (2 11) (2 12) (7 15) (10 15) (1 14) (1 15)

machine: 10

(5 1) (10 3) (3 3) (7 2) (4 6) (10 6) (2 6) (2 7) (9 8) (9 9) (9 10) (8 7) (3 11) (5 10) (5 11) (3 12) (8 13) (1 13) (4 15) (6 15)

machine: 11

machine: 12

machine: 13

machine: 14

machine: 15

AGV1:

(3 1) (10 1) (3 2) (4 1) (10 2) (6 1) (9 4) (10 3) (5 2) (6 3) (2 1) (4 5) (3 5) (9 6) (6 7) (3 8) (7 4) (1 5) (2 6) (5 8) (1 6) (6 10) (5 10) (8 8) (7 8) (9 13) (2 11) (8 11) (10 14) (5 13) (8 12) (7 15) (2 13) (1 13) (10 15) (6 13) (2 14) (1 14) (6 15)

AGV2:

(9 1) (1 1) (9 3) (5 1) (8 1) (3 3) (10 4) (7 1) (7 2) (3 4) (8 4) (5 5) (6 6) (4 6) (7 3) (10 6) (4 7) (9 7) (1 4) (2 5) (4 8) (9 8) (10 7) (3 11) (2 8) (10 8) (4 12) (8 7) (9 11) (10 11) (1 10) (5 12) (6 11) (6 12) (7 11) (7 12) (1 12) (4 14) (8 13) (3 13) (4 15) (8 14) (9 14) (5 15)

MKT08:

Makespan:722

machine: 1

(7 1) (3 2) (3 3) (8 1) (11 2) (9 3) (2 4) (14 1) (4 4) (7 3) (8 3) (17 5) (14 3) (10 5) (10 6) (13 5) (12 4) (5 5) (9 9) (9 10) (16 8) (16 9) (3 10) (1 6) (5 7) (17 9) (18 6) (14 8) (3 12) (7 11) (7 12) (2 10) (15 8) (8 8) (12 8) (15 10) (17 12) (18 10) (20 10) (2 12) (9 13) (10 11) (6 10)

machine: 2

(16 1) (2 1) (19 2) (18 2) (9 6) (17 7) (20 6) (13 11) (14 11)

machine: 3

(6 1) (6 2) (12 2) (1 3) (18 1) (3 4) (11 4) (13 4) (17 6) (2 6) (7 7) (20 5) (3 7) (15 6) (18 4) (10 8) (8 7) (16 10) (4 6) (9 12) (20 8) (10 10) (14 9) (11 11)

machine: 4

(8 4) (3 5) (3 6) (5 9) (5 10) (8 9)

machine: 5

(17 2) (17 3) (15 1) (15 2) (5 1) (5 2) (6 3) (7 4) (8 5) (2 8) (2 9) (3 9) (18 7) (4 7) (20 9) (8 10) (4 10)

machine: 6

machine: 7

(16 2) (2 2) (1 1) (1 2) (4 2) (19 1) (4 3) (15 3) (8 2) (13 3) (14 2) (20 3) (11 5) (5 3) (1 4) (12 3) (15 5) (2 7) (19 7) (9 8) (14 5) (14 6) (8 6) (6 6) (15 7) (12 5) (12 6) (5 8) (18 8) (18 9) (17 11) (2 11) (17 13)

machine: 8

(9 1) (9 2) (2 3) (11 3) (16 5) (10 3) (19 3) (10 4) (7 5) (11 6) (7 6) (11 7) (5 4) (11 8) (19 8) (6 5) (7 9) (18 5) (14 7) (3 11) (13 6) (13 7) (19 9) (13 8) (4 8) (15 9) (1 8) (5 11) (1 9) (1 10) (12 9) (15 11) (16 11)

machine: 9

(11 1) (3 1) (16 4) (19 4) (20 4) (14 4) (16 7) (10 7) (5 6) (9 11) (11 10) (4 9) (13 10) (18 11) (14 10) (12 10)

machine: 10

(4 1) (17 1) (13 1) (16 3) (13 2) (12 1) (10 1) (20 1) (20 2) (7 2) (10 2) (17 4) (16 6) (15 4) (9 4) (9 5) (2 5) (19 5) (19 6) (18 3) (9 7) (6 4) (7 8) (4 5) (3 8) (1 5) (17 8) (7 10) (6 7) (6 8) (11 9) (20 7) (12 7) (10 9) (1 7) (17 10) (3 13) (3 14) (6 9) (13 9) (19 10) (5 12) (8 11) (9 14)

AGV1:

(16 1) (2 1) (16 2) (7 1) (2 2) (16 3) (12 1) (15 1) (6 1) (10 1) (12 2) (8 1) (20 1) (16 4) (11 2) (8 2) (2 3) (9 3) (11 3) (16 5) (2 4) (14 1) (2 5) (10 3) (16 6) (7 3) (14 2) (15 4) (20 3) (13 4) (11 5) (14 3) (8 4) (7 5) (10 5) (14 4) (18 3) (2 6) (17 7) (9 7) (15 5) (5 4) (7 7) (13 5) (15 6) (3 7) (7 8) (9 8) (2 8) (8 6) (9 9) (5 6) (10 8) (15 7) (14 7) (6 6) (8 7) (18 5) (7 10) (1 6) (12 5) (6 7) (17 9) (13 6) (14 8) (5 8) (12 7) (4 6) (10 9) (7 11) (18 7) (2 10) (17 10) (20 8) (8 8) (3 13) (10 10) (20 9) (4 8) (13 9) (17 11) (18 10) (2 11) (17 12) (14 9) (9 13) (12 9) (4 9) (15 11) (5 12) (13 10) (4 10) (8 11) (10 11) (9 14) (6 10)

AGV2:

(4 1) (17 1) (13 1) (17 2) (11 1) (3 1) (1 1) (9 1) (3 2) (7 2) (4 2) (19 1) (1 3) (5 1) (15 3) (19 2) (18 1) (6 3) (17 4) (13 3) (4 4) (3 4) (18 2) (19 3) (11 4) (12 3) (8 3) (9 4) (17 5) (7 4) (5 3) (11 6) (19 4) (17 6) (1 4) (20 4) (19 5) (9 6) (3 5) (8 5) (6 4) (16 7) (20 5) (2 7) (1 5) (19 7) (12 4) (10 7) (14 5) (19 8) (5 5) (4 5) (6 5) (11 9) (18 4) (3 8) (7 9) (16 8) (17 8) (3 9) (3 10) (9 11) (5 7) (3 11) (18 6) (16 10) (20 6) (20 7) (3 12) (1 7) (11 10) (9 12) (4 7) (18 8) (5 9) (15 8) (12 8) (15 9) (19 10) (1 8) (15 10) (8 9) (5 11) (8 10) (20 10) (17 13) (2 12) (18 11) (11 11) (14 10) (13 11) (16 11) (12 10) (14 11)

MKT09:

Makespan:632

machine: 1

(8 1) (15 1) (15 2) (4 1) (4 2) (4 3) (14 2) (6 3) (20 8) (9 3) (13 6) (1 4) (13 7) (7 5) (3 7) (3 8) (17 7) (2 8) (16 9) (2 9) (16 10) (4 7) (2 10) (19 6) (19 7) (13 9) (10 11) (13 10) (11 9) (10 12) (13 11) (9 10) (11 10) (5 13) (5 14) (18 11) (4 11)

machine: 2

(13 1) (12 1) (2 3) (19 2) (16 4) (18 1) (9 2) (13 3) (1 1) (3 3) (14 3) (14 4) (8 6) (8 7) (14 5) (3 4) (15 6) (15 7) (15 8) (8 8) (12 4) (19 4) (19 5) (12 5) (1 5) (1 6) (7 6) (10 9) (17 8) (17 9) (7 7) (17 10) (12 7) (10 10) (18 8) (18 9) (20 10) (20 11) (15 11) (4 8) (20 12) (1 11) (6 9) (15 12) (20 13) (8 11) (19 11) (19 12) (12 11)

machine: 3

(20 4) (19 1) (16 3) (13 2) (10 3) (2 5) (6 4) (18 5) (18 6) (1 7) (12 6) (15 10) (11 7) (11 8) (17 11) (17 12) (14 8) (14 9) (14 10) (4 9) (3 10) (3 11) (4 10) (2 13)

machine: 4

(10 1) (10 2) (2 2) (20 5) (20 6) (12 2) (18 2) (18 3) (12 3) (5 2) (19 3) (15 5) (11 4) (7 4) (4 5) (3 5) (11 5) (3 6) (10 7) (10 8) (14 6) (9 4) (9 5) (15 9) (9 6) (14 7) (7 8) (7 9) (16 11) (1 10) (2 11) (3 9) (12 9) (12 10) (1 12) (2 12) (8 12) (8 13)

machine: 5

(8 2) (8 3) (11 2) (2 4) (20 7) (18 4) (5 3) (5 4) (13 4) (13 5) (17 6) (6 5) (11 6) (1 8) (5 9) (5 10) (16 12) (16 13) (16 14) (17 13) (9 11) (19 13)

machine: 6

machine: 7

(20 1) (20 2) (20 3) (8 4) (17 3) (5 5) (16 7) (16 8) (6 6) (7 12) (7 13)

machine: 8

(2 1) (16 1) (7 1) (16 2) (9 1) (7 2) (7 3) (5 1) (3 1) (3 2) (4 4) (16 5) (16 6) (17 4) (1 2) (1 3) (17 5) (4 6) (2 7) (20 9) (5 7) (5 8) (13 8) (6 7) (9 7) (6 8) (7 10) (12 8) (7 11) (5 11) (18 10) (5 12) (19 10) (6 10) (6 11)

machine: 9

(17 2) (11 1) (14 1) (8 5) (10 5) (10 6) (18 7) (1 9) (9 8) (9 9) (8 10)

machine: 10

(17 1) (6 1) (6 2) (15 3) (15 4) (10 4) (11 3) (2 6) (5 6) (8 9) (19 8) (19 9) (7 14)

AGV1:

(13 1) (10 1) (6 1) (17 2) (20 1) (14 1) (16 1) (11 2) (8 4) (20 4) (4 1) (15 3) (12 1) (5 1) (9 2) (3 1) (17 3) (8 5) (1 1) (16 5) (3 3) (6 3) (14 3) (19 3) (18 4) (11 3) (10 5) (8 6) (2 6) (11 4) (12 4) (1 2) (4 5) (19 4) (3 5) (7 5) (20 9) (1 4) (5 6) (2 7) (17 6) (18 5) (6 5) (17 7) (7 6) (15 9) (11 6) (6 6) (16 9) (17 8) (12 6) (18 7) (15 10) (12 7) (7 8) (9 7) (20 10) (19 6) (16 11) (7 10) (9 8) (1 10) (14 8) (11 9) (2 11) (16 12) (5 11) (7 12) (12 9) (3 10) (17 13) (7 14) (19 10) (5 13) (9 11) (18 11) (19 13)

AGV2:

(17 1) (8 1) (15 1) (8 2) (2 1) (11 1) (7 1) (2 2) (19 1) (9 1) (16 3) (20 5) (2 3) (13 2) (19 2) (16 4) (2 4) (18 1) (12 2) (10 3) (13 3) (18 2) (14 2) (4 4) (5 2) (20 7) (2 5) (10 4) (15 5) (5 3) (20 8) (13 4) (5 5) (17 4) (7 4) (15 6) (9 3) (6 4) (13 6) (9 4) (4 6) (16 7) (10 7) (3 7) (1 5) (14 6) (10 9) (8 9) (5 7) (2 8) (13 8) (4 7) (1 7) (11 7) (1 8) (6 7) (5 9) (1 9) (18 8) (12 8) (13 9) (4 8) (17 11) (15 11) (10 11) (19 8) (8 10) (9 10) (3 9) (1 11) (18 10) (6 9) (4 9) (8 11) (1 12) (12 11) (6 10) (19 11) (8 12) (2 13) (4 11)

MKT10:

Makespan:525

machine: 1

(20 1) (20 2) (20 3) (3 1) (3 2) (3 3) (7 3) (6 1) (6 2) (14 3) (12 4) (5 5) (12 5) (5 6) (5 7) (1 5) (1 6) (19 8) (13 5) (13 6) (17 10) (17 11) (5 10) (5 11) (5 12) (19 10) (7 12) (7 13) (7 14)

machine: 2

(13 1) (13 2) (19 1) (19 2) (19 3) (7 1) (2 2) (2 3) (2 4) (20 4) (20 5) (8 4) (1 3) (8 5) (14 1) (16 5) (8 6) (18 5) (18 6) (14 4) (3 4) (16 7) (11 6) (11 7) (11 8) (16 8) (7 7) (4 4) (12 6) (12 7) (12 8) (18 8) (18 9) (1 7) (5 8) (18 10) (5 9) (16 12) (14 9) (6 8) (16 13) (6 9) (17 12) (4 9) (15 11) (17 13) (4 10) (9 10) (3 11) (9 11) (2 13)

machine: 3

(8 1) (15 1) (2 5) (16 6) (1 4) (14 5) (8 7) (18 7) (17 7) (17 8) (2 7) (11 9) (3 7) (2 8) (11 10) (3 8) (1 8) (1 9) (2 10) (15 10) (2 11) (3 10) (14 10) (13 9) (13 10) (15 12) (5 14)

machine: 4

(17 1) (17 2) (17 3) (2 6) (8 8) (8 9) (9 6) (9 7) (9 8) (9 9) (2 9) (18 11) (19 11) (4 11) (13 11)

machine: 5

(10 2) (16 2) (12 2) (15 2) (11 5) (20 6) (20 7) (4 3) (19 6) (19 7) (14 6) (8 10) (7 8) (7 9) (7 10) (6 10) (6 11) (19 12) (19 13)

machine: 6

(1 1) (1 2) (17 4) (17 5) (17 9) (16 10) (10 9) (8 11) (13 7) (13 8) (16 14)

machine: 7

(5 1) (16 1) (9 1) (9 2) (2 1) (19 4) (7 2) (19 5) (13 3) (13 4) (15 6) (15 7) (6 7) (4 6) (20 9) (10 10) (20 10) (20 11) (10 11) (7 11) (1 11) (20 12) (20 13) (12 11)

machine: 8

(10 12)

machine: 9

(10 3) (10 4) (9 3) (9 4) (16 3) (16 4) (15 3) (7 4) (14 2) (12 3) (7 5) (6 3) (6 4) (7 6) (20 8)

machine: 10

(12 1) (11 1) (11 2) (10 1) (11 3) (5 2) (5 3) (11 4) (18 1) (8 2) (18 2) (18 3) (8 3) (4 1) (4 2) (18 4) (5 4) (10 5) (10 6) (10 7) (9 5) (15 4) (15 5) (17 6) (10 8) (3 5) (6 5) (6 6) (3 6) (16 9) (14 7) (14 8) (4 5) (15 8) (16 11) (15 9) (19 9) (4 7) (3 9) (4 8) (8 12) (1 10) (12 9) (12 10) (2 12) (5 13) (1 12) (8 13)

machine: 11

machine: 12

machine: 13

machine: 14

machine: 15

AGV1:

(13 1) (19 1) (10 1) (8 1) (18 1) (9 1) (16 2) (10 3) (15 1) (8 2) (12 2) (16 3) (3 1) (20 4) (13 3) (9 3) (4 1) (8 4) (2 5) (15 2) (1 3) (20 6) (15 3) (6 1) (7 4) (16 5) (14 2) (9 5) (15 4) (5 5) (3 4) (1 4) (16 7) (14 5) (17 6) (15 6) (19 6) (20 8) (6 5) (17 7) (8 8) (2 7) (18 8) (16 9) (9 6) (8 10) (14 7) (3 7) (17 9) (13 5) (1 7) (12 9) (10 9) (16 11) (20 9) (4 7) (16 12) (18 11) (2 10) (5 10) (13 7) (8 12) (3 10) (15 11) (6 10) (7 11) (10 12) (19 11) (9 10) (15 12) (3 11) (4 11) (19 12) (5 14)

AGV2:

(12 1) (11 1) (5 1) (16 1) (5 2) (10 2) (20 1) (2 1) (7 1) (19 4) (2 2) (7 2) (1 1) (7 3) (17 1) (14 1) (11 5) (12 3) (10 5) (18 5) (16 6) (2 6) (17 4) (14 3) (6 3) (12 4) (14 4) (8 7) (4 3) (11 6) (3 5) (7 7) (18 7) (14 6) (4 4) (11 9) (1 5) (12 6) (7 8) (19 8) (5 8) (4 5) (6 7) (15 8) (16 10) (17 10) (19 9) (4 6) (6 8) (1 8) (2 9) (8 11) (10 10) (14 9) (3 9) (15 10) (1 10) (19 10) (17 12) (14 10) (4 9) (16 14) (13 9) (2 12) (1 11) (7 12) (5 13) (12 11) (1 12) (2 13) (13 11)

Mt10c1t:

Makespan:979

machine: 1

(5 2) (7 2) (2 1) (1 1) (6 7)

machine: 2

(7 1) (5 3) (4 1) (6 2) (9 2) (10 1) (3 1) (8 3) (1 2) (2 6)

machine: 3

(5 1) (8 1) (6 1) (7 4) (4 2) (2 2) (10 3) (9 5) (1 3) (3 4)

machine: 4

(7 3) (5 5) (6 4) (9 3) (3 3) (1 4) (2 5) (4 8) (10 8) (8 10)

machine: 5

(5 6) (4 4) (2 3) (8 5) (6 9) (1 5) (7 10) (9 9) (10 9) (3 10)

machine: 6

(5 4) (6 3) (7 6) (9 4) (8 4) (1 6) (10 7) (3 6) (2 8) (4 10)

machine: 7

(7 5) (4 5) (10 4) (6 8) (9 7) (8 6) (1 7) (2 7) (3 8) (5 10)

machine: 8

(5 8) (7 9) (4 7) (6 10) (9 8) (3 7) (1 8) (8 9) (2 9) (10 10)

machine: 9

(5 7) (6 5) (7 8) (4 6) (10 5) (3 5) (8 7) (9 10) (1 9) (2 10)

machine: 10

(7 7) (6 6) (5 9) (9 6) (2 4) (10 6) (8 8) (4 9) (3 9) (1 10)

machine: 11

(9 1) (8 2) (4 3) (10 2) (3 2)

AGV1:

(7 1) (8 1) (5 2) (5 3) (7 2) (10 1) (5 4) (7 3) (6 2) (6 3) (8 3) (4 2) (5 6) (7 6) (7 7) (9 3) (7 8) (2 2) (6 5) (10 2) (5 9) (10 3) (3 2) (6 7) (1 2) (4 5) (4 6) (10 4) (3 3) (5 10) (10 5) (4 7) (8 5) (9 7) (6 9) (6 10) (8 6) (10 6) (2 5) (3 5) (9 8) (1 7) (2 6) (2 7) (8 7) (1 8) (10 8) (4 9) (9 10) (4 10) (2 9) (8 10) (3 9) (10 10) (2 10) (1 10)

AGV2:

(9 1) (5 1) (4 1) (6 1) (8 2) (3 1) (9 2) (5 5) (7 4) (7 5) (6 4) (2 1) (5 7) (4 3) (5 8) (4 4) (6 6) (9 4) (1 1) (2 3) (9 5) (8 4) (7 9) (6 8) (7 10) (1 3) (9 6) (1 4) (3 4) (2 4) (1 5) (4 8) (1 6) (10 7) (3 6) (3 7) (9 9) (8 8) (3 8) (2 8) (8 9) (10 9) (1 9) (3 10)

Mt10cct:

Makespan:948

machine: 1

(2 1) (5 2) (8 2) (1 1) (10 2) (7 2) (6 7)

machine: 2

(3 1) (9 2) (6 2) (8 3) (4 1) (10 1) (7 1) (5 3) (1 2) (2 6)

machine: 3

(8 1) (5 1) (6 1) (2 2) (3 4) (4 2) (10 3) (9 5) (7 4) (1 3)

machine: 4

(3 3) (9 3) (6 4) (2 5) (7 3) (5 5) (1 4) (10 8) (4 8) (8 10)

machine: 5

(2 3) (8 5) (4 4) (5 6) (1 5) (3 10) (9 9) (10 9) (6 9) (7 10)

machine: 6

(6 3) (8 4) (9 4) (3 6) (5 4) (7 6) (10 7) (1 6) (2 8) (4 10)

machine: 7

(8 6) (10 4) (3 8) (7 5) (4 5) (9 7) (2 7) (1 7) (6 8) (5 10)

machine: 8

(3 7) (4 7) (8 9) (2 9) (6 10)

machine: 9

(3 5) (6 5) (10 5) (8 7) (4 6) (5 7) (7 8) (9 10) (1 9) (2 10)

machine: 10

(2 4) (6 6) (9 6) (10 6) (7 7) (3 9) (8 8) (5 9) (4 9) (1 10)

machine: 11

(9 1) (3 2) (4 3)

machine: 12

(9 8) (5 8) (1 8) (7 9) (10 10)

AGV1:

(9 1) (8 1) (6 1) (5 2) (9 2) (3 2) (1 1) (10 1) (8 3) (6 3) (4 1) (8 4) (3 4) (2 3) (7 1) (8 5) (8 6) (10 2) (10 3) (4 3) (7 2) (5 3) (9 5) (1 2) (5 4) (10 4) (4 4) (2 6) (5 5) (7 4) (6 7) (10 6) (8 7) (4 5) (7 6) (3 9) (6 8) (7 7) (10 7) (2 7) (7 8) (1 6) (1 7) (9 9) (4 8) (10 9) (7 9) (5 9) (2 9) (8 10) (1 9) (10 10) (7 10) (2 10) (6 10) (1 10)

AGV2:

(3 1) (2 1) (5 1) (8 2) (2 2) (6 2) (3 3) (9 3) (6 4) (4 2) (3 5) (2 4) (2 5) (9 4) (6 5) (3 6) (3 7) (3 8) (6 6) (7 3) (10 5) (1 3) (9 6) (7 5) (5 6) (1 4) (9 7) (4 6) (1 5) (9 8) (5 7) (4 7) (10 8) (8 8) (3 10) (5 8) (2 8) (8 9) (9 10) (1 8) (4 9) (5 10) (6 9) (4 10)

Mt10xt:

Makespan:978

machine: 1

(9 1) (5 2) (1 1) (2 1) (8 2) (4 3) (3 2) (10 2) (7 2) (6 7)

machine: 2

(4 1) (5 3) (9 2) (6 2) (3 1) (8 3) (10 1) (7 1) (1 2) (2 6)

machine: 3

(5 1) (6 1) (8 1) (4 2) (2 2) (9 5) (10 3) (3 4) (1 3) (7 4)

machine: 4

(9 3) (6 4) (2 5) (10 8)

machine: 5

(5 6) (4 4) (8 5) (2 3) (1 5) (6 9) (9 9) (10 9) (7 10) (3 10)

machine: 6

(5 4) (6 3) (9 4) (8 4) (7 6) (1 6) (3 6) (10 7) (2 8) (4 10)

machine: 7

(4 5) (9 7) (10 4) (8 6) (7 5) (6 8) (1 7) (2 7) (3 8) (5 10)

machine: 8

(5 8) (4 7) (9 8) (3 7) (6 10) (8 9) (1 8) (7 9) (2 9) (10 10)

machine: 9

(5 7) (6 5) (4 6) (10 5) (3 5) (8 7) (7 8) (9 10) (1 9) (2 10)

machine: 10

(5 9) (9 6) (6 6) (2 4) (10 6) (7 7) (8 8) (4 9) (3 9) (1 10)

machine: 11

(5 5) (3 3) (7 3) (1 4) (4 8) (8 10)

AGV1:

(4 1) (6 1) (2 1) (8 1) (3 1) (4 2) (5 4) (6 2) (7 1) (8 2) (9 3) (5 6) (6 3) (8 3) (9 4) (3 2) (6 4) (8 4) (9 5) (5 9) (10 2) (3 3) (10 3) (8 5) (4 6) (9 7) (6 6) (7 3) (8 6) (9 8) (1 3) (5 10) (7 4) (1 4) (2 5) (6 8) (4 8) (1 5) (7 6) (7 7) (1 6) (8 8) (2 6) (3 7) (9 9) (6 10) (2 7) (10 8) (9 10) (3 8) (10 9) (8 10) (7 9) (1 9) (4 10) (2 9) (3 9) (1 10) (3 10)

AGV2:

(9 1) (5 1) (5 2) (1 1) (5 3) (9 2) (2 2) (5 5) (10 1) (4 3) (5 7) (5 8) (4 4) (6 5) (9 6) (4 5) (1 2) (7 2) (2 3) (3 4) (10 4) (10 5) (4 7) (6 7) (2 4) (3 5) (10 6) (7 5) (8 7) (3 6) (10 7) (1 7) (6 9) (7 8) (8 9) (1 8) (4 9) (2 8) (7 10) (10 10) (2 10)

Mt10xxt:

Makespan:979

machine: 1

(9 1) (5 2) (7 2) (2 1) (8 2) (4 3) (3 2) (10 2) (1 1) (6 7)

machine: 2

(7 1) (4 1) (6 2) (5 3) (9 2) (3 1) (10 1) (8 3) (1 2) (2 6)

machine: 3

(5 1) (6 1) (8 1) (4 2) (7 4) (2 2) (9 5) (10 3) (3 4) (1 3)

machine: 4

(7 3) (6 4) (2 5)

machine: 5

(5 6) (4 4) (2 3) (8 5) (6 9) (1 5) (9 9) (7 10) (10 9) (3 10)

machine: 6

(6 3) (5 4) (7 6) (9 4) (8 4) (3 6) (1 6) (10 7) (2 8) (4 10)

machine: 7

(7 5) (4 5) (9 7) (10 4) (6 8) (8 6) (2 7) (1 7) (3 8) (5 10)

machine: 8

(5 8) (7 9) (9 8) (4 7) (6 10) (3 7) (8 9) (1 8) (2 9) (10 10)

machine: 9

(6 5) (5 7) (7 8) (4 6) (10 5) (3 5) (8 7) (9 10) (1 9) (2 10)

machine: 10

(7 7) (6 6) (9 6) (2 4) (5 9) (10 6) (8 8) (4 9) (3 9) (1 10)

machine: 11

(9 3) (3 3) (4 8)

machine: 12

(5 5) (1 4) (10 8) (8 10)

AGV1:

(7 1) (6 1) (5 2) (8 1) (7 2) (5 3) (6 2) (6 3) (7 3) (2 2) (7 4) (9 3) (4 3) (5 5) (1 1) (5 6) (6 5) (3 2) (4 4) (7 8) (5 7) (6 6) (10 2) (5 8) (10 3) (9 6) (6 7) (9 7) (1 2) (3 4) (10 4) (10 5) (4 7) (2 4) (2 5) (1 3) (3 5) (10 6) (6 10) (2 6) (8 7) (3 6) (10 7) (1 7) (4 8) (9 10) (10 8) (1 8) (8 10) (2 9) (4 9) (1 9) (4 10) (1 10) (10 10) (2 10)

AGV2:

(5 1) (9 1) (3 1) (4 1) (2 1) (10 1) (9 2) (4 2) (8 2) (5 4) (6 4) (7 5) (8 3) (7 6) (9 4) (7 7) (2 3) (9 5) (3 3) (8 4) (4 5) (4 6) (7 9) (5 9) (6 8) (9 8) (7 10) (8 5) (8 6) (1 4) (6 9) (1 5) (5 10) (2 7) (1 6) (8 8) (9 9) (3 7) (2 8) (8 9) (3 8) (10 9) (3 9) (3 10)

Mt10xxxt:

Makespan:963

machine: 1

(9 1) (2 1) (7 2) (4 3) (8 2) (5 2) (1 1) (10 2) (6 7) (3 2)

machine: 2

(4 1) (6 2) (7 1) (9 2) (10 1) (3 1) (5 3) (8 3) (1 2) (2 6)

machine: 3

(6 1) (4 2) (8 1) (5 1) (7 4) (2 2) (9 5) (10 3) (1 3) (3 4)

machine: 4

(8 10)

machine: 5

(4 4) (2 3) (5 6) (8 5) (1 5) (7 10) (9 9) (6 9) (10 9) (3 10)

machine: 6

(6 3) (9 4) (7 6) (5 4) (8 4) (2 8) (1 6) (10 7) (3 6) (4 10)

machine: 7

(7 5) (4 5) (9 7) (10 4) (6 8) (2 7) (8 6) (1 7) (3 8) (5 10)

machine: 8

(4 7) (9 8) (7 9) (5 8) (2 9) (3 7) (1 8) (8 9) (6 10) (10 10)

machine: 9

(6 5) (4 6) (7 8) (10 5) (5 7) (3 5) (8 7) (9 10) (1 9) (2 10)

machine: 10

(6 6) (7 7) (2 4) (9 6) (10 6) (5 9) (8 8) (4 9) (3 9) (1 10)

machine: 11

(7 3) (2 5) (3 3) (1 4) (10 8)

machine: 12

(6 4) (4 8)

machine: 13

(9 3) (5 5)

AGV1:

(6 1) (9 1) (7 1) (3 1) (5 1) (10 1) (4 2) (7 2) (2 2) (7 3) (9 3) (5 2) (6 5) (4 4) (7 5) (6 6) (7 6) (9 5) (2 3) (7 7) (6 7) (8 3) (10 3) (2 4) (7 8) (9 7) (5 5) (10 4) (9 8) (3 3) (10 5) (7 9) (1 4) (3 4) (2 7) (6 9) (1 5) (8 6) (2 8) (3 5) (9 9) (1 6) (10 7) (1 7) (10 8) (8 8) (5 10) (3 8) (9 10) (8 9) (6 10) (1 9) (4 10) (8 10) (2 10) (10 10) (3 10)

AGV2:

(4 1) (2 1) (8 1) (1 1) (6 2) (6 3) (9 2) (6 4) (4 3) (8 2) (7 4) (9 4) (10 2) (5 3) (4 5) (4 6) (1 2) (3 2) (5 4) (4 7) (9 6) (2 5) (8 4) (6 8) (5 6) (4 8) (2 6) (1 3) (8 5) (5 7) (10 6) (5 8) (7 10) (4 9) (2 9) (5 9) (8 7) (3 6) (3 7) (1 8) (10 9) (3 9) (1 10)

Mt10xyt:

Makespan:950

machine: 1

(2 1) (5 2) (9 1) (1 1) (7 2) (4 3) (8 2) (10 2) (3 2) (6 7)

machine: 2

(4 1) (5 3) (7 1) (6 2) (9 2) (10 1) (3 1) (2 6) (8 3) (1 2)

machine: 3

(6 1) (4 2) (8 1) (7 4) (9 5) (3 4)

machine: 4

(9 3) (7 3) (10 8) (8 10)

machine: 5

(2 3) (5 6) (4 4) (8 5) (1 5) (9 9) (7 10) (10 9) (6 9) (3 10)

machine: 6

(5 4) (6 3) (9 4) (7 6) (8 4) (2 8) (10 7) (1 6) (3 6) (4 10)

machine: 7

(4 5) (7 5) (10 4) (2 7) (9 7) (6 8) (8 6) (1 7) (3 8) (5 10)

machine: 8

(5 8) (4 7) (9 8) (7 9) (2 9) (3 7) (1 8) (8 9) (10 10) (6 10)

machine: 9

(6 5) (5 7) (4 6) (10 5) (7 8) (3 5) (8 7) (9 10) (2 10) (1 9)

machine: 10

(2 4) (6 6) (9 6) (7 7) (10 6) (4 9) (8 8) (5 9) (3 9) (1 10)

machine: 11

(5 5) (6 4) (2 5) (3 3) (1 4) (4 8)

machine: 12

(5 1) (2 2) (10 3) (1 3)

AGV1:

(2 1) (6 1) (5 1) (7 1) (5 3) (8 1) (4 2) (6 2) (5 4) (9 2) (7 2) (6 3) (1 2) (4 3) (5 6) (6 4) (2 5) (8 2) (4 4) (10 2) (7 4) (9 5) (6 6) (2 6) (3 2) (5 8) (8 3) (10 4) (10 5) (4 7) (9 6) (3 3) (3 4) (1 3) (1 4) (3 5) (10 7) (2 9) (6 9) (10 8) (7 10) (9 10) (4 9) (8 8) (10 9) (3 8) (5 9) (8 9) (10 10) (8 10) (4 10) (3 10) (6 10)

AGV2:

(4 1) (9 1) (10 1) (2 2) (5 2) (1 1) (3 1) (2 3) (5 5) (2 4) (9 3) (7 3) (9 4) (6 5) (5 7) (10 3) (4 5) (7 5) (4 6) (7 6) (2 7) (7 7) (6 7) (8 4) (9 7) (2 8) (7 8) (10 6) (6 8) (9 8) (8 5) (4 8) (8 6) (1 5) (7 9) (9 9) (1 6) (1 7) (8 7) (3 6) (3 7) (2 10) (1 8) (1 9) (3 9) (1 10) (5 10)

Mt10xyzt:

Makespan:916

machine: 1

(1 1) (5 2) (9 1) (8 2) (10 2) (4 3) (2 1) (3 2) (7 2) (6 7)

machine: 2

(4 1) (6 2) (10 1) (8 3)

machine: 3

(6 1) (4 2) (9 5) (3 4)

machine: 4

(5 5) (6 4) (3 3) (10 8)

machine: 5

(5 6) (1 5) (4 4) (8 5) (2 3) (10 9) (9 9) (6 9) (7 10) (3 10)

machine: 6

(5 4) (6 3) (8 4) (1 6) (9 4) (10 7) (7 6) (3 6) (2 8) (4 10)

machine: 7

(10 4) (1 7) (4 5) (8 6) (9 7) (7 5) (6 8) (2 7) (3 8) (5 10)

machine: 8

(5 8) (1 8) (4 7) (9 8) (8 9) (3 7) (10 10) (7 9) (2 9) (6 10)

machine: 9

(5 7) (6 5) (10 5) (4 6) (1 9) (8 7) (3 5) (7 8) (9 10) (2 10)

machine: 10

(6 6) (10 6) (9 6) (2 4) (8 8) (7 7) (5 9) (4 9) (1 10) (3 9)

machine: 11

(1 4) (9 3) (7 3) (2 5) (4 8) (8 10)

machine: 12

(5 1) (8 1) (1 3) (10 3) (2 2) (7 4)

machine: 13

(5 3) (1 2) (9 2) (3 1) (7 1) (2 6)

AGV1:

(1 1) (4 1) (5 2) (5 3) (8 1) (3 1) (7 1) (6 2) (2 1) (9 2) (5 5) (5 6) (10 2) (10 3) (5 7) (8 4) (5 8) (6 5) (10 4) (3 2) (9 4) (6 6) (8 5) (5 9) (9 5) (1 8) (3 3) (6 7) (7 3) (4 7) (1 9) (9 7) (7 4) (8 7) (10 8) (8 8) (6 8) (7 6) (10 9) (2 7) (9 9) (3 7) (6 9) (10 10) (8 10) (4 9) (7 9) (6 10) (5 10) (2 10)

AGV2:

(5 1) (6 1) (9 1) (1 2) (10 1) (5 4) (8 2) (4 2) (6 3) (1 3) (1 4) (6 4) (8 3) (4 3) (1 5) (9 3) (4 4) (1 6) (10 5) (2 2) (1 7) (7 2) (4 5) (10 6) (8 6) (4 6) (2 3) (3 4) (9 6) (10 7) (2 4) (7 5) (2 5) (9 8) (3 5) (1 10) (4 8) (7 7) (2 6) (8 9) (7 8) (3 6) (3 8) (2 8) (9 10) (4 10) (2 9) (7 10) (3 9) (3 10)

Setb4c9t:

Makespan:957

machine: 1

(12 1) (9 2) (1 3) (6 2) (2 4) (3 5) (10 2) (15 5) (14 9) (4 6) (7 8) (13 8) (11 7) (5 8) (8 9)

machine: 2

(3 1) (4 1) (13 2) (7 4) (14 8) (5 5) (10 5) (2 5) (12 8) (6 6) (1 9) (15 9) (8 8) (11 9) (9 10)

machine: 3

(15 1) (14 2) (7 2) (5 2) (12 3) (3 6) (1 7) (13 5) (8 5) (11 5) (10 7) (9 7) (2 9) (4 10) (6 10)

machine: 4

(3 2) (12 2) (2 3) (13 3) (14 7) (10 3) (8 4) (11 2) (9 6) (15 7) (5 7) (4 8) (1 10) (6 9) (7 10)

machine: 5

(14 1) (9 1) (4 3) (3 4) (1 5) (6 3) (7 6) (11 3) (8 6) (2 6) (10 9) (15 10) (12 10) (13 10) (5 10)

machine: 6

(15 2) (14 3) (3 3) (8 3) (5 4) (4 5) (9 4) (12 6) (6 4) (11 4) (1 8) (10 8) (2 7) (13 9) (7 9)

machine: 7

(7 1) (2 1) (14 4) (1 4) (4 4) (13 4) (3 7) (15 6) (10 6) (5 6) (11 6) (12 9) (9 9) (6 8) (8 10)

machine: 8

(1 1) (5 1) (4 2) (8 2) (14 6) (12 4) (11 1) (9 5) (7 7) (13 7) (3 10) (15 8) (6 7) (2 10) (10 10)

machine: 9

(6 1) (14 5) (5 3) (10 4) (3 8) (4 7)

machine: 10

(1 2) (13 1) (15 3) (10 1) (9 3) (7 5) (12 7) (6 5) (3 9) (8 7) (2 8) (11 8) (4 9) (5 9) (14 10)

machine: 11

(8 1) (2 2) (7 3) (15 4) (1 6) (12 5) (13 6) (9 8) (11 10)

AGV1:

(15 1) (12 1) (14 2) (7 1) (4 1) (3 2) (15 2) (13 1) (2 1) (7 2) (14 3) (15 3) (1 3) (2 2) (5 2) (3 3) (8 2) (4 3) (14 5) (6 2) (7 3) (2 3) (14 6) (3 4) (8 3) (15 4) (7 4) (3 5) (9 3) (12 4) (6 3) (14 7) (1 6) (10 3) (14 8) (5 4) (12 5) (5 5) (14 9) (10 4) (15 6) (3 7) (13 5) (4 6) (12 6) (2 5) (7 6) (3 8) (7 7) (14 10) (11 3) (1 8) (6 5) (7 8) (13 7) (15 7) (10 7) (8 6) (3 9) (6 6) (2 6) (13 8) (12 9) (5 7) (15 8) (4 7) (4 8) (6 7) (5 8) (9 8) (11 8) (2 9) (9 9) (11 9) (8 9) (5 9) (12 10) (13 10) (8 10) (7 10) (6 10)

AGV2:

(3 1) (14 1) (1 1) (5 1) (1 2) (9 1) (8 1) (9 2) (6 1) (4 2) (14 4) (12 2) (10 1) (13 2) (1 4) (12 3) (5 3) (2 4) (13 3) (4 4) (1 5) (10 2) (11 1) (13 4) (15 5) (3 6) (4 5) (7 5) (8 4) (6 4) (1 7) (9 4) (11 2) (10 5) (9 5) (12 7) (13 6) (8 5) (9 6) (10 6) (11 4) (5 6) (11 5) (9 7) (12 8) (11 6) (8 7) (3 10) (7 9) (10 8) (11 7) (2 7) (1 9) (10 9) (2 8) (15 9) (13 9) (1 10) (15 10) (8 8) (10 10) (4 9) (6 8) (9 10) (4 10) (2 10) (11 10) (6 9) (5 10)

Setb4cct:

Makespan:943

machine: 1

(12 1) (9 2) (6 2) (15 5) (1 3) (10 2) (3 5) (2 4) (5 8) (14 9) (4 6) (13 8) (7 8) (11 7) (8 9)

machine: 2

(3 1) (13 2) (4 1) (5 5) (7 4) (14 8) (2 5) (10 5) (6 6) (12 8) (15 9) (8 8) (9 10) (1 9) (11 9)

machine: 3

(15 1) (14 2) (5 2) (7 2) (12 3) (13 5) (8 5) (3 6) (9 7) (1 7) (11 5) (10 7) (2 9) (4 10) (6 10)

machine: 4

(3 2) (13 3) (12 2) (2 3) (8 4) (5 7) (14 7) (10 3) (9 6) (11 2) (15 7) (4 8) (7 10) (6 9) (1 10)

machine: 5

(14 1) (9 1) (6 3) (3 4) (4 3) (8 6) (1 5) (7 6) (2 6) (11 3) (5 10) (15 10) (10 9) (13 10) (12 10)

machine: 6

(5 4) (6 4) (4 5) (12 6) (2 7) (1 8) (10 8) (7 9)

machine: 7

(2 1) (7 1) (14 4) (13 4) (5 6) (4 4) (1 4) (15 6) (3 7) (10 6) (9 9) (11 6) (12 9) (6 8) (8 10)

machine: 8

(5 1) (1 1) (8 2) (4 2) (14 6) (12 4) (9 5) (11 1) (13 7) (7 7) (15 8) (6 7) (3 10) (2 10) (10 10)

machine: 9

(6 1) (15 4) (14 5) (13 6) (12 5) (9 8)

machine: 10

(13 1) (15 3) (1 2) (10 1) (9 3) (6 5) (7 5) (5 9) (12 7) (8 7) (2 8) (3 9) (4 9) (11 8) (14 10)

machine: 11

(8 1) (2 2) (5 3) (7 3) (10 4) (1 6) (4 7) (3 8) (11 10)

machine: 12

(15 2) (14 3) (3 3) (8 3) (9 4) (11 4) (13 9)

AGV1:

(3 1) (14 1) (5 1) (14 2) (15 2) (9 1) (3 2) (2 2) (13 2) (1 1) (4 1) (1 2) (15 4) (6 2) (13 3) (3 3) (14 4) (6 3) (5 4) (4 2) (14 5) (1 3) (3 4) (7 3) (11 1) (14 6) (3 5) (5 6) (2 4) (9 4) (8 4) (9 5) (14 7) (3 6) (13 6) (2 5) (9 6) (4 5) (10 4) (6 6) (8 6) (13 7) (9 7) (4 6) (2 6) (1 5) (12 6) (3 7) (1 6) (7 7) (13 8) (5 10) (9 8) (1 7) (10 6) (9 9) (1 8) (3 8) (11 5) (15 8) (15 9) (6 7) (9 10) (11 7) (13 9) (2 9) (1 9) (8 9) (10 9) (3 10) (6 8) (2 10) (11 9) (1 10) (8 10) (12 10) (6 10)

AGV2:

(13 1) (15 1) (8 1) (12 1) (2 1) (6 1) (7 1) (15 3) (9 2) (10 1) (8 2) (5 2) (14 3) (12 2) (7 2) (5 3) (2 3) (9 3) (15 5) (13 4) (5 5) (8 3) (15 6) (4 3) (12 3) (6 4) (10 2) (13 5) (7 4) (10 3) (1 4) (12 4) (6 5) (4 4) (5 7) (8 5) (5 8) (14 8) (7 5) (12 5) (14 9) (5 9) (11 2) (10 5) (8 7) (14 10) (7 6) (12 7) (15 7) (11 3) (2 7) (4 7) (7 8) (2 8) (11 4) (10 7) (4 8) (12 8) (11 6) (12 9) (8 8) (15 10) (3 9) (10 8) (7 9) (4 9) (11 8) (4 10) (7 10) (13 10) (10 10) (6 9) (11 10)

Setb4xt:

Makespan:961

machine: 1

(12 1) (6 2) (10 2) (9 2) (1 3) (3 5) (2 4) (15 5) (14 9) (5 8) (4 6) (13 8) (7 8) (11 7) (8 9)

machine: 2

(3 1) (13 2) (4 1) (5 5) (14 8) (7 4) (2 5) (10 5) (6 6) (12 8) (15 9) (8 8) (1 9) (9 10) (11 9)

machine: 3

(15 1) (14 2) (5 2) (7 2) (12 3) (13 5) (8 5) (3 6) (9 7) (1 7) (11 5) (10 7) (2 9) (4 10) (6 10)

machine: 4

(3 2) (13 3) (12 2) (2 3) (10 3) (14 7) (8 4) (5 7) (9 6) (11 2) (15 7) (4 8) (1 10) (6 9) (7 10)

machine: 5

(14 1) (9 1) (6 3) (3 4) (4 3) (8 6) (1 5) (2 6) (11 3) (7 6) (5 10) (15 10) (10 9) (12 10) (13 10)

machine: 6

(15 2) (14 3) (3 3) (5 4) (8 3) (9 4) (6 4) (4 5) (12 6) (2 7) (11 4) (1 8) (10 8) (13 9) (7 9)

machine: 7

(2 1) (7 1) (14 4) (13 4) (5 6) (4 4) (1 4) (15 6) (3 7) (10 6) (9 9) (11 6) (12 9) (6 8) (8 10)

machine: 8

(5 1) (1 1) (8 2) (4 2) (14 6) (12 4) (9 5) (11 1) (13 7) (7 7) (15 8) (6 7) (3 10) (10 10) (2 10)

machine: 9

(6 1) (8 1) (2 2) (5 3) (14 5) (15 4) (7 3) (10 4) (13 6) (12 5) (1 6) (4 7) (9 8) (3 8) (11 10)

machine: 10

(10 1) (15 3) (6 5) (12 7) (8 7) (2 8) (4 9)

machine: 11

(13 1) (1 2) (9 3) (7 5) (5 9) (3 9) (11 8) (14 10)

AGV1:

(3 1) (15 1) (5 1) (12 1) (10 1) (2 1) (15 3) (13 2) (1 1) (11 1) (14 3) (10 2) (13 3) (9 2) (6 3) (5 3) (15 4) (9 3) (1 3) (13 4) (4 2) (8 3) (3 4) (6 4) (14 6) (4 3) (9 4) (2 4) (15 5) (3 6) (14 7) (8 4) (14 8) (10 4) (4 4) (8 5) (13 6) (9 6) (6 5) (4 5) (7 5) (8 6) (11 2) (13 7) (4 6) (5 9) (3 7) (14 10) (7 6) (12 7) (13 8) (1 7) (2 8) (9 8) (7 7) (1 8) (11 5) (5 10) (12 8) (11 6) (6 7) (3 9) (8 8) (15 10) (4 9) (2 9) (1 10) (11 8) (12 10) (11 9) (10 10) (13 10) (6 10)

AGV2:

(6 1) (13 1) (14 1) (8 1) (14 2) (15 2) (3 2) (6 2) (9 1) (7 1) (2 2) (4 1) (12 2) (8 2) (1 2) (5 2) (3 3) (14 4) (10 3) (7 2) (2 3) (14 5) (5 4) (5 5) (3 5) (12 3) (7 3) (1 4) (5 6) (13 5) (12 4) (9 5) (2 5) (7 4) (14 9) (15 6) (5 7) (12 5) (5 8) (10 5) (9 7) (6 6) (1 5) (8 7) (2 6) (1 6) (12 6) (15 7) (11 3) (2 7) (4 7) (11 4) (10 6) (3 8) (4 8) (9 9) (10 7) (15 8) (7 8) (13 9) (15 9) (9 10) (12 9) (10 8) (1 9) (11 7) (8 9) (7 9) (10 9) (3 10) (4 10) (6 8) (2 10) (8 10) (6 9) (7 10) (11 10)

Setb4xxt:

Makespan:961

machine: 1

(12 1) (6 2) (1 3) (10 2) (15 5) (3 5) (9 2) (14 9) (2 4) (4 6) (5 8) (7 8) (13 8) (11 7) (8 9)

machine: 2

(3 1) (4 1) (13 2) (5 5) (14 8) (7 4) (10 5) (2 5) (6 6) (12 8) (15 9) (8 8) (1 9) (9 10) (11 9)

machine: 3

(15 1) (14 2) (5 2) (7 2) (12 3) (3 6) (8 5) (13 5) (1 7) (9 7) (11 5) (10 7) (2 9) (4 10) (6 10)

machine: 4

(3 2) (12 2) (13 3) (10 3) (14 7) (8 4) (2 3) (11 2) (5 7) (9 6) (15 7) (4 8) (1 10) (6 9) (7 10)

machine: 5

(14 1) (4 3) (3 4) (9 1) (1 5) (6 3) (8 6) (7 6) (11 3) (2 6) (5 10) (15 10) (10 9) (12 10) (13 10)

machine: 6

(15 2) (14 3) (3 3) (5 4) (8 3) (4 5) (9 4) (6 4) (12 6) (11 4) (1 8) (2 7) (10 8) (13 9) (7 9)

machine: 7

(7 1) (14 4) (2 1) (1 4) (4 4) (13 4) (5 6) (15 6) (3 7) (10 6) (11 6) (9 9) (12 9) (6 8) (8 10)

machine: 8

(1 1) (5 1) (4 2) (8 2) (14 6) (11 1) (12 4) (9 5) (7 7) (13 7) (15 8) (6 7) (3 10) (10 10) (2 10)

machine: 9

(6 1) (8 1) (15 4) (5 3) (14 5) (7 3) (2 2) (10 4) (1 6) (12 5) (13 6) (4 7) (9 8) (3 8) (11 10)

machine: 10

(15 3) (10 1) (6 5) (12 7) (2 8) (11 8)

machine: 11

(1 2) (9 3) (8 7) (4 9) (14 10)

machine: 12

(13 1) (7 5) (5 9) (3 9)

AGV1:

(6 1) (15 1) (14 1) (5 1) (8 1) (7 1) (15 3) (13 1) (10 1) (12 2) (15 4) (2 1) (7 2) (1 3) (13 2) (4 3) (3 3) (10 2) (5 4) (13 3) (12 3) (7 3) (14 6) (9 1) (3 5) (10 3) (15 6) (1 5) (7 4) (14 7) (14 8) (8 4) (9 3) (14 9) (2 3) (6 3) (5 6) (11 2) (9 4) (4 6) (7 5) (6 4) (9 5) (5 7) (13 6) (6 5) (2 5) (1 8) (9 7) (12 6) (15 7) (7 8) (12 7) (6 6) (10 6) (4 8) (14 10) (10 7) (15 8) (13 8) (7 9) (8 8) (5 10) (12 9) (11 7) (2 8) (3 9) (2 9) (4 9) (10 9) (4 10) (11 8) (1 10) (10 10) (13 10) (2 10) (7 10) (6 10)

AGV2:

(3 1) (12 1) (1 1) (14 2) (15 2) (4 1) (1 2) (3 2) (6 2) (4 2) (5 2) (14 3) (8 2) (14 4) (5 3) (11 1) (14 5) (15 5) (1 4) (8 3) (3 4) (4 4) (5 5) (2 2) (9 2) (3 6) (13 4) (10 4) (1 6) (4 5) (8 5) (3 7) (12 4) (12 5) (10 5) (2 4) (13 5) (1 7) (8 6) (9 6) (11 3) (7 6) (7 7) (5 8) (11 4) (4 7) (13 7) (8 7) (5 9) (11 5) (9 8) (2 6) (11 6) (3 8) (9 9) (12 8) (15 9) (6 7) (2 7) (10 8) (1 9) (15 10) (9 10) (8 9) (13 9) (3 10) (6 8) (12 10) (11 9) (8 10) (6 9) (11 10)

Setb4xxxt:

Makespan:961

machine: 1

(12 1) (1 3) (9 2) (10 2) (6 2) (15 5) (3 5) (14 9) (2 4) (4 6) (5 8) (7 8) (13 8) (11 7) (8 9)

machine: 2

(3 1) (4 1) (13 2) (5 5) (14 8) (7 4) (10 5) (2 5) (6 6) (12 8) (15 9) (8 8) (1 9) (9 10) (11 9)

machine: 3

(15 1) (14 2) (5 2) (7 2) (12 3) (3 6) (13 5) (8 5) (1 7) (11 5) (9 7) (10 7) (2 9) (4 10) (6 10)

machine: 4

(3 2) (12 2) (10 3) (13 3) (14 7) (8 4) (2 3) (11 2) (5 7) (9 6) (15 7) (4 8) (7 10) (1 10) (6 9)

machine: 5

(14 1) (9 1) (4 3) (3 4) (1 5) (6 3) (11 3) (7 6) (8 6) (2 6) (5 10) (15 10) (10 9) (12 10) (13 10)

machine: 6

(15 2) (14 3) (3 3) (5 4) (8 3) (9 4) (4 5) (6 4) (12 6) (11 4) (1 8) (2 7) (7 9) (10 8) (13 9)

machine: 7

(7 1) (2 1) (14 4) (1 4) (4 4) (13 4) (5 6) (15 6) (3 7) (10 6) (11 6) (9 9) (12 9) (6 8) (8 10)

machine: 8

(1 1) (5 1) (4 2) (8 2) (14 6) (11 1) (12 4) (9 5) (7 7) (13 7) (15 8) (6 7) (2 10) (3 10) (10 10)

machine: 9

(8 1) (6 1) (15 4) (5 3) (14 5) (7 3) (2 2) (10 4) (1 6) (12 5) (13 6) (4 7) (9 8) (3 8) (11 10)

machine: 10

(1 2) (10 1) (7 5) (12 7) (2 8)

machine: 11

(9 3) (14 10) (5 9)

machine: 12

(15 3) (3 9)

machine: 13

(13 1) (6 5) (8 7) (4 9) (11 8)

AGV1:

(3 1) (15 1) (14 1) (14 2) (15 2) (6 1) (3 2) (7 1) (9 1) (13 1) (1 3) (12 2) (5 2) (14 3) (7 2) (5 3) (3 3) (15 5) (1 4) (10 2) (12 3) (10 3) (8 3) (5 5) (13 3) (1 5) (3 5) (10 4) (13 4) (15 6) (14 9) (3 6) (2 3) (8 5) (1 6) (9 5) (13 5) (10 5) (12 5) (7 5) (4 6) (2 5) (9 6) (12 6) (6 5) (11 4) (4 7) (11 5) (1 8) (13 7) (4 8) (3 8) (10 7) (9 8) (6 7) (11 7) (9 9) (5 10) (8 8) (12 9) (10 8) (7 10) (3 9) (4 9) (1 10) (4 10) (2 10) (11 9) (10 10) (8 10) (6 9) (6 10)

AGV2:

(8 1) (1 1) (5 1) (1 2) (12 1) (4 1) (15 3) (8 2) (10 1) (2 1) (11 1) (15 4) (4 2) (6 2) (14 4) (4 3) (9 2) (2 2) (13 2) (14 5) (5 4) (7 3) (14 6) (9 3) (6 3) (4 4) (3 4) (7 4) (14 7) (14 8) (8 4) (12 4) (9 4) (5 6) (4 5) (11 2) (2 4) (6 4) (3 7) (14 10) (13 6) (1 7) (5 7) (11 3) (5 8) (7 6) (8 6) (7 7) (12 7) (9 7) (10 6) (15 7) (6 6) (7 8) (5 9) (2 6) (8 7) (11 6) (12 8) (2 7) (15 8) (13 8) (7 9) (2 8) (15 9) (1 9) (2 9) (15 10) (9 10) (8 9) (13 9) (10 9) (6 8) (11 8) (3 10) (12 10) (13 10) (11 10)

Setb4xyt:

Makespan:948

machine: 1

(12 1) (9 2) (1 3) (2 4) (6 2) (10 2) (15 5) (3 5) (14 9) (4 6) (5 8) (13 8) (11 7) (7 8) (8 9)

machine: 2

(3 1) (4 1) (13 2) (2 5) (14 8) (5 5) (7 4) (10 5) (6 6) (15 9) (12 8) (8 8) (1 9) (11 9) (9 10)

machine: 3

(14 2) (15 1) (7 2) (5 2) (12 3) (13 5) (8 5) (3 6) (1 7) (11 5) (10 7) (9 7) (2 9) (4 10) (6 10)

machine: 4

(3 2) (2 3) (13 3) (12 2) (14 7) (10 3) (8 4) (11 2) (5 7) (15 7) (9 6) (4 8) (1 10) (6 9) (7 10)

machine: 5

(14 1) (9 1) (4 3) (3 4) (1 5) (6 3) (2 6) (11 3) (8 6) (7 6) (5 10) (15 10) (10 9) (12 10) (13 10)

machine: 6

(14 3) (15 2) (3 3) (8 3) (5 4) (4 5) (9 4) (6 4) (2 7) (11 4) (12 6) (1 8) (10 8) (13 9) (7 9)

machine: 7

(2 1) (7 1) (14 4) (1 4) (13 4) (3 7) (11 6) (9 9) (6 8)

machine: 8

(1 1) (5 1) (4 2) (8 2) (14 6) (11 1) (9 5) (12 4) (13 7) (15 8) (7 7) (6 7) (3 10) (10 10) (2 10)

machine: 9

(8 1) (2 2) (6 1) (14 5) (15 4) (5 3) (7 3) (10 4) (13 6) (1 6) (12 5) (4 7) (3 8) (9 8) (11 10)

machine: 10

(1 2) (9 3) (7 5) (5 9) (2 8) (11 8) (3 9)

machine: 11

(13 1) (15 3) (10 1) (14 10) (6 5) (8 7) (12 7) (4 9)

machine: 12

(4 4) (15 6) (5 6) (10 6) (12 9) (8 10)

AGV1:

(8 1) (14 1) (1 1) (5 1) (1 2) (13 1) (9 1) (3 2) (8 2) (9 2) (4 2) (12 2) (15 2) (2 3) (3 3) (15 3) (13 3) (2 4) (1 4) (6 2) (2 5) (14 6) (8 3) (3 4) (4 4) (10 2) (15 5) (10 3) (12 3) (9 3) (3 5) (5 4) (5 5) (14 9) (8 4) (10 4) (9 4) (11 2) (8 5) (13 6) (9 5) (2 6) (12 4) (9 6) (6 5) (13 7) (12 5) (2 7) (1 7) (3 7) (8 7) (15 8) (13 8) (1 8) (12 6) (2 8) (7 6) (4 8) (12 7) (8 8) (9 7) (11 7) (13 9) (5 10) (7 8) (12 8) (4 9) (3 9) (9 8) (4 10) (9 9) (1 10) (7 9) (10 10) (13 10) (6 9) (7 10) (6 10)

AGV2:

(3 1) (2 1) (14 2) (12 1) (4 1) (2 2) (7 1) (6 1) (15 1) (14 3) (1 3) (13 2) (5 2) (14 4) (7 2) (4 3) (14 5) (10 1) (11 1) (15 4) (7 3) (13 4) (5 3) (1 5) (6 3) (14 7) (14 8) (4 5) (15 6) (1 6) (13 5) (3 6) (7 4) (6 4) (5 6) (15 7) (4 6) (14 10) (10 5) (5 7) (11 3) (7 5) (8 6) (11 4) (5 8) (4 7) (11 5) (10 6) (5 9) (10 7) (6 6) (11 6) (7 7) (3 8) (15 9) (6 7) (10 8) (11 8) (15 10) (1 9) (12 9) (2 9) (10 9) (11 9) (8 9) (3 10) (6 8) (9 10) (12 10) (11 10) (8 10) (2 10)

Setb4xyzt:

Makespan:939

machine: 1

(12 1) (9 2) (1 3) (10 2) (2 4) (6 2) (3 5) (15 5) (14 9) (4 6) (5 8) (13 8) (11 7) (7 8) (8 9)

machine: 2

(3 1) (4 1) (13 2) (2 5) (14 8) (5 5) (7 4) (10 5) (6 6) (15 9) (8 8) (12 8) (1 9) (11 9) (9 10)

machine: 3

(14 2) (15 1) (3 6) (12 3) (2 9) (1 7) (10 7) (4 10)

machine: 4

(3 2) (2 3) (13 3) (10 3) (14 7) (12 2) (8 4) (11 2) (5 7) (15 7) (9 6) (4 8) (1 10) (6 9) (7 10)

machine: 5

(14 1) (9 1) (4 3) (3 4) (1 5) (2 6) (6 3) (11 3) (8 6) (7 6) (15 10) (5 10) (10 9) (12 10) (13 10)

machine: 6

(14 3) (15 2) (3 3) (8 3) (5 4) (9 4) (2 7) (4 5) (6 4) (11 4) (12 6) (1 8) (10 8) (13 9) (7 9)

machine: 7

(7 1) (4 4) (15 6) (10 6) (12 9) (8 10)

machine: 8

(1 1) (5 1) (4 2) (8 2) (14 6) (11 1) (9 5) (12 4) (13 7) (2 10) (15 8) (7 7) (6 7) (3 10) (10 10)

machine: 9

(8 1) (2 2) (6 1) (14 5) (5 3) (15 4) (7 3) (10 4) (13 6) (1 6) (12 5) (4 7) (3 8) (9 8) (11 10)

machine: 10

(13 1) (15 3) (9 3) (2 8) (6 5) (8 7) (5 9) (3 9)

machine: 11

(1 2) (10 1) (14 10) (7 5) (12 7) (11 8) (4 9)

machine: 12

(2 1) (14 4) (1 4) (13 4) (5 6) (3 7) (11 6) (9 9) (6 8)

machine: 13

(5 2) (7 2) (13 5) (8 5) (11 5) (9 7) (6 10)

AGV1:

(8 1) (1 1) (12 1) (2 1) (1 2) (3 2) (8 2) (9 2) (10 1) (4 2) (5 2) (15 2) (14 4) (2 3) (5 3) (15 3) (10 2) (7 2) (13 3) (14 6) (2 5) (15 4) (4 4) (5 4) (1 5) (7 3) (6 3) (15 5) (3 6) (8 4) (14 9) (2 7) (9 5) (15 6) (7 4) (3 7) (2 9) (5 6) (6 4) (4 6) (14 10) (12 5) (11 3) (7 5) (8 6) (11 4) (1 7) (3 8) (6 6) (10 6) (5 9) (7 6) (7 7) (15 9) (11 7) (6 7) (8 8) (15 10) (3 9) (1 9) (5 10) (11 9) (10 9) (1 10) (6 8) (9 10) (10 10) (8 10) (6 9)

AGV2:

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Seti5cct:

Makespan:1261

machine: 1

(13 1) (11 2) (2 1) (10 1) (5 7) (8 10) (14 10) (6 12) (7 13) (9 15) (3 13) (12 15) (4 15) (15 15) (1 15)

machine: 2

(4 1) (15 1) (6 1) (3 3) (2 2) (9 6) (12 6) (14 5) (13 5) (5 10) (10 7) (7 11) (1 11) (8 13) (11 15)

machine: 3

(11 1) (6 3) (8 6) (1 5) (2 4) (7 7) (4 10) (5 11) (3 11) (14 13) (9 14) (15 13) (10 13) (12 14) (13 14)

machine: 4

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machine: 5

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machine: 6

(5 2) (6 2) (10 2) (8 5) (11 6) (3 6) (9 7) (4 8) (1 7) (14 8) (15 11) (13 11) (12 13) (7 14) (2 14)

machine: 7

(4 2) (11 3) (9 3) (15 3) (7 3) (3 5) (13 4) (12 9) (6 7) (1 9) (14 11) (10 9) (5 13) (2 11) (8 14)

machine: 8

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machine: 9

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machine: 10

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machine: 11

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machine: 12

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machine: 13

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machine: 14

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machine: 15

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machine: 16

(2 3) (4 9) (8 9) (9 11) (12 11) (14 15) (7 15)

machine: 17

(4 5) (5 5) (1 6) (13 6) (14 14) (10 14)

AGV1:

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AGV2:

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Seti5xxxt:

Makespan:1318

machine: 1

(11 2) (10 1) (13 1) (2 1) (5 7) (14 10) (8 10) (6 12) (3 13) (9 15) (7 13) (15 15) (4 15) (1 15) (12 15)

machine: 2

(4 1) (15 1) (6 1) (3 3) (14 5) (2 2) (9 6) (13 5) (12 6) (10 7) (5 10) (1 11) (7 11) (8 13) (11 15)

machine: 3

(11 1) (8 6) (6 3) (1 5) (2 4) (7 7) (3 11) (14 13) (4 10) (5 11) (15 13) (10 13) (9 14) (13 14) (12 14)

machine: 4

(8 1) (9 1) (3 2) (11 5) (14 6) (13 3) (7 5) (15 7) (12 5) (1 10) (2 12) (6 13) (4 13) (10 15) (5 15)

machine: 5

(8 3) (11 4) (4 4) (14 4) (1 3) (5 4) (15 5) (10 4) (12 3) (6 5) (2 5) (9 8) (7 8) (13 8) (3 15)

machine: 6

(5 2) (10 2) (8 5) (6 2) (11 6) (3 6) (14 8) (9 7) (1 7) (4 8) (15 11) (13 11) (2 14) (7 14) (12 13)

machine: 7

(4 2) (11 3) (15 3) (9 3) (7 3) (3 5) (13 4) (6 7) (14 11) (1 9) (10 9) (12 9) (2 11) (8 14) (5 13)

machine: 8

(8 2) (4 3) (7 2) (10 3) (15 8) (3 9) (6 8) (14 12) (9 10) (11 12) (1 12) (5 12) (13 13) (12 12) (2 15)

machine: 9

(8 4) (9 2) (14 7) (3 7) (15 6) (5 8) (1 8) (11 11) (2 8) (10 10) (7 10) (12 10) (13 12) (4 12) (6 15)

machine: 10

(7 1) (1 1) (5 3) (9 4) (11 8) (12 4) (14 9) (2 6) (4 7) (6 9) (15 12) (13 10) (10 12) (3 14) (8 15)

machine: 11

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machine: 12

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machine: 13

(5 1) (14 2) (3 4) (15 4) (11 7) (1 4) (8 8) (10 6) (12 7) (7 9) (9 12) (2 10) (4 14) (6 14) (13 15)

machine: 14

(14 3) (13 2) (6 4) (5 6) (7 6) (15 9) (11 10) (9 9) (10 8) (12 8) (8 11) (2 9) (3 12) (4 11) (1 13)

machine: 15

(4 5) (9 5) (11 9)

machine: 16

(3 1) (5 5) (6 6) (13 6) (2 7) (14 14)

machine: 17

(12 2) (8 7) (1 6) (15 14) (10 14)

machine: 18

(7 4)

AGV1:

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AGV2:

(14 1) (4 1) (5 1) (15 1) (6 1) (9 1) (8 2) (3 2) (14 2) (8 3) (8 4) (5 2) (9 2) (11 4) (5 3) (1 2) (8 5) (2 1) (3 4) (4 5) (8 6) (9 3) (15 4) (7 3) (9 4) (5 4) (11 6) (2 2) (7 4) (8 7) (14 7) (11 7) (2 3) (11 8) (7 5) (13 4) (1 5) (6 4) (10 5) (5 6) (6 5) (9 7) (1 6) (7 6) (5 7) (6 6) (2 5) (5 8) (2 6) (15 9) (7 7) (6 7) (12 6) (13 6) (14 10) (8 10) (9 9) (10 7) (12 7) (11 11) (13 7) (14 12) (6 9) (4 9) (15 11) (1 10) (9 10) (15 12) (13 8) (9 11) (10 10) (6 11) (9 12) (11 12) (7 10) (14 14) (10 11) (13 10) (7 11) (4 11) (9 13) (3 12) (2 10) (13 11) (2 11) (13 12) (6 13) (8 14) (2 13) (9 14) (15 14) (10 14) (12 11) (7 12) (9 15) (1 14) (5 13) (6 14) (2 15) (7 13) (3 15) (11 15) (5 14) (4 15) (6 15) (1 15)

Seti5xyzt:

Makespan:1240

machine: 1

(13 1) (11 2) (10 1) (2 1) (5 7) (14 10) (8 10) (6 12) (3 13) (7 13) (9 15) (15 15) (1 15) (4 15) (12 15)

machine: 2

(4 1) (15 1) (6 1) (3 3) (9 6) (12 6) (14 5) (10 7) (1 11) (8 13)

machine: 3

(11 1) (6 3) (8 6) (1 5) (2 4) (7 7) (5 11) (4 10) (3 11) (15 13) (9 14) (14 13) (10 13) (13 14) (12 14)

machine: 4

(8 1) (9 1) (3 2) (13 3) (11 5) (12 5) (7 5) (15 7) (14 6) (1 10) (2 12) (6 13) (4 13) (10 15) (5 15)

machine: 5

(4 4) (8 3) (11 4) (12 3) (1 3) (5 4) (10 4) (15 5) (6 5) (14 4) (9 8) (2 5) (7 8) (13 8) (3 15)

machine: 6

(5 2) (10 2) (6 2) (8 5) (11 6) (3 6) (9 7) (1 7) (4 8) (14 8) (15 11) (13 11) (2 14) (7 14) (12 13)

machine: 7

(4 2) (11 3) (9 3) (15 3) (7 3) (3 5) (13 4) (6 7) (1 9) (10 9) (12 9) (14 11) (2 11) (5 13) (8 14)

machine: 8

(4 3) (8 2) (7 2) (10 3) (15 8) (6 8) (3 9) (9 10) (5 12) (11 12) (14 12) (1 12) (13 13) (12 12) (2 15)

machine: 9

(9 2) (8 4) (15 6) (3 7) (5 8) (14 7) (1 8) (11 11) (2 8) (7 10) (10 10) (12 10) (13 12) (4 12) (6 15)

machine: 10

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machine: 11

(12 1) (14 1) (15 2) (1 2) (4 6) (10 5) (3 10) (6 10) (13 9) (9 13) (7 12) (2 13) (8 12) (11 14) (5 14)

machine: 12

(3 8) (15 10) (13 7) (11 13) (12 11) (1 14) (14 15)

machine: 13

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machine: 14

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machine: 15

(5 5) (6 6) (11 9) (2 7) (14 14)

machine: 16

(3 1) (12 2) (4 5) (9 5) (7 4) (8 7) (1 6) (13 6) (15 14) (10 14)

machine: 17

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machine: 18

(2 2) (13 5) (5 10) (7 11) (11 15)

AGV1:

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AGV2:

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