```
Python 2.7.13 (v2.7.13:a06454b1afa1, Dec 17 2016, 20:53:40) [MSC v.1500 64 bit
(AMD64)] on win32
Type "copyright", "credits" or "license()" for more information.
>>>
 RESTART: C:\Users\teleuser\Documents\Kantor\Kuliah\Master\Semester
3\Perencanaan
Jaringan\Tugas\program\Python\tsp-atncolony\Python-Ant-Colony-TSP-Solver-master\
anttsp.py
[[0, 10, 30, 31], [10, 0, 22, 18], [30, 22, 0, 18], [31, 18, 18, 0]]
4
Average = 16
Tau0 = 0.03125
iter_counter = 1
starting ant = 0
Exploitationstarting ant = 1

Ant 0 : [2, 3], 18starting ant = 2

Exploitationstarting ant = 3

Ant 1 : [2, 3], 18starting ant = 4

Explorationstarting ant = 5

avg = 0.00137208781362starting ant = 6

p = 0.00173611111111starting ant = 7

Ant 0 : [2, 3, 1], 36starting ant = 8

Exploitationstarting ant = 9

Ant 2 : [1, 0], 10starting ant = 10

Exploitationstarting ant = 11

Ant 3 : [1, 0], 10starting ant = 12

Exploitationstarting ant = 13

Ant 1 : [2, 3, 1], 36starting ant = 14

Exploitationstarting ant = 15

Ant 4 : [0, 1], 10starting ant = 16

Exploitationstarting ant = 17

Ant 5 : [0, 1], 10starting ant = 18

Explorationstarting ant = 19

avg = 0.00209385521886
p = 0.003125
```

```
Ant 6 : [1, 0], 10
Exploration
avg = 0.00172491039427
p = 0.003125
Ant 7 : [0, 1], 10
Exploration
avg = 0.003125
Ant 0 : [2, 3, 1, 0], 46
Update called by 0Exploitation

Ant thread 0 terminating.Ant 8 : [2, 3], 18

Exploration
avg = 0.00139941077441
p = 0.00142045454545
p = 0.00173611111111
Ant 9 : [2, 3], 18
Exploitation
Ant 2 : [1, 0, 2], 40
Exploitation
Ant 10 : [0, 1], 10
Exploration
avg = 0.00209385521886
p = 0.003125
Ant 11 : [1, 0], 10
Exploration
avg = 0.0010248655914
p = 0.00104166666667
Ant 3 : [1, 0, 2], 40
Exploitation
Ant 12 : [2, 3], 18
Exploration
avg = 0.00172491039427
p = 0.003125
Ant 13 : [0, 1], 10
Exploration
avg = 0.003125
Ant 1 : [2, 3, 1, 0], 46
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.00172491039427

p = 0.003125
Ant 14 : [0, 1], 10
Exploration
avg = 0.00209385521886
p = 0.003125
Ant 15 : [1, 0], 10
Exploitation
Ant 4 : [0, 1, 3], 28
Exploitation
Ant 16 : [2, 3], 18
Exploration
avg = 0.00209385521886
```

```
p = 0.003125
Ant 17 : [1, 0], 10
Exploitation
Ant 5 : [0, 1, 3], 28
Exploration
avg = 0.00209385521886
p = 0.003125
Ant 18 : [1, 0], 10
Exploitation
Ant 19 : [2, 3], 18
Exploration
avg = 0.0010248655914
p = 0.00104166666667
Ant 6 : [1, 0, 2], 40
Exploration
avg = 0.00157828282828
p = 0.00173611111111
Ant 7 : [0, 1, 3], 28
Exploitation
Ant 8 : [2, 3, 1], 36
Exploitation
Ant 9 : [2, 3, 1], 36
Exploitation
Ant 2 : [1, 0, 2, 3], 58
ExploitationUpdate called by 2

Ant 10 : [0, 1, 3], 28Ant thread 2 terminating.

Exploitation
Ant 11 : [1, 0, 2], 40
Exploitation
Ant 3 : [1, 0, 2, 3], 58
Update called by 3Exploitation

Ant thread 3 terminating.Ant 12 : [2, 3, 1], 36

Exploration
avg = 0.00157828282828
p = 0.00173611111111
Ant 13 : [0, 1, 3], 28
Exploitation
Ant 14 : [0, 1, 3], 28
Exploration
avg = 0.0010248655914
p = 0.00104166666667
Ant 15 : [1, 0, 2], 40
Exploitation
Ant 4 : [0, 1, 3, 2], 46
Update called by 4Exploration

Ant thread 4 terminating.avg = 0.00137208781362

p = 0.00173611111111
Ant 16 : [2, 3, 1], 36
```

```
Exploitation
Ant 17 : [1, 0, 2], 40
Exploitation
Ant 5 : [0, 1, 3, 2], 46
Update called by 5Exploration

Ant thread 5 terminating.avg = 0.0010248655914

p = 0.00104166666667
Ant 18 : [1, 0, 2], 40
Exploitation
Ant 19 : [2, 3, 1], 36
Exploration
avg = 0.00173611111111
Ant 6 : [1, 0, 2, 3], 58
Update called by 6Exploration

Ant thread 6 terminating.avg = 0.00173611111111

Ant 7 : [0, 1, 3, 2], 46
Update called by 7Exploration

Ant thread 7 terminating.avg = 0.003125

Ant 8 : [2, 3, 1, 0], 46
Update called by 8Exploitation

Ant thread 8 terminating.Ant 9 : [2, 3, 1, 0], 46

Update called by 9Exploration

Ant thread 9 terminating.avg = 0.00173611111111

Ant 10 : [0, 1, 3, 2], 46
ExplorationUpdate called by 10

avg = 0.00173611111111Ant thread 10 terminating.

Ant 11 : [1, 0, 2, 3], 58
Update called by 11Exploration

Ant thread 11 terminating.avg = 0.003125

Ant 12 : [2, 3, 1, 0], 46
Update called by 12Exploration

Ant thread 12 terminating.avg = 0.00173611111111

Ant 13 : [0, 1, 3, 2], 46
Update called by 13Exploration

Ant thread 13 terminating.avg = 0.00173611111111

Ant 14 : [0, 1, 3, 2], 46
```

Update called by 14Exploration

Ant thread 14 terminating.avg = 0.00173611111111

Ant 15 : [1, 0, 2, 3], 58
Update called by 15Exploration

Ant thread 15 terminating.avg = 0.003125

Ant 16 : [2, 3, 1, 0], 46
ExplorationUpdate called by 16

avg = 0.00173611111111Ant thread 16 terminating.

Ant 17 : [1, 0, 2, 3], 58
Update called by 17Exploration

Ant thread 17 terminating.avg = 0.00173611111111

Ant 18 : [1, 0, 2, 3], 58
Update called by 18Exploration

Ant thread 18 terminating.avg = 0.003125

Ant 19 : [2, 3, 1, 0], 46
Update called by 19
Best: [2, 3, 1, 0], 76, 1, 76
Ant thread 19 terminating.iter_counter = 2

starting ant = 0
Explorationstarting ant = 1

avg = 0.00125946969697starting ant = 2

p = 0.00127840909091starting ant = 3

p = 0.0015625starting ant = 4

Ant 0 : [2, 3], 18starting ant = 5

Exploitationstarting ant = 6

Ant 1 : [2, 3], 18starting ant = 7

Explorationstarting ant = 8

avg = 0.00188446969697starting ant = 9

p = 0.0028125starting ant = 10

Ant 2 : [1, 0], 10starting ant = 11

Explorationstarting ant = 12

avg = 0.00198759469697starting ant = 13

p = 0.003121875starting ant = 14

Ant 3 : [1, 0], 10starting ant = 15

Explorationstarting ant = 16

avg = 0.00155241935484starting ant = 17

p = 0.0028125starting ant = 18

Ant 4 : [0, 1], 10starting ant = 19

```
Exploitation
Ant 0 : [2, 3, 1], 36
Exploration
avg = 0.00165554435484
p = 0.003121875
Ant 5 : [0, 1], 10
Exploitation
Ant 6 : [1, 0], 10
Exploration
avg = 0.00132081653226
p = 0.001734375
Ant 1 : [2, 3, 1], 36
Exploitation
Ant 7 : [0, 1], 10
Exploitation
Ant 8 : [2, 3], 18
Exploitation
Ant 9 : [2, 3], 18
Exploration
avg = 0.00165658591734
p = 0.0031249996875
Ant 10 : [0, 1], 10
Exploitation
Ant 2 : [1, 0, 2], 40
Exploitation
Ant 11 : [1, 0], 10
Exploration
avg = 0.00131734006676
p = 0.00173611110937
Ant 12 : [2, 3], 18
Exploration
avg = 0.00169096102046
p = 0.00312499999688
Ant 13 : [0, 1], 10
Exploration
avg = 0.00169096102149
p = 0.00312499999997
Ant 14 : [0, 1], 10
Exploitation
Ant 3 : [1, 0, 2], 40
```

```
Exploitation
Ant 15 : [1, 0], 10
Exploration
avg = 0.00131734006733
p = 0.00173611111109
Ant 16 : [2, 3], 18
Exploration
avg = 0.00198863636363
p = 0.00312499999997
Ant 17 : [1, 0], 10
Exploitation
Ant 18 : [1, 0], 10
Exploitation
Ant 4 : [0, 1, 3], 28
Exploitation
Ant 19 : [2, 3], 18
Exploitation
Ant 0 : [2, 3, 1, 0], 46
Update called by 0Exploitation

Ant thread 0 terminating.Ant 5 : [0, 1, 3], 28

Exploration
avg = 0.000974457157258
p = 0.00104165625
Ant 6 : [1, 0, 2], 40
Exploitation
Ant 1 : [2, 3, 1, 0], 46
Update called by 1Exploitation

Ant thread 1 terminating.Ant 7 : [0, 1, 3], 28

Exploration
avg = 0.00132167590726
p = 0.00173609375
Ant 8 : [2, 3, 1], 36
Exploration
avg = 0.00132168450101
p = 0.0017361109375
Ant 9 : [2, 3, 1], 36
Exploitation
Ant 10 : [0, 1, 3], 28
Exploration
avg = 0.00173611111111
Ant 2 : [1, 0, 2, 3], 58
Update called by 2Exploitation

Ant thread 2 terminating.Ant 11 : [1, 0, 2], 40

Exploration
avg = 0.00132168458695
p = 0.00173611110937
Ant 12 : [2, 3, 1], 36
Exploration
```

```
avg = 0.00150726010014
p = 0.00173611110937
Ant 13 : [0, 1, 3], 28
Exploration
avg = 0.001507260101
p = 0.00173611111109
Ant 14 : [0, 1, 3], 28
Exploration
avg = 0.00173611111111
Ant 3 : [1, 0, 2, 3], 58
Update called by 3Exploration

Ant thread 3 terminating.avg = 0.000974462365071

p = 0.00104166666563
Ant 15 : [1, 0, 2], 40
Exploitation
Ant 16 : [2, 3, 1], 36
Exploration
avg = 0.000974462365586
p = 0.00104166666666
Ant 17 : [1, 0, 2], 40
Exploitation
Ant 18 : [1, 0, 2], 40
Exploration
avg = 0.0015625
Ant 4 : [0, 1, 3, 2], 46
Update called by 4Exploration

Ant thread 4 terminating.avg = 0.00132168458781

p = 0.00173611111111
Ant 19 : [2, 3, 1], 36
Exploration
avg = 0.001734375
Ant 5 : [0, 1, 3, 2], 46
ExploitationUpdate called by 5

Ant 6 : [1, 0, 2, 3], 58Ant thread 5 terminating.

Update called by 6Exploration

Ant thread 6 terminating.avg = 0.00173609375

Ant 7 : [0, 1, 3, 2], 46
Update called by 7Exploration

Ant thread 7 terminating.avg = 0.003125

Ant 8 : [2, 3, 1, 0], 46
Update called by 8Exploration

Ant thread 8 terminating.avg = 0.003125
```

```
Ant 9 : [2, 3, 1, 0], 46
Update called by 9Exploration

Ant thread 9 terminating.avg = 0.0017361109375

Ant 10 : [0, 1, 3, 2], 46
Update called by 10Exploration

Ant thread 10 terminating.avg = 0.00173611111111

Ant 11 : [1, 0, 2, 3], 58
Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [2, 3, 1, 0], 46

Update called by 12Exploitation

Ant thread 12 terminating.Ant 13 : [0, 1, 3, 2], 46

Update called by 13Exploration

Ant thread 13 terminating.avg = 0.00173611111109

Ant 14 : [0, 1, 3, 2], 46
Update called by 14Exploration

Ant thread 14 terminating.avg = 0.00173611111111

Ant 15 : [1, 0, 2, 3], 58
Update called by 15Exploitation

Ant thread 15 terminating.Ant 16 : [2, 3, 1, 0], 46

Update called by 16Exploration

Ant thread 16 terminating.avg = 0.00173611111111

Ant 17 : [1, 0, 2, 3], 58
Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [1, 0, 2, 3], 58

Update called by 18Exploration

Ant thread 18 terminating.avg = 0.003125

Ant 19 : [2, 3, 1, 0], 46
Update called by 19
Best: [2, 3, 1, 0], 76, 2, 76
Ant thread 19 terminating.iter_counter = 3

starting ant = 0
Explorationstarting ant = 1
```

avg = 0.00118560606061starting ant = 2

p = 0.0015625starting ant = 3

Ant 0 : [2, 3], 18starting ant = 4

Explorationstarting ant = 5

avg = 0.00124289772727starting ant = 6

p = 0.001734375starting ant = 7

Ant 1 : [2, 3], 18starting ant = 8

Explorationstarting ant = 9

avg = 0.00184185606061starting ant = 10

p = 0.0028125starting ant = 11

Ant 2 : [1, 0], 10starting ant = 12

Exploitationstarting ant = 13

Ant 3 : [1, 0], 10starting ant = 14

Exploitationstarting ant = 15

Ant 0 : [2, 3, 1], 36starting ant = 16

Exploitationstarting ant = 17

Ant 4 : [0, 1], 10starting ant = 18

Explorationstarting ant = 19

avg = 0.00162530241935
p = 0.003121875
Ant 5 : [0, 1], 10
Exploration
avg = 0.00194601231061
p = 0.00312496875
Ant 6 : [1, 0], 10
Exploration
avg = 0.00162633366935
p = 0.00312496875
Ant 7 : [0, 1], 10
Exploitation
Ant 1 : [2, 3, 1], 36
Exploration
avg = 0.00124347064394
p = 0.00173609375
Ant 8 : [2, 3], 18
Exploitation

```
Ant 9 : [2, 3], 18
Exploitation
Ant 10 : [0, 1], 10
Exploration
avg = 0.00194602262311
p = 0.0031249996875
Ant 11 : [1, 0], 10
Exploitation
Ant 2 : [1, 0, 2], 40
Exploitation
Ant 12 : [2, 3], 18
Exploration
avg = 0.00166071908498
p = 0.00312499999688
Ant 13 : [0, 1], 10
Exploration
avg = 0.000928578629032
p = 0.001040625
Ant 3 : [1, 0, 2], 40
Exploitation
Ant 14 : [0, 1], 10
Exploration
avg = 0.00194602272623
p = 0.00312499999688
Ant 15 : [1, 0], 10
Exploitation
Ant 0 : [2, 3, 1, 0], 46
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.00124347643097

p = 0.00173611111109
Ant 16 : [2, 3], 18
Exploitation
Ant 17 : [1, 0], 10
Exploration
avg = 0.00135653409091
p = 0.0015625
Ant 4 : [0, 1, 3], 28
Exploitation
Ant 18 : [1, 0], 10
Exploration
Ant 19 : [2, 3], 18
Exploration
avg = 0.00144247159091
p = 0.001734375
Ant 5 : [0, 1, 3], 28
Exploitation
Ant 6 : [1, 0, 2], 40
Exploration
avg = 0.00144333096591
p = 0.00173609375
Ant 7 : [0, 1, 3], 28
Exploitation
```

```
Ant 1 : [2, 3, 1, 0], 46
Update called by 1Exploitation

Ant thread 1 terminating.Ant 8 : [2, 3, 1], 36

Exploration
avg = 0.00127632159778
p = 0.0017361109375
Ant 9 : [2, 3, 1], 36
Exploitation
Ant 10 : [0, 1, 3], 28
Exploration
avg = 0.000929099410282
p = 0.0010416665625
Ant 11 : [1, 0, 2], 40
Exploration
avg = 0.00173611111111
Ant 2 : [1, 0, 2, 3], 58
Update called by 2Exploration

Ant thread 2 terminating.avg = 0.00127632168372

p = 0.00173611110937
Ant 12 : [2, 3, 1], 36
Exploration
avg = 0.0014433396456
p = 0.00173611110937
Ant 13 : [0, 1, 3], 28
Exploitation
Ant 3 : [1, 0, 2, 3], 58
Update called by 3Exploration

Ant thread 3 terminating.avg = 0.00144333964646

p = 0.00173611111109
Ant 14 : [0, 1, 3], 28
Exploration
avg = 0.000929099461845
p = 0.00104166666563
Ant 15 : [1, 0, 2], 40
Exploitation
Ant 16 : [2, 3, 1], 36
Exploitation
Ant 17 : [1, 0, 2], 40
Exploitation
Ant 4 : [0, 1, 3, 2], 46
Update called by 4Exploration

Ant thread 4 terminating.avg = 0.000929099462366

p = 0.00104166666667
Ant 18 : [1, 0, 2], 40
Exploitation
Ant 19 : [2, 3, 1], 36
```

Exploration
avg = 0.001734375
Ant 5 : [0, 1, 3, 2], 46
Update called by 5Exploitation

Ant thread 5 terminating.Ant 6 : [1, 0, 2, 3], 58

Update called by 6Exploitation

Ant thread 6 terminating.Ant 7 : [0, 1, 3, 2], 46

Update called by 7Exploitation

Ant thread 7 terminating.Ant 8 : [2, 3, 1, 0], 46

ExplorationUpdate called by 8

avg = 0.003125Ant thread 8 terminating.

Ant 9 : [2, 3, 1, 0], 46
Update called by 9Exploration

Ant thread 9 terminating.avg = 0.0017361109375

Ant 10 : [0, 1, 3, 2], 46
Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [1, 0, 2, 3], 58

Update called by 11Exploration

Ant thread 11 terminating.avg = 0.003125

Ant 12 : [2, 3, 1, 0], 46
Update called by 12Exploration

Ant thread 12 terminating.avg = 0.00173611110937

Ant 13 : [0, 1, 3, 2], 46
Update called by 13Exploitation

Ant thread 13 terminating.Ant 14 : [0, 1, 3, 2], 46

Update called by 14Exploration

Ant thread 14 terminating.avg = 0.00173611111111

Ant 15 : [1, 0, 2, 3], 58
Update called by 15Exploration

Ant thread 15 terminating.avg = 0.003125

Ant 16 : [2, 3, 1, 0], 46
ExplorationUpdate called by 16

avg = 0.00173611111111Ant thread 16 terminating.

Ant 17 : [1, 0, 2, 3], 58
Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [1, 0, 2, 3], 58

Update called by 18Exploration

Ant thread 18 terminating.avg = 0.003125

Ant 19 : [2, 3, 1, 0], 46
Update called by 19
Best: [2, 3, 1, 0], 76, 3, 76
Ant thread 19 terminating.iter_counter = 4

starting ant = 0
Exploitationstarting ant = 1

Ant 0 : [2, 3], 18starting ant = 2

Explorationstarting ant = 3

avg = 0.00117642045455starting ant = 4

p = 0.001734375starting ant = 5

Ant 1 : [2, 3], 18starting ant = 6

Explorationstarting ant = 7

avg = 0.00114868951613starting ant = 8

p = 0.0015625starting ant = 9

Ant 0 : [2, 3, 1], 36starting ant = 10

Exploitationstarting ant = 11

Ant 2 : [1, 0], 10starting ant = 12

Exploitationstarting ant = 13

Ant 3 : [1, 0], 10starting ant = 14

Exploitationstarting ant = 15

Ant 4 : [0, 1], 10starting ant = 16

Explorationstarting ant = 17

avg = 0.00159808467742starting ant = 18

```
p = 0.003121875starting ant = 19

Ant 5 : [0, 1], 10
Exploitation
Ant 1 : [2, 3, 1], 36
Exploration
avg = 0.00190766003788
p = 0.00312496875
Ant 6 : [1, 0], 10
Exploration
avg = 0.00159911592742
p = 0.00312496875
Ant 7 : [0, 1], 10
Exploitation
Ant 8 : [2, 3], 18
Exploration
avg = 0.00117699910038
p = 0.0017361109375
Ant 9 : [2, 3], 18
Exploration
avg = 0.0031249996875
Ant 0 : [2, 3, 1, 0], 46
Update called by 0Exploitation

Ant thread 0 terminating.Ant 10 : [0, 1], 10

Exploitation
Ant 11 : [1, 0], 10
Exploitation
Ant 2 : [1, 0, 2], 40
Exploration
avg = 0.00117699915767
p = 0.00173611110937
Ant 12 : [2, 3], 18
Exploration
avg = 0.00163350134304
p = 0.00312499999688
Ant 13 : [0, 1], 10
Exploitation
Ant 3 : [1, 0, 2], 40
Exploration
avg = 0.00163384509408
p = 0.00312499999997
Ant 14 : [0, 1], 10
Exploitation
Ant 15 : [1, 0], 10
Exploitation
Ant 4 : [0, 1, 3], 28
Exploitation
Ant 16 : [2, 3], 18
Exploration
avg = 0.00196496212121
p = 0.003125
Ant 17 : [1, 0], 10
```

```
Exploration
avg = 0.00196496212121
p = 0.003125
Ant 18 : [1, 0], 10
Exploration
avg = 0.00117699915825
p = 0.00173611111111
Ant 19 : [2, 3], 18
Exploration
avg = 0.00138494318182
p = 0.001734375
Ant 5 : [0, 1, 3], 28
Exploitation
Ant 1 : [2, 3, 1, 0], 46
Update called by 1Exploitation

Ant thread 1 terminating.Ant 6 : [1, 0, 2], 40

Exploration
avg = 0.00138580255682
p = 0.00173609375
Ant 7 : [0, 1, 3], 28
Exploration
avg = 0.00123548639113
p = 0.00173609375
Ant 8 : [2, 3, 1], 36
Exploration
avg = 0.00123549498488
p = 0.0017361109375
Ant 9 : [2, 3, 1], 36
Exploitation
Ant 10 : [0, 1, 3], 28
Exploration
avg = 0.000888272797379
p = 0.0010416665625
Ant 11 : [1, 0, 2], 40
Exploitation
Ant 2 : [1, 0, 2, 3], 58
Update called by 2Exploration

Ant thread 2 terminating.avg = 0.00123549507082

p = 0.00173611110937
Ant 12 : [2, 3, 1], 36
Exploitation
Ant 13 : [0, 1, 3], 28
Exploitation
Ant 3 : [1, 0, 2, 3], 58
Update called by 3Exploration

Ant thread 3 terminating.avg = 0.00138581123737

p = 0.00173611111109
Ant 14 : [0, 1, 3], 28
```

```
Exploitation
Ant 15 : [1, 0, 2], 40
Exploitation
Ant 4 : [0, 1, 3, 2], 46
Update called by 4Exploration

Ant thread 4 terminating.avg = 0.00123549507168

p = 0.00173611111109
Ant 16 : [2, 3, 1], 36
Exploration
avg = 0.000888272849457
p = 0.00104166666666
Ant 17 : [1, 0, 2], 40
Exploitation
Ant 18 : [1, 0, 2], 40
Exploration
avg = 0.00123549507168
p = 0.00173611111111
Ant 19 : [2, 3, 1], 36
Exploitation
Ant 5 : [0, 1, 3, 2], 46
Update called by 5Exploitation

Ant thread 5 terminating.Ant 6 : [1, 0, 2, 3], 58

Update called by 6Exploration

Ant thread 6 terminating.avg = 0.00173609375

Ant 7 : [0, 1, 3, 2], 46
Update called by 7Exploration

Ant thread 7 terminating.avg = 0.003125

Ant 8 : [2, 3, 1, 0], 46
Update called by 8Exploration

Ant thread 8 terminating.avg = 0.003125

Ant 9 : [2, 3, 1, 0], 46
Update called by 9Exploration

Ant thread 9 terminating.avg = 0.0017361109375

Ant 10 : [0, 1, 3, 2], 46
Update called by 10Exploration

Ant thread 10 terminating.avg = 0.00173611111111

Ant 11 : [1, 0, 2, 3], 58
Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [2, 3, 1, 0], 46
```

Update called by 12Exploration

Ant thread 12 terminating.avg = 0.00173611110937

Ant 13 : [0, 1, 3, 2], 46
Update called by 13Exploitation

Ant thread 13 terminating.Ant 14 : [0, 1, 3, 2], 46

Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [1, 0, 2, 3], 58

Update called by 15Exploitation

Ant thread 15 terminating.Ant 16 : [2, 3, 1, 0], 46

Update called by 16Exploration

Ant thread 16 terminating.avg = 0.00173611111111

Ant 17 : [1, 0, 2, 3], 58
Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [1, 0, 2, 3], 58

Update called by 18Exploration

Ant thread 18 terminating.avg = 0.003125

Ant 19 : [2, 3, 1, 0], 46
Update called by 19
Best: [2, 3, 1, 0], 76, 4, 76
Ant thread 19 terminating.iter_counter = 5

starting ant = 0
Explorationstarting ant = 1

avg = 0.00105929924242starting ant = 2

p = 0.0015625starting ant = 3

Ant 0 : [2, 3], 18starting ant = 4

Exploitationstarting ant = 5

Ant 1 : [2, 3], 18starting ant = 6

Explorationstarting ant = 7

avg = 0.00176898674242starting ant = 8

p = 0.0028125starting ant = 9

Ant 2 : [1, 0], 10starting ant = 10

Exploitationstarting ant = 11

Ant 3 : [1, 0], 10starting ant = 12

Explorationstarting ant = 13

avg = 0.00111194556452starting ant = 14

p = 0.0015625starting ant = 15

Ant 0 : [2, 3, 1], 36starting ant = 16

Exploitationstarting ant = 17

Ant 4 : [0, 1], 10starting ant = 18

Explorationstarting ant = 19

avg = 0.00157358870968
p = 0.003121875
Ant 5 : [0, 1], 10
Exploration
avg = 0.00119788306452
p = 0.001734375
Ant 1 : [2, 3, 1], 36
Exploitation
Ant 6 : [1, 0], 10
Exploitation
Ant 7 : [0, 1], 10
Exploitation
Ant 8 : [2, 3], 18
Exploitation
Ant 9 : [2, 3], 18
Exploration
avg = 0.000799445564516
p = 0.0009375
Ant 2 : [1, 0, 2], 40
Exploitation
Ant 10 : [0, 1], 10
Exploitation
Ant 11 : [1, 0], 10
Exploitation
Ant 3 : [1, 0, 2], 40
Exploration
avg = 0.00111716961222
p = 0.00173611110937
Ant 12 : [2, 3], 18
Exploitation
Ant 13 : [0, 1], 10
Exploration
avg = 0.00160934912633

```
p = 0.00312499999997
Ant 14 : [0, 1], 10
Exploitation
Ant 15 : [1, 0], 10
Exploitation
Ant 0 : [2, 3, 1, 0], 46
Update called by 0Exploitation

Ant thread 0 terminating.Ant 16 : [2, 3], 18

Exploitation
Ant 17 : [1, 0], 10
Exploitation
Ant 4 : [0, 1, 3], 28
Exploration
avg = 0.00193044507576
p = 0.003125
Ant 18 : [1, 0], 10
Exploration
avg = 0.00111716961279
p = 0.00173611111111
Ant 19 : [2, 3], 18
Exploitation
Ant 5 : [0, 1, 3], 28
Exploitation
Ant 1 : [2, 3, 1, 0], 46
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.000851523689516

p = 0.00104165625
Ant 6 : [1, 0, 2], 40
Exploitation
Ant 7 : [0, 1, 3], 28
Exploration
avg = 0.00119874243952
p = 0.00173609375
Ant 8 : [2, 3, 1], 36
Exploitation
Ant 9 : [2, 3, 1], 36
Exploration
avg = 0.00173611111111
Ant 2 : [1, 0, 2, 3], 58
Update called by 2Exploitation

Ant thread 2 terminating.Ant 10 : [0, 1, 3], 28

Exploitation
Ant 11 : [1, 0, 2], 40
Exploration
avg = 0.00173611111111
Ant 3 : [1, 0, 2, 3], 58
Update called by 3Exploration
```

```
Ant thread 3 terminating.avg = 0.0011987511192

p = 0.00173611110937
Ant 12 : [2, 3, 1], 36
Exploration
avg = 0.00133403566832
p = 0.00173611110937
Ant 13 : [0, 1, 3], 28
Exploration
avg = 0.00133403566918
p = 0.00173611111109
Ant 14 : [0, 1, 3], 28
Exploitation
Ant 15 : [1, 0, 2], 40
Exploitation
Ant 16 : [2, 3, 1], 36
Exploitation
Ant 17 : [1, 0, 2], 40
Exploration
avg = 0.0015625
Ant 4 : [0, 1, 3, 2], 46
Update called by 4Exploitation

Ant thread 4 terminating.Ant 18 : [1, 0, 2], 40

Exploration
avg = 0.00119875112007
p = 0.00173611111111
Ant 19 : [2, 3, 1], 36
Exploration
avg = 0.001734375
Ant 5 : [0, 1, 3, 2], 46
Update called by 5Exploration

Ant thread 5 terminating.avg = 0.00173611111111

Ant 6 : [1, 0, 2, 3], 58
Update called by 6Exploitation

Ant thread 6 terminating.Ant 7 : [0, 1, 3, 2], 46

Update called by 7Exploitation

Ant thread 7 terminating.Ant 8 : [2, 3, 1, 0], 46

Update called by 8Exploitation

Ant thread 8 terminating.Ant 9 : [2, 3, 1, 0], 46

Update called by 9Exploration

Ant thread 9 terminating.avg = 0.0017361109375

Ant 10 : [0, 1, 3, 2], 46
```

Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [1, 0, 2, 3], 58

Update called by 11Exploration

Ant thread 11 terminating.avg = 0.003125

Ant 12 : [2, 3, 1, 0], 46
Update called by 12Exploration

Ant thread 12 terminating.avg = 0.00173611110937

Ant 13 : [0, 1, 3, 2], 46
Update called by 13Exploration

Ant thread 13 terminating.avg = 0.00173611111109

Ant 14 : [0, 1, 3, 2], 46
Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [1, 0, 2, 3], 58

ExplorationUpdate called by 15

avg = 0.003125Ant thread 15 terminating.

Ant 16 : [2, 3, 1, 0], 46
Update called by 16Exploitation

Ant thread 16 terminating.Ant 17 : [1, 0, 2, 3], 58

Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [1, 0, 2, 3], 58

Update called by 18Exploitation

Ant thread 18 terminating.Ant 19 : [2, 3, 1, 0], 46

Update called by 19
Best: [2, 3, 1, 0], 76, 5, 76
Ant thread 19 terminating.iter_counter = 6

starting ant = 0
starting ant = 1Exploration

starting ant = 2avg = 0.00100545265152

starting ant = 3p = 0.0015625

starting ant = 4Ant 0 : [2, 3], 18

starting ant = 5Exploitation

starting ant = 6Ant 1 : [2, 3], 18

starting ant = 7Exploration

starting ant = 8avg = 0.00173792140152

starting ant = 9p = 0.0028125

starting ant = 10Ant 2 : [1, 0], 10

starting ant = 11Exploration

starting ant = 12avg = 0.00184104640152

starting ant = 13p = 0.003121875

starting ant = 14Ant 3 : [1, 0], 10

starting ant = 15Exploration

starting ant = 16avg = 0.00144841733871

starting ant = 17p = 0.0028125

starting ant = 18Ant 4 : [0, 1], 10

starting ant = 19Exploitation

Ant 0 : [2, 3, 1], 36
Exploration
avg = 0.00155154233871
p = 0.003121875
Ant 5 : [0, 1], 10
Exploration
avg = 0.00184207765152
p = 0.00312496875
Ant 6 : [1, 0], 10
Exploitation
Ant 1 : [2, 3, 1], 36
Exploration
avg = 0.00155257358871
p = 0.00312496875
Ant 7 : [0, 1], 10
Exploration
avg = 0.00106331723485
p = 0.00173609375
Ant 8 : [2, 3], 18
Exploration
avg = 0.00106332296402
p = 0.0017361109375
Ant 9 : [2, 3], 18
Exploitation
Ant 10 : [0, 1], 10

```
Exploration
avg = 0.000766376008065
p = 0.0009375
Ant 2 : [1, 0, 2], 40
Exploration
avg = 0.00184208796402
p = 0.0031249996875
Ant 11 : [1, 0], 10
Exploitation
Ant 12 : [2, 3], 18
Exploration
avg = 0.00158695900433
p = 0.00312499999688
Ant 13 : [0, 1], 10
Exploration
avg = 0.00158695900537
p = 0.00312499999997
Ant 14 : [0, 1], 10
Exploration
avg = 0.000817938508065
p = 0.001040625
Ant 3 : [1, 0, 2], 40
Exploitation
Ant 15 : [1, 0], 10
Exploration
avg = 0.00106332302188
p = 0.00173611111109
Ant 16 : [2, 3], 18
Exploitation
Ant 17 : [1, 0], 10
Exploration
avg = 0.00184208806818
p = 0.003125
Ant 18 : [1, 0], 10
Exploration
avg = 0.00120063210227
p = 0.0015625
Ant 4 : [0, 1, 3], 28
Exploration
avg = 0.00106332302189
p = 0.00173611111111
Ant 19 : [2, 3], 18
Exploitation
Ant 0 : [2, 3, 1, 0], 46
Update called by 0Exploitation

Ant thread 0 terminating.Ant 5 : [0, 1, 3], 28

Exploration
avg = 0.000818454133065
p = 0.00104165625
Ant 6 : [1, 0, 2], 40
Exploration
avg = 0.003125
```

```
Ant 1 : [2, 3, 1, 0], 46
Update called by 1Exploitation

Ant thread 1 terminating.Ant 7 : [0, 1, 3], 28

Exploitation
Ant 8 : [2, 3, 1], 36
Exploration
avg = 0.00116568147681
p = 0.0017361109375
Ant 9 : [2, 3, 1], 36
Exploration
avg = 0.00128743757102
p = 0.0017361109375
Ant 10 : [0, 1, 3], 28
Exploitation
Ant 2 : [1, 0, 2, 3], 58
Update called by 2Exploration

Ant thread 2 terminating.avg = 0.000818459289315

p = 0.0010416665625
Ant 11 : [1, 0, 2], 40
Exploration
avg = 0.00116568156275
p = 0.00173611110937
Ant 12 : [2, 3, 1], 36
Exploitation
Ant 13 : [0, 1, 3], 28
Exploitation
Ant 14 : [0, 1, 3], 28
Exploration
avg = 0.00173611111111
Ant 3 : [1, 0, 2, 3], 58
Update called by 3Exploration

Ant thread 3 terminating.avg = 0.000818459340877

p = 0.00104166666563
Ant 15 : [1, 0, 2], 40
Exploration
avg = 0.00116568156361
p = 0.00173611111109
Ant 16 : [2, 3, 1], 36
Exploitation
Ant 17 : [1, 0, 2], 40
Exploration
avg = 0.000818459341398
p = 0.00104166666667
Ant 18 : [1, 0, 2], 40
Exploitation
Ant 4 : [0, 1, 3, 2], 46
Update called by 4Exploitation
```

```
Ant thread 4 terminating.Ant 19 : [2, 3, 1], 36

Exploration
avg = 0.001734375
Ant 5 : [0, 1, 3, 2], 46
Update called by 5Exploration

Ant thread 5 terminating.avg = 0.00173611111111

Ant 6 : [1, 0, 2, 3], 58
Update called by 6Exploration

Ant thread 6 terminating.avg = 0.00173609375

Ant 7 : [0, 1, 3, 2], 46
Update called by 7Exploration

Ant thread 7 terminating.avg = 0.003125

Ant 8 : [2, 3, 1, 0], 46
Update called by 8Exploration

Ant thread 8 terminating.avg = 0.003125

Ant 9 : [2, 3, 1, 0], 46
Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [0, 1, 3, 2], 46

Update called by 10Exploration

Ant thread 10 terminating.avg = 0.00173611111111

Ant 11 : [1, 0, 2, 3], 58
Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [2, 3, 1, 0], 46

Update called by 12Exploration

Ant thread 12 terminating.avg = 0.00173611110937

Ant 13 : [0, 1, 3, 2], 46
Update called by 13Exploration

Ant thread 13 terminating.avg = 0.00173611111109

Ant 14 : [0, 1, 3, 2], 46
Update called by 14Exploration

Ant thread 14 terminating.avg = 0.00173611111111

Ant 15 : [1, 0, 2, 3], 58
Update called by 15Exploitation
```

Ant thread 15 terminating.Ant 16 : [2, 3, 1, 0], 46

Update called by 16Exploitation

Ant thread 16 terminating.Ant 17 : [1, 0, 2, 3], 58

Update called by 17Exploration

Ant thread 17 terminating.avg = 0.00173611111111

Ant 18 : [1, 0, 2, 3], 58
Update called by 18Exploitation

Ant thread 18 terminating.Ant 19 : [2, 3, 1, 0], 46

Update called by 19
Best: [2, 3, 1, 0], 76, 6, 76
Ant thread 19 terminating.iter_counter = 7

starting ant = 0
Explorationstarting ant = 1

avg = 0.000956990719697starting ant = 2

p = 0.0015625starting ant = 3

Ant 0 : [2, 3], 18starting ant = 4

Explorationstarting ant = 5

avg = 0.00101428238636starting ant = 6

p = 0.001734375starting ant = 7

Ant 1 : [2, 3], 18starting ant = 8

Exploitationstarting ant = 9

Ant 2 : [1, 0], 10starting ant = 10

Exploitationstarting ant = 11

Ant 3 : [1, 0], 10starting ant = 12

Exploitationstarting ant = 13

Ant 0 : [2, 3, 1], 36starting ant = 14

Explorationstarting ant = 15

avg = 0.00142857560484starting ant = 16

p = 0.0028125starting ant = 17

Ant 4 : [0, 1], 10starting ant = 18

Exploitationstarting ant = 19

Ant 5 : [0, 1], 10
Exploration
avg = 0.0018141188447
p = 0.00312496875
Ant 6 : [1, 0], 10
Exploration
avg = 0.00153273185484
p = 0.00312496875
Ant 7 : [0, 1], 10
Exploration
avg = 0.00113505090726
p = 0.001734375
Ant 1 : [2, 3, 1], 36
Exploration
avg = 0.00101485530303
p = 0.00173609375
Ant 8 : [2, 3], 18
Exploration
avg = 0.0010148610322
p = 0.0017361109375
Ant 9 : [2, 3], 18
Exploration
avg = 0.000736613407258
p = 0.0009375
Ant 2 : [1, 0, 2], 40
Exploration
avg = 0.00156711716734
p = 0.0031249996875
Ant 10 : [0, 1], 10
Exploration
avg = 0.0018141291572
p = 0.0031249996875
Ant 11 : [1, 0], 10
Exploration
avg = 0.000788175907258
p = 0.001040625
Ant 3 : [1, 0, 2], 40
Exploration
avg = 0.00101486108949
p = 0.00173611110937
Ant 12 : [2, 3], 18
Exploration
avg = 0.00156746102046
p = 0.00312499999688
Ant 13 : [0, 1], 10
Exploitation
Ant 0 : [2, 3, 1, 0], 46
Update called by 0Exploitation

```
Ant thread 0 terminating.Ant 14 : [0, 1], 10

Exploitation
Ant 15 : [1, 0], 10
Exploration
avg = 0.00101486109006
p = 0.00173611111109
Ant 16 : [2, 3], 18
Exploitation
Ant 17 : [1, 0], 10
Exploration
avg = 0.00115869389205
p = 0.0015625
Ant 4 : [0, 1, 3], 28
Exploitation
Ant 18 : [1, 0], 10
Exploitation
Ant 19 : [2, 3], 18
Exploitation
Ant 5 : [0, 1, 3], 28
Exploitation
Ant 6 : [1, 0, 2], 40
Exploration
avg = 0.00124549076705
p = 0.00173609375
Ant 7 : [0, 1, 3], 28
Exploitation
Ant 1 : [2, 3, 1, 0], 46
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.00113591028226

p = 0.00173609375
Ant 8 : [2, 3, 1], 36
Exploration
avg = 0.00113591887601
p = 0.0017361109375
Ant 9 : [2, 3, 1], 36
Exploration
avg = 0.00173611111111
Ant 2 : [1, 0, 2, 3], 58
Update called by 2Exploitation

Ant thread 2 terminating.Ant 10 : [0, 1, 3], 28

Exploitation
Ant 11 : [1, 0, 2], 40
Exploitation
Ant 3 : [1, 0, 2, 3], 58
Update called by 3Exploitation

Ant thread 3 terminating.Ant 12 : [2, 3, 1], 36

Exploitation
```

```
Ant 13 : [0, 1, 3], 28
Exploration
avg = 0.00124549944759
p = 0.00173611111109
Ant 14 : [0, 1, 3], 28
Exploration
avg = 0.000788696740071
p = 0.00104166666563
Ant 15 : [1, 0, 2], 40
Exploitation
Ant 16 : [2, 3, 1], 36
Exploitation
Ant 17 : [1, 0, 2], 40
Exploration
avg = 0.0015625
Ant 4 : [0, 1, 3, 2], 46
Update called by 4Exploitation

Ant thread 4 terminating.Ant 18 : [1, 0, 2], 40

Exploration
avg = 0.00113591896281
p = 0.00173611111111
Ant 19 : [2, 3, 1], 36
Exploration
avg = 0.001734375
Ant 5 : [0, 1, 3, 2], 46
Update called by 5Exploitation

Ant thread 5 terminating.Ant 6 : [1, 0, 2, 3], 58

Update called by 6Exploitation

Ant thread 6 terminating.Ant 7 : [0, 1, 3, 2], 46

Update called by 7Exploration

Ant thread 7 terminating.avg = 0.003125

Ant 8 : [2, 3, 1, 0], 46
Update called by 8Exploration

Ant thread 8 terminating.avg = 0.003125

Ant 9 : [2, 3, 1, 0], 46
Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [0, 1, 3, 2], 46

Update called by 10Exploration

Ant thread 10 terminating.avg = 0.00173611111111

Ant 11 : [1, 0, 2, 3], 58
```

ExplorationUpdate called by 11

avg = 0.003125Ant thread 11 terminating.

Ant 12 : [2, 3, 1, 0], 46
Update called by 12Exploration

Ant thread 12 terminating.avg = 0.00173611110937

Ant 13 : [0, 1, 3, 2], 46
Update called by 13Exploitation

Ant thread 13 terminating.Ant 14 : [0, 1, 3, 2], 46

Update called by 14Exploration

Ant thread 14 terminating.avg = 0.00173611111111

Ant 15 : [1, 0, 2, 3], 58
Update called by 15Exploration

Ant thread 15 terminating.avg = 0.003125

Ant 16 : [2, 3, 1, 0], 46
ExploitationUpdate called by 16

Ant 17 : [1, 0, 2, 3], 58Ant thread 16 terminating.

Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [1, 0, 2, 3], 58

Update called by 18Exploitation

Ant thread 18 terminating.Ant 19 : [2, 3, 1, 0], 46

Update called by 19
Best: [2, 3, 1, 0], 76, 7, 76
Ant thread 19 terminating.iter_counter = 8

starting ant = 0
Exploitationstarting ant = 1

Ant 0 : [2, 3], 18starting ant = 2

Explorationstarting ant = 3

avg = 0.000970666647727starting ant = 4

p = 0.001734375starting ant = 5

Ant 1 : [2, 3], 18starting ant = 6

Exploitationstarting ant = 7

Ant 0 : [2, 3, 1], 36starting ant = 8

Explorationstarting ant = 9

avg = 0.00168479966856starting ant = 10

p = 0.0028125starting ant = 11

Ant 2 : [1, 0], 10starting ant = 12

Explorationstarting ant = 13

avg = 0.00178792466856starting ant = 14

p = 0.003121875starting ant = 15

Ant 3 : [1, 0], 10starting ant = 16

Exploitationstarting ant = 17

Ant 4 : [0, 1], 10starting ant = 18

Exploitationstarting ant = 19

Ant 5 : [0, 1], 10
Exploration
avg = 0.00110826456653
p = 0.001734375
Ant 1 : [2, 3, 1], 36
Exploitation
Ant 6 : [1, 0], 10
Exploration
avg = 0.00151487429435
p = 0.00312496875
Ant 7 : [0, 1], 10
Exploration
avg = 0.0031249996875
Ant 0 : [2, 3, 1, 0], 46
Update called by 0Exploitation

Ant thread 0 terminating.Ant 8 : [2, 3], 18

Exploration
avg = 0.000971245293561
p = 0.0017361109375
Ant 9 : [2, 3], 18
Exploration
avg = 0.00151488460685
p = 0.0031249996875
Ant 10 : [0, 1], 10
Exploitation
Ant 11 : [1, 0], 10
Exploitation

```
Ant 2 : [1, 0, 2], 40
Exploration
avg = 0.000971245350852
p = 0.00173611110937
Ant 12 : [2, 3], 18
Exploration
avg = 0.00154925970998
p = 0.00312499999688
Ant 13 : [0, 1], 10
Exploration
avg = 0.00154925971101
p = 0.00312499999997
Ant 14 : [0, 1], 10
Exploitation
Ant 15 : [1, 0], 10
Exploration
avg = 0.000761389566532
p = 0.001040625
Ant 3 : [1, 0, 2], 40
Exploration
avg = 0.000971245351425
p = 0.00173611111109
Ant 16 : [2, 3], 18
Exploitation
Ant 17 : [1, 0], 10
Exploitation
Ant 4 : [0, 1, 3], 28
Exploration
avg = 0.00184625800189
p = 0.003125
Ant 18 : [1, 0], 10
Exploration
avg = 0.000971245351431
p = 0.00173611111111
Ant 19 : [2, 3], 18
Exploitation
Ant 5 : [0, 1, 3], 28
Exploration
avg = 0.003125
Ant 1 : [2, 3, 1, 0], 46
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.000761905191532

p = 0.00104165625
Ant 6 : [1, 0, 2], 40
Exploitation
Ant 7 : [0, 1, 3], 28
Exploration
avg = 0.00110912394153
p = 0.00173609375
Ant 8 : [2, 3, 1], 36
Exploration
avg = 0.00110913253528
```

```
p = 0.0017361109375
Ant 9 : [2, 3, 1], 36
Exploration
avg = 0.00120775497159
p = 0.0017361109375
Ant 10 : [0, 1, 3], 28
Exploitation
Ant 11 : [1, 0, 2], 40
Exploitation
Ant 2 : [1, 0, 2, 3], 58
ExplorationUpdate called by 2

avg = 0.00110913262122Ant thread 2 terminating.

p = 0.00173611110937
Ant 12 : [2, 3, 1], 36
Exploration
avg = 0.00120775505753
p = 0.00173611110937
Ant 13 : [0, 1, 3], 28
Exploitation
Ant 14 : [0, 1, 3], 28
Exploration
avg = 0.000761910399345
p = 0.00104166666563
Ant 15 : [1, 0, 2], 40
Exploration
avg = 0.00173611111111
Ant 3 : [1, 0, 2, 3], 58
Update called by 3Exploration

Ant thread 3 terminating.avg = 0.00110913262208

p = 0.00173611111109
Ant 16 : [2, 3, 1], 36
Exploitation
Ant 17 : [1, 0, 2], 40
Exploration
avg = 0.0015625
Ant 4 : [0, 1, 3, 2], 46
Update called by 4Exploration

Ant thread 4 terminating.avg = 0.000761910399866

p = 0.00104166666667
Ant 18 : [1, 0, 2], 40
Exploration
avg = 0.00110913262209
p = 0.00173611111111
Ant 19 : [2, 3, 1], 36
Exploitation
Ant 5 : [0, 1, 3, 2], 46
Update called by 5Exploitation
```

Ant thread 5 terminating.Ant 6 : [1, 0, 2, 3], 58

Update called by 6Exploration

Ant thread 6 terminating.avg = 0.00173609375

Ant 7 : [0, 1, 3, 2], 46
Update called by 7Exploration

Ant thread 7 terminating.avg = 0.003125

Ant 8 : [2, 3, 1, 0], 46
Update called by 8Exploitation

Ant thread 8 terminating.Ant 9 : [2, 3, 1, 0], 46

Update called by 9Exploration

Ant thread 9 terminating.avg = 0.0017361109375

Ant 10 : [0, 1, 3, 2], 46
Update called by 10Exploration

Ant thread 10 terminating.avg = 0.00173611111111

Ant 11 : [1, 0, 2, 3], 58
Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [2, 3, 1, 0], 46

Update called by 12Exploration

Ant thread 12 terminating.avg = 0.00173611110937

Ant 13 : [0, 1, 3, 2], 46
Update called by 13Exploitation

Ant thread 13 terminating.Ant 14 : [0, 1, 3, 2], 46

Update called by 14Exploration

Ant thread 14 terminating.avg = 0.00173611111111

Ant 15 : [1, 0, 2, 3], 58
Update called by 15Exploitation

Ant thread 15 terminating.Ant 16 : [2, 3, 1, 0], 46

Update called by 16Exploitation

Ant thread 16 terminating.Ant 17 : [1, 0, 2, 3], 58

Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [1, 0, 2, 3], 58

Update called by 18Exploration

Ant thread 18 terminating.avg = 0.003125

Ant 19 : [2, 3, 1, 0], 46
Update called by 19
Best: [2, 3, 1, 0], 76, 8, 76
Ant thread 19 terminating.iter_counter = 9

starting ant = 0
Explorationstarting ant = 1

avg = 0.000874120816288starting ant = 2

p = 0.0015625starting ant = 3

Ant 0 : [2, 3], 18starting ant = 4

Explorationstarting ant = 5

avg = 0.000931412482955starting ant = 6

p = 0.001734375starting ant = 7

Ant 1 : [2, 3], 18starting ant = 8

Explorationstarting ant = 9

avg = 0.00166215303504starting ant = 10

p = 0.0028125starting ant = 11

Ant 2 : [1, 0], 10starting ant = 12

Exploitationstarting ant = 13

Ant 3 : [1, 0], 10starting ant = 14

Explorationstarting ant = 15

avg = 0.000998219359879starting ant = 16

p = 0.0015625starting ant = 17

Ant 0 : [2, 3, 1], 36starting ant = 18

Exploitationstarting ant = 19

Ant 4 : [0, 1], 10
Exploitation
Ant 5 : [0, 1], 10
Exploration

```
avg = 0.00176630928504
p = 0.00312496875
Ant 6 : [1, 0], 10
Exploration
avg = 0.00149880248992
p = 0.00312496875
Ant 7 : [0, 1], 10
Exploration
avg = 0.00108415685988
p = 0.001734375
Ant 1 : [2, 3, 1], 36
Exploitation
Ant 8 : [2, 3], 18
Exploitation
Ant 9 : [2, 3], 18
Exploitation
Ant 10 : [0, 1], 10
Exploration
avg = 0.00176631959754
p = 0.0031249996875
Ant 11 : [1, 0], 10
Exploration
avg = 0.000685719359879
p = 0.0009375
Ant 2 : [1, 0, 2], 40
Exploration
avg = 0.00093199118608
p = 0.00173611110937
Ant 12 : [2, 3], 18
Exploitation
Ant 13 : [0, 1], 10
Exploration
avg = 0.000737281859879
p = 0.001040625
Ant 3 : [1, 0, 2], 40
Exploitation
Ant 14 : [0, 1], 10
Exploitation
Ant 15 : [1, 0], 10
Exploitation
Ant 16 : [2, 3], 18
Exploration
avg = 0.00176631970169
p = 0.00312499999997
Ant 17 : [1, 0], 10
Exploration
avg = 0.003125
Ant 0 : [2, 3, 1, 0], 46
Update called by 0Exploitation

Ant thread 0 terminating.Ant 18 : [1, 0], 10

Exploration
avg = 0.000931991186658
```

```
p = 0.00173611111111
Ant 19 : [2, 3], 18
Exploration
avg = 0.00108697955256
p = 0.0015625
Ant 4 : [0, 1, 3], 28
Exploitation
Ant 5 : [0, 1, 3], 28
Exploitation
Ant 6 : [1, 0, 2], 40
Exploitation
Ant 7 : [0, 1, 3], 28
Exploration
avg = 0.003125
Ant 1 : [2, 3, 1, 0], 46
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.00108501623488

p = 0.00173609375
Ant 8 : [2, 3, 1], 36
Exploitation
Ant 9 : [2, 3, 1], 36
Exploration
avg = 0.00117378502131
p = 0.0017361109375
Ant 10 : [0, 1, 3], 28
Exploitation
Ant 11 : [1, 0, 2], 40
Exploitation
Ant 2 : [1, 0, 2, 3], 58
Update called by 2Exploration

Ant thread 2 terminating.avg = 0.00108502491457

p = 0.00173611110937
Ant 12 : [2, 3, 1], 36
Exploitation
Ant 13 : [0, 1, 3], 28
Exploration
avg = 0.00173611111111
Ant 3 : [1, 0, 2, 3], 58
Update called by 3Exploitation

Ant thread 3 terminating.Ant 14 : [0, 1, 3], 28

Exploitation
Ant 15 : [1, 0, 2], 40
Exploitation
Ant 16 : [2, 3, 1], 36
Exploration
avg = 0.000737802693207
p = 0.00104166666666
Ant 17 : [1, 0, 2], 40
```

```
Exploitation
Ant 18 : [1, 0, 2], 40
Exploration
avg = 0.00108502491543
p = 0.00173611111111
Ant 19 : [2, 3, 1], 36
Exploitation
Ant 4 : [0, 1, 3, 2], 46
Update called by 4Exploitation

Ant thread 4 terminating.Ant 5 : [0, 1, 3, 2], 46

Update called by 5Exploration

Ant thread 5 terminating.avg = 0.00173611111111

Ant 6 : [1, 0, 2, 3], 58
Update called by 6Exploitation

Ant thread 6 terminating.Ant 7 : [0, 1, 3, 2], 46

Update called by 7Exploration

Ant thread 7 terminating.avg = 0.003125

Ant 8 : [2, 3, 1, 0], 46
Update called by 8Exploration

Ant thread 8 terminating.avg = 0.003125

Ant 9 : [2, 3, 1, 0], 46
Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [0, 1, 3, 2], 46

Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [1, 0, 2, 3], 58

ExploitationUpdate called by 11

Ant 12 : [2, 3, 1, 0], 46Ant thread 11 terminating.

Update called by 12Exploration

Ant thread 12 terminating.avg = 0.00173611110937

Ant 13 : [0, 1, 3, 2], 46
Update called by 13Exploitation

Ant thread 13 terminating.Ant 14 : [0, 1, 3, 2], 46

Update called by 14Exploration
```

Ant thread 14 terminating.avg = 0.00173611111111

Ant 15 : [1, 0, 2, 3], 58
Update called by 15Exploitation

Ant thread 15 terminating.Ant 16 : [2, 3, 1, 0], 46

Update called by 16Exploitation

Ant thread 16 terminating.Ant 17 : [1, 0, 2, 3], 58

Update called by 17Exploration

Ant thread 17 terminating.avg = 0.00173611111111

Ant 18 : [1, 0, 2, 3], 58
Update called by 18Exploitation

Ant thread 18 terminating.Ant 19 : [2, 3, 1, 0], 46

Update called by 19
Best: [2, 3, 1, 0], 76, 9, 76
Ant thread 19 terminating.iter_counter = 10

starting ant = 0
Explorationstarting ant = 1

avg = 0.000838792067992starting ant = 2

p = 0.0015625starting ant = 3

Ant 0 : [2, 3], 18starting ant = 4

Explorationstarting ant = 5

avg = 0.000896083734659starting ant = 6

p = 0.001734375starting ant = 7

Ant 1 : [2, 3], 18starting ant = 8

Exploitationstarting ant = 9

Ant 2 : [1, 0], 10starting ant = 10

Explorationstarting ant = 11

avg = 0.00174489606487starting ant = 12

p = 0.003121875starting ant = 13

Ant 3 : [1, 0], 10starting ant = 14

Explorationstarting ant = 15

avg = 0.000976522423891starting ant = 16

p = 0.0015625starting ant = 17

Ant 0 : [2, 3, 1], 36starting ant = 18

Explorationstarting ant = 19

avg = 0.00138018161593
p = 0.0028125
Ant 4 : [0, 1], 10
Exploitation
Ant 5 : [0, 1], 10
Exploration
avg = 0.00174592731487
p = 0.00312496875
Ant 6 : [1, 0], 10
Exploitation
Ant 7 : [0, 1], 10
Exploitation
Ant 1 : [2, 3, 1], 36
Exploitation
Ant 8 : [2, 3], 18
Exploitation
Ant 9 : [2, 3], 18
Exploration
avg = 0.000664022423891
p = 0.0009375
Ant 2 : [1, 0, 2], 40
Exploration
avg = 0.00151872317843
p = 0.0031249996875
Ant 10 : [0, 1], 10
Exploration
avg = 0.00174593762737
p = 0.0031249996875
Ant 11 : [1, 0], 10
Exploration
avg = 0.000896662437784
p = 0.00173611110937
Ant 12 : [2, 3], 18
Exploration
avg = 0.00151872328155
p = 0.00312499999688
Ant 13 : [0, 1], 10
Exploitation
Ant 3 : [1, 0, 2], 40
Exploitation
Ant 14 : [0, 1], 10
Exploration
avg = 0.00174593773049
p = 0.00312499999688
Ant 15 : [1, 0], 10

```
Exploration
avg = 0.000896662438357
p = 0.00173611111109
Ant 16 : [2, 3], 18
Exploitation
Ant 17 : [1, 0], 10
Exploration
avg = 0.003125
Ant 0 : [2, 3, 1, 0], 46
Update called by 0Exploitation

Ant thread 0 terminating.Ant 18 : [1, 0], 10

Exploitation
Ant 19 : [2, 3], 18
Exploration
avg = 0.0010564065973
p = 0.0015625
Ant 4 : [0, 1, 3], 28
Exploitation
Ant 5 : [0, 1, 3], 28
Exploitation
Ant 6 : [1, 0, 2], 40
Exploitation
Ant 7 : [0, 1, 3], 28
Exploration
avg = 0.003125
Ant 1 : [2, 3, 1, 0], 46
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.00106331929889

p = 0.00173609375
Ant 8 : [2, 3, 1], 36
Exploration
avg = 0.00106332789264
p = 0.0017361109375
Ant 9 : [2, 3, 1], 36
Exploitation
Ant 2 : [1, 0, 2, 3], 58
Update called by 2Exploitation

Ant thread 2 terminating.Ant 10 : [0, 1, 3], 28

Exploration
avg = 0.000716105705141
p = 0.0010416665625
Ant 11 : [1, 0, 2], 40
Exploration
avg = 0.00106332797858
p = 0.00173611110937
Ant 12 : [2, 3, 1], 36
Exploitation
Ant 13 : [0, 1, 3], 28
```

```
Exploration
avg = 0.00173611111111
Ant 3 : [1, 0, 2, 3], 58
Update called by 3Exploitation

Ant thread 3 terminating.Ant 14 : [0, 1, 3], 28

Exploration
avg = 0.000716105756704
p = 0.00104166666563
Ant 15 : [1, 0, 2], 40
Exploration
avg = 0.00106332797944
p = 0.00173611111109
Ant 16 : [2, 3, 1], 36
Exploration
avg = 0.000716105757219
p = 0.00104166666666
Ant 17 : [1, 0, 2], 40
Exploitation
Ant 18 : [1, 0, 2], 40
Exploration
avg = 0.00106332797945
p = 0.00173611111111
Ant 19 : [2, 3, 1], 36
Exploitation
Ant 4 : [0, 1, 3, 2], 46
Update called by 4Exploration

Ant thread 4 terminating.avg = 0.001734375

Ant 5 : [0, 1, 3, 2], 46
Update called by 5Exploration

Ant thread 5 terminating.avg = 0.00173611111111

Ant 6 : [1, 0, 2, 3], 58
ExplorationUpdate called by 6

avg = 0.00173609375Ant thread 6 terminating.

Ant 7 : [0, 1, 3, 2], 46
Update called by 7Exploitation

Ant thread 7 terminating.Ant 8 : [2, 3, 1, 0], 46

Update called by 8Exploration

Ant thread 8 terminating.avg = 0.003125

Ant 9 : [2, 3, 1, 0], 46
ExplorationUpdate called by 9

avg = 0.0017361109375Ant thread 9 terminating.
```

```
Ant 10 : [0, 1, 3, 2], 46
Update called by 10Exploration

Ant thread 10 terminating.avg = 0.00173611111111

Ant 11 : [1, 0, 2, 3], 58
Update called by 11Exploration

Ant thread 11 terminating.avg = 0.003125

Ant 12 : [2, 3, 1, 0], 46
Update called by 12Exploitation

Ant thread 12 terminating.Ant 13 : [0, 1, 3, 2], 46

Update called by 13Exploitation

Ant thread 13 terminating.Ant 14 : [0, 1, 3, 2], 46

ExploitationUpdate called by 14

Ant 15 : [1, 0, 2, 3], 58Ant thread 14 terminating.

Update called by 15Exploration

Ant thread 15 terminating.avg = 0.003125

Ant 16 : [2, 3, 1, 0], 46
Update called by 16Exploration

Ant thread 16 terminating.avg = 0.00173611111111

Ant 17 : [1, 0, 2, 3], 58
Update called by 17Exploration

Ant thread 17 terminating.avg = 0.00173611111111

Ant 18 : [1, 0, 2, 3], 58
Update called by 18Exploration

Ant thread 18 terminating.avg = 0.003125

Ant 19 : [2, 3, 1, 0], 46
Update called by 19
Best: [2, 3, 1, 0], 76, 10, 76
Ant thread 19 terminating.iter_counter = 11

starting ant = 0
Explorationstarting ant = 1

avg = 0.000806996194527starting ant = 2

p = 0.0015625starting ant = 3
```

Ant 0 : [2, 3], 18starting ant = 4

Exploitationstarting ant = 5

Ant 1 : [2, 3], 18starting ant = 6

Explorationstarting ant = 7

avg = 0.00162342729171starting ant = 8

p = 0.0028125starting ant = 9

Ant 2 : [1, 0], 10starting ant = 10

Explorationstarting ant = 11

avg = 0.00172655229171starting ant = 12

p = 0.003121875starting ant = 13

Ant 3 : [1, 0], 10starting ant = 14

Explorationstarting ant = 15

avg = 0.000956995181502starting ant = 16

p = 0.0015625starting ant = 17

Ant 0 : [2, 3, 1], 36starting ant = 18

Exploitationstarting ant = 19

Ant 4 : [0, 1], 10
Exploitation
Ant 5 : [0, 1], 10
Exploration
avg = 0.0010429326815
p = 0.001734375
Ant 1 : [2, 3, 1], 36
Exploration
avg = 0.00172758354171
p = 0.00312496875
Ant 6 : [1, 0], 10
Exploitation
Ant 7 : [0, 1], 10
Exploration
avg = 0.00086486077786
p = 0.00173609375
Ant 8 : [2, 3], 18
Exploration
avg = 0.000864866507027
p = 0.0017361109375
Ant 9 : [2, 3], 18

```
Exploitation
Ant 2 : [1, 0, 2], 40
Exploitation
Ant 10 : [0, 1], 10
Exploration
avg = 0.00172759385421
p = 0.0031249996875
Ant 11 : [1, 0], 10
Exploitation
Ant 12 : [2, 3], 18
Exploration
avg = 0.00150570511996
p = 0.00312499999688
Ant 13 : [0, 1], 10
Exploitation
Ant 3 : [1, 0, 2], 40
Exploration
avg = 0.00150604887099
p = 0.00312499999997
Ant 14 : [0, 1], 10
Exploration
avg = 0.00172759395734
p = 0.00312499999688
Ant 15 : [1, 0], 10
Exploration
avg = 0.000864866564891
p = 0.00173611111109
Ant 16 : [2, 3], 18
Exploration
avg = 0.00172759395837
p = 0.00312499999997
Ant 17 : [1, 0], 10
Exploitation
Ant 0 : [2, 3, 1, 0], 46
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.00172759395838

p = 0.003125
Ant 18 : [1, 0], 10
Exploitation
Ant 19 : [2, 3], 18
Exploitation
Ant 4 : [0, 1, 3], 28
Exploitation
Ant 5 : [0, 1, 3], 28
Exploitation
Ant 1 : [2, 3, 1, 0], 46
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.000696573306502

p = 0.00104165625
Ant 6 : [1, 0, 2], 40
```

Exploitation
Ant 7 : [0, 1, 3], 28
Exploitation
Ant 8 : [2, 3, 1], 36
Exploration
avg = 0.00104380065025
p = 0.0017361109375
Ant 9 : [2, 3, 1], 36
Exploitation
Ant 2 : [1, 0, 2, 3], 58
Update called by 2Exploitation

Ant thread 2 terminating.Ant 10 : [0, 1, 3], 28

Exploitation
Ant 11 : [1, 0, 2], 40
Exploitation
Ant 12 : [2, 3, 1], 36
Exploration
avg = 0.00111569649226
p = 0.00173611110937
Ant 13 : [0, 1, 3], 28
Exploitation
Ant 3 : [1, 0, 2, 3], 58
Update called by 3Exploration

Ant thread 3 terminating.avg = 0.00111569649312

p = 0.00173611111109
Ant 14 : [0, 1, 3], 28
Exploitation
Ant 15 : [1, 0, 2], 40
Exploration
avg = 0.00104380073705
p = 0.00173611111109
Ant 16 : [2, 3, 1], 36
Exploitation
Ant 17 : [1, 0, 2], 40
Exploration
avg = 0.000696578514835
p = 0.00104166666667
Ant 18 : [1, 0, 2], 40
Exploitation
Ant 19 : [2, 3, 1], 36
Exploitation
Ant 4 : [0, 1, 3, 2], 46
Update called by 4Exploitation

Ant thread 4 terminating.Ant 5 : [0, 1, 3, 2], 46

Update called by 5Exploration

Ant thread 5 terminating.avg = 0.00173611111111

```
Ant 6 : [1, 0, 2, 3], 58
Update called by 6Exploration

Ant thread 6 terminating.avg = 0.00173609375

Ant 7 : [0, 1, 3, 2], 46
Update called by 7Exploration

Ant thread 7 terminating.avg = 0.003125

Ant 8 : [2, 3, 1, 0], 46
Update called by 8Exploration

Ant thread 8 terminating.avg = 0.003125

Ant 9 : [2, 3, 1, 0], 46
Update called by 9Exploration

Ant thread 9 terminating.avg = 0.0017361109375

Ant 10 : [0, 1, 3, 2], 46
ExploitationUpdate called by 10

Ant 11 : [1, 0, 2, 3], 58Ant thread 10 terminating.

Update called by 11Exploration

Ant thread 11 terminating.avg = 0.003125

Ant 12 : [2, 3, 1, 0], 46
Update called by 12Exploration

Ant thread 12 terminating.avg = 0.00173611110937

Ant 13 : [0, 1, 3, 2], 46
Update called by 13Exploration

Ant thread 13 terminating.avg = 0.00173611111109

Ant 14 : [0, 1, 3, 2], 46
Update called by 14Exploration

Ant thread 14 terminating.avg = 0.00173611111111

Ant 15 : [1, 0, 2, 3], 58
Update called by 15Exploration

Ant thread 15 terminating.avg = 0.003125

Ant 16 : [2, 3, 1, 0], 46
Update called by 16Exploitation

Ant thread 16 terminating.Ant 17 : [1, 0, 2, 3], 58
```

Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [1, 0, 2, 3], 58

Update called by 18Exploitation

Ant thread 18 terminating.Ant 19 : [2, 3, 1, 0], 46

Update called by 19
Best: [2, 3, 1, 0], 76, 11, 76
Ant thread 19 terminating.iter_counter = 12

starting ant = 0
Explorationstarting ant = 1

avg = 0.000778379908407starting ant = 2

p = 0.0015625starting ant = 3

Ant 0 : [2, 3], 18starting ant = 4

Explorationstarting ant = 5

avg = 0.000835671575074starting ant = 6

p = 0.001734375starting ant = 7

Ant 1 : [2, 3], 18starting ant = 8

Exploitationstarting ant = 9

Ant 2 : [1, 0], 10starting ant = 10

Exploitationstarting ant = 11

Ant 3 : [1, 0], 10starting ant = 12

Explorationstarting ant = 13

avg = 0.000939420663352starting ant = 14

p = 0.0015625starting ant = 15

Ant 0 : [2, 3, 1], 36starting ant = 16

Exploitationstarting ant = 17

Ant 4 : [0, 1], 10starting ant = 18

Explorationstarting ant = 19

avg = 0.0014585721089
p = 0.003121875
Ant 5 : [0, 1], 10

```
Exploitation
Ant 6 : [1, 0], 10
Exploitation
Ant 7 : [0, 1], 10
Exploration
avg = 0.00102535816335
p = 0.001734375
Ant 1 : [2, 3, 1], 36
Exploitation
Ant 8 : [2, 3], 18
Exploration
avg = 0.000836250220907
p = 0.0017361109375
Ant 9 : [2, 3], 18
Exploration
avg = 0.000626920663352
p = 0.0009375
Ant 2 : [1, 0, 2], 40
Exploration
avg = 0.0014939886714
p = 0.0031249996875
Ant 10 : [0, 1], 10
Exploitation
Ant 11 : [1, 0], 10
Exploitation
Ant 3 : [1, 0, 2], 40
Exploration
avg = 0.000836250278199
p = 0.00173611110937
Ant 12 : [2, 3], 18
Exploitation
Ant 13 : [0, 1], 10
Exploitation
Ant 14 : [0, 1], 10
Exploration
avg = 0.0017110845615
p = 0.00312499999688
Ant 15 : [1, 0], 10
Exploration
avg = 0.00312499999997
Ant 0 : [2, 3, 1, 0], 46
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.000836250278772

p = 0.00173611111109
Ant 16 : [2, 3], 18
Exploitation
Ant 17 : [1, 0], 10
Exploration
avg = 0.00100412684381
p = 0.0015625
Ant 4 : [0, 1, 3], 28
Exploitation
```

```
Ant 18 : [1, 0], 10
Exploration
avg = 0.000836250278778
p = 0.00173611111111
Ant 19 : [2, 3], 18
Exploitation
Ant 5 : [0, 1, 3], 28
Exploitation
Ant 6 : [1, 0, 2], 40
Exploration
avg = 0.00109092371881
p = 0.00173609375
Ant 7 : [0, 1, 3], 28
Exploration
avg = 0.003125
Ant 1 : [2, 3, 1, 0], 46
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.00102621753835

p = 0.00173609375
Ant 8 : [2, 3, 1], 36
Exploitation
Ant 9 : [2, 3, 1], 36
Exploitation
Ant 2 : [1, 0, 2, 3], 58
Update called by 2Exploitation

Ant thread 2 terminating.Ant 10 : [0, 1, 3], 28

Exploitation
Ant 11 : [1, 0, 2], 40
Exploration
avg = 0.00173611111111
Ant 3 : [1, 0, 2, 3], 58
Update called by 3Exploitation

Ant thread 3 terminating.Ant 12 : [2, 3, 1], 36

Exploitation
Ant 13 : [0, 1, 3], 28
Exploitation
Ant 14 : [0, 1, 3], 28
Exploration
avg = 0.000679003996164
p = 0.00104166666563
Ant 15 : [1, 0, 2], 40
Exploitation
Ant 16 : [2, 3, 1], 36
Exploration
avg = 0.0067900399668
p = 0.00104166666666
Ant 17 : [1, 0, 2], 40
Exploitation
```

```
Ant 4 : [0, 1, 3, 2], 46
Update called by 4Exploration

Ant thread 4 terminating.avg = 0.000679003996685

p = 0.00104166666667
Ant 18 : [1, 0, 2], 40
Exploration
avg = 0.00102622621891
p = 0.00173611111111
Ant 19 : [2, 3, 1], 36
Exploitation
Ant 5 : [0, 1, 3, 2], 46
Update called by 5Exploration

Ant thread 5 terminating.avg = 0.00173611111111

Ant 6 : [1, 0, 2, 3], 58
Update called by 6Exploration

Ant thread 6 terminating.avg = 0.00173609375

Ant 7 : [0, 1, 3, 2], 46
Update called by 7Exploration

Ant thread 7 terminating.avg = 0.003125

Ant 8 : [2, 3, 1, 0], 46
Update called by 8Exploitation

Ant thread 8 terminating.Ant 9 : [2, 3, 1, 0], 46

Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [0, 1, 3, 2], 46

Update called by 10Exploration

Ant thread 10 terminating.avg = 0.00173611111111

Ant 11 : [1, 0, 2, 3], 58
Update called by 11Exploration

Ant thread 11 terminating.avg = 0.003125

Ant 12 : [2, 3, 1, 0], 46
Update called by 12Exploitation

Ant thread 12 terminating.Ant 13 : [0, 1, 3, 2], 46

Update called by 13Exploitation

Ant thread 13 terminating.Ant 14 : [0, 1, 3, 2], 46
```

Update called by 14Exploration

Ant thread 14 terminating.avg = 0.00173611111111

Ant 15 : [1, 0, 2, 3], 58
Update called by 15Exploitation

Ant thread 15 terminating.Ant 16 : [2, 3, 1, 0], 46

Update called by 16Exploration

Ant thread 16 terminating.avg = 0.00173611111111

Ant 17 : [1, 0, 2, 3], 58
Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [1, 0, 2, 3], 58

Update called by 18Exploitation

Ant thread 18 terminating.Ant 19 : [2, 3, 1, 0], 46

Update called by 19
Best: [2, 3, 1, 0], 76, 12, 76
Ant thread 19 terminating.

                        Results

Best path = [2, 3, 1, 0]
('C ',)
('D ',)
('B ',)
('A ',)

Best path cost = 76

>>>
 RESTART: C:\Users\teleuser\Documents\Kantor\Kuliah\Master\Semester
3\Perencanaan
Jaringan\Tugas\program\Python\tsp-atncolony\Python-Ant-Colony-TSP-Solver-master\
anttsp.py
[[0, 10, 30, 31, 20], [10, 0, 22, 18, 40], [30, 22, 0, 18, 26], [31, 18, 18, 0,
15], [20, 40, 26, 15, 0]]
5
Average = 18
Tau0 = 0.0222222222222
iter_counter = 1
starting ant = 0
Exploitationstarting ant = 1

Ant 0 : [3, 4], 15starting ant = 2

Explorationstarting ant = 3

avg = 0.00100071225071starting ant = 4

p = 0.00111111111111starting ant = 5

p = 0.00148148148148starting ant = 6

Ant 1 : [4, 3], 15starting ant = 7

Exploitationstarting ant = 8

Ant 0 : [3, 4, 0], 35starting ant = 9

Explorationstarting ant = 10

avg = 0.00116686579052starting ant = 11

p = 0.00123456790123starting ant = 12

p = 0.00123456790123starting ant = 13

p = 0.00148148148148starting ant = 14

Ant 2 : [3, 4], 15starting ant = 15

Explorationstarting ant = 16

avg = 0.00119772998805starting ant = 17

p = 0.00222222222222starting ant = 18

Ant 3 : [0, 1], 10starting ant = 19

Exploitation
Ant 4 : [0, 1], 10
Exploration
avg = 0.00116686579052
p = 0.00123456790123
p = 0.00123456790123
p = 0.00148148148148
Ant 5 : [3, 4], 15
Exploitation
Ant 6 : [3, 4], 15
Exploitation
Ant 1 : [4, 3, 1], 33
Exploitation
Ant 7 : [0, 1], 10
Exploration
avg = 0.00100071225071
p = 0.00111111111111
p = 0.00148148148148
Ant 8 : [4, 3], 15
Exploitation

```
Ant 0 : [3, 4, 0, 1], 45
Exploration
avg = 0.00119772998805
p = 0.00222222222222
Ant 9 : [0, 1], 10
Exploration
avg = 0.00116686579052
p = 0.00123456790123
p = 0.00123456790123
p = 0.00148148148148
Ant 10 : [3, 4], 15
Exploitation
Ant 11 : [0, 1], 10
Exploitation
Ant 12 : [1, 0], 10
Exploitation
Ant 13 : [1, 0], 10
Exploitation
Ant 14 : [2, 3], 18
Exploration
avg = 0.000840455840456
p = 0.00111111111111
p = 0.000854700854701
Ant 2 : [3, 4, 2], 41
Exploitation
Ant 15 : [1, 0], 10
Exploitation
Ant 16 : [1, 0], 10
Exploitation
Ant 17 : [1, 0], 10
Exploitation
Ant 18 : [2, 3], 18
Exploitation
Ant 3 : [0, 1, 3], 28
Exploitation
Ant 19 : [2, 3], 18
Exploitation
Ant 4 : [0, 1, 3], 28
Exploitation
Ant 5 : [3, 4, 0], 35
Exploitation
Ant 6 : [3, 4, 0], 35
Exploration
avg = 0.00161616161616
p = 0.00222222222222
Ant 1 : [4, 3, 1, 0], 43
Exploitation
Ant 7 : [0, 1, 3], 28
Exploration
avg = 0.00106199389354
p = 0.00123456790123
p = 0.00123456790123
Ant 8 : [4, 3, 2], 33
Exploitation
```

```
Ant 0 : [3, 4, 0, 1, 2], 67
Update called by 0Exploitation

Ant thread 0 terminating.Ant 9 : [0, 1, 3], 28

Exploitation
Ant 10 : [3, 4, 0], 35
Exploration
avg = 0.00093340815563
p = 0.0010101010101
p = 0.00123456790123
Ant 11 : [0, 1, 3], 28
Exploitation
Ant 12 : [1, 0, 4], 30
Exploitation
Ant 13 : [1, 0, 4], 30
Exploration
avg = 0.00114429842028
p = 0.00123456790123
p = 0.00148148148148
Ant 14 : [2, 3, 4], 33
Exploration
avg = 0.000875420875421
p = 0.0010101010101
Ant 2 : [3, 4, 2, 1], 63
Exploration
avg = 0.000856232576663
p = 0.00111111111111
Ant 15 : [1, 0, 4], 30
Exploitation
Ant 16 : [1, 0, 4], 30
Exploration
avg = 0.000856232576663
p = 0.00111111111111
Ant 17 : [1, 0, 4], 30
Exploitation
Ant 18 : [2, 3, 4], 33
Exploitation
Ant 3 : [0, 1, 3, 4], 43
Exploration
avg = 0.00114429842028
p = 0.00123456790123
p = 0.00148148148148
Ant 19 : [2, 3, 4], 33
Exploitation
Ant 4 : [0, 1, 3, 4], 43
Exploration
avg = 0.00148148148148
p = 0.00222222222222
Ant 5 : [3, 4, 0, 1], 45
Exploration
avg = 0.00148148148148
p = 0.00222222222222
Ant 6 : [3, 4, 0, 1], 45
```

Exploration
avg = 0.000740740740741
Ant 1 : [4, 3, 1, 0, 2], 73
Update called by 1Exploitation

Ant thread 1 terminating.Ant 7 : [0, 1, 3, 4], 43

Exploitation
Ant 8 : [4, 3, 2, 1], 55
Exploitation
Ant 9 : [0, 1, 3, 4], 43
Exploration
avg = 0.00148148148148
p = 0.00222222222222
Ant 10 : [3, 4, 0, 1], 45
Exploration
avg = 0.00135802469136
p = 0.00148148148148
Ant 11 : [0, 1, 3, 4], 43
Exploration
avg = 0.00116809116809
p = 0.00148148148148
Ant 12 : [1, 0, 4, 3], 45
Exploitation
Ant 13 : [1, 0, 4, 3], 45
Exploitation
Ant 14 : [2, 3, 4, 0], 53
Exploration
avg = 0.00222222222222
Ant 2 : [3, 4, 2, 1, 0], 73
Update called by 2Exploration

Ant thread 2 terminating.avg = 0.00116809116809

p = 0.00148148148148
Ant 15 : [1, 0, 4, 3], 45
Exploitation
Ant 16 : [1, 0, 4, 3], 45
Exploration
avg = 0.00116809116809
p = 0.00148148148148
Ant 17 : [1, 0, 4, 3], 45
Exploration
avg = 0.000833333333333
p = 0.00111111111111
Ant 18 : [2, 3, 4, 0], 53
Exploration
avg = 0.000854700854701
Ant 3 : [0, 1, 3, 4, 2], 69
Update called by 3Exploitation

Ant thread 3 terminating.Ant 19 : [2, 3, 4, 0], 53

Exploration

```
avg = 0.000854700854701
Ant 4 : [0, 1, 3, 4, 2], 69
Update called by 4Exploration

Ant thread 4 terminating.avg = 0.0010101010101

Ant 5 : [3, 4, 0, 1, 2], 67
Update called by 5Exploitation

Ant thread 5 terminating.Ant 6 : [3, 4, 0, 1, 2], 67

Update called by 6Exploitation

Ant thread 6 terminating.Ant 7 : [0, 1, 3, 4, 2], 69

Update called by 7Exploration

Ant thread 7 terminating.avg = 0.00222222222222

Ant 8 : [4, 3, 2, 1, 0], 65
Update called by 8Exploration

Ant thread 8 terminating.avg = 0.000854700854701

Ant 9 : [0, 1, 3, 4, 2], 69
Update called by 9Exploration

Ant thread 9 terminating.avg = 0.0010101010101

Ant 10 : [3, 4, 0, 1, 2], 67
Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [0, 1, 3, 4, 2], 69

Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [1, 0, 4, 3, 2], 63

Update called by 12Exploration

Ant thread 12 terminating.avg = 0.00123456790123

Ant 13 : [1, 0, 4, 3, 2], 63
Update called by 13Exploration

Ant thread 13 terminating.avg = 0.00222222222222

Ant 14 : [2, 3, 4, 0, 1], 63
Update called by 14Exploration

Ant thread 14 terminating.avg = 0.00123456790123

Ant 15 : [1, 0, 4, 3, 2], 63
Update called by 15Exploitation
```

Ant thread 15 terminating.Ant 16 : [1, 0, 4, 3, 2], 63

Update called by 16Exploration

Ant thread 16 terminating.avg = 0.00123456790123

Ant 17 : [1, 0, 4, 3, 2], 63
Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [2, 3, 4, 0, 1], 63

Update called by 18Exploitation

Ant thread 18 terminating.Ant 19 : [2, 3, 4, 0, 1], 63

Update called by 19
Best: [3, 4, 0, 1, 2], 85, 1, 90
Ant thread 19 terminating.iter_counter = 2

starting ant = 0
Exploitationstarting ant = 1

Ant 0 : [3, 4], 15starting ant = 2

Explorationstarting ant = 3

avg = 0.000900641025641starting ant = 4

p = 0.001starting ant = 5

p = 0.00133333333333starting ant = 6

Ant 1 : [4, 3], 15starting ant = 7

Exploitationstarting ant = 8

Ant 0 : [3, 4, 0], 35starting ant = 9

Exploitationstarting ant = 10

Ant 2 : [3, 4], 15starting ant = 11

Exploitationstarting ant = 12

Ant 3 : [0, 1], 10starting ant = 13

Explorationstarting ant = 14

avg = 0.00113295698925starting ant = 15

p = 0.00222starting ant = 16

Ant 4 : [0, 1], 10starting ant = 17

Explorationstarting ant = 18

avg = 0.0010872125448starting ant = 19

p = 0.00111111111111
p = 0.00111111111111
p = 0.00148146666667
Ant 5 : [3, 4], 15
Exploration
avg = 0.00108721621147
p = 0.00111111111111
p = 0.00111111111111
p = 0.00148148133333
Ant 6 : [3, 4], 15
Exploration
avg = 0.000955794504182
p = 0.00111111111111
p = 0.00111111111111
Ant 1 : [4, 3, 2], 33
Exploitation
Ant 7 : [0, 1], 10
Exploration
avg = 0.000964807692308
p = 0.00111
p = 0.00148
Ant 8 : [4, 3], 15
Exploration
avg = 0.00144444433333
p = 0.002222222
Ant 0 : [3, 4, 0, 1], 45
Exploitation
Ant 9 : [0, 1], 10
Exploitation
Ant 10 : [3, 4], 15
Exploitation
Ant 2 : [3, 4, 0], 35
Exploration
avg = 0.0011335125448
p = 0.0022222222222
Ant 11 : [0, 1], 10
Exploitation
Ant 12 : [1, 0], 10
Exploration
avg = 0.000840067340067
p = 0.000909090909091
p = 0.00111111111111
Ant 3 : [0, 1, 3], 28
Exploration
avg = 0.00121560606061
p = 0.00222
p = 0.00123333333333
Ant 13 : [1, 3], 18
Exploitation

```
Ant 14 : [2, 3], 18
Exploration
avg = 0.00121591161616
p = 0.00222
p = 0.00123455555556
Ant 15 : [1, 3], 18
Exploitation
Ant 16 : [1, 0], 10
Exploitation
Ant 4 : [0, 1, 3], 28
Exploration
avg = 0.00121646470227
p = 0.0022222
p = 0.0012345679
Ant 17 : [1, 3], 18
Exploitation
Ant 18 : [2, 3], 18
Exploitation
Ant 19 : [2, 3], 18
Exploitation
Ant 5 : [3, 4, 0], 35
Exploration
avg = 0.00079344725641
p = 0.001111111
Ant 6 : [3, 4, 0], 35
Exploitation
Ant 1 : [4, 3, 2, 1], 55
Exploration
avg = 0.000881219603438
p = 0.000909090909091
p = 0.00123456790122
Ant 7 : [0, 1, 3], 28
Exploration
avg = 0.000996535244922
p = 0.00111111111111
p = 0.00123333333333
Ant 8 : [4, 3, 2], 33
Exploitation
Ant 0 : [3, 4, 0, 1, 2], 67
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.000914552936775

p = 0.00100909090909
p = 0.00123456790123
Ant 9 : [0, 1, 3], 28
Exploration
avg = 0.000793447293077
p = 0.00111111111
Ant 10 : [3, 4, 0], 35
Exploration
avg = 0.00144444444444
p = 0.00222222222222
Ant 2 : [3, 4, 0, 1], 45
```

```
Exploration
avg = 0.000914552936775
p = 0.00100909090909
p = 0.00123456790123
Ant 11 : [0, 1, 3], 28
Exploitation
Ant 12 : [1, 0, 4], 30
Exploration
avg = 0.00135801851851
p = 0.00148148148147
Ant 3 : [0, 1, 3, 4], 43
Exploitation
Ant 13 : [1, 3, 4], 33
Exploitation
Ant 14 : [2, 3, 4], 33
Exploitation
Ant 15 : [1, 3, 4], 33
Exploration
avg = 0.000807275985663
p = 0.00111
Ant 16 : [1, 0, 4], 30
Exploitation
Ant 4 : [0, 1, 3, 4], 43
Exploitation
Ant 17 : [1, 3, 4], 33
Exploitation
Ant 18 : [2, 3, 4], 33
Exploitation
Ant 19 : [2, 3, 4], 33
Exploitation
Ant 5 : [3, 4, 0, 1], 45
Exploration
avg = 0.00144444444444
p = 0.00222222222222
Ant 6 : [3, 4, 0, 1], 45
Exploration
avg = 0.0022222
Ant 1 : [4, 3, 2, 1, 0], 65
Update called by 1Exploitation

Ant thread 1 terminating.Ant 7 : [0, 1, 3, 4], 43

Exploitation
Ant 8 : [4, 3, 2, 1], 55
Exploitation
Ant 9 : [0, 1, 3, 4], 43
Exploration
avg = 0.00144444444444
p = 0.00222222222222
Ant 10 : [3, 4, 0, 1], 45
Exploration
avg = 0.00100909090909
Ant 2 : [3, 4, 0, 1, 2], 67
Update called by 2Exploitation
```

Ant thread 2 terminating.Ant 11 : [0, 1, 3, 4], 43

Exploitation
Ant 12 : [1, 0, 4, 3], 45
Exploitation
Ant 3 : [0, 1, 3, 4, 2], 69
ExploitationUpdate called by 3

Ant 13 : [1, 3, 4, 0], 53Ant thread 3 terminating.

Exploitation
Ant 14 : [2, 3, 4, 0], 53
Exploitation
Ant 15 : [1, 3, 4, 0], 53
Exploitation
Ant 16 : [1, 0, 4, 3], 45
Exploration
avg = 0.000853846153846
Ant 4 : [0, 1, 3, 4, 2], 69
Update called by 4Exploitation

Ant thread 4 terminating.Ant 17 : [1, 3, 4, 0], 53

Exploitation
Ant 18 : [2, 3, 4, 0], 53
Exploitation
Ant 19 : [2, 3, 4, 0], 53
Exploration
avg = 0.00101009090909
Ant 5 : [3, 4, 0, 1, 2], 67
Update called by 5Exploration

Ant thread 5 terminating.avg = 0.00101010090909

Ant 6 : [3, 4, 0, 1, 2], 67
Update called by 6Exploration

Ant thread 6 terminating.avg = 0.000854692307692

Ant 7 : [0, 1, 3, 4, 2], 69
Update called by 7Exploration

Ant thread 7 terminating.avg = 0.002222222

Ant 8 : [4, 3, 2, 1, 0], 65
Update called by 8Exploitation

Ant thread 8 terminating.Ant 9 : [0, 1, 3, 4, 2], 69

Update called by 9Exploration

Ant thread 9 terminating.avg = 0.00101010100909

```
Ant 10 : [3, 4, 0, 1, 2], 67
Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [0, 1, 3, 4, 2], 69

Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [1, 0, 4, 3, 2], 63

Update called by 12Exploitation

Ant thread 12 terminating.Ant 13 : [1, 3, 4, 0, 2], 83

Update called by 13Exploitation

Ant thread 13 terminating.Ant 14 : [2, 3, 4, 0, 1], 63

Update called by 14Exploration

Ant thread 14 terminating.avg = 0.00074

Ant 15 : [1, 3, 4, 0, 2], 83
Update called by 15Exploration

Ant thread 15 terminating.avg = 0.00123456777778

Ant 16 : [1, 0, 4, 3, 2], 63
Update called by 16Exploration

Ant thread 16 terminating.avg = 0.000740733333333

Ant 17 : [1, 3, 4, 0, 2], 83
Update called by 17Exploration

Ant thread 17 terminating.avg = 0.00222222222222

Ant 18 : [2, 3, 4, 0, 1], 63
Update called by 18Exploitation

Ant thread 18 terminating.Ant 19 : [2, 3, 4, 0, 1], 63

Update called by 19
Best: [3, 4, 0, 1, 2], 85, 2, 91
Ant thread 19 terminating.iter_counter = 3

starting ant = 0
Explorationstarting ant = 1

avg = 0.00100627240116starting ant = 2

p = 0.00111111111starting ant = 3

p = 0.00133333333333starting ant = 4
```

Ant 0 : [3, 4], 15starting ant = 5

Explorationstarting ant = 6

avg = 0.000888141025306starting ant = 7

p = 0.001starting ant = 8

p = 0.001333333332starting ant = 9

Ant 1 : [4, 3], 15starting ant = 10

Explorationstarting ant = 11

avg = 0.00104293906782starting ant = 12

p = 0.00111111111starting ant = 13

p = 0.00148starting ant = 14

Ant 2 : [3, 4], 15starting ant = 15

Exploitationstarting ant = 16

Ant 3 : [0, 1], 10starting ant = 17

Explorationstarting ant = 18

avg = 0.00111682544032starting ant = 19

p = 0.00222
Ant 4 : [0, 1], 10
Exploitation
Ant 0 : [3, 4, 0], 35
Exploitation
Ant 5 : [3, 4], 15
Exploitation
Ant 6 : [3, 4], 15
Exploitation
Ant 7 : [0, 1], 10
Exploitation
Ant 8 : [4, 3], 15
Exploitation
Ant 9 : [0, 1], 10
Exploration
avg = 0.00089725209043
p = 0.001
p = 0.00111111111
Ant 1 : [4, 3, 2], 33
Exploration
avg = 0.00107386499365
p = 0.00123333333332
p = 0.00148148148
Ant 10 : [3, 4], 15

```
Exploration
avg = 0.00111738099532
p = 0.00222222222
Ant 11 : [0, 1], 10
Exploration
avg = 0.00111755050455
p = 0.001999999998
Ant 12 : [1, 0], 10
Exploitation
Ant 13 : [1, 0], 10
Exploration
avg = 0.000828125127622
p = 0.000909081818182
p = 0.001111111
Ant 14 : [2, 3], 18
Exploration
avg = 0.000776410256408
p = 0.00111
Ant 2 : [3, 4, 0], 35
Exploration
avg = 0.00117310050505
p = 0.0022222
Ant 15 : [1, 0], 10
Exploitation
Ant 16 : [1, 0], 10
Exploration
avg = 0.000823400673398
p = 0.000909090909082
p = 0.00111111111111
Ant 3 : [0, 1, 3], 28
Exploration
avg = 0.0012036616156
p = 0.00222222222
p = 0.00123333333333
Ant 17 : [1, 3], 18
Exploitation
Ant 18 : [2, 3], 18
Exploitation
Ant 19 : [2, 3], 18
Exploration
avg = 0.000864548821546
p = 0.000909090909082
p = 0.00123455555556
Ant 4 : [0, 1, 3], 28
Exploitation
Ant 0 : [3, 4, 0, 1], 45
Exploration
avg = 0.000776776923074
p = 0.0011111
Ant 5 : [3, 4, 0], 35
Exploration
avg = 0.000776780589741
p = 0.001111111
Ant 6 : [3, 4, 0], 35
```

Exploitation
Ant 7 : [0, 1, 3], 28
Exploration
avg = 0.000937992831538
p = 0.001
p = 0.00123333333332
Ant 8 : [4, 3, 2], 33
Exploration
avg = 0.000864552936361
p = 0.000909090909082
p = 0.0012345679
Ant 9 : [0, 1, 3], 28
Exploration
avg = 0.000754540909091
p = 0.000909081818182
Ant 1 : [4, 3, 2, 1], 55
Exploitation
Ant 10 : [3, 4, 0], 35
Exploration
avg = 0.000864552936768
p = 0.000909090909082
p = 0.00123456790122
Ant 11 : [0, 1, 3], 28
Exploitation
Ant 12 : [1, 0, 4], 30
Exploration
avg = 0.000785770553763
p = 0.0011099999
Ant 13 : [1, 0, 4], 30
Exploitation
Ant 14 : [2, 3, 4], 33
Exploitation
Ant 2 : [3, 4, 0, 1], 45
Exploration
avg = 0.00078613725343
p = 0.001111099999
Ant 15 : [1, 0, 4], 30
Exploration
avg = 0.000786140920427
p = 0.00111111099999
Ant 16 : [1, 0, 4], 30
Exploitation
Ant 3 : [0, 1, 3, 4], 43
Exploration
avg = 0.00109889406611
p = 0.00123455555556
p = 0.00148148148148
Ant 17 : [1, 3, 4], 33
Exploitation
Ant 18 : [2, 3, 4], 33
Exploration
avg = 0.00102070888092
p = 0.00148148148148
Ant 19 : [2, 3, 4], 33

```
Exploration
avg = 0.00135801851852
p = 0.00148148148148
Ant 4 : [0, 1, 3, 4], 43
Exploitation
Ant 0 : [3, 4, 0, 1, 2], 67
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.00144444441111

p = 0.00222222222222
Ant 5 : [3, 4, 0, 1], 45
Exploration
avg = 0.00144444441111
p = 0.00222222222222
Ant 6 : [3, 4, 0, 1], 45
Exploration
avg = 0.00135801851852
p = 0.00148148148148
Ant 7 : [0, 1, 3, 4], 43
Exploration
avg = 0.000804545409091
p = 0.00100909081818
Ant 8 : [4, 3, 2, 1], 55
Exploitation
Ant 9 : [0, 1, 3, 4], 43
Exploration
avg = 0.00222222222
Ant 1 : [4, 3, 2, 1, 0], 65
Update called by 1Exploitation

Ant thread 1 terminating.Ant 10 : [3, 4, 0, 1], 45

Exploitation
Ant 11 : [0, 1, 3, 4], 43
Exploitation
Ant 12 : [1, 0, 4, 3], 45
Exploration
avg = 0.00112535605128
p = 0.00148148133333
Ant 13 : [1, 0, 4, 3], 45
Exploitation
Ant 14 : [2, 3, 4, 0], 53
Exploitation
Ant 2 : [3, 4, 0, 1, 2], 67
Update called by 2Exploration

Ant thread 2 terminating.avg = 0.00112535612461

p = 0.00148148148
Ant 15 : [1, 0, 4, 3], 45
Exploration
avg = 0.00112535612534
p = 0.00148148148147
```

```
Ant 16 : [1, 0, 4, 3], 45
Exploitation
Ant 3 : [0, 1, 3, 4, 2], 69
Update called by 3Exploration

Ant thread 3 terminating.avg = 0.000982478632479

p = 0.00111111111111
Ant 17 : [1, 3, 4, 0], 53
Exploitation
Ant 18 : [2, 3, 4, 0], 53
Exploration
avg = 0.000780555555556
p = 0.00111111111111
Ant 19 : [2, 3, 4, 0], 53
Exploitation
Ant 4 : [0, 1, 3, 4, 2], 69
Update called by 4Exploration

Ant thread 4 terminating.avg = 0.00101009090909

Ant 5 : [3, 4, 0, 1, 2], 67
Update called by 5Exploitation

Ant thread 5 terminating.Ant 6 : [3, 4, 0, 1, 2], 67

Update called by 6Exploration

Ant thread 6 terminating.avg = 0.000854692307692

Ant 7 : [0, 1, 3, 4, 2], 69
Update called by 7Exploitation

Ant thread 7 terminating.Ant 8 : [4, 3, 2, 1, 0], 65

Update called by 8Exploitation

Ant thread 8 terminating.Ant 9 : [0, 1, 3, 4, 2], 69

Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [3, 4, 0, 1, 2], 67

Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [0, 1, 3, 4, 2], 69

Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [1, 0, 4, 3, 2], 63

Update called by 12Exploration

Ant thread 12 terminating.avg = 0.00123456777778
```

```
Ant 13 : [1, 0, 4, 3, 2], 63
Update called by 13Exploration

Ant thread 13 terminating.avg = 0.00222222222222

Ant 14 : [2, 3, 4, 0, 1], 63
Update called by 14Exploration

Ant thread 14 terminating.avg = 0.0012345679

Ant 15 : [1, 0, 4, 3, 2], 63
ExplorationUpdate called by 15

avg = 0.00123456790122Ant thread 15 terminating.

Ant 16 : [1, 0, 4, 3, 2], 63
Update called by 16Exploitation

Ant thread 16 terminating.Ant 17 : [1, 3, 4, 0, 2], 83

Update called by 17Exploration

Ant thread 17 terminating.avg = 0.00222222222222

Ant 18 : [2, 3, 4, 0, 1], 63
Update called by 18Exploration

Ant thread 18 terminating.avg = 0.00222222222222

Ant 19 : [2, 3, 4, 0, 1], 63
Update called by 19
Best: [3, 4, 0, 1, 2], 85, 3, 89
Ant thread 19 terminating.iter_counter = 4

starting ant = 0
Exploitationstarting ant = 1

Ant 0 : [3, 4], 15starting ant = 2

Exploitationstarting ant = 3

Ant 1 : [4, 3], 15starting ant = 4

Exploitationstarting ant = 5

Ant 0 : [3, 4, 0], 35starting ant = 6

Exploitationstarting ant = 7

Ant 2 : [3, 4], 15starting ant = 8

Explorationstarting ant = 9
```

avg = 0.00104714516089starting ant = 10

p = 0.002starting ant = 11

Ant 3 : [0, 1], 10starting ant = 12

Explorationstarting ant = 13

avg = 0.000844563918757starting ant = 14

p = 0.0009starting ant = 15

p = 0.00111111111111starting ant = 16

Ant 1 : [4, 3, 2], 33starting ant = 17

Exploitationstarting ant = 18

Ant 4 : [0, 1], 10starting ant = 19

Exploitation
Ant 5 : [3, 4], 15
Exploration
avg = 0.0014440999997
p = 0.0022222
Ant 0 : [3, 4, 0, 1], 45
Exploration
avg = 0.00103434882796
p = 0.00123333333333
p = 0.00148148133333
Ant 6 : [3, 4], 15
Exploration
avg = 0.00110270066089
p = 0.002222222
Ant 7 : [0, 1], 10
Exploitation
Ant 2 : [3, 4, 0], 35
Exploration
avg = 0.000941332692306
p = 0.0011111
p = 0.00148
Ant 8 : [4, 3], 15
Exploration
avg = 0.00110270071589
p = 0.00222222222
Ant 9 : [0, 1], 10
Exploration
avg = 0.00103434886462
p = 0.00123333333333
p = 0.00148148148
Ant 10 : [3, 4], 15
Exploration
avg = 0.00110270071644
p = 0.0022222222222

```
Ant 11 : [0, 1], 10
Exploration
avg = 0.000808400673398
p = 0.000909090909082
p = 0.00111111111111
Ant 3 : [0, 1, 3], 28
Exploration
avg = 0.0011368560606
p = 0.002
p = 0.00123333333333
Ant 12 : [1, 3], 18
Exploration
avg = 0.00113716161616
p = 0.002
p = 0.00123455555556
Ant 13 : [1, 3], 18
Exploitation
Ant 14 : [2, 3], 18
Exploration
avg = 0.0011371646717
p = 0.002
p = 0.00123456777778
Ant 15 : [1, 3], 18
Exploration
avg = 0.0011371647022
p = 0.002
p = 0.0012345679
Ant 16 : [1, 3], 18
Exploitation
Ant 1 : [4, 3, 2, 1], 55
Exploitation
Ant 17 : [1, 0], 10
Exploration
avg = 0.000851375268368
p = 0.00100909081817
p = 0.00123333333222
Ant 18 : [2, 3], 18
Exploration
avg = 0.000849552936768
p = 0.000909090909082
p = 0.00123456790122
Ant 4 : [0, 1, 3], 28
Exploration
avg = 0.000851680824199
p = 0.00100909081817
p = 0.00123455555554
Ant 19 : [2, 3], 18
Exploration
avg = 0.000761776923074
p = 0.0011111
p = 0.000769230769223
Ant 5 : [3, 4, 2], 41
Exploitation
Ant 0 : [3, 4, 0, 1, 2], 67
```

```
Update called by 0Exploitation

Ant thread 0 terminating.Ant 6 : [3, 4, 0], 35

Exploitation
Ant 7 : [0, 1, 3], 28
Exploration
avg = 0.00144411111081
p = 0.00222222222222
Ant 2 : [3, 4, 0, 1], 45
Exploration
avg = 0.000885304659498
p = 0.0009
p = 0.00123333333333
Ant 8 : [4, 3, 2], 33
Exploration
avg = 0.000882886270108
p = 0.00100909090909
p = 0.00123456790123
Ant 9 : [0, 1, 3], 28
Exploration
avg = 0.000789985717949
p = 0.001111111
p = 0.000853846153846
Ant 10 : [3, 4, 2], 41
Exploration
avg = 0.000882886270108
p = 0.00100909090909
p = 0.00123456790123
Ant 11 : [0, 1, 3], 28
Exploration
avg = 0.00135801851851
p = 0.00148148148147
Ant 3 : [0, 1, 3, 4], 43
Exploration
avg = 0.0010795392274
p = 0.00123455555556
p = 0.00148148148148
Ant 12 : [1, 3, 4], 33
Exploitation
Ant 13 : [1, 3, 4], 33
Exploration
avg = 0.000968020708881
p = 0.00148148148148
Ant 14 : [2, 3, 4], 33
Exploitation
Ant 15 : [1, 3, 4], 33
Exploration
avg = 0.0010795392274
p = 0.00123455555556
p = 0.00148148148148
Ant 16 : [1, 3, 4], 33
Exploration
avg = 0.00222
```

```
Ant 1 : [4, 3, 2, 1, 0], 65
Update called by 1Exploitation

Ant thread 1 terminating.Ant 17 : [1, 0, 4], 30

Exploration
avg = 0.000968020708881
p = 0.00148148148148
Ant 18 : [2, 3, 4], 33
Exploration
avg = 0.00135801851852
p = 0.00148148148148
Ant 4 : [0, 1, 3, 4], 43
Exploitation
Ant 19 : [2, 3, 4], 33
Exploration
avg = 0.000774545409087
p = 0.00100909081817
Ant 5 : [3, 4, 2, 1], 63
Exploration
avg = 0.00144411111081
p = 0.00222222222222
Ant 6 : [3, 4, 0, 1], 45
Exploration
avg = 0.00135801851852
p = 0.00148148148148
Ant 7 : [0, 1, 3, 4], 43
Exploration
avg = 0.00100909090909
Ant 2 : [3, 4, 0, 1, 2], 67
Update called by 2Exploitation

Ant thread 2 terminating.Ant 8 : [4, 3, 2, 1], 55

Exploitation
Ant 9 : [0, 1, 3, 4], 43
Exploration
avg = 0.000775050454541
p = 0.00101010090908
Ant 10 : [3, 4, 2, 1], 63
Exploration
avg = 0.00135801851852
p = 0.00148148148148
Ant 11 : [0, 1, 3, 4], 43
Exploitation
Ant 3 : [0, 1, 3, 4, 2], 69
Update called by 3Exploitation

Ant thread 3 terminating.Ant 12 : [1, 3, 4, 0], 53

Exploration
avg = 0.000982905939615
p = 0.00111111111
Ant 13 : [1, 3, 4, 0], 53
```

```
Exploration
avg = 0.00075805555555
p = 0.0011111111111
Ant 14 : [2, 3, 4, 0], 53
Exploitation
Ant 15 : [1, 3, 4, 0], 53
Exploitation
Ant 16 : [1, 3, 4, 0], 53
Exploration
avg = 0.00116808371795
p = 0.00148146666667
Ant 17 : [1, 0, 4, 3], 45
Exploration
avg = 0.000758055555556
p = 0.00111111111111
Ant 18 : [2, 3, 4, 0], 53
Exploration
avg = 0.000854700769231
Ant 4 : [0, 1, 3, 4, 2], 69
Update called by 4Exploitation

Ant thread 4 terminating.Ant 19 : [2, 3, 4, 0], 53

Exploitation
Ant 5 : [3, 4, 2, 1, 0], 73
Update called by 5Exploitation

Ant thread 5 terminating.Ant 6 : [3, 4, 0, 1, 2], 67

Update called by 6Exploitation

Ant thread 6 terminating.Ant 7 : [0, 1, 3, 4, 2], 69

Update called by 7Exploitation

Ant thread 7 terminating.Ant 8 : [4, 3, 2, 1, 0], 65

Update called by 8Exploitation

Ant thread 8 terminating.Ant 9 : [0, 1, 3, 4, 2], 69

Update called by 9Exploration

Ant thread 9 terminating.avg = 0.00222222222

Ant 10 : [3, 4, 2, 1, 0], 73
Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [0, 1, 3, 4, 2], 69

Update called by 11Exploration

Ant thread 11 terminating.avg = 0.0006659999994
```

```
Ant 12 : [1, 3, 4, 0, 2], 83
Update called by 12Exploration

Ant thread 12 terminating.avg = 0.000739993333327

Ant 13 : [1, 3, 4, 0, 2], 83
Update called by 13Exploration

Ant thread 13 terminating.avg = 0.00222222222222

Ant 14 : [2, 3, 4, 0, 1], 63
Update called by 14Exploration

Ant thread 14 terminating.avg = 0.000740733266667

Ant 15 : [1, 3, 4, 0, 2], 83
Update called by 15Exploitation

Ant thread 15 terminating.Ant 16 : [1, 3, 4, 0, 2], 83

Update called by 16Exploration

Ant thread 16 terminating.avg = 0.00123455555556

Ant 17 : [1, 0, 4, 3, 2], 63
Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [2, 3, 4, 0, 1], 63

Update called by 18Exploitation

Ant thread 18 terminating.Ant 19 : [2, 3, 4, 0, 1], 63

Update called by 19
Best: [3, 4, 0, 1, 2], 85, 4, 94
Ant thread 19 terminating.iter_counter = 5

starting ant = 0
Explorationstarting ant = 1

avg = 0.000931191728495starting ant = 2

p = 0.001111111starting ant = 3

p = 0.00133333333333starting ant = 4

Ant 0 : [3, 4], 15starting ant = 5

Explorationstarting ant = 6

avg = 0.000866765992308starting ant = 7

p = 0.001starting ant = 8
```

p = 0.0013333332starting ant = 9

Ant 1 : [4, 3], 15starting ant = 10

Explorationstarting ant = 11

avg = 0.000967858395161starting ant = 12

p = 0.001111111starting ant = 13

p = 0.00148starting ant = 14

Ant 2 : [3, 4], 15starting ant = 15

Exploitationstarting ant = 16

Ant 3 : [0, 1], 10starting ant = 17

Explorationstarting ant = 18

avg = 0.00108899731166starting ant = 19

p = 0.00222
Ant 4 : [0, 1], 10
Exploration
avg = 0.000711243589744
p = 0.001
p = 0.000769230769231
Ant 0 : [3, 4, 2], 41
Exploration
avg = 0.000968225061828
p = 0.001111111
p = 0.00148146666667
Ant 5 : [3, 4], 15
Exploration
avg = 0.000968228728495
p = 0.001111111
p = 0.00148148133333
Ant 6 : [3, 4], 15
Exploration
avg = 0.00108954731166
p = 0.0022222
Ant 7 : [0, 1], 10
Exploitation
Ant 8 : [4, 3], 15
Exploitation
Ant 9 : [0, 1], 10
Exploration
avg = 0.000797144526882
p = 0.00081
p = 0.001111111
Ant 1 : [4, 3, 2], 33
Exploitation
Ant 10 : [3, 4], 15

```
Exploitation
Ant 11 : [0, 1], 10
Exploration
avg = 0.00109617548232
p = 0.00199999999998
p = 0.00111111111111
Ant 12 : [1, 3], 18
Exploitation
Ant 13 : [1, 0], 10
Exploitation
Ant 14 : [2, 3], 18
Exploration
avg = 0.000739448717949
p = 0.001
p = 0.000853846153846
Ant 2 : [3, 4, 2], 41
Exploitation
Ant 15 : [1, 0], 10
Exploitation
Ant 16 : [1, 0], 10
Exploration
avg = 0.000835641383838
p = 0.000909090818182
p = 0.00123333333333
Ant 3 : [0, 1, 3], 28
Exploration
avg = 0.00118259209343
p = 0.002222222
p = 0.00123455555556
Ant 17 : [1, 3], 18
Exploitation
Ant 18 : [2, 3], 18
Exploration
avg = 0.000797603923624
p = 0.000909090908182
p = 0.00123455555554
Ant 19 : [2, 3], 18
Exploration
avg = 0.0008360528652
p = 0.000909090818182
p = 0.00123456777778
Ant 4 : [0, 1, 3], 28
Exploration
avg = 0.000697545454091
p = 0.000909090908182
Ant 0 : [3, 4, 2, 1], 63
Exploration
avg = 0.000739730769231
p = 0.001
p = 0.000854692307692
Ant 5 : [3, 4, 2], 41
Exploration
avg = 0.000739733589744
p = 0.001
```

```
p = 0.000854700769231
Ant 6 : [3, 4, 2], 41
Exploration
avg = 0.000836052906061
p = 0.000909090818182
p = 0.0012345679
Ant 7 : [0, 1, 3], 28
Exploration
avg = 0.000837885304289
p = 0.00123333333222
Ant 8 : [4, 3, 2], 33
Exploitation
Ant 9 : [0, 1, 3], 28
Exploitation
Ant 1 : [4, 3, 2, 1], 55
Exploration
avg = 0.000739733617949
p = 0.001
p = 0.000854700853846
Ant 10 : [3, 4, 2], 41
Exploitation
Ant 11 : [0, 1, 3], 28
Exploration
avg = 0.00106211987255
p = 0.00123455555554
p = 0.00148148148147
Ant 12 : [1, 3, 4], 33
Exploration
avg = 0.000711996415543
p = 0.000998999999991
Ant 13 : [1, 0, 4], 30
Exploitation
Ant 14 : [2, 3, 4], 33
Exploration
avg = 0.000748045454545
p = 0.00101009090909
Ant 2 : [3, 4, 2, 1], 63
Exploitation
Ant 15 : [1, 0, 4], 30
Exploitation
Ant 16 : [1, 0, 4], 30
Exploration
avg = 0.00135801851851
p = 0.00148148148148
Ant 3 : [0, 1, 3, 4], 43
Exploration
avg = 0.00106211987256
p = 0.00123455555554
p = 0.00148148148148
Ant 17 : [1, 3, 4], 33
Exploration
avg = 0.000920601354042
p = 0.00148148148148
Ant 18 : [2, 3, 4], 33
```

```
Exploration
avg = 0.000920601354042
p = 0.00148148148148
Ant 19 : [2, 3, 4], 33
Exploitation
Ant 4 : [0, 1, 3, 4], 43
Exploration
avg = 0.002222222
Ant 0 : [3, 4, 2, 1, 0], 73
Update called by 0Exploitation

Ant thread 0 terminating.Ant 5 : [3, 4, 2, 1], 63

Exploitation
Ant 6 : [3, 4, 2, 1], 63
Exploration
avg = 0.00135801851851
p = 0.00148148148148
Ant 7 : [0, 1, 3, 4], 43
Exploration
avg = 0.000748050505045
p = 0.00101010101009
Ant 8 : [4, 3, 2, 1], 55
Exploration
avg = 0.00135801851851
p = 0.00148148148148
Ant 9 : [0, 1, 3, 4], 43
Exploration
avg = 0.00222222222
Ant 1 : [4, 3, 2, 1, 0], 65
Update called by 1Exploitation

Ant thread 1 terminating.Ant 10 : [3, 4, 2, 1], 63

Exploitation
Ant 11 : [0, 1, 3, 4], 43
Exploration
avg = 0.000927350427346
p = 0.001
Ant 12 : [1, 3, 4, 0], 53
Exploitation
Ant 13 : [1, 0, 4, 3], 45
Exploitation
Ant 14 : [2, 3, 4, 0], 53
Exploitation
Ant 2 : [3, 4, 2, 1, 0], 73
Update called by 2Exploration

Ant thread 2 terminating.avg = 0.00116809109401

p = 0.00148148133333
Ant 15 : [1, 0, 4, 3], 45
Exploitation
Ant 16 : [1, 0, 4, 3], 45
```

```
Exploitation
Ant 3 : [0, 1, 3, 4, 2], 69
Update called by 3Exploration

Ant thread 3 terminating.avg = 0.00098290042735

p = 0.0011111
Ant 17 : [1, 3, 4, 0], 53
Exploration
avg = 0.0007378055
p = 0.001111111
Ant 18 : [2, 3, 4, 0], 53
Exploitation
Ant 19 : [2, 3, 4, 0], 53
Exploration
avg = 0.000854700854701
Ant 4 : [0, 1, 3, 4, 2], 69
Update called by 4Exploration

Ant thread 4 terminating.avg = 0.00222222222222

Ant 5 : [3, 4, 2, 1, 0], 73
Update called by 5Exploitation

Ant thread 5 terminating.Ant 6 : [3, 4, 2, 1, 0], 73

Update called by 6Exploration

Ant thread 6 terminating.avg = 0.000854700854701

Ant 7 : [0, 1, 3, 4, 2], 69
Update called by 7Exploration

Ant thread 7 terminating.avg = 0.00222222222222

Ant 8 : [4, 3, 2, 1, 0], 65
Update called by 8Exploitation

Ant thread 8 terminating.Ant 9 : [0, 1, 3, 4, 2], 69

Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [3, 4, 2, 1, 0], 73

Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [0, 1, 3, 4, 2], 69

Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [1, 3, 4, 0, 2], 83

Update called by 12Exploration
```

Ant thread 12 terminating.avg = 0.00123455555554

Ant 13 : [1, 0, 4, 3, 2], 63
Update called by 13Exploitation

Ant thread 13 terminating.Ant 14 : [2, 3, 4, 0, 1], 63

Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [1, 0, 4, 3, 2], 63

Update called by 15Exploitation

Ant thread 15 terminating.Ant 16 : [1, 0, 4, 3, 2], 63

Update called by 16Exploitation

Ant thread 16 terminating.Ant 17 : [1, 3, 4, 0, 2], 83

Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [2, 3, 4, 0, 1], 63

Update called by 18Exploitation

Ant thread 18 terminating.Ant 19 : [2, 3, 4, 0, 1], 63

Update called by 19
Best: [3, 4, 0, 1, 2], 85, 5, 95
Ant thread 19 terminating.iter_counter = 6

starting ant = 0
Explorationstarting ant = 1

avg = 0.000899183691753starting ant = 2

p = 0.0011111111111starting ant = 3

p = 0.00133333333333starting ant = 4

Ant 0 : [3, 4], 15starting ant = 5

Exploitationstarting ant = 6

Ant 1 : [4, 3], 15starting ant = 7

Explorationstarting ant = 8

avg = 0.00093585035842starting ant = 9

p = 0.0011111111111starting ant = 10

p = 0.00148starting ant = 11

Ant 2 : [3, 4], 15starting ant = 12

Exploitationstarting ant = 13

Ant 3 : [0, 1], 10starting ant = 14

Exploitationstarting ant = 15

Ant 4 : [0, 1], 10starting ant = 16

Exploitationstarting ant = 17

Ant 0 : [3, 4, 0], 35starting ant = 18

Exploitationstarting ant = 19

```
Ant 5 : [3, 4], 15
Exploration
avg = 0.000936220691753
p = 0.0011111111111
p = 0.00148148133333
Ant 6 : [3, 4], 15
Exploitation
Ant 1 : [4, 3, 2], 33
Exploitation
Ant 7 : [0, 1], 10
Exploitation
Ant 8 : [4, 3], 15
Exploration
avg = 0.00107804305542
p = 0.002222222
Ant 9 : [0, 1], 10
Exploration
avg = 0.000966776283978
p = 0.00123333333333
p = 0.00148148148
Ant 10 : [3, 4], 15
Exploration
avg = 0.00107804311042
p = 0.00222222222
Ant 11 : [0, 1], 10
Exploration
avg = 0.00073576025641
p = 0.00111
p = 0.000769230769231
Ant 2 : [3, 4, 2], 41
Exploration
avg = 0.00106433571187
p = 0.002
p = 0.00111111111111
Ant 12 : [1, 3], 18
Exploration
avg = 0.00109489126742
p = 0.002
```

```
p = 0.00123333333333
Ant 13 : [1, 3], 18
Exploration
avg = 0.000793595763973
p = 0.000818181736364
p = 0.00123455555556
Ant 3 : [0, 1, 3], 28
Exploration
avg = 0.000740573554196
p = 0.000909090909091
p = 0.001111111
Ant 14 : [2, 3], 18
Exploration
avg = 0.00109519987854
p = 0.002
p = 0.00123456777778
Ant 15 : [1, 3], 18
Exploitation
Ant 4 : [0, 1, 3], 28
Exploitation
Ant 16 : [1, 0], 10
Exploitation
Ant 17 : [1, 0], 10
Exploitation
Ant 0 : [3, 4, 0, 1], 45
Exploitation
Ant 18 : [2, 3], 18
Exploration
avg = 0.000771434693082
p = 0.000909090909091
p = 0.00123455555554
Ant 19 : [2, 3], 18
Exploitation
Ant 5 : [3, 4, 0], 35
Exploitation
Ant 6 : [3, 4, 0], 35
Exploration
avg = 0.000673245454545
p = 0.000909090909091
Ant 1 : [4, 3, 2, 1], 55
Exploitation
Ant 7 : [0, 1, 3], 28
Exploration
avg = 0.000795207885305
p = 0.00123333333333
Ant 8 : [4, 3, 2], 33
Exploitation
Ant 9 : [0, 1, 3], 28
Exploration
avg = 0.000764335717949
p = 0.001111111
p = 0.000853846153846
Ant 10 : [3, 4, 2], 41
Exploration
```

```
avg = 0.000793599879199
p = 0.000818181736364
p = 0.00123456790123
Ant 11 : [0, 1, 3], 28
Exploration
avg = 0.000723245454545
p = 0.00100909090909
Ant 2 : [3, 4, 2, 1], 63
Exploitation
Ant 12 : [1, 3, 4], 33
Exploitation
Ant 13 : [1, 3, 4], 33
Exploitation
Ant 3 : [0, 1, 3, 4], 43
Exploitation
Ant 14 : [2, 3, 4], 33
Exploration
avg = 0.00104644245321
p = 0.00123455555556
p = 0.00148148148148
Ant 15 : [1, 3, 4], 33
Exploration
avg = 0.00135801851852
p = 0.00148148148148
Ant 4 : [0, 1, 3, 4], 43
Exploitation
Ant 16 : [1, 0, 4], 30
Exploitation
Ant 17 : [1, 0, 4], 30
Exploration
avg = 0.000818181736364
Ant 0 : [3, 4, 0, 1, 2], 67
Update called by 0Exploitation

Ant thread 0 terminating.Ant 18 : [2, 3, 4], 33

Exploitation
Ant 19 : [2, 3, 4], 33
Exploration
avg = 0.00144444111111
p = 0.00222222222222
Ant 5 : [3, 4, 0, 1], 45
Exploitation
Ant 6 : [3, 4, 0, 1], 45
Exploration
avg = 0.0022222
Ant 1 : [4, 3, 2, 1, 0], 65
Update called by 1Exploitation

Ant thread 1 terminating.Ant 7 : [0, 1, 3, 4], 43

Exploration
avg = 0.000723745454545
p = 0.00101009090909
```

```
Ant 8 : [4, 3, 2, 1], 55
Exploration
avg = 0.00135801851852
p = 0.00148148148148
Ant 9 : [0, 1, 3, 4], 43
Exploration
avg = 0.000723750454545
p = 0.00101010090909
Ant 10 : [3, 4, 2, 1], 63
Exploitation
Ant 11 : [0, 1, 3, 4], 43
Exploration
avg = 0.002222222
Ant 2 : [3, 4, 2, 1, 0], 73
Update called by 2Exploration

Ant thread 2 terminating.avg = 0.000982901653846

p = 0.001111111
Ant 12 : [1, 3, 4, 0], 53
Exploitation
Ant 13 : [1, 3, 4, 0], 53
Exploitation
Ant 3 : [0, 1, 3, 4, 2], 69
Update called by 3Exploitation

Ant thread 3 terminating.Ant 14 : [2, 3, 4, 0], 53

Exploitation
Ant 15 : [1, 3, 4, 0], 53
Exploitation
Ant 4 : [0, 1, 3, 4, 2], 69
Update called by 4Exploration

Ant thread 4 terminating.avg = 0.00116808376026

p = 0.00148146666667
Ant 16 : [1, 0, 4, 3], 45
Exploration
avg = 0.00116809109359
p = 0.00148148133333
Ant 17 : [1, 0, 4, 3], 45
Exploitation
Ant 18 : [2, 3, 4, 0], 53
Exploitation
Ant 19 : [2, 3, 4, 0], 53
Exploitation
Ant 5 : [3, 4, 0, 1, 2], 67
Update called by 5Exploitation

Ant thread 5 terminating.Ant 6 : [3, 4, 0, 1, 2], 67

Update called by 6Exploration
```

Ant thread 6 terminating.avg = 0.000854700853846

Ant 7 : [0, 1, 3, 4, 2], 69
Update called by 7Exploration

Ant thread 7 terminating.avg = 0.00222222222

Ant 8 : [4, 3, 2, 1, 0], 65
Update called by 8Exploitation

Ant thread 8 terminating.Ant 9 : [0, 1, 3, 4, 2], 69

Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [3, 4, 2, 1, 0], 73

Update called by 10Exploration

Ant thread 10 terminating.avg = 0.000854700854701

Ant 11 : [0, 1, 3, 4, 2], 69
Update called by 11Exploration

Ant thread 11 terminating.avg = 0.00066666

Ant 12 : [1, 3, 4, 0, 2], 83
Update called by 12Exploration

Ant thread 12 terminating.avg = 0.000739999933333

Ant 13 : [1, 3, 4, 0, 2], 83
Update called by 13Exploitation

Ant thread 13 terminating.Ant 14 : [2, 3, 4, 0, 1], 63

Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [1, 3, 4, 0, 2], 83

ExplorationUpdate called by 15

avg = 0.00123455555556Ant thread 15 terminating.

Ant 16 : [1, 0, 4, 3, 2], 63
Update called by 16Exploration

Ant thread 16 terminating.avg = 0.00123456777778

Ant 17 : [1, 0, 4, 3, 2], 63
Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [2, 3, 4, 0, 1], 63

Update called by 18Exploration

Ant thread 18 terminating.avg = 0.00222222222222

Ant 19 : [2, 3, 4, 0, 1], 63
Update called by 19
Best: [3, 4, 0, 1, 2], 85, 6, 93
Ant thread 19 terminating.iter_counter = 7

starting ant = 0
Explorationstarting ant = 1

avg = 0.000870376433414starting ant = 2

p = 0.00111111111starting ant = 3

p = 0.00133333333333starting ant = 4

Ant 0 : [3, 4], 15starting ant = 5

Exploitationstarting ant = 6

Ant 1 : [4, 3], 15starting ant = 7

Exploitationstarting ant = 8

Ant 2 : [3, 4], 15starting ant = 9

Explorationstarting ant = 10

avg = 0.00101190447258starting ant = 11

p = 0.002starting ant = 12

Ant 3 : [0, 1], 10starting ant = 13

Exploitationstarting ant = 14

Ant 4 : [0, 1], 10starting ant = 15

Explorationstarting ant = 16

avg = 0.000688158589744starting ant = 17

p = 0.001starting ant = 18

p = 0.000769230769231starting ant = 19

Ant 0 : [3, 4, 2], 41
Exploration
avg = 0.000907409766747
p = 0.00111111111
p = 0.00148146666667
Ant 5 : [3, 4], 15
Exploration

```
avg = 0.000907413433414
p = 0.00111111111
p = 0.00148148133333
Ant 6 : [3, 4], 15
Exploration
avg = 0.000716057466774
p = 0.00111111111
Ant 1 : [4, 3, 2], 33
Exploration
avg = 0.00106745447258
p = 0.0022222
Ant 7 : [0, 1], 10
Exploration
avg = 0.000907272788458
p = 0.001
p = 0.00147999999999
Ant 8 : [4, 3], 15
Exploration
avg = 0.000716363717949
p = 0.001
p = 0.000853846153846
Ant 2 : [3, 4, 2], 41
Exploration
avg = 0.00106745997258
p = 0.002222222
Ant 9 : [0, 1], 10
Exploration
avg = 0.000937969025911
p = 0.00123333333332
p = 0.00148148148
Ant 10 : [3, 4], 15
Exploitation
Ant 11 : [0, 1], 10
Exploration
avg = 0.00107886171187
p = 0.002
p = 0.00111111111111
Ant 12 : [1, 3], 18
Exploration
avg = 0.000812556356566
p = 0.000909090736364
p = 0.00123333333333
Ant 3 : [0, 1, 3], 28
Exploration
avg = 0.00110972282298
p = 0.002
p = 0.00123455555556
Ant 13 : [1, 3], 18
Exploration
avg = 0.000717021246276
p = 0.000909090908182
p = 0.001111111
Ant 14 : [2, 3], 18
Exploration
```

```
avg = 0.000812967838047
p = 0.000909090736364
p = 0.00123456777778
Ant 4 : [0, 1, 3], 28
Exploitation
Ant 15 : [1, 0], 10
Exploitation
Ant 16 : [1, 0], 10
Exploration
avg = 0.00116527590909
p = 0.0022222
p = 0.0012345679
Ant 17 : [1, 3], 18
Exploration
avg = 0.000747576829332
p = 0.000909090908182
p = 0.00123333333222
Ant 18 : [2, 3], 18
Exploitation
Ant 19 : [2, 3], 18
Exploration
avg = 0.000651375454091
p = 0.000909090908182
Ant 0 : [3, 4, 2, 1], 63
Exploitation
Ant 5 : [3, 4, 0], 35
Exploitation
Ant 6 : [3, 4, 0], 35
Exploitation
Ant 1 : [4, 3, 2, 1], 55
Exploitation
Ant 7 : [0, 1, 3], 28
Exploitation
Ant 8 : [4, 3, 2], 33
Exploitation
Ant 2 : [3, 4, 2, 1], 63
Exploitation
Ant 9 : [0, 1, 3], 28
Exploration
avg = 0.000753679102564
p = 0.0011111
p = 0.000854692307692
Ant 10 : [3, 4, 2], 41
Exploration
avg = 0.000812967879199
p = 0.000909090736364
p = 0.00123456790123
Ant 11 : [0, 1, 3], 28
Exploration
avg = 0.00103233277578
p = 0.00123455555556
p = 0.00148148148147
Ant 12 : [1, 3, 4], 33
Exploration
```

```
avg = 0.00135801851852
p = 0.00148148148148
Ant 3 : [0, 1, 3, 4], 43
Exploration
avg = 0.00103233277579
p = 0.00123455555556
p = 0.00148148148148
Ant 13 : [1, 3, 4], 33
Exploitation
Ant 14 : [2, 3, 4], 33
Exploitation
Ant 4 : [0, 1, 3, 4], 43
Exploration
avg = 0.000682539296769
p = 0.000999989999991
Ant 15 : [1, 0, 4], 30
Exploration
avg = 0.000719209263439
p = 0.0011099999
Ant 16 : [1, 0, 4], 30
Exploration
avg = 0.00103233277579
p = 0.00123455555556
p = 0.00148148148148
Ant 17 : [1, 3, 4], 33
Exploration
avg = 0.000839514257268
p = 0.00148148148148
Ant 18 : [2, 3, 4], 33
Exploration
avg = 0.000839514257268
p = 0.00148148148148
Ant 19 : [2, 3, 4], 33
Exploration
avg = 0.0022222
Ant 0 : [3, 4, 2, 1, 0], 73
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.0014444444111

p = 0.0022222222222
Ant 5 : [3, 4, 0, 1], 45
Exploration
avg = 0.00144444441111
p = 0.00222222222222
Ant 6 : [3, 4, 0, 1], 45
Exploitation
Ant 1 : [4, 3, 2, 1, 0], 65
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.00135801851852

p = 0.00148148148148
Ant 7 : [0, 1, 3, 4], 43
```

```
Exploration
avg = 0.000701880454545
p = 0.00101010090909
Ant 8 : [4, 3, 2, 1], 55
Exploration
avg = 0.00222222222
Ant 2 : [3, 4, 2, 1, 0], 73
Update called by 2Exploitation

Ant thread 2 terminating.Ant 9 : [0, 1, 3, 4], 43

Exploitation
Ant 10 : [3, 4, 2, 1], 63
Exploitation
Ant 11 : [0, 1, 3, 4], 43
Exploration
avg = 0.000982900384615
p = 0.0011111
Ant 12 : [1, 3, 4, 0], 53
Exploration
avg = 0.000854700769231
Ant 3 : [0, 1, 3, 4, 2], 69
Update called by 3Exploitation

Ant thread 3 terminating.Ant 13 : [1, 3, 4, 0], 53

Exploitation
Ant 14 : [2, 3, 4, 0], 53
Exploration
avg = 0.000854700853846
Ant 4 : [0, 1, 3, 4, 2], 69
Update called by 4Exploitation

Ant thread 4 terminating.Ant 15 : [1, 0, 4, 3], 45

Exploration
avg = 0.00116809109401
p = 0.00148148133333
Ant 16 : [1, 0, 4, 3], 45
Exploitation
Ant 17 : [1, 3, 4, 0], 53
Exploration
avg = 0.000703178055556
p = 0.00111111111111
Ant 18 : [2, 3, 4, 0], 53
Exploration
avg = 0.000703178055556
p = 0.00111111111111
Ant 19 : [2, 3, 4, 0], 53
Exploitation
Ant 5 : [3, 4, 0, 1, 2], 67
Update called by 5Exploitation

Ant thread 5 terminating.Ant 6 : [3, 4, 0, 1, 2], 67
```

Update called by 6Exploitation

Ant thread 6 terminating.Ant 7 : [0, 1, 3, 4, 2], 69

Update called by 7Exploration

Ant thread 7 terminating.avg = 0.0022222222222

Ant 8 : [4, 3, 2, 1, 0], 65
Update called by 8Exploration

Ant thread 8 terminating.avg = 0.000854700854701

Ant 9 : [0, 1, 3, 4, 2], 69
Update called by 9Exploration

Ant thread 9 terminating.avg = 0.00222222222222

Ant 10 : [3, 4, 2, 1, 0], 73
Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [0, 1, 3, 4, 2], 69

Update called by 11Exploration

Ant thread 11 terminating.avg = 0.000666666599994

Ant 12 : [1, 3, 4, 0, 2], 83
Update called by 12Exploitation

Ant thread 12 terminating.Ant 13 : [1, 3, 4, 0, 2], 83

Update called by 13Exploration

Ant thread 13 terminating.avg = 0.00222222222222

Ant 14 : [2, 3, 4, 0, 1], 63
Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [1, 0, 4, 3, 2], 63

Update called by 15Exploitation

Ant thread 15 terminating.Ant 16 : [1, 0, 4, 3, 2], 63

Update called by 16Exploration

Ant thread 16 terminating.avg = 0.000740733333327

Ant 17 : [1, 3, 4, 0, 2], 83
Update called by 17Exploration

Ant thread 17 terminating.avg = 0.00222222222222

Ant 18 : [2, 3, 4, 0, 1], 63
Update called by 18Exploration

Ant thread 18 terminating.avg = 0.00222222222222

Ant 19 : [2, 3, 4, 0, 1], 63
Update called by 19
Best: [3, 4, 0, 1, 2], 85, 7, 94
Ant thread 19 terminating.iter_counter = 8

starting ant = 0
Explorationstarting ant = 1

avg = 0.000844449901156starting ant = 2

p = 0.00111111111starting ant = 3

p = 0.00133333333333starting ant = 4

Ant 0 : [3, 4], 15starting ant = 5

Explorationstarting ant = 6

avg = 0.000842071150308starting ant = 7

p = 0.001starting ant = 8

p = 0.001333333332starting ant = 9

Ant 1 : [4, 3], 15starting ant = 10

Explorationstarting ant = 11

avg = 0.000881116567823starting ant = 12

p = 0.00111111111starting ant = 13

p = 0.00148starting ant = 14

Ant 2 : [3, 4], 15starting ant = 15

Exploitationstarting ant = 16

Ant 3 : [0, 1], 10starting ant = 17

Exploitationstarting ant = 18

Ant 4 : [0, 1], 10starting ant = 19

Exploitation
Ant 0 : [3, 4, 0], 35
Exploration
avg = 0.000881483234489

```
p = 0.00111111111
p = 0.00148146666667
Ant 5 : [3, 4], 15
Exploration
avg = 0.000881486901156
p = 0.00111111111
p = 0.00148148133333
Ant 6 : [3, 4], 15
Exploration
avg = 0.0010579304401
p = 0.0022222
Ant 7 : [0, 1], 10
Exploration
avg = 0.000906237817304
p = 0.00111
p = 0.00147999999999
Ant 8 : [4, 3], 15
Exploration
avg = 0.0010579359401
p = 0.002222222
Ant 9 : [0, 1], 10
Exploitation
Ant 1 : [4, 3, 2], 33
Exploitation
Ant 10 : [3, 4], 15
Exploration
avg = 0.0010579359951
p = 0.00222222222
Ant 11 : [0, 1], 10
Exploitation
Ant 12 : [1, 0], 10
Exploration
avg = 0.00112647835732
p = 0.00222
Ant 13 : [1, 0], 10
Exploitation
Ant 14 : [2, 3], 18
Exploitation
Ant 2 : [3, 4, 0], 35
Exploitation
Ant 15 : [1, 0], 10
Exploitation
Ant 16 : [1, 0], 10
Exploration
avg = 0.000761971143092
p = 0.000909081818166
p = 0.00111111111111
Ant 3 : [0, 1, 3], 28
Exploitation
Ant 17 : [1, 0], 10
Exploitation
Ant 18 : [2, 3], 18
Exploitation
Ant 4 : [0, 1, 3], 28
```

```
Exploitation
Ant 19 : [2, 3], 18
Exploration
avg = 0.0014444444111
p = 0.0022222222222
Ant 0 : [3, 4, 0, 1], 45
Exploitation
Ant 5 : [3, 4, 0], 35
Exploitation
Ant 6 : [3, 4, 0], 35
Exploitation
Ant 7 : [0, 1, 3], 28
Exploitation
Ant 8 : [4, 3, 2], 33
Exploitation
Ant 9 : [0, 1, 3], 28
Exploration
avg = 0.000631692454541
p = 0.000909090909082
Ant 1 : [4, 3, 2, 1], 55
Exploitation
Ant 10 : [3, 4, 0], 35
Exploration
avg = 0.000803123406055
p = 0.000909081818166
p = 0.0012345679
Ant 11 : [0, 1, 3], 28
Exploitation
Ant 12 : [1, 0, 4], 30
Exploitation
Ant 13 : [1, 0, 4], 30
Exploitation
Ant 14 : [2, 3, 4], 33
Exploitation
Ant 2 : [3, 4, 0, 1], 45
Exploration
avg = 0.00070687725343
p = 0.001111099999
Ant 15 : [1, 0, 4], 30
Exploitation
Ant 16 : [1, 0, 4], 30
Exploitation
Ant 3 : [0, 1, 3, 4], 43
Exploitation
Ant 17 : [1, 0, 4], 30
Exploration
avg = 0.000804945547591
p = 0.00148148148148
Ant 18 : [2, 3, 4], 33
Exploration
avg = 0.00135801851852
p = 0.00148148148148
Ant 4 : [0, 1, 3, 4], 43
Exploitation
```

```
Ant 19 : [2, 3, 4], 33
Exploitation
Ant 0 : [3, 4, 0, 1, 2], 67
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.00144444441111

p = 0.00222222222222
Ant 5 : [3, 4, 0, 1], 45
Exploration
avg = 0.00144444441111
p = 0.00222222222222
Ant 6 : [3, 4, 0, 1], 45
Exploration
avg = 0.00135801851852
p = 0.00148148148148
Ant 7 : [0, 1, 3, 4], 43
Exploitation
Ant 8 : [4, 3, 2, 1], 55
Exploration
avg = 0.00135801851852
p = 0.00148148148148
Ant 9 : [0, 1, 3, 4], 43
Exploration
avg = 0.0022222222222
Ant 1 : [4, 3, 2, 1, 0], 65
Update called by 1Exploitation

Ant thread 1 terminating.Ant 10 : [3, 4, 0, 1], 45

Exploration
avg = 0.00135801851852
p = 0.00148148148148
Ant 11 : [0, 1, 3, 4], 43
Exploitation
Ant 12 : [1, 0, 4, 3], 45
Exploitation
Ant 13 : [1, 0, 4, 3], 45
Exploration
avg = 0.00068841580555
p = 0.0011111111111
Ant 14 : [2, 3, 4, 0], 53
Exploration
avg = 0.00100909081818
Ant 2 : [3, 4, 0, 1, 2], 67
Update called by 2Exploitation

Ant thread 2 terminating.Ant 15 : [1, 0, 4, 3], 45

Exploitation
Ant 16 : [1, 0, 4, 3], 45
Exploitation
Ant 3 : [0, 1, 3, 4, 2], 69
Update called by 3Exploration
```

```
Ant thread 3 terminating.avg = 0.00116766381766

p = 0.00148148148148
Ant 17 : [1, 0, 4, 3], 45
Exploitation
Ant 18 : [2, 3, 4, 0], 53
Exploitation
Ant 4 : [0, 1, 3, 4, 2], 69
Update called by 4Exploitation

Ant thread 4 terminating.Ant 19 : [2, 3, 4, 0], 53

Exploitation
Ant 5 : [3, 4, 0, 1, 2], 67
Update called by 5Exploration

Ant thread 5 terminating.avg = 0.00101010090908

Ant 6 : [3, 4, 0, 1, 2], 67
Update called by 6Exploitation

Ant thread 6 terminating.Ant 7 : [0, 1, 3, 4, 2], 69

Update called by 7Exploration

Ant thread 7 terminating.avg = 0.00222222222222

Ant 8 : [4, 3, 2, 1, 0], 65
Update called by 8Exploitation

Ant thread 8 terminating.Ant 9 : [0, 1, 3, 4, 2], 69

Update called by 9Exploration

Ant thread 9 terminating.avg = 0.00101010100909

Ant 10 : [3, 4, 0, 1, 2], 67
Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [0, 1, 3, 4, 2], 69

Update called by 11Exploration

Ant thread 11 terminating.avg = 0.00123455555556

Ant 12 : [1, 0, 4, 3, 2], 63
Update called by 12Exploitation

Ant thread 12 terminating.Ant 13 : [1, 0, 4, 3, 2], 63

Update called by 13Exploitation

Ant thread 13 terminating.Ant 14 : [2, 3, 4, 0, 1], 63
```

Update called by 14Exploration

Ant thread 14 terminating.avg = 0.0012345679

Ant 15 : [1, 0, 4, 3, 2], 63
Update called by 15Exploration

Ant thread 15 terminating.avg = 0.00123456790122

Ant 16 : [1, 0, 4, 3, 2], 63
Update called by 16Exploitation

Ant thread 16 terminating.Ant 17 : [1, 0, 4, 3, 2], 63

Update called by 17Exploration

Ant thread 17 terminating.avg = 0.00222222222222

Ant 18 : [2, 3, 4, 0, 1], 63
Update called by 18Exploration

Ant thread 18 terminating.avg = 0.00222222222222

Ant 19 : [2, 3, 4, 0, 1], 63
Update called by 19
Best: [3, 4, 0, 1, 2], 85, 8, 88
Ant thread 19 terminating.iter_counter = 9

starting ant = 0
starting ant = 1Exploration

starting ant = 2avg = 0.000821116022401

starting ant = 3p = 0.00111111111111

starting ant = 4p = 0.00133333333333

starting ant = 5Ant 0 : [3, 4], 15

starting ant = 6Exploitation

starting ant = 7Ant 1 : [4, 3], 15

starting ant = 8Exploitation

starting ant = 9Ant 2 : [3, 4], 15

starting ant = 10Exploitation

starting ant = 11Ant 3 : [0, 1], 10

starting ant = 12Exploration

starting ant = 13avg = 0.00103214464629

starting ant = 14p = 0.00222

starting ant = 15Ant 4 : [0, 1], 10

starting ant = 16Exploitation

starting ant = 17Ant 5 : [3, 4], 15

starting ant = 18Exploration

starting ant = 19avg = 0.000669459739741

```
p = 0.001
p = 0.000769230769223
Ant 0 : [3, 4, 2], 41
Exploitation
Ant 6 : [3, 4], 15
Exploration
avg = 0.00103269464629
p = 0.0022222
Ant 7 : [0, 1], 10
Exploitation
Ant 1 : [4, 3, 2], 33
Exploitation
Ant 8 : [4, 3], 15
Exploration
avg = 0.00103270014629
p = 0.002222222
Ant 9 : [0, 1], 10
Exploration
avg = 0.000697664867949
p = 0.001
p = 0.000853846153846
Ant 2 : [3, 4, 2], 41
Exploitation
Ant 10 : [3, 4], 15
Exploration
avg = 0.00103270020129
p = 0.00222222222
Ant 11 : [0, 1], 10
Exploitation
Ant 3 : [0, 1, 3], 28
Exploitation
Ant 12 : [1, 0], 10
Exploitation
Ant 13 : [1, 0], 10
Exploration
avg = 0.000676744527622
p = 0.000909081818182
p = 0.001111111
Ant 14 : [2, 3], 18
Exploration
```

avg = 0.0011509431731
p = 0.0022222
p = 0.00123333333333
Ant 15 : [1, 3], 18
Exploitation
Ant 4 : [0, 1, 3], 28
Exploration
avg = 0.00115125178421
p = 0.0022222
p = 0.00123456777778
Ant 16 : [1, 3], 18
Exploitation
Ant 17 : [1, 0], 10
Exploitation
Ant 5 : [3, 4, 0], 35
Exploitation
Ant 18 : [2, 3], 18
Exploration
avg = 0.000707605666508
p = 0.000909081818182
p = 0.00123455555554
Ant 19 : [2, 3], 18
Exploitation
Ant 0 : [3, 4, 2, 1], 63
Exploitation
Ant 6 : [3, 4, 0], 35
Exploitation
Ant 7 : [0, 1, 3], 28
Exploitation
Ant 1 : [4, 3, 2, 1], 55
Exploitation
Ant 8 : [4, 3, 2], 33
Exploitation
Ant 9 : [0, 1, 3], 28
Exploitation
Ant 2 : [3, 4, 2, 1], 63
Exploitation
Ant 10 : [3, 4, 0], 35
Exploitation
Ant 11 : [0, 1, 3], 28
Exploration
avg = 0.00135801851851
p = 0.00148148148147
Ant 3 : [0, 1, 3, 4], 43
Exploration
avg = 0.000636192861717
p = 0.00099999999999
Ant 12 : [1, 0, 4], 30
Exploitation
Ant 13 : [1, 0, 4], 30
Exploitation
Ant 14 : [2, 3, 4], 33
Exploration
avg = 0.0010082052274

```
p = 0.00123455555556
p = 0.00148148148148
Ant 15 : [1, 3, 4], 33
Exploration
avg = 0.00135801851852
p = 0.00148148148148
Ant 4 : [0, 1, 3, 4], 43
Exploration
avg = 0.0010082052274
p = 0.00123455555556
p = 0.00148148148148
Ant 16 : [1, 3, 4], 33
Exploration
avg = 0.000673226195054
p = 0.0011111
Ant 17 : [1, 0, 4], 30
Exploration
avg = 0.0014111110811
p = 0.0022222222222
Ant 5 : [3, 4, 0, 1], 45
Exploitation
Ant 18 : [2, 3, 4], 33
Exploration
avg = 0.000773833708881
p = 0.00148148148148
Ant 19 : [2, 3, 4], 33
Exploitation
Ant 0 : [3, 4, 2, 1, 0], 73
Update called by 0Exploitation

Ant thread 0 terminating.Ant 6 : [3, 4, 0, 1], 45

Exploration
avg = 0.00135801851852
p = 0.00148148148148
Ant 7 : [0, 1, 3, 4], 43
Exploration
avg = 0.00222222222
Ant 1 : [4, 3, 2, 1, 0], 65
Update called by 1Exploitation

Ant thread 1 terminating.Ant 8 : [4, 3, 2, 1], 55

Exploration
avg = 0.00135801851852
p = 0.00148148148148
Ant 9 : [0, 1, 3, 4], 43
Exploration
avg = 0.0022222222222
Ant 2 : [3, 4, 2, 1, 0], 73
Update called by 2Exploration

Ant thread 2 terminating.avg = 0.00141111108111
```

```
p = 0.00222222222222
Ant 10 : [3, 4, 0, 1], 45
Exploitation
Ant 11 : [0, 1, 3, 4], 43
Exploitation
Ant 3 : [0, 1, 3, 4, 2], 69
Update called by 3Exploitation

Ant thread 3 terminating.Ant 12 : [1, 0, 4, 3], 45

Exploration
avg = 0.00116809105128
p = 0.00148148133333
Ant 13 : [1, 0, 4, 3], 45
Exploration
avg = 0.000675129725
p = 0.001111111
Ant 14 : [2, 3, 4, 0], 53
Exploitation
Ant 15 : [1, 3, 4, 0], 53
Exploitation
Ant 4 : [0, 1, 3, 4, 2], 69
Update called by 4Exploitation

Ant thread 4 terminating.Ant 16 : [1, 3, 4, 0], 53

Exploration
avg = 0.00116809116692
p = 0.00148148148
Ant 17 : [1, 0, 4, 3], 45
Exploration
avg = 0.000909090909082
Ant 5 : [3, 4, 0, 1, 2], 67
Update called by 5Exploration

Ant thread 5 terminating.avg = 0.000675129780556

p = 0.00111111111111
Ant 18 : [2, 3, 4, 0], 53
Exploitation
Ant 19 : [2, 3, 4, 0], 53
Exploration
avg = 0.00100909090909
Ant 6 : [3, 4, 0, 1, 2], 67
ExploitationUpdate called by 6

Ant 7 : [0, 1, 3, 4, 2], 69Ant thread 6 terminating.

Update called by 7Exploration

Ant thread 7 terminating.avg = 0.00222222222222

Ant 8 : [4, 3, 2, 1, 0], 65
Update called by 8Exploitation
```

Ant thread 8 terminating.Ant 9 : [0, 1, 3, 4, 2], 69

Update called by 9Exploration

Ant thread 9 terminating.avg = 0.00101009090909

Ant 10 : [3, 4, 0, 1, 2], 67
Update called by 10Exploration

Ant thread 10 terminating.avg = 0.000854700854701

Ant 11 : [0, 1, 3, 4, 2], 69
Update called by 11Exploration

Ant thread 11 terminating.avg = 0.00123455555556

Ant 12 : [1, 0, 4, 3, 2], 63
Update called by 12Exploration

Ant thread 12 terminating.avg = 0.00123456777778

Ant 13 : [1, 0, 4, 3, 2], 63
Update called by 13Exploration

Ant thread 13 terminating.avg = 0.00222222222222

Ant 14 : [2, 3, 4, 0, 1], 63
Update called by 14Exploration

Ant thread 14 terminating.avg = 0.00059999994

Ant 15 : [1, 3, 4, 0, 2], 83
Update called by 15Exploitation

Ant thread 15 terminating.Ant 16 : [1, 3, 4, 0, 2], 83

Update called by 16Exploration

Ant thread 16 terminating.avg = 0.0012345679

Ant 17 : [1, 0, 4, 3, 2], 63
Update called by 17Exploration

Ant thread 17 terminating.avg = 0.00222222222222

Ant 18 : [2, 3, 4, 0, 1], 63
Update called by 18Exploration

Ant thread 18 terminating.avg = 0.00222222222222

Ant 19 : [2, 3, 4, 0, 1], 63
Update called by 19
Best: [3, 4, 0, 1, 2], 85, 9, 92

```
Ant thread 19 terminating.iter_counter = 10

starting ant = 0
Explorationstarting ant = 1

avg = 0.00080011553127starting ant = 2

p = 0.0011111111111starting ant = 3

p = 0.00133333333333starting ant = 4

Ant 0 : [3, 4], 15starting ant = 5

Explorationstarting ant = 6

avg = 0.000829449426888starting ant = 7

p = 0.001starting ant = 8

p = 0.00133333333332starting ant = 9

Ant 1 : [4, 3], 15starting ant = 10

Exploitationstarting ant = 11

Ant 2 : [3, 4], 15starting ant = 12

Exploitationstarting ant = 13

Ant 3 : [0, 1], 10starting ant = 14

Exploitationstarting ant = 15

Ant 4 : [0, 1], 10starting ant = 16

Explorationstarting ant = 17

avg = 0.000661488124744starting ant = 18

p = 0.001starting ant = 19

p = 0.000769230769231
Ant 0 : [3, 4, 2], 41
Exploration
avg = 0.000837148864603
p = 0.0011111111111
p = 0.00148146666667
Ant 5 : [3, 4], 15
Exploitation
Ant 6 : [3, 4], 15
Exploration
avg = 0.00104164367016
p = 0.0022222
Ant 7 : [0, 1], 10
```

```
Exploration
avg = 0.000887269939712
p = 0.001
p = 0.00148
Ant 8 : [4, 3], 15
Exploration
avg = 0.00104164917016
p = 0.002222222
Ant 9 : [0, 1], 10
Exploration
avg = 0.000622376263915
p = 0.0011111111111
Ant 1 : [4, 3, 2], 33
Exploration
avg = 0.000867708123495
p = 0.00123333333333
p = 0.00148148148
Ant 10 : [3, 4], 15
Exploitation
Ant 11 : [0, 1], 10
Exploration
avg = 0.000689693252949
p = 0.001
p = 0.000853846153846
Ant 2 : [3, 4, 2], 41
Exploration
avg = 0.00105885888357
p = 0.002
p = 0.00111111111111
Ant 12 : [1, 3], 18
Exploration
avg = 0.00108941443913
p = 0.002
p = 0.00123333333333
Ant 13 : [1, 3], 18
Exploration
avg = 0.000786293326246
p = 0.000909090818182
p = 0.00123455555556
Ant 3 : [0, 1, 3], 28
Exploitation
Ant 14 : [2, 3], 18
Exploration
avg = 0.00108972305024
p = 0.002
p = 0.00123456777778
Ant 15 : [1, 3], 18
Exploitation
Ant 4 : [0, 1, 3], 28
Exploitation
Ant 16 : [1, 0], 10
Exploitation
Ant 17 : [1, 0], 10
Exploration
```

```
avg = 0.00069013275087
p = 0.000909090908182
p = 0.00123333333222
Ant 18 : [2, 3], 18
Exploitation
Ant 19 : [2, 3], 18
Exploration
avg = 0.000598034524091
p = 0.000909090908182
Ant 0 : [3, 4, 2, 1], 63
Exploration
avg = 0.000689975304231
p = 0.001
p = 0.000854692307692
Ant 5 : [3, 4, 2], 41
Exploration
avg = 0.000689978124744
p = 0.001
p = 0.000854700769231
Ant 6 : [3, 4, 2], 41
Exploitation
Ant 7 : [0, 1, 3], 28
Exploration
avg = 0.000663117004659
p = 0.00123333333333
Ant 8 : [4, 3, 2], 33
Exploitation
Ant 9 : [0, 1, 3], 28
Exploitation
Ant 1 : [4, 3, 2, 1], 55
Exploitation
Ant 10 : [3, 4, 0], 35
Exploitation
Ant 11 : [0, 1, 3], 28
Exploration
avg = 0.000648534524545
p = 0.00101009090909
Ant 2 : [3, 4, 2, 1], 63
Exploitation
Ant 12 : [1, 3, 4], 33
Exploration
avg = 0.000997919272561
p = 0.00123455555556
p = 0.00148148148148
Ant 13 : [1, 3, 4], 33
Exploration
avg = 0.00135801851852
p = 0.00148148148148
Ant 3 : [0, 1, 3, 4], 43
Exploration
avg = 0.000745833054042
p = 0.00148148148148
Ant 14 : [2, 3, 4], 33
Exploitation
```

```
Ant 15 : [1, 3, 4], 33
Exploration
avg = 0.00135801851852
p = 0.00148148148148
Ant 4 : [0, 1, 3, 4], 43
Exploration
avg = 0.000648124893547
p = 0.000666653999995
p = 0.0009999999
Ant 16 : [1, 0, 4], 30
Exploration
avg = 0.000684791593213
p = 0.001109999999
Ant 17 : [1, 0, 4], 30
Exploitation
Ant 18 : [2, 3, 4], 33
Exploration
avg = 0.000745833054042
p = 0.00148148148148
Ant 19 : [2, 3, 4], 33
Exploration
avg = 0.0022222
Ant 0 : [3, 4, 2, 1, 0], 73
Update called by 0Exploitation

Ant thread 0 terminating.Ant 5 : [3, 4, 2, 1], 63

Exploitation
Ant 6 : [3, 4, 2, 1], 63
Exploitation
Ant 7 : [0, 1, 3, 4], 43
Exploitation
Ant 8 : [4, 3, 2, 1], 55
Exploitation
Ant 9 : [0, 1, 3, 4], 43
Exploitation
Ant 1 : [4, 3, 2, 1, 0], 65
Update called by 1Exploitation

Ant thread 1 terminating.Ant 10 : [3, 4, 0, 1], 45

Exploration
avg = 0.00135801851852
p = 0.00148148148148
Ant 11 : [0, 1, 3, 4], 43
Exploration
avg = 0.00222222222
Ant 2 : [3, 4, 2, 1, 0], 73
Update called by 2Exploitation

Ant thread 2 terminating.Ant 12 : [1, 3, 4, 0], 53

Exploitation
Ant 13 : [1, 3, 4, 0], 53
```

```
Exploration
avg = 0.000854700853846
Ant 3 : [0, 1, 3, 4, 2], 69
Update called by 3Exploitation

Ant thread 3 terminating.Ant 14 : [2, 3, 4, 0], 53

Exploitation
Ant 15 : [1, 3, 4, 0], 53
Exploitation
Ant 4 : [0, 1, 3, 4, 2], 69
Update called by 4Exploitation

Ant thread 4 terminating.Ant 16 : [1, 0, 4, 3], 45

Exploitation
Ant 17 : [1, 0, 4, 3], 45
Exploitation
Ant 18 : [2, 3, 4, 0], 53
Exploitation
Ant 19 : [2, 3, 4, 0], 53
Exploitation
Ant 5 : [3, 4, 2, 1, 0], 73
Update called by 5Exploitation

Ant thread 5 terminating.Ant 6 : [3, 4, 2, 1, 0], 73

Update called by 6Exploration

Ant thread 6 terminating.avg = 0.000854700854701

Ant 7 : [0, 1, 3, 4, 2], 69
Update called by 7Exploitation

Ant thread 7 terminating.Ant 8 : [4, 3, 2, 1, 0], 65

Update called by 8Exploration

Ant thread 8 terminating.avg = 0.000854700854701

Ant 9 : [0, 1, 3, 4, 2], 69
Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [3, 4, 0, 1, 2], 67

Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [0, 1, 3, 4, 2], 69

Update called by 11Exploration

Ant thread 11 terminating.avg = 0.000666653999995

Ant 12 : [1, 3, 4, 0, 2], 83
```

Update called by 12Exploitation

Ant thread 12 terminating.Ant 13 : [1, 3, 4, 0, 2], 83

Update called by 13Exploitation

Ant thread 13 terminating.Ant 14 : [2, 3, 4, 0, 1], 63

Update called by 14Exploration

Ant thread 14 terminating.avg = 0.000740733332067

Ant 15 : [1, 3, 4, 0, 2], 83
Update called by 15Exploration

Ant thread 15 terminating.avg = 0.00123455555556

Ant 16 : [1, 0, 4, 3, 2], 63
Update called by 16Exploration

Ant thread 16 terminating.avg = 0.00123456777778

Ant 17 : [1, 0, 4, 3, 2], 63
Update called by 17Exploration

Ant thread 17 terminating.avg = 0.00222222222222

Ant 18 : [2, 3, 4, 0, 1], 63
Update called by 18Exploitation

Ant thread 18 terminating.Ant 19 : [2, 3, 4, 0, 1], 63

Update called by 19
Best: [3, 4, 0, 1, 2], 85, 10, 95
Ant thread 19 terminating.iter_counter = 11

starting ant = 0
Explorationstarting ant = 1

avg = 0.000781215088978starting ant = 2

p = 0.00111111111starting ant = 3

p = 0.00133333333333starting ant = 4

Ant 0 : [3, 4], 15starting ant = 5

Exploitationstarting ant = 6

Ant 1 : [4, 3], 15starting ant = 7

Exploitationstarting ant = 8

Ant 2 : [3, 4], 15starting ant = 9

Explorationstarting ant = 10

avg = 0.00097915132564starting ant = 11

p = 0.002starting ant = 12

p = 0.000999989999991starting ant = 13

Ant 3 : [0, 4], 20starting ant = 14

Explorationstarting ant = 15

avg = 0.00100665380064starting ant = 16

p = 0.002starting ant = 17

p = 0.0011099999starting ant = 18

Ant 4 : [0, 4], 20starting ant = 19

```
Exploration
avg = 0.000654313671244
p = 0.001
p = 0.000769230769231
Ant 0 : [3, 4, 2], 41
Exploitation
Ant 5 : [3, 4], 15
Exploration
avg = 0.000818252088978
p = 0.00111111111
p = 0.00148148133333
Ant 6 : [3, 4], 15
Exploitation
Ant 1 : [4, 3, 2], 33
Exploitation
Ant 7 : [0, 1], 10
Exploration
avg = 0.000881889099583
p = 0.001
p = 0.00147999999999
Ant 8 : [4, 3], 15
Exploration
avg = 0.000682518799449
p = 0.001
p = 0.000853846153846
Ant 2 : [3, 4, 2], 41
Exploration
avg = 0.00106192882539
p = 0.00222
p = 0.001111099999
Ant 9 : [0, 4], 20
Exploitation
Ant 10 : [3, 4], 15
```

```
Exploration
avg = 0.00106193157564
p = 0.00222
p = 0.00111111099999
Ant 11 : [0, 4], 20
Exploration
avg = 0.00105325079324
p = 0.002
p = 0.00111111111111
Ant 12 : [1, 3], 18
Exploitation
Ant 13 : [1, 0], 10
Exploration
avg = 0.00084328973962
p = 0.000854692307692
p = 0.00148146666667
Ant 3 : [0, 4, 3], 35
Exploitation
Ant 14 : [2, 3], 18
Exploitation
Ant 15 : [1, 0], 10
Exploration
avg = 0.0011393563488
p = 0.0022222
p = 0.00123333333333
Ant 16 : [1, 3], 18
Exploitation
Ant 17 : [1, 0], 10
Exploration
avg = 0.000674680082021
p = 0.000909090909091
p = 0.00123333333222
Ant 18 : [2, 3], 18
Exploitation
Ant 4 : [0, 4, 3], 35
Exploration
avg = 0.000674985637851
p = 0.000909090909091
p = 0.00123455555554
Ant 19 : [2, 3], 18
Exploration
avg = 0.000583685617545
p = 0.000909090909091
Ant 0 : [3, 4, 2, 1], 63
Exploitation
Ant 5 : [3, 4, 0], 35
Exploration
avg = 0.000719467517397
p = 0.00111
p = 0.000854692307692
Ant 6 : [3, 4, 2], 41
Exploration
avg = 0.000633685617545
p = 0.00100909090909
```

```
Ant 1 : [4, 3, 2, 1], 55
Exploitation
Ant 7 : [0, 1, 3], 28
Exploitation
Ant 8 : [4, 3, 2], 33
Exploitation
Ant 2 : [3, 4, 2, 1], 63
Exploitation
Ant 9 : [0, 4, 3], 35
Exploitation
Ant 10 : [3, 4, 0], 35
Exploration
avg = 0.000843297498399
p = 0.000854700769231
p = 0.00148148148147
Ant 11 : [0, 4, 3], 35
Exploitation
Ant 12 : [1, 3, 4], 33
Exploitation
Ant 13 : [1, 0, 4], 30
Exploitation
Ant 3 : [0, 4, 3, 2], 53
Exploration
avg = 0.000720632464687
p = 0.00148148148148
Ant 14 : [2, 3, 4], 33
Exploration
avg = 0.000675908804556
p = 0.0011111111111
Ant 15 : [1, 0, 4], 30
Exploitation
Ant 16 : [1, 3, 4], 33
Exploitation
Ant 17 : [1, 0, 4], 30
Exploitation
Ant 18 : [2, 3, 4], 33
Exploration
avg = 0.000832517493889
p = 0.00123456777778
Ant 4 : [0, 4, 3, 2], 53
Exploration
avg = 0.000720632464687
p = 0.00148148148148
Ant 19 : [2, 3, 4], 33
Exploration
avg = 0.002222222
Ant 0 : [3, 4, 2, 1, 0], 73
Update called by 0Exploitation

Ant thread 0 terminating.Ant 5 : [3, 4, 0, 1], 45

Exploitation
Ant 6 : [3, 4, 2, 1], 63
Exploration
```

```
avg = 0.00222222222
Ant 1 : [4, 3, 2, 1, 0], 65
Update called by 1Exploitation

Ant thread 1 terminating.Ant 7 : [0, 1, 3, 4], 43

Exploitation
Ant 8 : [4, 3, 2, 1], 55
Exploration
avg = 0.0022222222222
Ant 2 : [3, 4, 2, 1, 0], 73
Update called by 2Exploration

Ant thread 2 terminating.avg = 0.000832517555

p = 0.0012345679
Ant 9 : [0, 4, 3, 2], 53
Exploration
avg = 0.00144443329999
p = 0.0022222
Ant 10 : [3, 4, 0, 1], 45
Exploration
avg = 0.000832517555611
p = 0.00123456790122
Ant 11 : [0, 4, 3, 2], 53
Exploitation
Ant 12 : [1, 3, 4, 0], 53
Exploration
avg = 0.00116809112536
p = 0.00148148148148
Ant 13 : [1, 0, 4, 3], 45
Exploration
avg = 0.00101010101009
Ant 3 : [0, 4, 3, 2, 1], 75
Update called by 3Exploitation

Ant thread 3 terminating.Ant 14 : [2, 3, 4, 0], 53

Exploitation
Ant 15 : [1, 0, 4, 3], 45
Exploration
avg = 0.000982905939615
p = 0.00111111111
Ant 16 : [1, 3, 4, 0], 53
Exploitation
Ant 17 : [1, 0, 4, 3], 45
Exploitation
Ant 18 : [2, 3, 4, 0], 53
Exploration
avg = 0.0010101010101
Ant 4 : [0, 4, 3, 2, 1], 75
Update called by 4Exploitation

Ant thread 4 terminating.Ant 19 : [2, 3, 4, 0], 53
```

```
Exploitation
Ant 5 : [3, 4, 0, 1, 2], 67
Update called by 5Exploitation

Ant thread 5 terminating.Ant 6 : [3, 4, 2, 1, 0], 73

ExploitationUpdate called by 6

Ant 7 : [0, 1, 3, 4, 2], 69Ant thread 6 terminating.

Update called by 7Exploitation

Ant thread 7 terminating.Ant 8 : [4, 3, 2, 1, 0], 65

Update called by 8Exploration

Ant thread 8 terminating.avg = 0.0010101010101

Ant 9 : [0, 4, 3, 2, 1], 75
Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [3, 4, 0, 1, 2], 67

Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [0, 4, 3, 2, 1], 75

Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [1, 3, 4, 0, 2], 83

Update called by 12Exploitation

Ant thread 12 terminating.Ant 13 : [1, 0, 4, 3, 2], 63

Update called by 13Exploitation

Ant thread 13 terminating.Ant 14 : [2, 3, 4, 0, 1], 63

Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [1, 0, 4, 3, 2], 63

Update called by 15Exploitation

Ant thread 15 terminating.Ant 16 : [1, 3, 4, 0, 2], 83

Update called by 16Exploration

Ant thread 16 terminating.avg = 0.00123456790123

Ant 17 : [1, 0, 4, 3, 2], 63
Update called by 17Exploration
```

```
Ant thread 17 terminating.avg = 0.00222222222

Ant 18 : [2, 3, 4, 0, 1], 63
Update called by 18Exploration

Ant thread 18 terminating.avg = 0.0022222222222

Ant 19 : [2, 3, 4, 0, 1], 63
Update called by 19
Best: [3, 4, 0, 1, 2], 85, 11, 90
Ant thread 19 terminating.iter_counter = 12

starting ant = 0
Exploitationstarting ant = 1

Ant 0 : [3, 4], 15starting ant = 2

Explorationstarting ant = 3

avg = 0.000819225830461starting ant = 4

p = 0.001starting ant = 5

p = 0.00133333333333starting ant = 6

Ant 1 : [4, 3], 15starting ant = 7

Exploitationstarting ant = 8

Ant 0 : [3, 4, 0], 35starting ant = 9

Exploitationstarting ant = 10

Ant 2 : [3, 4], 15starting ant = 11

Explorationstarting ant = 12

avg = 0.000972903458079starting ant = 13

p = 0.002starting ant = 14

p = 0.001starting ant = 15

Ant 3 : [0, 4], 20starting ant = 16

Exploitationstarting ant = 17

Ant 4 : [0, 1], 10starting ant = 18

Exploitationstarting ant = 19

Ant 5 : [3, 4], 15
Exploitation
```

```
Ant 6 : [3, 4], 15
Exploitation
Ant 1 : [4, 3, 2], 33
Exploration
avg = 0.00105540345808
p = 0.00222
p = 0.00111
Ant 7 : [0, 4], 20
Exploration
avg = 0.000883392497128
p = 0.00111
p = 0.00148
Ant 8 : [4, 3], 15
Exploration
avg = 0.00144333
p = 0.00222
Ant 0 : [3, 4, 0, 1], 45
Exploitation
Ant 9 : [0, 1], 10
Exploitation
Ant 10 : [3, 4], 15
Exploitation
Ant 2 : [3, 4, 0], 35
Exploitation
Ant 11 : [0, 1], 10
Exploration
avg = 0.0010486329891
p = 0.002
p = 0.001111111
Ant 12 : [1, 3], 18
Exploitation
Ant 13 : [1, 0], 10
Exploration
avg = 0.000630217096796
p = 0.000909090909091
p = 0.001111111
Ant 14 : [2, 3], 18
Exploration
avg = 0.00113418857216
p = 0.00222
p = 0.00123333333222
Ant 15 : [1, 3], 18
Exploitation
Ant 3 : [0, 4, 3], 35
Exploitation
Ant 16 : [1, 0], 10
Exploitation
Ant 17 : [1, 0], 10
Exploitation
Ant 4 : [0, 1, 3], 28
Exploration
avg = 0.000660772679851
p = 0.000909090909091
p = 0.00123333333222
```

Ant 18 : [2, 3], 18
Exploitation
Ant 19 : [2, 3], 18
Exploration
avg = 0.000684889996171
p = 0.0011111
p = 0.000769230768462
Ant 5 : [3, 4, 2], 41
Exploration
avg = 0.000713095124629
p = 0.0011111
p = 0.000853846153838
Ant 6 : [3, 4, 2], 41
Exploitation
Ant 1 : [4, 3, 2, 1], 55
Exploration
avg = 0.000836837620359
p = 0.000854692307692
p = 0.00148148133333
Ant 7 : [0, 4, 3], 35
Exploitation
Ant 8 : [4, 3, 2], 33
Exploitation
Ant 0 : [3, 4, 0, 1, 2], 67
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.00080599927173

p = 0.00100909081736
p = 0.00123456777778
Ant 9 : [0, 1, 3], 28
Exploration
avg = 0.000713377175914
p = 0.0011111
p = 0.000854692307692
Ant 10 : [3, 4, 2], 41
Exploration
avg = 0.00144444111
p = 0.00222222222
Ant 2 : [3, 4, 0, 1], 45
Exploration
avg = 0.000805999312471
p = 0.00100909081736
p = 0.0012345679
Ant 11 : [0, 1, 3], 28
Exploitation
Ant 12 : [1, 3, 4], 33
Exploration
avg = 0.000667571277439
p = 0.0011111
Ant 13 : [1, 0, 4], 30
Exploitation
Ant 14 : [2, 3, 4], 33
Exploration

```
avg = 0.000980330289787
p = 0.00123455555556
p = 0.00148148148148
Ant 15 : [1, 3, 4], 33
Exploitation
Ant 3 : [0, 4, 3, 2], 53
Exploitation
Ant 16 : [1, 0, 4], 30
Exploitation
Ant 17 : [1, 0, 4], 30
Exploitation
Ant 4 : [0, 1, 3, 4], 43
Exploitation
Ant 18 : [2, 3, 4], 33
Exploration
avg = 0.000697951934268
p = 0.00148148148148
Ant 19 : [2, 3, 4], 33
Exploitation
Ant 5 : [3, 4, 2, 1], 63
Exploitation
Ant 6 : [3, 4, 2, 1], 63
Exploitation
Ant 1 : [4, 3, 2, 1, 0], 65
Update called by 1Exploitation

Ant thread 1 terminating.Ant 7 : [0, 4, 3, 2], 53

Exploitation
Ant 8 : [4, 3, 2, 1], 55
Exploration
avg = 0.00135802469074
p = 0.00148148148148
Ant 9 : [0, 1, 3, 4], 43
Exploitation
Ant 10 : [3, 4, 2, 1], 63
Exploitation
Ant 2 : [3, 4, 0, 1, 2], 67
Update called by 2Exploitation

Ant thread 2 terminating.Ant 11 : [0, 1, 3, 4], 43

Exploration
avg = 0.000982900384615
p = 0.0011111
Ant 12 : [1, 3, 4, 0], 53
Exploration
avg = 0.00116809112462
p = 0.00148148148
Ant 13 : [1, 0, 4, 3], 45
Exploitation
Ant 14 : [2, 3, 4, 0], 53
Exploration
avg = 0.000982905939615
```

```
p = 0.00111111111
Ant 15 : [1, 3, 4, 0], 53
Exploration
avg = 0.00101010101009
Ant 3 : [0, 4, 3, 2, 1], 75
Update called by 3Exploitation

Ant thread 3 terminating.Ant 16 : [1, 0, 4, 3], 45

Exploitation
Ant 17 : [1, 0, 4, 3], 45
Exploitation
Ant 4 : [0, 1, 3, 4, 2], 69
Update called by 4Exploitation

Ant thread 4 terminating.Ant 18 : [2, 3, 4, 0], 53

Exploration
avg = 0.000642725165581
p = 0.00111111111111
Ant 19 : [2, 3, 4, 0], 53
Exploration
avg = 0.00222222222
Ant 5 : [3, 4, 2, 1, 0], 73
Update called by 5Exploration

Ant thread 5 terminating.avg = 0.0022222222222

Ant 6 : [3, 4, 2, 1, 0], 73
Update called by 6Exploration

Ant thread 6 terminating.avg = 0.0010101010101

Ant 7 : [0, 4, 3, 2, 1], 75
Update called by 7Exploration

Ant thread 7 terminating.avg = 0.00222222222222

Ant 8 : [4, 3, 2, 1, 0], 65
Update called by 8Exploration

Ant thread 8 terminating.avg = 0.000854700853846

Ant 9 : [0, 1, 3, 4, 2], 69
Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [3, 4, 2, 1, 0], 73

Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [0, 1, 3, 4, 2], 69

Update called by 11Exploration
```

```
Ant thread 11 terminating.avg = 0.000666659999994

Ant 12 : [1, 3, 4, 0, 2], 83
Update called by 12Exploitation

Ant thread 12 terminating.Ant 13 : [1, 0, 4, 3, 2], 63

Update called by 13Exploitation

Ant thread 13 terminating.Ant 14 : [2, 3, 4, 0, 1], 63

Update called by 14Exploration

Ant thread 14 terminating.avg = 0.000739999933333

Ant 15 : [1, 3, 4, 0, 2], 83
Update called by 15Exploration

Ant thread 15 terminating.avg = 0.00123456790122

Ant 16 : [1, 0, 4, 3, 2], 63
Update called by 16Exploration

Ant thread 16 terminating.avg = 0.00123456790123

Ant 17 : [1, 0, 4, 3, 2], 63
Update called by 17Exploration

Ant thread 17 terminating.avg = 0.00222222222222

Ant 18 : [2, 3, 4, 0, 1], 63
Update called by 18Exploitation

Ant thread 18 terminating.Ant 19 : [2, 3, 4, 0, 1], 63

Update called by 19
Best: [3, 4, 0, 1, 2], 85, 12, 91
Ant thread 19 terminating.
-------------------------------------------------------------

                      Results
-------------------------------------------------------------

Best path = [3, 4, 0, 1, 2]
('D ',)
('E ',)
('A ',)
('B ',)
('C ',)

Best path cost = 85

>>>
 RESTART: C:\Users\teleuser\Documents\Kantor\Kuliah\Master\Semester
```

```
3\Perencanaan
Jaringan\Tugas\program\Python\tsp-atncolony\Python-Ant-Colony-TSP-Solver-master\
pickled.py
>>>
 RESTART: C:\Users\teleuser\Documents\Kantor\Kuliah\Master\Semester
3\Perencanaan
Jaringan\Tugas\program\Python\tsp-atncolony\Python-Ant-Colony-TSP-Solver-master\
anttsp.py
[[0, 10, 30, 31, 20, 28], [10, 0, 22, 18, 40, 26], [30, 22, 0, 18, 26, 23], [31,
18, 18, 0, 15, 22], [20, 40, 26, 15, 0, 12], [28, 26, 23, 22, 12, 0]]
6
Average = 18
Tau0 = 0.0185185185185
iter_counter = 1
starting ant = 0
Exploitationstarting ant = 1

Ant 0 : [0, 1], 10starting ant = 2

Explorationstarting ant = 3

avg = 0.000979524590636starting ant = 4

p = 0.00185185185185starting ant = 5

p = 0.00102880658436starting ant = 6

Ant 1 : [1, 3], 18starting ant = 7

Explorationstarting ant = 8

avg = 0.000761442775332starting ant = 9

p = 0.000841750841751starting ant = 10

p = 0.00102880658436starting ant = 11

Ant 0 : [0, 1, 3], 28starting ant = 12

Explorationstarting ant = 13

avg = 0.000975783475783starting ant = 14

p = 0.00123456790123starting ant = 15

p = 0.00154320987654starting ant = 16

Ant 2 : [4, 5], 12starting ant = 17

Explorationstarting ant = 18

avg = 0.000946260695365starting ant = 19

p = 0.00102880658436
```

```
p = 0.00102880658436
p = 0.00123456790123
Ant 3 : [3, 4], 15
Exploration
avg = 0.000912748014197
p = 0.00154320987654
Ant 4 : [5, 4], 12
Exploration
avg = 0.000946260695365
p = 0.00102880658436
p = 0.00102880658436
p = 0.00123456790123
Ant 5 : [3, 4], 15
Exploration
avg = 0.000801049013609
p = 0.000841750841751
p = 0.00102880658436
p = 0.000805152979066
Ant 6 : [2, 5], 23
Exploration
avg = 0.000925624223115
p = 0.00102880658436
p = 0.00123456790123
Ant 1 : [1, 3, 4], 33
Exploitation
Ant 7 : [0, 1], 10
Exploitation
Ant 8 : [2, 3], 18
Exploitation
Ant 9 : [2, 3], 18
Exploitation
Ant 10 : [3, 4], 15
Exploration
avg = 0.000975783475783
p = 0.00123456790123
p = 0.00154320987654
Ant 11 : [4, 5], 12
Exploration
avg = 0.00103504177578
p = 0.00123456790123
Ant 0 : [0, 1, 3, 4], 43
Exploitation
Ant 12 : [3, 4], 15
Exploration
avg = 0.000801049013609
p = 0.000841750841751
p = 0.00102880658436
p = 0.000805152979066
Ant 13 : [2, 5], 23
Exploration
avg = 0.000975783475783
p = 0.00123456790123
p = 0.00154320987654
Ant 14 : [4, 5], 12
```

```
Exploration
avg = 0.000801049013609
p = 0.000841750841751
p = 0.00102880658436
p = 0.000805152979066
Ant 15 : [2, 5], 23
Exploitation
Ant 16 : [4, 5], 12
Exploitation
Ant 2 : [4, 5, 3], 34
Exploitation
Ant 17 : [2, 3], 18
Exploitation
Ant 18 : [4, 5], 12
Exploitation
Ant 19 : [5, 4], 12
Exploitation
Ant 3 : [3, 4, 5], 27
Exploitation
Ant 4 : [5, 4, 3], 27
Exploitation
Ant 5 : [3, 4, 5], 27
Exploitation
Ant 6 : [2, 5, 4], 35
Exploitation
Ant 1 : [1, 3, 4, 5], 45
Exploration
avg = 0.000761442775332
p = 0.000841750841751
p = 0.00102880658436
Ant 7 : [0, 1, 3], 28
Exploration
avg = 0.000925624223115
p = 0.00102880658436
p = 0.00123456790123
Ant 8 : [2, 3, 4], 33
Exploration
avg = 0.000925624223115
p = 0.00102880658436
p = 0.00123456790123
Ant 9 : [2, 3, 4], 33
Exploration
avg = 0.000911087369421
p = 0.000925925925926
p = 0.00154320987654
Ant 10 : [3, 4, 5], 27
Exploration
avg = 0.000755132548611
p = 0.000805152979066
p = 0.000841750841751
Ant 11 : [4, 5, 3], 34
Exploitation
Ant 0 : [0, 1, 3, 4, 5], 55
Exploitation
```

```
Ant 12 : [3, 4, 5], 27
Exploration
avg = 0.00093964677298
p = 0.00154320987654
Ant 13 : [2, 5, 4], 35
Exploration
avg = 0.000755132548611
p = 0.000805152979066
p = 0.000841750841751
Ant 14 : [4, 5, 3], 34
Exploitation
Ant 15 : [2, 5, 4], 35
Exploration
avg = 0.000755132548611
p = 0.000805152979066
p = 0.000841750841751
Ant 16 : [4, 5, 3], 34
Exploration
avg = 0.000884994911279
p = 0.00102880658436
p = 0.00102880658436
Ant 2 : [4, 5, 3, 2], 52
Exploitation
Ant 17 : [2, 3, 4], 33
Exploration
avg = 0.000755132548611
p = 0.000805152979066
p = 0.000841750841751
Ant 18 : [4, 5, 3], 34
Exploration
avg = 0.000833926875594
p = 0.000925925925926
p = 0.00123456790123
Ant 19 : [5, 4, 3], 27
Exploration
avg = 0.000726259784231
p = 0.000805152979066
Ant 3 : [3, 4, 5, 2], 50
Exploration
avg = 0.000884994911279
p = 0.00102880658436
p = 0.00102880658436
Ant 4 : [5, 4, 3, 2], 45
Exploration
avg = 0.000726259784231
p = 0.000805152979066
Ant 5 : [3, 4, 5, 2], 50
Exploitation
Ant 6 : [2, 5, 4, 3], 50
Exploration
avg = 0.000733264320221
p = 0.000805152979066
Ant 1 : [1, 3, 4, 5, 2], 68
Exploration
```

```
avg = 0.00103504177578
p = 0.00123456790123
Ant 7 : [0, 1, 3, 4], 43
Exploration
avg = 0.000977366255144
p = 0.00154320987654
Ant 8 : [2, 3, 4, 5], 45
Exploitation
Ant 9 : [2, 3, 4, 5], 45
Exploitation
Ant 10 : [3, 4, 5, 2], 50
Exploration
avg = 0.000884994911279
p = 0.00102880658436
p = 0.00102880658436
Ant 11 : [4, 5, 3, 2], 52
Exploration
avg = 0.000805152979066
Ant 0 : [0, 1, 3, 4, 5, 2], 78
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.000726259784231

p = 0.000805152979066
Ant 12 : [3, 4, 5, 2], 50
Exploration
avg = 0.000874485596708
p = 0.000925925925926
p = 0.00123456790123
Ant 13 : [2, 5, 4, 3], 50
Exploration
avg = 0.000884994911279
p = 0.00102880658436
p = 0.00102880658436
Ant 14 : [4, 5, 3, 2], 52
Exploitation
Ant 15 : [2, 5, 4, 3], 50
Exploitation
Ant 16 : [4, 5, 3, 1], 52
Exploration
avg = 0.000729517396184
p = 0.000841750841751
Ant 2 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.000977366255144
p = 0.00154320987654
Ant 17 : [2, 3, 4, 5], 45
Exploration
avg = 0.000884994911279
p = 0.00102880658436
p = 0.00102880658436
Ant 18 : [4, 5, 3, 2], 52
Exploration
avg = 0.000884994911279
```

```
p = 0.00102880658436
p = 0.00102880658436
Ant 19 : [5, 4, 3, 2], 45
Exploration
avg = 0.000729517396184
p = 0.000841750841751
Ant 3 : [3, 4, 5, 2, 1], 72
Exploitation
Ant 4 : [5, 4, 3, 2, 1], 67
Exploration
avg = 0.000729517396184
p = 0.000841750841751
Ant 5 : [3, 4, 5, 2, 1], 72
Exploitation
Ant 6 : [2, 5, 4, 3, 1], 68
Exploitation
Ant 1 : [1, 3, 4, 5, 2, 0], 98
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.0011277302944

p = 0.00154320987654
Ant 7 : [0, 1, 3, 4, 5], 55
Exploration
avg = 0.000686813186813
p = 0.000712250712251
Ant 8 : [2, 3, 4, 5, 1], 71
Exploitation
Ant 9 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.000729517396184
p = 0.000841750841751
Ant 10 : [3, 4, 5, 2, 1], 72
Exploitation
Ant 11 : [4, 5, 3, 2, 1], 74
Exploitation
Ant 12 : [3, 4, 5, 2, 1], 72
Exploitation
Ant 13 : [2, 5, 4, 3, 1], 68
Exploration
avg = 0.000729517396184
p = 0.000841750841751
Ant 14 : [4, 5, 3, 2, 1], 74
Exploitation
Ant 15 : [2, 5, 4, 3, 1], 68
Exploration
avg = 0.0013468013468
p = 0.00185185185185
Ant 16 : [4, 5, 3, 1, 0], 62
Exploration
avg = 0.00185185185185
Ant 2 : [4, 5, 3, 2, 1, 0], 84
Update called by 2Exploration
```

```
Ant thread 2 terminating.avg = 0.000686813186813

p = 0.000712250712251
Ant 17 : [2, 3, 4, 5, 1], 71
Exploitation
Ant 18 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.000729517396184
p = 0.000841750841751
Ant 19 : [5, 4, 3, 2, 1], 67
Exploitation
Ant 3 : [3, 4, 5, 2, 1, 0], 82
Update called by 3Exploitation

Ant thread 3 terminating.Ant 4 : [5, 4, 3, 2, 1, 0], 77

Update called by 4Exploitation

Ant thread 4 terminating.Ant 5 : [3, 4, 5, 2, 1, 0], 82

Update called by 5Exploitation

Ant thread 5 terminating.Ant 6 : [2, 5, 4, 3, 1, 0], 78

Update called by 6Exploitation

Ant thread 6 terminating.Ant 7 : [0, 1, 3, 4, 5, 2], 78

Update called by 7Exploration

Ant thread 7 terminating.avg = 0.00185185185185

Ant 8 : [2, 3, 4, 5, 1, 0], 81
Update called by 8Exploration

Ant thread 8 terminating.avg = 0.00185185185185

Ant 9 : [2, 3, 4, 5, 1, 0], 81
Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [3, 4, 5, 2, 1, 0], 82

Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [4, 5, 3, 2, 1, 0], 84

Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [3, 4, 5, 2, 1, 0], 82

Update called by 12Exploration

Ant thread 12 terminating.avg = 0.00185185185185
```

```
Ant 13 : [2, 5, 4, 3, 1, 0], 78
Update called by 13Exploration

Ant thread 13 terminating.avg = 0.00185185185185

Ant 14 : [4, 5, 3, 2, 1, 0], 84
Update called by 14Exploration

Ant thread 14 terminating.avg = 0.00185185185185

Ant 15 : [2, 5, 4, 3, 1, 0], 78
Update called by 15Exploitation

Ant thread 15 terminating.Ant 16 : [4, 5, 3, 1, 0, 2], 92

Update called by 16Exploration

Ant thread 16 terminating.avg = 0.00185185185185

Ant 17 : [2, 3, 4, 5, 1, 0], 81
Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [4, 5, 3, 2, 1, 0], 84

Update called by 18Exploitation

Ant thread 18 terminating.Ant 19 : [5, 4, 3, 2, 1, 0], 77

Update called by 19
Best: [4, 5, 3, 2, 1, 0], 104, 1, 108
Ant thread 19 terminating.iter_counter = 2

starting ant = 0
Explorationstarting ant = 1

avg = 0.000837685611879starting ant = 2

p = 0.00166666666667starting ant = 3

Ant 0 : [0, 1], 10starting ant = 4

Explorationstarting ant = 5

avg = 0.000881572131572starting ant = 6

p = 0.00166666666667starting ant = 7

p = 0.000925925925926starting ant = 8

Ant 1 : [1, 3], 18starting ant = 9

Exploitationstarting ant = 10

Ant 2 : [4, 5], 12starting ant = 11
```

Exploitationstarting ant = 12

Ant 3 : [3, 4], 15starting ant = 13

Explorationstarting ant = 14

avg = 0.000710761460761starting ant = 15

p = 0.000757575757576starting ant = 16

p = 0.00102777777778starting ant = 17

Ant 0 : [0, 1, 3], 28starting ant = 18

Explorationstarting ant = 19

avg = 0.000821473212778
p = 0.00138888888889
Ant 4 : [5, 4], 12
Exploitation
Ant 5 : [3, 4], 15
Exploitation
Ant 6 : [2, 3], 18
Exploitation
Ant 7 : [0, 1], 10
Exploitation
Ant 8 : [2, 3], 18
Exploitation
Ant 1 : [1, 3, 4], 33
Exploration
avg = 0.000741518186323
p = 0.000757575757576
p = 0.0010287962963
Ant 9 : [2, 3], 18
Exploration
avg = 0.000876325959162
p = 0.000925925925926
p = 0.000925925925926
p = 0.00123456777778
Ant 10 : [3, 4], 15
Exploration
avg = 0.00067961929375
p = 0.000724637681159
p = 0.000757575757576
Ant 2 : [4, 5, 3], 34
Exploitation
Ant 11 : [4, 5], 12
Exploitation
Ant 12 : [3, 4], 15
Exploration
avg = 0.000858555021368
p = 0.00154319444444
Ant 3 : [3, 4, 5], 27

```
Exploration
avg = 0.00074152022336
p = 0.000757575757576
p = 0.00102880648148
Ant 13 : [2, 3], 18
Exploration
avg = 0.000909069294872
p = 0.00111111111111
p = 0.00154320972222
Ant 14 : [4, 5], 12
Exploitation
Ant 15 : [2, 3], 18
Exploration
avg = 0.000909069325427
p = 0.00111111111111
p = 0.001543209875
Ant 16 : [4, 5], 12
Exploration
avg = 0.000741520243934
p = 0.000757575757576
p = 0.00102880658435
Ant 17 : [2, 3], 18
Exploration
avg = 0.000972689861575
p = 0.00123456790122
Ant 0 : [0, 1, 3, 4], 43
Exploration
avg = 0.000909069325733
p = 0.00111111111111
p = 0.00154320987653
Ant 18 : [4, 5], 12
Exploitation
Ant 19 : [5, 4], 12
Exploitation
Ant 4 : [5, 4, 3], 27
Exploration
avg = 0.000858558879392
p = 0.00154320987654
Ant 5 : [3, 4, 5], 27
Exploitation
Ant 6 : [2, 3, 4], 33
Exploration
avg = 0.000711016090391
p = 0.000757575757576
p = 0.0010287962963
Ant 7 : [0, 1, 3], 28
Exploration
avg = 0.000863925998335
p = 0.000925925925926
p = 0.00123456790123
Ant 8 : [2, 3, 4], 33
Exploitation
Ant 1 : [1, 3, 4, 5], 45
Exploitation
```

```
Ant 9 : [2, 3, 4], 33
Exploration
avg = 0.000858558879392
p = 0.00154320987654
Ant 10 : [3, 4, 5], 27
Exploitation
Ant 2 : [4, 5, 3, 1], 52
Exploitation
Ant 11 : [4, 5, 3], 34
Exploitation
Ant 12 : [3, 4, 5], 27
Exploitation
Ant 3 : [3, 4, 5, 2], 50
Exploration
avg = 0.000889388961298
p = 0.00102777777778
p = 0.00123456790123
Ant 13 : [2, 3, 4], 33
Exploration
avg = 0.000720588496648
p = 0.000804347826087
p = 0.000841742424242
Ant 14 : [4, 5, 3], 34
Exploitation
Ant 15 : [2, 3, 4], 33
Exploitation
Ant 16 : [4, 5, 3], 34
Exploration
avg = 0.000889388961298
p = 0.00102777777778
p = 0.00123456790123
Ant 17 : [2, 3, 4], 33
Exploitation
Ant 0 : [0, 1, 3, 4, 5], 55
Exploration
avg = 0.000720590600815
p = 0.000804347826087
p = 0.000841750840909
Ant 18 : [4, 5, 3], 34
Exploration
avg = 0.00078108974359
p = 0.000833333333333
p = 0.00123333333333
Ant 19 : [5, 4, 3], 27
Exploration
avg = 0.000830446037435
p = 0.00102777777778
p = 0.000925925925926
Ant 4 : [5, 4, 3, 2], 45
Exploitation
Ant 5 : [3, 4, 5, 2], 50
Exploitation
Ant 6 : [2, 3, 4, 5], 45
Exploration
```

```
avg = 0.00100664047886
p = 0.00102777777778
p = 0.00123456790123
Ant 7 : [0, 1, 3, 4], 43
Exploration
avg = 0.000931069958848
p = 0.00154320987654
Ant 8 : [2, 3, 4, 5], 45
Exploration
avg = 0.000700191511387
p = 0.000805144927536
Ant 1 : [1, 3, 4, 5, 2], 68
Exploitation
Ant 9 : [2, 3, 4, 5], 45
Exploration
avg = 0.000680472211605
p = 0.000805152898551
Ant 10 : [3, 4, 5, 2], 50
Exploration
avg = 0.00121212121212
p = 0.00166666666667
Ant 2 : [4, 5, 3, 1, 0], 62
Exploration
avg = 0.000864396654719
p = 0.00102777777778
p = 0.00102777777778
Ant 11 : [4, 5, 3, 2], 52
Exploitation
Ant 12 : [3, 4, 5, 2], 50
Exploitation
Ant 3 : [3, 4, 5, 2, 1], 72
Exploration
avg = 0.000931069958848
p = 0.00154320987654
Ant 13 : [2, 3, 4, 5], 45
Exploitation
Ant 14 : [4, 5, 3, 2], 52
Exploration
avg = 0.000931069958848
p = 0.00154320987654
Ant 15 : [2, 3, 4, 5], 45
Exploration
avg = 0.000864739555954
p = 0.00102777777778
p = 0.00102880648148
Ant 16 : [4, 5, 3, 2], 52
Exploration
avg = 0.000931069958848
p = 0.00154320987654
Ant 17 : [2, 3, 4, 5], 45
Exploration
avg = 0.000805152979058
Ant 0 : [0, 1, 3, 4, 5, 2], 78
Update called by 0Exploitation
```

```
Ant thread 0 terminating.Ant 18 : [4, 5, 3, 2], 52

Exploitation
Ant 19 : [5, 4, 3, 2], 45
Exploration
avg = 0.000698232323232
p = 0.000840909090909
Ant 4 : [5, 4, 3, 2, 1], 67
Exploitation
Ant 5 : [3, 4, 5, 2, 1], 72
Exploitation
Ant 6 : [2, 3, 4, 5, 1], 71
Exploitation
Ant 7 : [0, 1, 3, 4, 5], 55
Exploitation
Ant 8 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.000555555555556
Ant 1 : [1, 3, 4, 5, 2, 0], 98
Update called by 1Exploitation

Ant thread 1 terminating.Ant 9 : [2, 3, 4, 5, 1], 71

Exploration
avg = 0.000729208712121
p = 0.000841750757576
Ant 10 : [3, 4, 5, 2, 1], 72
Exploration
avg = 0.000555555555556
Ant 2 : [4, 5, 3, 1, 0, 2], 92
ExploitationUpdate called by 2

Ant 11 : [4, 5, 3, 2, 1], 74Ant thread 2 terminating.

Exploitation
Ant 12 : [3, 4, 5, 2, 1], 72
Exploration
avg = 0.00185
Ant 3 : [3, 4, 5, 2, 1, 0], 82
Update called by 3Exploration

Ant thread 3 terminating.avg = 0.000653744368132

p = 0.000712250641026
Ant 13 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.000729208754209
p = 0.000841750841751
Ant 14 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.000653744403388
p = 0.000712250711538
Ant 15 : [2, 3, 4, 5, 1], 71
```

Exploitation
Ant 16 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.000653744403741
p = 0.000712250712244
Ant 17 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.000729208754209
p = 0.000841750841751
Ant 18 : [4, 5, 3, 2, 1], 74
Exploitation
Ant 19 : [5, 4, 3, 2, 1], 67
Exploration
avg = 0.00185183333333
Ant 4 : [5, 4, 3, 2, 1, 0], 77
Update called by 4Exploitation

Ant thread 4 terminating.Ant 5 : [3, 4, 5, 2, 1, 0], 82

Update called by 5Exploitation

Ant thread 5 terminating.Ant 6 : [2, 3, 4, 5, 1, 0], 81

Update called by 6Exploration

Ant thread 6 terminating.avg = 0.000805152979066

Ant 7 : [0, 1, 3, 4, 5, 2], 78
Update called by 7Exploration

Ant thread 7 terminating.avg = 0.00185185185183

Ant 8 : [2, 3, 4, 5, 1, 0], 81
Update called by 8Exploitation

Ant thread 8 terminating.Ant 9 : [2, 3, 4, 5, 1, 0], 81

Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [3, 4, 5, 2, 1, 0], 82

Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [4, 5, 3, 2, 1, 0], 84

Update called by 11Exploration

Ant thread 11 terminating.avg = 0.00185185185185

Ant 12 : [3, 4, 5, 2, 1, 0], 82
Update called by 12Exploitation

Ant thread 12 terminating.Ant 13 : [2, 3, 4, 5, 1, 0], 81

Update called by 13Exploration

Ant thread 13 terminating.avg = 0.00185185185185

Ant 14 : [4, 5, 3, 2, 1, 0], 84
Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [2, 3, 4, 5, 1, 0], 81

Update called by 15Exploitation

Ant thread 15 terminating.Ant 16 : [4, 5, 3, 2, 1, 0], 84

Update called by 16Exploitation

Ant thread 16 terminating.Ant 17 : [2, 3, 4, 5, 1, 0], 81

Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [4, 5, 3, 2, 1, 0], 84

Update called by 18Exploitation

Ant thread 18 terminating.Ant 19 : [5, 4, 3, 2, 1, 0], 77

Update called by 19
Best: [4, 5, 3, 2, 1, 0], 104, 2, 109
Ant thread 19 terminating.iter_counter = 3

starting ant = 0
Exploitationstarting ant = 1

Ant 0 : [0, 1], 10starting ant = 2

Explorationstarting ant = 3

avg = 0.000845266751748starting ant = 4

p = 0.00166666666667starting ant = 5

p = 0.000925925833333starting ant = 6

Ant 1 : [1, 3], 18starting ant = 7

Explorationstarting ant = 8

avg = 0.000665379758898starting ant = 9

p = 0.000681818181818starting ant = 10

p = 0.00102777777685starting ant = 11

Ant 0 : [0, 1, 3], 28starting ant = 12

Explorationstarting ant = 13

avg = 0.000840382393162starting ant = 14

p = 0.0011111starting ant = 15

p = 0.00138888888889starting ant = 16

Ant 2 : [4, 5], 12starting ant = 17

Explorationstarting ant = 18

avg = 0.000825545237319starting ant = 19

```
p = 0.000925
p = 0.000925925925926
p = 0.00111111111111
Ant 3 : [3, 4], 15
Exploitation
Ant 4 : [5, 4], 12
Exploration
avg = 0.000849989681764
p = 0.000925
p = 0.000925925925926
p = 0.00123333333333
Ant 5 : [3, 4], 15
Exploration
avg = 0.000693519734694
p = 0.000757575757576
p = 0.000925925925926
Ant 6 : [2, 3], 18
Exploration
avg = 0.00083154265776
p = 0.000925925925926
p = 0.00123455555556
Ant 1 : [1, 3, 4], 33
Exploration
avg = 0.000834917017358
p = 0.00184999983333
Ant 7 : [0, 1], 10
Exploitation
Ant 8 : [2, 3], 18
Exploitation
Ant 9 : [2, 3], 18
Exploration
avg = 0.000850236570653
p = 0.000925
p = 0.000925925925926
p = 0.00123456777778
Ant 10 : [3, 4], 15
Exploration
avg = 0.000870937948718
p = 0.0011111
p = 0.00154166666667
```

```
Ant 11 : [4, 5], 12
Exploitation
Ant 0 : [0, 1, 3, 4], 43
Exploitation
Ant 12 : [3, 4], 15
Exploration
avg = 0.000714095845805
p = 0.000757575757576
p = 0.00102880648148
Ant 13 : [2, 3], 18
Exploitation
Ant 14 : [4, 5], 12
Exploitation
Ant 15 : [2, 3], 18
Exploration
avg = 0.000871246559829
p = 0.0011111
p = 0.00154320972222
Ant 16 : [4, 5], 12
Exploration
avg = 0.000664738341367
p = 0.000724637681159
p = 0.000757575757568
Ant 2 : [4, 5, 3], 34
Exploitation
Ant 17 : [2, 3], 18
Exploration
avg = 0.000871246590385
p = 0.0011111
p = 0.001543209875
Ant 18 : [4, 5], 12
Exploitation
Ant 19 : [5, 4], 12
Exploration
avg = 0.000811283238363
p = 0.00154320987653
Ant 3 : [3, 4, 5], 27
Exploration
avg = 0.000703255769231
p = 0.00075
p = 0.0011111
Ant 4 : [5, 4, 3], 27
Exploitation
Ant 5 : [3, 4, 5], 27
Exploration
avg = 0.000831314262699
p = 0.000925
p = 0.00123456790123
Ant 6 : [2, 3, 4], 33
Exploration
avg = 0.000956710984489
p = 0.00154320987654
Ant 1 : [1, 3, 4, 5], 45
Exploitation
```

```
Ant 7 : [0, 1, 3], 28
Exploration
avg = 0.000831314262699
p = 0.000925
p = 0.00123456790123
Ant 8 : [2, 3, 4], 33
Exploitation
Ant 9 : [2, 3, 4], 33
Exploitation
Ant 10 : [3, 4, 5], 27
Exploration
avg = 0.000685571674702
p = 0.000724637681159
p = 0.000840909090909
Ant 11 : [4, 5, 3], 34
Exploration
avg = 0.00106006647673
p = 0.00154320987654
Ant 0 : [0, 1, 3, 4, 5], 55
Exploitation
Ant 12 : [3, 4, 5], 27
Exploration
avg = 0.000831314262699
p = 0.000925
p = 0.00123456790123
Ant 13 : [2, 3, 4], 33
Exploitation
Ant 14 : [4, 5, 3], 34
Exploitation
Ant 15 : [2, 3, 4], 33
Exploitation
Ant 16 : [4, 5, 3], 34
Exploitation
Ant 2 : [4, 5, 3, 2], 52
Exploration
avg = 0.000831314262699
p = 0.000925
p = 0.00123456790123
Ant 17 : [2, 3, 4], 33
Exploration
avg = 0.000685782112202
p = 0.000724637681159
p = 0.000841750840909
Ant 18 : [4, 5, 3], 34
Exploitation
Ant 19 : [5, 4, 3], 27
Exploitation
Ant 3 : [3, 4, 5, 2], 50
Exploration
avg = 0.000812216248507
p = 0.000925
p = 0.00102777777778
Ant 4 : [5, 4, 3, 2], 45
Exploitation
```

```
Ant 5 : [3, 4, 5, 2], 50
Exploration
avg = 0.000889403292181
p = 0.00154320987654
Ant 6 : [2, 3, 4, 5], 45
Exploitation
Ant 1 : [1, 3, 4, 5, 2], 68
Exploration
avg = 0.000981727459783
p = 0.0010287962963
p = 0.00123456790123
Ant 7 : [0, 1, 3, 4], 43
Exploitation
Ant 8 : [2, 3, 4, 5], 45
Exploitation
Ant 9 : [2, 3, 4, 5], 45
Exploration
avg = 0.000660630941764
p = 0.000805152898551
Ant 10 : [3, 4, 5, 2], 50
Exploration
avg = 0.000812555754679
p = 0.000925
p = 0.0010287962963
Ant 11 : [4, 5, 3, 2], 52
Exploitation
Ant 0 : [0, 1, 3, 4, 5, 2], 78
Update called by 0Exploitation

Ant thread 0 terminating.Ant 12 : [3, 4, 5, 2], 50

Exploration
avg = 0.000889403292181
p = 0.00154320987654
Ant 13 : [2, 3, 4, 5], 45
Exploration
avg = 0.000812559149741
p = 0.000925
p = 0.00102880648148
Ant 14 : [4, 5, 3, 2], 52
Exploitation
Ant 15 : [2, 3, 4, 5], 45
Exploitation
Ant 16 : [4, 5, 3, 2], 52
Exploitation
Ant 2 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.000889403292181
p = 0.00154320987654
Ant 17 : [2, 3, 4, 5], 45
Exploration
avg = 0.000812559184031
p = 0.000925
p = 0.00102880658435
```

```
Ant 18 : [4, 5, 3, 2], 52
Exploration
avg = 0.000812559184035
p = 0.000925
p = 0.00102880658436
Ant 19 : [5, 4, 3, 2], 45
Exploration
avg = 0.000697954545455
p = 0.000840909090909
Ant 3 : [3, 4, 5, 2, 1], 72
Exploration
avg = 0.000698371212121
p = 0.000841742424242
Ant 4 : [5, 4, 3, 2, 1], 67
Exploitation
Ant 5 : [3, 4, 5, 2, 1], 72
Exploration
avg = 0.00058836996337
p = 0.000641025641026
Ant 6 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.000555
Ant 1 : [1, 3, 4, 5, 2, 0], 98
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.00106006647673

p = 0.00154320987654
Ant 7 : [0, 1, 3, 4, 5], 55
Exploration
avg = 0.000623626373626
p = 0.000711538461538
Ant 8 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.000623978937729
p = 0.000712243589744
Ant 9 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.00072920597601
p = 0.000841750840909
Ant 10 : [3, 4, 5, 2, 1], 72
Exploration
avg = 0.000729205976427
p = 0.000841750841742
Ant 11 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.000729205976431
p = 0.000841750841751
Ant 12 : [3, 4, 5, 2, 1], 72
Exploitation
Ant 13 : [2, 3, 4, 5, 1], 71
Exploitation
Ant 14 : [4, 5, 3, 2, 1], 74
Exploitation
```

Ant 15 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.000729205976431
p = 0.000841750841751
Ant 16 : [4, 5, 3, 2, 1], 74
Exploitation
Ant 2 : [4, 5, 3, 2, 1, 0], 84
Update called by 2Exploration

Ant thread 2 terminating.avg = 0.000623982498979

p = 0.000712250712244
Ant 17 : [2, 3, 4, 5, 1], 71
Exploitation
Ant 18 : [4, 5, 3, 2, 1], 74
Exploitation
Ant 19 : [5, 4, 3, 2, 1], 67
Exploration
avg = 0.00185
Ant 3 : [3, 4, 5, 2, 1, 0], 82
Update called by 3Exploration

Ant thread 3 terminating.avg = 0.00185183333333

Ant 4 : [5, 4, 3, 2, 1, 0], 77
Update called by 4Exploration

Ant thread 4 terminating.avg = 0.00185185166667

Ant 5 : [3, 4, 5, 2, 1, 0], 82
Update called by 5Exploration

Ant thread 5 terminating.avg = 0.00185185185

Ant 6 : [2, 3, 4, 5, 1, 0], 81
Update called by 6Exploitation

Ant thread 6 terminating.Ant 7 : [0, 1, 3, 4, 5, 2], 78

Update called by 7Exploitation

Ant thread 7 terminating.Ant 8 : [2, 3, 4, 5, 1, 0], 81

Update called by 8Exploration

Ant thread 8 terminating.avg = 0.00185185185185

Ant 9 : [2, 3, 4, 5, 1, 0], 81
Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [3, 4, 5, 2, 1, 0], 82

Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [4, 5, 3, 2, 1, 0], 84

Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [3, 4, 5, 2, 1, 0], 82

Update called by 12Exploration

Ant thread 12 terminating.avg = 0.00185185185185

Ant 13 : [2, 3, 4, 5, 1, 0], 81
Update called by 13Exploration

Ant thread 13 terminating.avg = 0.00185185185185

Ant 14 : [4, 5, 3, 2, 1, 0], 84
Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [2, 3, 4, 5, 1, 0], 81

Update called by 15Exploration

Ant thread 15 terminating.avg = 0.00185185185185

Ant 16 : [4, 5, 3, 2, 1, 0], 84
Update called by 16Exploration

Ant thread 16 terminating.avg = 0.00185185185185

Ant 17 : [2, 3, 4, 5, 1, 0], 81
Update called by 17Exploration

Ant thread 17 terminating.avg = 0.00185185185185

Ant 18 : [4, 5, 3, 2, 1, 0], 84
Update called by 18Exploitation

Ant thread 18 terminating.Ant 19 : [5, 4, 3, 2, 1, 0], 77

Update called by 19
Best: [4, 5, 3, 2, 1, 0], 104, 3, 108
Ant thread 19 terminating.iter_counter = 4

starting ant = 0
Exploitationstarting ant = 1

Ant 0 : [0, 1], 10starting ant = 2

Exploitationstarting ant = 3

Ant 1 : [1, 0], 10starting ant = 4

Explorationstarting ant = 5

avg = 0.00059907324155starting ant = 6

p = 0.000613636363636starting ant = 7

p = 0.000925925833333starting ant = 8

Ant 0 : [0, 1, 3], 28starting ant = 9

Explorationstarting ant = 10

avg = 0.000806343931424starting ant = 11

p = 0.001111099999starting ant = 12

p = 0.00138888888889starting ant = 13

Ant 2 : [4, 5], 12starting ant = 14

Explorationstarting ant = 15

avg = 0.000783731454328starting ant = 16

p = 0.0008325starting ant = 17

p = 0.000925925925926starting ant = 18

p = 0.00111111111111starting ant = 19

Ant 3 : [3, 4], 15
Exploitation
Ant 1 : [1, 0, 4], 30
Exploitation
Ant 4 : [5, 4], 12
Exploration
avg = 0.000808175898773
p = 0.0008325
p = 0.000925925925926
p = 0.00123333333333
Ant 5 : [3, 4], 15
Exploitation
Ant 6 : [2, 3], 18
Exploitation
Ant 7 : [0, 1], 10
Exploitation
Ant 8 : [2, 3], 18
Exploitation
Ant 0 : [0, 1, 3, 4], 43
Exploitation
Ant 9 : [2, 3], 18
Exploitation
Ant 10 : [3, 4], 15
Exploration
avg = 0.000836899486979
p = 0.001111099999

```
p = 0.00154166666667
Ant 11 : [4, 5], 12
Exploitation
Ant 12 : [3, 4], 15
Exploration
avg = 0.000689512906005
p = 0.000757575757576
p = 0.00102880648148
Ant 13 : [2, 3], 18
Exploration
avg = 0.000651345484224
p = 0.000724637681159
p = 0.000757575757568
Ant 2 : [4, 5, 3], 34
Exploration
avg = 0.000837205042535
p = 0.001111099999
p = 0.00154319444444
Ant 14 : [4, 5], 12
Exploitation
Ant 15 : [2, 3], 18
Exploitation
Ant 16 : [4, 5], 12
Exploration
avg = 0.00068951292658
p = 0.000757575757576
p = 0.00102880658435
Ant 17 : [2, 3], 18
Exploitation
Ant 18 : [4, 5], 12
Exploration
avg = 0.0008460763596
p = 0.00154166652777
Ant 19 : [5, 4], 12
Exploration
avg = 0.00076873516144
p = 0.00154320987653
Ant 3 : [3, 4, 5], 27
Exploration
avg = 0.00105784688159
p = 0.001111099999
p = 0.00154320987654
Ant 1 : [1, 0, 4, 5], 42
Exploration
avg = 0.000660707692058
p = 0.000675
p = 0.001111099999
Ant 4 : [5, 4, 3], 27
Exploration
avg = 0.000768735161443
p = 0.00154320987654
Ant 5 : [3, 4, 5], 27
Exploitation
Ant 6 : [2, 3, 4], 33
```

```
Exploitation
Ant 7 : [0, 1, 3], 28
Exploration
avg = 0.00077904703396
p = 0.0008325
p = 0.00123456790123
Ant 8 : [2, 3, 4], 33
Exploration
avg = 0.00103122032289
p = 0.00154320987654
Ant 0 : [0, 1, 3, 4, 5], 55
Exploitation
Ant 9 : [2, 3, 4], 33
Exploration
avg = 0.000768735161443
p = 0.00154320987654
Ant 10 : [3, 4, 5], 27
Exploitation
Ant 11 : [4, 5, 3], 34
Exploration
avg = 0.000768735161443
p = 0.00154320987654
Ant 12 : [3, 4, 5], 27
Exploration
avg = 0.00077904703396
p = 0.0008325
p = 0.00123456790123
Ant 13 : [2, 3, 4], 33
Exploitation
Ant 2 : [4, 5, 3, 2], 52
Exploration
avg = 0.000672387150893
p = 0.000724637681159
p = 0.000841742424242
Ant 14 : [4, 5, 3], 34
Exploitation
Ant 15 : [2, 3, 4], 33
Exploitation
Ant 16 : [4, 5, 3], 34
Exploitation
Ant 17 : [2, 3, 4], 33
Exploitation
Ant 18 : [4, 5, 3], 34
Exploitation
Ant 19 : [5, 4, 3], 27
Exploration
avg = 0.000615935393109
p = 0.000641025641026
p = 0.000724637681159
Ant 3 : [3, 4, 5, 2], 50
Exploration
avg = 0.000823049333915
p = 0.000841750841742
Ant 1 : [1, 0, 4, 5, 3], 64
```

```
Exploration
avg = 0.000765253882915
p = 0.0008325
p = 0.00102777777778
Ant 4 : [5, 4, 3, 2], 45
Exploitation
Ant 5 : [3, 4, 5, 2], 50
Exploitation
Ant 6 : [2, 3, 4, 5], 45
Exploitation
Ant 7 : [0, 1, 3, 4], 43
Exploitation
Ant 8 : [2, 3, 4, 5], 45
Exploration
avg = 0.000805144927536
Ant 0 : [0, 1, 3, 4, 5, 2], 78
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.000851903292181

p = 0.00154320987654
Ant 9 : [2, 3, 4, 5], 45
Exploitation
Ant 10 : [3, 4, 5, 2], 50
Exploitation
Ant 11 : [4, 5, 3, 2], 52
Exploitation
Ant 12 : [3, 4, 5, 2], 50
Exploration
avg = 0.000851903292181
p = 0.00154320987654
Ant 13 : [2, 3, 4, 5], 45
Exploration
avg = 0.000656285378788
p = 0.000757575757576
Ant 2 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.00076559678415
p = 0.0008325
p = 0.00102880648148
Ant 14 : [4, 5, 3, 2], 52
Exploitation
Ant 15 : [2, 3, 4, 5], 45
Exploration
avg = 0.0007655968181
p = 0.0008325
p = 0.00102880658333
Ant 16 : [4, 5, 3, 2], 52
Exploration
avg = 0.000851903292181
p = 0.00154320987654
Ant 17 : [2, 3, 4, 5], 45
Exploitation
Ant 18 : [4, 5, 3, 2], 52
```

```
Exploitation
Ant 19 : [5, 4, 3, 2], 45
Exploration
avg = 0.000697952045455
p = 0.000840909090909
Ant 3 : [3, 4, 5, 2, 1], 72
Exploitation
Ant 1 : [1, 0, 4, 5, 3, 2], 82
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.000698368712121

p = 0.000841742424242
Ant 4 : [5, 4, 3, 2, 1], 67
Exploitation
Ant 5 : [3, 4, 5, 2, 1], 72
Exploitation
Ant 6 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.00103122032289
p = 0.00154320987654
Ant 7 : [0, 1, 3, 4, 5], 55
Exploration
avg = 0.000596840659341
p = 0.000711538461538
Ant 8 : [2, 3, 4, 5, 1], 71
Exploitation
Ant 9 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.000698372920455
p = 0.000841750840909
Ant 10 : [3, 4, 5, 2, 1], 72
Exploitation
Ant 11 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.000698372920875
p = 0.000841750841751
Ant 12 : [3, 4, 5, 2, 1], 72
Exploration
avg = 0.000597196749084
p = 0.000712250641026
Ant 13 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.00185
Ant 2 : [4, 5, 3, 2, 1, 0], 84
Update called by 2Exploration

Ant thread 2 terminating.avg = 0.000698372920875

p = 0.000841750841751
Ant 14 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.000597196784341
p = 0.000712250711538
```

```
Ant 15 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.000698372920875
p = 0.000841750841751
Ant 16 : [4, 5, 3, 2, 1], 74
Exploitation
Ant 17 : [2, 3, 4, 5, 1], 71
Exploitation
Ant 18 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.000698372920875
p = 0.000841750841751
Ant 19 : [5, 4, 3, 2, 1], 67
Exploration
avg = 0.00185183333333
Ant 3 : [3, 4, 5, 2, 1, 0], 82
Update called by 3Exploitation

Ant thread 3 terminating.Ant 4 : [5, 4, 3, 2, 1, 0], 77

Update called by 4Exploration

Ant thread 4 terminating.avg = 0.00185185185

Ant 5 : [3, 4, 5, 2, 1, 0], 82
Update called by 5Exploration

Ant thread 5 terminating.avg = 0.00185185185183

Ant 6 : [2, 3, 4, 5, 1, 0], 81
Update called by 6Exploration

Ant thread 6 terminating.avg = 0.000805152979058

Ant 7 : [0, 1, 3, 4, 5, 2], 78
Update called by 7Exploitation

Ant thread 7 terminating.Ant 8 : [2, 3, 4, 5, 1, 0], 81

Update called by 8Exploration

Ant thread 8 terminating.avg = 0.00185185185185

Ant 9 : [2, 3, 4, 5, 1, 0], 81
Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [3, 4, 5, 2, 1, 0], 82

Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [4, 5, 3, 2, 1, 0], 84

Update called by 11Exploration
```

Ant thread 11 terminating.avg = 0.00185185185185

Ant 12 : [3, 4, 5, 2, 1, 0], 82
Update called by 12Exploration

Ant thread 12 terminating.avg = 0.00185185185185

Ant 13 : [2, 3, 4, 5, 1, 0], 81
Update called by 13Exploration

Ant thread 13 terminating.avg = 0.00185185185185

Ant 14 : [4, 5, 3, 2, 1, 0], 84
Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [2, 3, 4, 5, 1, 0], 81

Update called by 15Exploration

Ant thread 15 terminating.avg = 0.00185185185185

Ant 16 : [4, 5, 3, 2, 1, 0], 84
Update called by 16Exploration

Ant thread 16 terminating.avg = 0.00185185185185

Ant 17 : [2, 3, 4, 5, 1, 0], 81
Update called by 17Exploration

Ant thread 17 terminating.avg = 0.00185185185185

Ant 18 : [4, 5, 3, 2, 1, 0], 84
Update called by 18Exploration

Ant thread 18 terminating.avg = 0.00185185185185

Ant 19 : [5, 4, 3, 2, 1, 0], 77
Update called by 19
Best: [4, 5, 3, 2, 1, 0], 104, 4, 108
Ant thread 19 terminating.iter_counter = 5

starting ant = 0
Exploitationstarting ant = 1

Ant 0 : [0, 1], 10starting ant = 2

Exploitationstarting ant = 3

Ant 1 : [1, 0], 10starting ant = 4

Exploitationstarting ant = 5

Ant 0 : [0, 1, 3], 28starting ant = 6

Explorationstarting ant = 7

avg = 0.000775709316039starting ant = 8

p = 0.001111099999starting ant = 9

p = 0.00138888888889starting ant = 10

Ant 2 : [4, 5], 12starting ant = 11

Exploitationstarting ant = 12

Ant 3 : [3, 4], 15starting ant = 13

Explorationstarting ant = 14

avg = 0.000526622263825starting ant = 15

p = 0.000831075starting ant = 16

Ant 1 : [1, 0, 4], 30starting ant = 17

Explorationstarting ant = 18

avg = 0.000789208529988starting ant = 19

p = 0.00138887499875
Ant 4 : [5, 4], 12
Exploration
avg = 0.000770543494081
p = 0.000925925925926
p = 0.00123333333333
Ant 5 : [3, 4], 15
Exploitation
Ant 0 : [0, 1, 3, 4], 43
Exploration
avg = 0.000635713149075
p = 0.000757575757576
p = 0.000925925925926
Ant 6 : [2, 3], 18
Exploitation
Ant 7 : [0, 1], 10
Exploitation
Ant 8 : [2, 3], 18
Exploitation
Ant 9 : [2, 3], 18
Exploration
avg = 0.000770790382969
p = 0.000925925925926
p = 0.00123456777778
Ant 10 : [3, 4], 15
Exploitation
Ant 2 : [4, 5, 3], 34
Exploitation

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Ant 11 : [4, 5], 12
Exploitation
Ant 12 : [3, 4], 15
Exploitation
Ant 3 : [3, 4, 5], 27
Exploitation
Ant 13 : [2, 3], 18
Exploitation
Ant 14 : [4, 5], 12
Exploitation
Ant 15 : [2, 3], 18
Exploitation
Ant 16 : [4, 5], 12
Exploitation
Ant 1 : [1, 0, 4, 5], 42
Exploitation
Ant 17 : [2, 3], 18
Exploitation
Ant 18 : [4, 5], 12
Exploration
avg = 0.000836433502458
p = 0.000840909090909
p = 0.00154166652777
Ant 19 : [5, 4], 12
Exploitation
Ant 4 : [5, 4, 3], 27
Exploration
avg = 0.000730441892213
p = 0.00154320987654
Ant 5 : [3, 4, 5], 27
Exploitation
Ant 0 : [0, 1, 3, 4, 5], 55
Exploitation
Ant 6 : [2, 3, 4], 33
Exploitation
Ant 7 : [0, 1, 3], 28
Exploration
avg = 0.000732006528095
p = 0.00074925
p = 0.00123456790123
Ant 8 : [2, 3, 4], 33
Exploration
avg = 0.000732006528095
p = 0.00074925
p = 0.00123456790123
Ant 9 : [2, 3, 4], 33
Exploration
avg = 0.000730441892213
p = 0.00154320987654
Ant 10 : [3, 4, 5], 27
Exploration
avg = 0.000689037136599
p = 0.00074925
p = 0.000925925925926
```

```
Ant 2 : [4, 5, 3, 2], 52
Exploitation
Ant 11 : [4, 5, 3], 34
Exploration
avg = 0.000730441892213
p = 0.00154320987654
Ant 12 : [3, 4, 5], 27
Exploitation
Ant 3 : [3, 4, 5, 2], 50
Exploration
avg = 0.000732006528095
p = 0.00074925
p = 0.00123456790123
Ant 13 : [2, 3, 4], 33
Exploration
avg = 0.000680261115696
p = 0.000804347826087
p = 0.000841742424242
Ant 14 : [4, 5, 3], 34
Exploitation
Ant 15 : [2, 3, 4], 33
Exploitation
Ant 16 : [4, 5, 3], 34
Exploitation
Ant 1 : [1, 0, 4, 5, 3], 64
Exploration
avg = 0.000732006528095
p = 0.00074925
p = 0.00123456790123
Ant 17 : [2, 3, 4], 33
Exploitation
Ant 18 : [4, 5, 3], 34
Exploitation
Ant 19 : [5, 4, 3], 27
Exploration
avg = 0.000722987753883
p = 0.00074925
p = 0.00102777777778
Ant 4 : [5, 4, 3, 2], 45
Exploration
avg = 0.000626434012847
p = 0.000641025641026
p = 0.000804347826087
Ant 5 : [3, 4, 5, 2], 50
Exploration
avg = 0.000805144927536
Ant 0 : [0, 1, 3, 4, 5, 2], 78
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.000818153292181

p = 0.00154320987654
Ant 6 : [2, 3, 4, 5], 45
Exploitation
```

```
Ant 7 : [0, 1, 3, 4], 43
Exploitation
Ant 8 : [2, 3, 4, 5], 45
Exploitation
Ant 9 : [2, 3, 4, 5], 45
Exploration
avg = 0.000626702370335
p = 0.000641025641026
p = 0.000805152898551
Ant 10 : [3, 4, 5, 2], 50
Exploration
avg = 0.000628535628788
p = 0.000757575757576
Ant 2 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.000723327260056
p = 0.00074925
p = 0.0010287962963
Ant 11 : [4, 5, 3, 2], 52
Exploration
avg = 0.000626702396905
p = 0.000641025641026
p = 0.000805152978261
Ant 12 : [3, 4, 5, 2], 50
Exploitation
Ant 3 : [3, 4, 5, 2, 1], 72
Exploitation
Ant 13 : [2, 3, 4, 5], 45
Exploration
avg = 0.000723330655117
p = 0.00074925
p = 0.00102880648148
Ant 14 : [4, 5, 3, 2], 52
Exploitation
Ant 15 : [2, 3, 4, 5], 45
Exploration
avg = 0.000723330689068
p = 0.00074925
p = 0.00102880658333
Ant 16 : [4, 5, 3, 2], 52
Exploitation
Ant 1 : [1, 0, 4, 5, 3, 2], 82
Update called by 1Exploitation

Ant thread 1 terminating.Ant 17 : [2, 3, 4, 5], 45

Exploitation
Ant 18 : [4, 5, 3, 2], 52
Exploration
avg = 0.000723330689411
p = 0.00074925
p = 0.00102880658436
Ant 19 : [5, 4, 3, 2], 45
Exploration
```

```
avg = 0.000670618962121
p = 0.000841742424242
Ant 4 : [5, 4, 3, 2, 1], 67
Exploration
avg = 0.000670623128788
p = 0.000841750757576
Ant 5 : [3, 4, 5, 2, 1], 72
Exploitation
Ant 6 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.00100525878443
p = 0.00154320987654
Ant 7 : [0, 1, 3, 4, 5], 55
Exploration
avg = 0.000572733516484
p = 0.000711538461538
Ant 8 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.000573086080586
p = 0.000712243589744
Ant 9 : [2, 3, 4, 5, 1], 71
Exploitation
Ant 10 : [3, 4, 5, 2, 1], 72
Exploitation
Ant 2 : [4, 5, 3, 2, 1, 0], 84
Update called by 2Exploration

Ant thread 2 terminating.avg = 0.000670623170871

p = 0.000841750841742
Ant 11 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.000670623170875
p = 0.000841750841751
Ant 12 : [3, 4, 5, 2, 1], 72
Exploitation
Ant 3 : [3, 4, 5, 2, 1, 0], 82
Update called by 3Exploration

Ant thread 3 terminating.avg = 0.000573089606227

p = 0.000712250641026
Ant 13 : [2, 3, 4, 5, 1], 71
Exploitation
Ant 14 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.000573089641484
p = 0.000712250711538
Ant 15 : [2, 3, 4, 5, 1], 71
Exploitation
Ant 16 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.000573089641836
p = 0.000712250712244
```

```
Ant 17 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.000670623170875
p = 0.000841750841751
Ant 18 : [4, 5, 3, 2, 1], 74
Exploitation
Ant 19 : [5, 4, 3, 2, 1], 67
Exploitation
Ant 4 : [5, 4, 3, 2, 1, 0], 77
Update called by 4Exploration

Ant thread 4 terminating.avg = 0.00185185185

Ant 5 : [3, 4, 5, 2, 1, 0], 82
Update called by 5Exploitation

Ant thread 5 terminating.Ant 6 : [2, 3, 4, 5, 1, 0], 81

Update called by 6Exploration

Ant thread 6 terminating.avg = 0.000805152979058

Ant 7 : [0, 1, 3, 4, 5, 2], 78
Update called by 7Exploration

Ant thread 7 terminating.avg = 0.00185185185185

Ant 8 : [2, 3, 4, 5, 1, 0], 81
Update called by 8Exploitation

Ant thread 8 terminating.Ant 9 : [2, 3, 4, 5, 1, 0], 81

Update called by 9Exploration

Ant thread 9 terminating.avg = 0.00185185185185

Ant 10 : [3, 4, 5, 2, 1, 0], 82
Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [4, 5, 3, 2, 1, 0], 84

Update called by 11Exploration

Ant thread 11 terminating.avg = 0.00185185185185

Ant 12 : [3, 4, 5, 2, 1, 0], 82
Update called by 12Exploration

Ant thread 12 terminating.avg = 0.00185185185185

Ant 13 : [2, 3, 4, 5, 1, 0], 81
Update called by 13Exploration

Ant thread 13 terminating.avg = 0.00185185185185
```

```
Ant 14 : [4, 5, 3, 2, 1, 0], 84
Update called by 14Exploration

Ant thread 14 terminating.avg = 0.00185185185185

Ant 15 : [2, 3, 4, 5, 1, 0], 81
Update called by 15Exploration

Ant thread 15 terminating.avg = 0.00185185185185

Ant 16 : [4, 5, 3, 2, 1, 0], 84
Update called by 16Exploration

Ant thread 16 terminating.avg = 0.00185185185185

Ant 17 : [2, 3, 4, 5, 1, 0], 81
Update called by 17Exploration

Ant thread 17 terminating.avg = 0.00185185185185

Ant 18 : [4, 5, 3, 2, 1, 0], 84
Update called by 18Exploration

Ant thread 18 terminating.avg = 0.00185185185185

Ant 19 : [5, 4, 3, 2, 1, 0], 77
Update called by 19
Best: [4, 5, 3, 2, 1, 0], 104, 5, 108
Ant thread 19 terminating.iter_counter = 6

starting ant = 0
Explorationstarting ant = 1

avg = 0.000729400464654starting ant = 2

p = 0.0016666499985starting ant = 3

p = 0.000832479675starting ant = 4

Ant 0 : [0, 4], 20starting ant = 5

Explorationstarting ant = 6

avg = 0.000756716142024starting ant = 7

p = 0.00166666666667starting ant = 8

p = 0.000925916665833starting ant = 9

Ant 1 : [1, 3], 18starting ant = 10

Explorationstarting ant = 11
```

avg = 0.000748138162193starting ant = 12

p = 0.001111099999starting ant = 13

p = 0.00138888888889starting ant = 14

Ant 2 : [4, 5], 12starting ant = 15

Explorationstarting ant = 16

avg = 0.000712229885413starting ant = 17

p = 0.000925925925926starting ant = 18

p = 0.00111111111111starting ant = 19

Ant 3 : [3, 4], 15
Exploitation
Ant 4 : [5, 4], 12
Exploitation
Ant 0 : [0, 4, 5], 32
Exploration
avg = 0.000736674329858
p = 0.000925925925926
p = 0.00123333333333
Ant 5 : [3, 4], 15
Exploration
avg = 0.000605811867837
p = 0.000757575757576
p = 0.000925925925926
Ant 6 : [2, 3], 18
Exploitation
Ant 7 : [0, 1], 10
Exploration
avg = 0.000626182238208
p = 0.000757575757576
p = 0.00102777777778
Ant 8 : [2, 3], 18
Exploration
avg = 0.000626385941912
p = 0.000757575757576
p = 0.0010287962963
Ant 9 : [2, 3], 18
Exploration
avg = 0.000752567217878
p = 0.000925925925926
p = 0.00123455555556
Ant 1 : [1, 3, 4], 33
Exploitation
Ant 10 : [3, 4], 15
Exploration
avg = 0.000778999273304
p = 0.001111099999
p = 0.00154319444444

```
Ant 11 : [4, 5], 12
Exploration
avg = 0.000736921243191
p = 0.000925925925926
p = 0.0012345679
Ant 12 : [3, 4], 15
Exploration
avg = 0.000626387978949
p = 0.000757575757576
p = 0.00102880648148
Ant 13 : [2, 3], 18
Exploitation
Ant 14 : [4, 5], 12
Exploration
avg = 0.000628443698512
p = 0.000641025641026
p = 0.000724637681159
p = 0.000757575757576
Ant 2 : [4, 5, 3], 34
Exploitation
Ant 15 : [2, 3], 18
Exploitation
Ant 16 : [4, 5], 12
Exploitation
Ant 17 : [2, 3], 18
Exploration
avg = 0.000779002359721
p = 0.001111099999
p = 0.00154320987653
Ant 18 : [4, 5], 12
Exploitation
Ant 19 : [5, 4], 12
Exploration
avg = 0.000695977949905
p = 0.00154320987654
Ant 3 : [3, 4, 5], 27
Exploration
avg = 0.000587950480519
p = 0.001111099999
Ant 4 : [5, 4, 3], 27
Exploitation
Ant 0 : [0, 4, 5, 3], 54
Exploitation
Ant 5 : [3, 4, 5], 27
Exploration
avg = 0.000689670072813
p = 0.00123456790122
Ant 6 : [2, 3, 4], 33
Exploration
avg = 0.0005546937657
p = 0.00102777768518
Ant 7 : [0, 1, 3], 28
Exploitation
Ant 8 : [2, 3, 4], 33
```

```
Exploration
avg = 0.000689670072816
p = 0.00123456790123
Ant 9 : [2, 3, 4], 33
Exploration
avg = 0.000836845599873
p = 0.00154320987654
Ant 1 : [1, 3, 4, 5], 45
Exploitation
Ant 10 : [3, 4, 5], 27
Exploitation
Ant 11 : [4, 5, 3], 34
Exploration
avg = 0.000695977949905
p = 0.00154320987654
Ant 12 : [3, 4, 5], 27
Exploration
avg = 0.000689670072816
p = 0.00123456790123
Ant 13 : [2, 3, 4], 33
Exploration
avg = 0.000649487448512
p = 0.000724637681159
p = 0.000841750757576
Ant 14 : [4, 5, 3], 34
Exploration
avg = 0.00065099762047
p = 0.000674325
p = 0.000925925925926
Ant 2 : [4, 5, 3, 2], 52
Exploitation
Ant 15 : [2, 3, 4], 33
Exploration
avg = 0.000649487469345
p = 0.000724637681159
p = 0.000841750840909
Ant 16 : [4, 5, 3], 34
Exploration
avg = 0.000689670072816
p = 0.00123456790123
Ant 17 : [2, 3, 4], 33
Exploitation
Ant 18 : [4, 5, 3], 34
Exploitation
Ant 19 : [5, 4, 3], 27
Exploration
avg = 0.000585399678824
p = 0.000641025641026
p = 0.000724637681159
Ant 3 : [3, 4, 5, 2], 50
Exploration
avg = 0.000684948237754
p = 0.00102777777778
Ant 4 : [5, 4, 3, 2], 45
```

```
Exploration
avg = 0.000851560648148
p = 0.0010287962963
Ant 0 : [0, 4, 5, 3, 2], 72
Exploitation
Ant 5 : [3, 4, 5, 2], 50
Exploration
avg = 0.000787778292181
p = 0.00154320987654
Ant 6 : [2, 3, 4, 5], 45
Exploitation
Ant 7 : [0, 1, 3, 4], 43
Exploitation
Ant 8 : [2, 3, 4, 5], 45
Exploration
avg = 0.000787778292181
p = 0.00154320987654
Ant 9 : [2, 3, 4, 5], 45
Exploration
avg = 0.000597840320911
p = 0.000805144927536
Ant 1 : [1, 3, 4, 5, 2], 68
Exploitation
Ant 10 : [3, 4, 5, 2], 50
Exploration
avg = 0.000685291138988
p = 0.00102880648148
Ant 11 : [4, 5, 3, 2], 52
Exploitation
Ant 12 : [3, 4, 5, 2], 50
Exploitation
Ant 13 : [2, 3, 4, 5], 45
Exploitation
Ant 14 : [4, 5, 3, 2], 52
Exploration
avg = 0.000603560853788
p = 0.000757575757576
Ant 2 : [4, 5, 3, 2, 1], 74
Exploitation
Ant 15 : [2, 3, 4, 5], 45
Exploration
avg = 0.000685291173279
p = 0.00102880658435
Ant 16 : [4, 5, 3, 2], 52
Exploitation
Ant 17 : [2, 3, 4, 5], 45
Exploitation
Ant 18 : [4, 5, 3, 2], 52
Exploration
avg = 0.000685291173282
p = 0.00102880658436
Ant 19 : [5, 4, 3, 2], 45
Exploration
avg = 0.000645227520455
```

```
p = 0.000840909090909
Ant 3 : [3, 4, 5, 2, 1], 72
Exploitation
Ant 4 : [5, 4, 3, 2, 1], 67
Exploitation
Ant 0 : [0, 4, 5, 3, 2, 1], 94
Update called by 0Exploitation

Ant thread 0 terminating.Ant 5 : [3, 4, 5, 2, 1], 72

Exploitation
Ant 6 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.00098189339981
p = 0.00154320987654
Ant 7 : [0, 1, 3, 4, 5], 55
Exploitation
Ant 8 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.000551389652015
p = 0.000712243589744
Ant 9 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.00044954595
Ant 1 : [1, 3, 4, 5, 2, 0], 98
Update called by 1Exploitation

Ant thread 1 terminating.Ant 10 : [3, 4, 5, 2, 1], 72

Exploration
avg = 0.000728678706181
p = 0.000841750841751
Ant 11 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.000728678706181
p = 0.000841750841751
Ant 12 : [3, 4, 5, 2, 1], 72
Exploitation
Ant 13 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.000728678706181
p = 0.000841750841751
Ant 14 : [4, 5, 3, 2, 1], 74
Exploitation
Ant 2 : [4, 5, 3, 2, 1, 0], 84
Update called by 2Exploitation

Ant thread 2 terminating.Ant 15 : [2, 3, 4, 5, 1], 71

Exploration
avg = 0.000728678706181
p = 0.000841750841751
Ant 16 : [4, 5, 3, 2, 1], 74
Exploration
```

```
avg = 0.000551393213265
p = 0.000712250712244
Ant 17 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.000728678706181
p = 0.000841750841751
Ant 18 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.000728678706181
p = 0.000841750841751
Ant 19 : [5, 4, 3, 2, 1], 67
Exploration
avg = 0.00185
Ant 3 : [3, 4, 5, 2, 1, 0], 82
Update called by 3Exploration

Ant thread 3 terminating.avg = 0.00185183333333

Ant 4 : [5, 4, 3, 2, 1, 0], 77
Update called by 4Exploitation

Ant thread 4 terminating.Ant 5 : [3, 4, 5, 2, 1, 0], 82

Update called by 5Exploration

Ant thread 5 terminating.avg = 0.00185185185

Ant 6 : [2, 3, 4, 5, 1, 0], 81
Update called by 6Exploration

Ant thread 6 terminating.avg = 0.000805152979058

Ant 7 : [0, 1, 3, 4, 5, 2], 78
Update called by 7Exploitation

Ant thread 7 terminating.Ant 8 : [2, 3, 4, 5, 1, 0], 81

Update called by 8Exploitation

Ant thread 8 terminating.Ant 9 : [2, 3, 4, 5, 1, 0], 81

Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [3, 4, 5, 2, 1, 0], 82

Update called by 10Exploration

Ant thread 10 terminating.avg = 0.00185185185185

Ant 11 : [4, 5, 3, 2, 1, 0], 84
Update called by 11Exploration

Ant thread 11 terminating.avg = 0.00185185185185
```

```
Ant 12 : [3, 4, 5, 2, 1, 0], 82
Update called by 12Exploitation

Ant thread 12 terminating.Ant 13 : [2, 3, 4, 5, 1, 0], 81

Update called by 13Exploitation

Ant thread 13 terminating.Ant 14 : [4, 5, 3, 2, 1, 0], 84

Update called by 14Exploration

Ant thread 14 terminating.avg = 0.00185185185185

Ant 15 : [2, 3, 4, 5, 1, 0], 81
Update called by 15Exploration

Ant thread 15 terminating.avg = 0.00185185185185

Ant 16 : [4, 5, 3, 2, 1, 0], 84
Update called by 16Exploration

Ant thread 16 terminating.avg = 0.00185185185185

Ant 17 : [2, 3, 4, 5, 1, 0], 81
Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [4, 5, 3, 2, 1, 0], 84

ExploitationUpdate called by 18

Ant 19 : [5, 4, 3, 2, 1, 0], 77Ant thread 18 terminating.

Update called by 19
Best: [4, 5, 3, 2, 1, 0], 104, 6, 108
Ant thread 19 terminating.iter_counter = 7

starting ant = 0
Exploitationstarting ant = 1

Ant 0 : [0, 1], 10starting ant = 2

Explorationstarting ant = 3

avg = 0.000732896194472starting ant = 4

p = 0.00166666666667starting ant = 5

p = 0.000925916665833starting ant = 6

Ant 1 : [1, 3], 18starting ant = 7

Exploitationstarting ant = 8

Ant 0 : [0, 1, 3], 28starting ant = 9
```

Exploitationstarting ant = 10

Ant 2 : [4, 5], 12starting ant = 11

Exploitationstarting ant = 12

Ant 3 : [3, 4], 15starting ant = 13

Explorationstarting ant = 14

avg = 0.000772719244274starting ant = 15

p = 0.00138887499875starting ant = 16

Ant 4 : [5, 4], 12starting ant = 17

Explorationstarting ant = 18

avg = 0.000706192082057starting ant = 19

p = 0.000925925925926
p = 0.00123333333333
Ant 5 : [3, 4], 15
Exploitation
Ant 6 : [2, 3], 18
Exploration
avg = 0.000731322533127
p = 0.000925925925926
p = 0.00123455555556
Ant 1 : [1, 3, 4], 33
Exploitation
Ant 7 : [0, 1], 10
Exploration
avg = 0.000629161996804
p = 0.000757575757576
p = 0.00102777777778
Ant 8 : [2, 3], 18
Exploitation
Ant 0 : [0, 1, 3, 4], 43
Exploitation
Ant 9 : [2, 3], 18
Exploration
avg = 0.00070643899539
p = 0.000925925925926
p = 0.0012345679
Ant 10 : [3, 4], 15
Exploration
avg = 0.000618680305654
p = 0.000641025641026
p = 0.000724637681159
p = 0.000757575757576
Ant 2 : [4, 5, 3], 34
Exploration

avg = 0.000753879679287
p = 0.001111099999
p = 0.00154166666667
Ant 11 : [4, 5], 12
Exploration
avg = 0.000706438995635
p = 0.000925925925926
p = 0.00123456790122
Ant 12 : [3, 4], 15
Exploitation
Ant 3 : [3, 4, 5], 27
Exploitation
Ant 13 : [2, 3], 18
Exploration
avg = 0.000754188290398
p = 0.001111099999
p = 0.00154320972222
Ant 14 : [4, 5], 12
Exploration
avg = 0.000629367757915
p = 0.000757575757576
p = 0.00102880658333
Ant 15 : [2, 3], 18
Exploration
avg = 0.000754188320954
p = 0.001111099999
p = 0.001543209875
Ant 16 : [4, 5], 12
Exploration
avg = 0.000556932932442
p = 0.001111099999
Ant 4 : [5, 4, 3], 27
Exploration
avg = 0.000629367758119
p = 0.000757575757576
p = 0.00102880658435
Ant 17 : [2, 3], 18
Exploitation
Ant 18 : [4, 5], 12
Exploration
avg = 0.000819944216743
p = 0.000840909090909
p = 0.00154166652777
Ant 19 : [5, 4], 12
Exploitation
Ant 5 : [3, 4, 5], 27
Exploration
avg = 0.000651567263065
p = 0.00123456790123
Ant 6 : [2, 3, 4], 33
Exploration
avg = 0.000804601369104
p = 0.00154320987654
Ant 1 : [1, 3, 4, 5], 45

```
Exploitation
Ant 7 : [0, 1, 3], 28
Exploitation
Ant 8 : [2, 3, 4], 33
Exploration
avg = 0.000960864553656
p = 0.00154320987654
Ant 0 : [0, 1, 3, 4, 5], 55
Exploitation
Ant 9 : [2, 3, 4], 33
Exploration
avg = 0.000664960401828
p = 0.00154320987654
Ant 10 : [3, 4, 5], 27
Exploration
avg = 0.000616762055954
p = 0.000925925925926
Ant 2 : [4, 5, 3, 2], 52
Exploitation
Ant 11 : [4, 5, 3], 34
Exploration
avg = 0.000664960401828
p = 0.00154320987654
Ant 12 : [3, 4, 5], 27
Exploration
avg = 0.000572381821681
p = 0.000641025641026
p = 0.000724637681159
Ant 3 : [3, 4, 5, 2], 50
Exploitation
Ant 13 : [2, 3, 4], 33
Exploration
avg = 0.000659649508553
p = 0.000804347826087
p = 0.000841742424242
Ant 14 : [4, 5, 3], 34
Exploitation
Ant 15 : [2, 3, 4], 33
Exploitation
Ant 16 : [4, 5, 3], 34
Exploitation
Ant 4 : [5, 4, 3, 2], 45
Exploitation
Ant 17 : [2, 3, 4], 33
Exploitation
Ant 18 : [4, 5, 3], 34
Exploration
avg = 0.000587491238245
p = 0.00123333322221
Ant 19 : [5, 4, 3], 27
Exploration
avg = 0.00059895186999
p = 0.000641025641026
p = 0.000804347826087
```

```
Ant 5 : [3, 4, 5, 2], 50
Exploration
avg = 0.000760440792181
p = 0.00154320987654
Ant 6 : [2, 3, 4, 5], 45
Exploration
avg = 0.000578313535197
p = 0.000805144927536
Ant 1 : [1, 3, 4, 5, 2], 68
Exploration
avg = 0.000903568368874
p = 0.0010287962963
p = 0.00123456790123
Ant 7 : [0, 1, 3, 4], 43
Exploration
avg = 0.000760440792181
p = 0.00154320987654
Ant 8 : [2, 3, 4, 5], 45
Exploitation
Ant 0 : [0, 1, 3, 4, 5, 2], 78
Update called by 0Exploitation

Ant thread 0 terminating.Ant 9 : [2, 3, 4, 5], 45

Exploration
avg = 0.000599220254048
p = 0.000641025641026
p = 0.000805152978261
Ant 10 : [3, 4, 5, 2], 50
Exploitation
Ant 2 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.000651052179411
p = 0.0010287962963
Ant 11 : [4, 5, 3, 2], 52
Exploitation
Ant 12 : [3, 4, 5, 2], 50
Exploitation
Ant 3 : [3, 4, 5, 2, 1], 72
Exploitation
Ant 13 : [2, 3, 4, 5], 45
Exploration
avg = 0.000651055574472
p = 0.00102880648148
Ant 14 : [4, 5, 3, 2], 52
Exploitation
Ant 15 : [2, 3, 4, 5], 45
Exploration
avg = 0.000651055608423
p = 0.00102880658333
Ant 16 : [4, 5, 3, 2], 52
Exploration
avg = 0.000697894168896
p = 0.000841742424242
```

```
Ant 4 : [5, 4, 3, 2, 1], 67
Exploration
avg = 0.000760440792181
p = 0.00154320987654
Ant 17 : [2, 3, 4, 5], 45
Exploration
avg = 0.000651055608762
p = 0.00102880658435
Ant 18 : [4, 5, 3, 2], 52
Exploitation
Ant 19 : [5, 4, 3, 2], 45
Exploitation
Ant 5 : [3, 4, 5, 2, 1], 72
Exploration
avg = 0.000496253891941
p = 0.000641025641026
Ant 6 : [2, 3, 4, 5, 1], 71
Exploitation
Ant 1 : [1, 3, 4, 5, 2, 0], 98
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.000960864553656

p = 0.00154320987654
Ant 7 : [0, 1, 3, 4, 5], 55
Exploration
avg = 0.000531510302198
p = 0.000711538461538
Ant 8 : [2, 3, 4, 5, 1], 71
Exploitation
Ant 9 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.000729201205578
p = 0.000841750840909
Ant 10 : [3, 4, 5, 2, 1], 72
Exploration
avg = 0.00166666666667
Ant 2 : [4, 5, 3, 2, 1, 0], 84
Update called by 2Exploration

Ant thread 2 terminating.avg = 0.000729201205995

p = 0.000841750841742
Ant 11 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.000729201205999
p = 0.000841750841751
Ant 12 : [3, 4, 5, 2, 1], 72
Exploitation
Ant 3 : [3, 4, 5, 2, 1, 0], 82
Update called by 3Exploitation

Ant thread 3 terminating.Ant 13 : [2, 3, 4, 5, 1], 71
```

```
Exploitation
Ant 14 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.000531866427198
p = 0.000712250711538
Ant 15 : [2, 3, 4, 5, 1], 71
Exploitation
Ant 16 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.00185183333333
Ant 4 : [5, 4, 3, 2, 1, 0], 77
Update called by 4Exploitation

Ant thread 4 terminating.Ant 17 : [2, 3, 4, 5, 1], 71

Exploitation
Ant 18 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.000729201205999
p = 0.000841750841751
Ant 19 : [5, 4, 3, 2, 1], 67
Exploitation
Ant 5 : [3, 4, 5, 2, 1, 0], 82
Update called by 5Exploration

Ant thread 5 terminating.avg = 0.00185185185

Ant 6 : [2, 3, 4, 5, 1, 0], 81
Update called by 6Exploration

Ant thread 6 terminating.avg = 0.000805152979066

Ant 7 : [0, 1, 3, 4, 5, 2], 78
Update called by 7Exploration

Ant thread 7 terminating.avg = 0.00185185185183

Ant 8 : [2, 3, 4, 5, 1, 0], 81
Update called by 8Exploitation

Ant thread 8 terminating.Ant 9 : [2, 3, 4, 5, 1, 0], 81

Update called by 9Exploration

Ant thread 9 terminating.avg = 0.00185185185185

Ant 10 : [3, 4, 5, 2, 1, 0], 82
Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [4, 5, 3, 2, 1, 0], 84

Update called by 11Exploration

Ant thread 11 terminating.avg = 0.00185185185185
```

Ant 12 : [3, 4, 5, 2, 1, 0], 82
Update called by 12Exploration

Ant thread 12 terminating.avg = 0.00185185185185

Ant 13 : [2, 3, 4, 5, 1, 0], 81
Update called by 13Exploitation

Ant thread 13 terminating.Ant 14 : [4, 5, 3, 2, 1, 0], 84

Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [2, 3, 4, 5, 1, 0], 81

Update called by 15Exploitation

Ant thread 15 terminating.Ant 16 : [4, 5, 3, 2, 1, 0], 84

ExploitationUpdate called by 16

Ant 17 : [2, 3, 4, 5, 1, 0], 81Ant thread 16 terminating.

Update called by 17Exploration

Ant thread 17 terminating.avg = 0.00185185185185

Ant 18 : [4, 5, 3, 2, 1, 0], 84
Update called by 18Exploration

Ant thread 18 terminating.avg = 0.00185185185185

Ant 19 : [5, 4, 3, 2, 1, 0], 77
Update called by 19
Best: [4, 5, 3, 2, 1, 0], 104, 7, 108
Ant thread 19 terminating.iter_counter = 8

starting ant = 0
Explorationstarting ant = 1

avg = 0.000669133956333starting ant = 2

p = 0.00166664984999starting ant = 3

p = 0.000749243085368starting ant = 4

Ant 0 : [0, 4], 20starting ant = 5

Exploitationstarting ant = 6

Ant 1 : [1, 0], 10starting ant = 7

Exploitationstarting ant = 8

Ant 2 : [4, 5], 12starting ant = 9

Exploitationstarting ant = 10

Ant 3 : [3, 4], 15starting ant = 11

Exploitationstarting ant = 12

Ant 4 : [5, 4], 12starting ant = 13

Explorationstarting ant = 14

avg = 0.00080371693084starting ant = 15

p = 0.001111099999starting ant = 16

p = 0.00154166666667starting ant = 17

Ant 0 : [0, 4, 5], 32starting ant = 18

Exploitationstarting ant = 19

Ant 5 : [3, 4], 15
Exploration
avg = 0.000592851515666
p = 0.000757575757576
p = 0.000925925925926
Ant 6 : [2, 3], 18
Exploration
avg = 0.000463483985958
p = 0.00092415909752
Ant 1 : [1, 0, 4], 30
Exploration
avg = 0.000704466990788
p = 0.00166664984999
p = 0.000925908257642
Ant 7 : [0, 4], 20
Exploitation
Ant 8 : [2, 3], 18
Exploitation
Ant 2 : [4, 5, 3], 34
Exploitation
Ant 9 : [2, 3], 18
Exploration
avg = 0.000679002503481
p = 0.000925925925926
p = 0.00123455555556
Ant 10 : [3, 4], 15
Exploration
avg = 0.000637040750534
p = 0.00154319444444
Ant 3 : [3, 4, 5], 27
Exploration
avg = 0.000731855655783

```
p = 0.001111099999
p = 0.00154320972222
Ant 11 : [4, 5], 12
Exploitation
Ant 12 : [3, 4], 15
Exploration
avg = 0.000529017139173
p = 0.001111099999
Ant 4 : [5, 4, 3], 27
Exploitation
Ant 13 : [2, 3], 18
Exploration
avg = 0.000756302330981
p = 0.00123333322221
p = 0.001543209875
Ant 14 : [4, 5], 12
Exploration
avg = 0.000613427647147
p = 0.000757575757576
p = 0.00102880658333
Ant 15 : [2, 3], 18
Exploration
avg = 0.000756302331286
p = 0.00123333322221
p = 0.00154320987653
Ant 16 : [4, 5], 12
Exploration
avg = 0.000613427647351
p = 0.000757575757576
p = 0.00102880658435
Ant 17 : [2, 3], 18
Exploration
avg = 0.000735524137698
p = 0.000840909090909
Ant 0 : [0, 4, 5, 3], 54
Exploitation
Ant 18 : [4, 5], 12
Exploration
avg = 0.000813081240553
p = 0.000841742424242
p = 0.00154166652777
Ant 19 : [5, 4], 12
Exploitation
Ant 5 : [3, 4, 5], 27
Exploration
avg = 0.000617274733981
p = 0.0012345679
Ant 6 : [2, 3, 4], 33
Exploitation
Ant 1 : [1, 0, 4, 5], 42
Exploitation
Ant 7 : [0, 4, 5], 32
Exploration
avg = 0.000617274734286
```

```
p = 0.00123456790122
Ant 8 : [2, 3, 4], 33
Exploitation
Ant 2 : [4, 5, 3, 2], 52
Exploration
avg = 0.00061727473429
p = 0.00123456790123
Ant 9 : [2, 3, 4], 33
Exploitation
Ant 10 : [3, 4, 5], 27
Exploration
avg = 0.000560665750252
p = 0.000641025641026
p = 0.000724637681159
Ant 3 : [3, 4, 5, 2], 50
Exploration
avg = 0.000650862454982
p = 0.000804347826087
p = 0.000841742424242
Ant 11 : [4, 5, 3], 34
Exploitation
Ant 12 : [3, 4, 5], 27
Exploitation
Ant 4 : [5, 4, 3, 2], 45
Exploration
avg = 0.00061727473429
p = 0.00123456790123
Ant 13 : [2, 3, 4], 33
Exploitation
Ant 14 : [4, 5, 3], 34
Exploitation
Ant 15 : [2, 3, 4], 33
Exploitation
Ant 16 : [4, 5, 3], 34
Exploitation
Ant 17 : [2, 3, 4], 33
Exploitation
Ant 0 : [0, 4, 5, 3, 2], 72
Exploration
avg = 0.000650864559357
p = 0.000804347826087
p = 0.000841750841742
Ant 18 : [4, 5, 3], 34
Exploitation
Ant 19 : [5, 4, 3], 27
Exploration
avg = 0.000587235798561
p = 0.000641025641026
p = 0.000804347826087
Ant 5 : [3, 4, 5, 2], 50
Exploration
avg = 0.000735837042181
p = 0.00154320987654
Ant 6 : [2, 3, 4, 5], 45
```

```
Exploration
avg = 0.000823447884643
p = 0.000841750841751
Ant 1 : [1, 0, 4, 5, 3], 64
Exploration
avg = 0.000762640470104
p = 0.000805144927536
p = 0.000841750841751
Ant 7 : [0, 4, 5, 3], 54
Exploration
avg = 0.000735837042181
p = 0.00154320987654
Ant 8 : [2, 3, 4, 5], 45
Exploration
avg = 0.000656281085399
p = 0.000757575757576
Ant 2 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.000735837042181
p = 0.00154320987654
Ant 9 : [2, 3, 4, 5], 45
Exploitation
Ant 10 : [3, 4, 5, 2], 50
Exploitation
Ant 3 : [3, 4, 5, 2, 1], 72
Exploitation
Ant 11 : [4, 5, 3, 2], 52
Exploration
avg = 0.000587504156049
p = 0.000641025641026
p = 0.000805152898551
Ant 12 : [3, 4, 5, 2], 50
Exploration
avg = 0.000698364418732
p = 0.000841742424242
Ant 4 : [5, 4, 3, 2, 1], 67
Exploration
avg = 0.000735837042181
p = 0.00154320987654
Ant 13 : [2, 3, 4, 5], 45
Exploitation
Ant 14 : [4, 5, 3, 2], 52
Exploration
avg = 0.000735837042181
p = 0.00154320987654
Ant 15 : [2, 3, 4, 5], 45
Exploration
avg = 0.000620243600698
p = 0.00102880658435
Ant 16 : [4, 5, 3, 2], 52
Exploitation
Ant 17 : [2, 3, 4, 5], 45
Exploitation
Ant 0 : [0, 4, 5, 3, 2, 1], 94
```

Update called by 0Exploration

Ant thread 0 terminating.avg = 0.000620243600701

p = 0.00102880658436
Ant 18 : [4, 5, 3, 2], 52
Exploitation
Ant 19 : [5, 4, 3, 2], 45
Exploration
avg = 0.000698368627066
p = 0.000841750840909
Ant 5 : [3, 4, 5, 2, 1], 72
Exploration
avg = 0.000478679784799
p = 0.000641025641026
Ant 6 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.00102880658436
Ant 1 : [1, 0, 4, 5, 3, 2], 82
Update called by 1Exploitation

Ant thread 1 terminating.Ant 7 : [0, 4, 5, 3, 2], 72

Exploration
avg = 0.000513936195055
p = 0.000711538461538
Ant 8 : [2, 3, 4, 5, 1], 71
Exploitation
Ant 2 : [4, 5, 3, 2, 1, 0], 84
Update called by 2Exploitation

Ant thread 2 terminating.Ant 9 : [2, 3, 4, 5, 1], 71

Exploration
avg = 0.000698368627482
p = 0.000841750841742
Ant 10 : [3, 4, 5, 2, 1], 72
Exploitation
Ant 3 : [3, 4, 5, 2, 1, 0], 82
Update called by 3Exploitation

Ant thread 3 terminating.Ant 11 : [4, 5, 3, 2, 1], 74

Exploration
avg = 0.000698368627486
p = 0.000841750841751
Ant 12 : [3, 4, 5, 2, 1], 72
Exploration
avg = 0.00185185166667
Ant 4 : [5, 4, 3, 2, 1, 0], 77
Update called by 4Exploitation

Ant thread 4 terminating.Ant 13 : [2, 3, 4, 5, 1], 71

```
Exploration
avg = 0.000698368627486
p = 0.000841750841751
Ant 14 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.000514292320055
p = 0.000712250711538
Ant 15 : [2, 3, 4, 5, 1], 71
Exploitation
Ant 16 : [4, 5, 3, 2, 1], 74
Exploitation
Ant 17 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.000698368627486
p = 0.000841750841751
Ant 18 : [4, 5, 3, 2, 1], 74
Exploitation
Ant 19 : [5, 4, 3, 2, 1], 67
Exploitation
Ant 5 : [3, 4, 5, 2, 1, 0], 82
Update called by 5Exploitation

Ant thread 5 terminating.Ant 6 : [2, 3, 4, 5, 1, 0], 81

Update called by 6Exploration

Ant thread 6 terminating.avg = 0.000841750841751

Ant 7 : [0, 4, 5, 3, 2, 1], 94
Update called by 7Exploration

Ant thread 7 terminating.avg = 0.00185185185185

Ant 8 : [2, 3, 4, 5, 1, 0], 81
Update called by 8Exploitation

Ant thread 8 terminating.Ant 9 : [2, 3, 4, 5, 1, 0], 81

Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [3, 4, 5, 2, 1, 0], 82

Update called by 10Exploration

Ant thread 10 terminating.avg = 0.00185185185185

Ant 11 : [4, 5, 3, 2, 1, 0], 84
Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [3, 4, 5, 2, 1, 0], 82

Update called by 12Exploitation

Ant thread 12 terminating.Ant 13 : [2, 3, 4, 5, 1, 0], 81
```

ExplorationUpdate called by 13

avg = 0.00185185185185Ant thread 13 terminating.

Ant 14 : [4, 5, 3, 2, 1, 0], 84
Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [2, 3, 4, 5, 1, 0], 81

Update called by 15Exploration

Ant thread 15 terminating.avg = 0.00185185185185

Ant 16 : [4, 5, 3, 2, 1, 0], 84
Update called by 16Exploitation

Ant thread 16 terminating.Ant 17 : [2, 3, 4, 5, 1, 0], 81

Update called by 17Exploration

Ant thread 17 terminating.avg = 0.00185185185185

Ant 18 : [4, 5, 3, 2, 1, 0], 84
Update called by 18Exploration

Ant thread 18 terminating.avg = 0.00185185185185

Ant 19 : [5, 4, 3, 2, 1, 0], 77
Update called by 19
Best: [4, 5, 3, 2, 1, 0], 104, 8, 108
Ant thread 19 terminating.iter_counter = 9

starting ant = 0
Explorationstarting ant = 1

avg = 0.000634023440198starting ant = 2

p = 0.00149998486499starting ant = 3

p = 0.000833333174319starting ant = 4

Ant 0 : [0, 4], 20starting ant = 5

Exploitationstarting ant = 6

Ant 1 : [1, 0], 10starting ant = 7

Explorationstarting ant = 8

avg = 0.000680892117962starting ant = 9

p = 0.001111099999starting ant = 10

p = 0.00138888888889starting ant = 11

Ant 2 : [4, 5], 12starting ant = 12

Exploitationstarting ant = 13

Ant 3 : [3, 4], 15starting ant = 14

Explorationstarting ant = 15

avg = 0.0007593629227starting ant = 16

p = 0.00138887499875starting ant = 17

Ant 4 : [5, 4], 12starting ant = 18

Exploitationstarting ant = 19

Ant 0 : [0, 4, 5], 32
Exploration
avg = 0.000654067438318
p = 0.000925925925926
p = 0.00123333333333
Ant 5 : [3, 4], 15
Exploration
avg = 0.000567236397769
p = 0.000757575757576
p = 0.000925925925926
Ant 6 : [2, 3], 18
Exploration
avg = 0.000440449790023
p = 0.00092499999841
Ant 1 : [1, 0, 4], 30
Exploitation
Ant 7 : [0, 1], 10
Exploration
avg = 0.00058760676814
p = 0.000757575757576
p = 0.00102777777778
Ant 8 : [2, 3], 18
Exploration
avg = 0.000587810471843
p = 0.000757575757576
p = 0.0010287962963
Ant 9 : [2, 3], 18
Exploitation
Ant 10 : [3, 4], 15
Exploration
avg = 0.000711753229073
p = 0.001111099999
p = 0.00154319444444
Ant 11 : [4, 5], 12
Exploitation
Ant 2 : [4, 5, 3], 34

```
Exploitation
Ant 12 : [3, 4], 15
Exploration
avg = 0.00058781250888
p = 0.000757575757576
p = 0.00102880648148
Ant 13 : [2, 3], 18
Exploitation
Ant 3 : [3, 4, 5], 27
Exploration
avg = 0.000711756315185
p = 0.001111099999
p = 0.001543209875
Ant 14 : [4, 5], 12
Exploitation
Ant 15 : [2, 3], 18
Exploration
avg = 0.00071175631549
p = 0.001111099999
p = 0.00154320987653
Ant 16 : [4, 5], 12
Exploration
avg = 0.000587812529454
p = 0.000757575757576
p = 0.00102880658435
Ant 17 : [2, 3], 18
Exploitation
Ant 4 : [5, 4, 3], 27
Exploration
avg = 0.000736202960136
p = 0.00123333322221
p = 0.00154320987654
Ant 18 : [4, 5], 12
Exploration
avg = 0.00080658789517
p = 0.000840909090909
p = 0.00154166652777
Ant 19 : [5, 4], 12
Exploration
avg = 0.000735524137456
p = 0.000840909090909
Ant 0 : [0, 4, 5, 3], 54
Exploitation
Ant 5 : [3, 4, 5], 27
Exploration
avg = 0.000586411458083
p = 0.0012345679
Ant 6 : [2, 3, 4], 33
Exploitation
Ant 1 : [1, 0, 4, 5], 42
Exploitation
Ant 7 : [0, 1, 3], 28
Exploration
avg = 0.000586411458388
```

```
p = 0.00123456790122
Ant 8 : [2, 3, 4], 33
Exploration
avg = 0.000586411458391
p = 0.00123456790123
Ant 9 : [2, 3, 4], 33
Exploration
avg = 0.000611920394617
p = 0.00154320987654
Ant 10 : [3, 4, 5], 27
Exploration
avg = 0.000623026570354
p = 0.000641025641026
p = 0.000724637680435
p = 0.000841742424242
Ant 11 : [4, 5, 3], 34
Exploration
avg = 0.000558219240631
p = 0.000925925925926
Ant 2 : [4, 5, 3, 2], 52
Exploration
avg = 0.000611920394617
p = 0.00154320987654
Ant 12 : [3, 4, 5], 27
Exploration
avg = 0.000586411458391
p = 0.00123456790123
Ant 13 : [2, 3, 4], 33
Exploitation
Ant 3 : [3, 4, 5, 2], 50
Exploration
avg = 0.000642956190099
p = 0.00080434782608
p = 0.000841750757576
Ant 14 : [4, 5, 3], 34
Exploration
avg = 0.000586411458391
p = 0.00123456790123
Ant 15 : [2, 3, 4], 33
Exploration
avg = 0.000642956210932
p = 0.00080434782608
p = 0.000841750840909
Ant 16 : [4, 5, 3], 34
Exploration
avg = 0.000586411458391
p = 0.00123456790123
Ant 17 : [2, 3, 4], 33
Exploration
avg = 0.000592169857915
p = 0.00102777777778
Ant 4 : [5, 4, 3, 2], 45
Exploitation
Ant 18 : [4, 5, 3], 34
```

```
Exploration
avg = 0.000534451231034
p = 0.00123333322221
Ant 19 : [5, 4, 3], 27
Exploration
avg = 0.000760189610648
p = 0.0010287962963
Ant 0 : [0, 4, 5, 3, 2], 72
Exploitation
Ant 5 : [3, 4, 5, 2], 50
Exploitation
Ant 6 : [2, 3, 4, 5], 45
Exploitation
Ant 1 : [1, 0, 4, 5, 3], 64
Exploration
avg = 0.000875240173027
p = 0.00102880648148
p = 0.00123456790123
Ant 7 : [0, 1, 3, 4], 43
Exploitation
Ant 8 : [2, 3, 4, 5], 45
Exploration
avg = 0.000713693667181
p = 0.00154320987654
Ant 9 : [2, 3, 4, 5], 45
Exploration
avg = 0.000576957034759
p = 0.000641025641026
p = 0.000805144927536
Ant 10 : [3, 4, 5, 2], 50
Exploitation
Ant 11 : [4, 5, 3, 2], 52
Exploitation
Ant 2 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.000576959691764
p = 0.000641025641026
p = 0.000805152898551
Ant 12 : [3, 4, 5, 2], 50
Exploration
avg = 0.000713693667181
p = 0.00154320987654
Ant 13 : [2, 3, 4, 5], 45
Exploitation
Ant 3 : [3, 4, 5, 2, 1], 72
Exploitation
Ant 14 : [4, 5, 3, 2], 52
Exploration
avg = 0.000713693667181
p = 0.00154320987654
Ant 15 : [2, 3, 4, 5], 45
Exploration
avg = 0.00059251279344
p = 0.00102880658435
```

```
Ant 16 : [4, 5, 3, 2], 52
Exploitation
Ant 17 : [2, 3, 4, 5], 45
Exploration
avg = 0.000670615098071
p = 0.000841742424242
Ant 4 : [5, 4, 3, 2, 1], 67
Exploitation
Ant 18 : [4, 5, 3, 2], 52
Exploration
avg = 0.000592512793443
p = 0.00102880658436
Ant 19 : [5, 4, 3, 2], 45
Exploitation
Ant 0 : [0, 4, 5, 3, 2, 1], 94
Update called by 0Exploitation

Ant thread 0 terminating.Ant 5 : [3, 4, 5, 2, 1], 72

Exploration
avg = 0.00046286308837
p = 0.000641025641026
Ant 6 : [2, 3, 4, 5, 1], 71
Exploitation
Ant 1 : [1, 0, 4, 5, 3, 2], 82
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.000924905226733

p = 0.00154320987654
Ant 7 : [0, 1, 3, 4, 5], 55
Exploration
avg = 0.000498119498626
p = 0.000711538461538
Ant 8 : [2, 3, 4, 5, 1], 71
Exploitation
Ant 9 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.000670619306821
p = 0.000841750841742
Ant 10 : [3, 4, 5, 2, 1], 72
Exploitation
Ant 11 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.00185
Ant 2 : [4, 5, 3, 2, 1, 0], 84
Update called by 2Exploitation

Ant thread 2 terminating.Ant 12 : [3, 4, 5, 2, 1], 72

Exploitation
Ant 13 : [2, 3, 4, 5, 1], 71
Exploitation
Ant 3 : [3, 4, 5, 2, 1, 0], 82
```

Update called by 3Exploitation

Ant thread 3 terminating.Ant 14 : [4, 5, 3, 2, 1], 74

Exploration
avg = 0.000498475623626
p = 0.000712250711538
Ant 15 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.000670619306825
p = 0.000841750841751
Ant 16 : [4, 5, 3, 2, 1], 74
Exploitation
Ant 17 : [2, 3, 4, 5, 1], 71
Exploitation
Ant 4 : [5, 4, 3, 2, 1, 0], 77
Update called by 4Exploration

Ant thread 4 terminating.avg = 0.000670619306825

p = 0.000841750841751
Ant 18 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.000670619306825
p = 0.000841750841751
Ant 19 : [5, 4, 3, 2, 1], 67
Exploration
avg = 0.00185185185
Ant 5 : [3, 4, 5, 2, 1, 0], 82
Update called by 5Exploitation

Ant thread 5 terminating.Ant 6 : [2, 3, 4, 5, 1, 0], 81

Update called by 6Exploitation

Ant thread 6 terminating.Ant 7 : [0, 1, 3, 4, 5, 2], 78

Update called by 7Exploration

Ant thread 7 terminating.avg = 0.00185185185185

Ant 8 : [2, 3, 4, 5, 1, 0], 81
Update called by 8Exploration

Ant thread 8 terminating.avg = 0.00185185185185

Ant 9 : [2, 3, 4, 5, 1, 0], 81
Update called by 9Exploration

Ant thread 9 terminating.avg = 0.00185185185185

Ant 10 : [3, 4, 5, 2, 1, 0], 82
Update called by 10Exploration

Ant thread 10 terminating.avg = 0.00185185185185

Ant 11 : [4, 5, 3, 2, 1, 0], 84
Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [3, 4, 5, 2, 1, 0], 82

Update called by 12Exploration

Ant thread 12 terminating.avg = 0.00185185185185

Ant 13 : [2, 3, 4, 5, 1, 0], 81
Update called by 13Exploration

Ant thread 13 terminating.avg = 0.00185185185185

Ant 14 : [4, 5, 3, 2, 1, 0], 84
Update called by 14Exploration

Ant thread 14 terminating.avg = 0.00185185185185

Ant 15 : [2, 3, 4, 5, 1, 0], 81
Update called by 15Exploration

Ant thread 15 terminating.avg = 0.00185185185185

Ant 16 : [4, 5, 3, 2, 1, 0], 84
Update called by 16Exploitation

Ant thread 16 terminating.Ant 17 : [2, 3, 4, 5, 1, 0], 81

Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [4, 5, 3, 2, 1, 0], 84

Update called by 18Exploitation

Ant thread 18 terminating.Ant 19 : [5, 4, 3, 2, 1, 0], 77

Update called by 19
Best: [4, 5, 3, 2, 1, 0], 104, 9, 108
Ant thread 19 terminating.iter_counter = 10

starting ant = 0
Explorationstarting ant = 1

avg = 0.000649988821857starting ant = 2

p = 0.00166349986378starting ant = 3

p = 0.000833324999986starting ant = 4

Ant 0 : [0, 4], 20starting ant = 5

Exploitationstarting ant = 6

Ant 1 : [1, 0], 10starting ant = 7

Explorationstarting ant = 8

avg = 0.000662802683924starting ant = 9

p = 0.001111099999starting ant = 10

p = 0.00138888888889starting ant = 11

Ant 2 : [4, 5], 12starting ant = 12

Exploitationstarting ant = 13

Ant 3 : [3, 4], 15starting ant = 14

Exploitationstarting ant = 15

Ant 4 : [5, 4], 12starting ant = 16

Exploitationstarting ant = 17

Ant 0 : [0, 4, 5], 32starting ant = 18

Explorationstarting ant = 19

avg = 0.000631845879671
p = 0.000925925925926
p = 0.00123333333333
Ant 5 : [3, 4], 15
Exploitation
Ant 6 : [2, 3], 18
Exploration
avg = 0.000419529790545
p = 0.000924999916667
Ant 1 : [1, 0, 4], 30
Exploitation
Ant 7 : [0, 1], 10
Exploitation
Ant 8 : [2, 3], 18
Exploitation
Ant 9 : [2, 3], 18
Exploitation
Ant 10 : [3, 4], 15
Exploitation
Ant 11 : [4, 5], 12
Exploration
avg = 0.000594867390474
p = 0.000641025641026
p = 0.000724637681152
p = 0.000757575757576
Ant 2 : [4, 5, 3], 34

Exploitation
Ant 12 : [3, 4], 15
Exploitation
Ant 13 : [2, 3], 18
Exploration
avg = 0.000589308563488
p = 0.00154320972222
Ant 3 : [3, 4, 5], 27
Exploration
avg = 0.000693666881146
p = 0.001111099999
p = 0.001543209875
Ant 14 : [4, 5], 12
Exploration
avg = 0.000564758923144
p = 0.000757575757576
p = 0.00102880658333
Ant 15 : [2, 3], 18
Exploration
avg = 0.000481281132683
p = 0.001111099999
Ant 4 : [5, 4, 3], 27
Exploitation
Ant 16 : [4, 5], 12
Exploitation
Ant 17 : [2, 3], 18
Exploration
avg = 0.000735524137696
p = 0.000840909090909
Ant 0 : [0, 4, 5, 3], 54
Exploration
avg = 0.000718113526097
p = 0.00123333322221
p = 0.00154320987654
Ant 18 : [4, 5], 12
Exploration
avg = 0.000801060551266
p = 0.000841742424242
p = 0.00154166652777
Ant 19 : [5, 4], 12
Exploitation
Ant 5 : [3, 4, 5], 27
Exploitation
Ant 6 : [2, 3, 4], 33
Exploitation
Ant 1 : [1, 0, 4, 5], 42
Exploration
avg = 0.000426395011344
p = 0.000924166665917
Ant 7 : [0, 1, 3], 28
Exploitation
Ant 8 : [2, 3, 4], 33
Exploration
avg = 0.000558634510083

```
p = 0.00123456790123
Ant 9 : [2, 3, 4], 33
Exploitation
Ant 10 : [3, 4, 5], 27
Exploration
avg = 0.000615909057141
p = 0.000641025641026
p = 0.000724637681152
p = 0.000841742424242
Ant 11 : [4, 5, 3], 34
Exploitation
Ant 2 : [4, 5, 3, 2], 52
Exploration
avg = 0.000589308602068
p = 0.00154320987654
Ant 12 : [3, 4, 5], 27
Exploration
avg = 0.000558634510083
p = 0.00123456790123
Ant 13 : [2, 3, 4], 33
Exploration
avg = 0.000540631268107
p = 0.000641025641026
p = 0.000724637681152
Ant 3 : [3, 4, 5, 2], 50
Exploitation
Ant 14 : [4, 5, 3], 34
Exploitation
Ant 15 : [2, 3, 4], 33
Exploitation
Ant 4 : [5, 4, 3, 2], 45
Exploitation
Ant 16 : [4, 5, 3], 34
Exploration
avg = 0.000558634510083
p = 0.00123456790123
Ant 17 : [2, 3, 4], 33
Exploration
avg = 0.000735610464398
p = 0.0010287962963
Ant 0 : [0, 4, 5, 3, 2], 72
Exploitation
Ant 18 : [4, 5, 3], 34
Exploitation
Ant 19 : [5, 4, 3], 27
Exploitation
Ant 5 : [3, 4, 5, 2], 50
Exploitation
Ant 6 : [2, 3, 4, 5], 45
Exploitation
Ant 1 : [1, 0, 4, 5, 3], 64
Exploration
avg = 0.000863161968481
p = 0.00102880648148
```

```
p = 0.00123456790123
Ant 7 : [0, 1, 3, 4], 43
Exploitation
Ant 8 : [2, 3, 4, 5], 45
Exploration
avg = 0.000693764629681
p = 0.00154320987654
Ant 9 : [2, 3, 4, 5], 45
Exploration
avg = 0.000567467016902
p = 0.000641025641026
p = 0.000805144927536
Ant 10 : [3, 4, 5, 2], 50
Exploration
avg = 0.000567555032617
p = 0.00102880648148
Ant 11 : [4, 5, 3, 2], 52
Exploitation
Ant 2 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.000567469673906
p = 0.000641025641026
p = 0.000805152898551
Ant 12 : [3, 4, 5, 2], 50
Exploitation
Ant 13 : [2, 3, 4, 5], 45
Exploration
avg = 0.000645224042809
p = 0.000840909090909
Ant 3 : [3, 4, 5, 2, 1], 72
Exploration
avg = 0.000567555066568
p = 0.00102880658333
Ant 14 : [4, 5, 3, 2], 52
Exploitation
Ant 15 : [2, 3, 4, 5], 45
Exploration
avg = 0.000645640709476
p = 0.000841742424242
Ant 4 : [5, 4, 3, 2, 1], 67
Exploration
avg = 0.000567555066908
p = 0.00102880658435
Ant 16 : [4, 5, 3, 2], 52
Exploitation
Ant 17 : [2, 3, 4, 5], 45
Exploitation
Ant 0 : [0, 4, 5, 3, 2, 1], 94
Update called by 0Exploitation

Ant thread 0 terminating.Ant 18 : [4, 5, 3, 2], 52

Exploitation
Ant 19 : [5, 4, 3, 2], 45
```

```
Exploration
avg = 0.000645644917809
p = 0.000841750840909
Ant 5 : [3, 4, 5, 2, 1], 72
Exploitation
Ant 6 : [2, 3, 4, 5, 1], 71
Exploitation
Ant 1 : [1, 0, 4, 5, 3, 2], 82
Update called by 1Exploitation

Ant thread 1 terminating.Ant 7 : [0, 1, 3, 4, 5], 55

Exploration
avg = 0.000483884471841
p = 0.000711538461538
Ant 8 : [2, 3, 4, 5, 1], 71
Exploitation
Ant 9 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.000645644918226
p = 0.000841750841742
Ant 10 : [3, 4, 5, 2, 1], 72
Exploitation
Ant 11 : [4, 5, 3, 2, 1], 74
Exploitation
Ant 2 : [4, 5, 3, 2, 1, 0], 84
Update called by 2Exploration

Ant thread 2 terminating.avg = 0.00064564491823

p = 0.000841750841751
Ant 12 : [3, 4, 5, 2, 1], 72
Exploration
avg = 0.000484240561584
p = 0.000712250641026
Ant 13 : [2, 3, 4, 5, 1], 71
Exploitation
Ant 3 : [3, 4, 5, 2, 1, 0], 82
Update called by 3Exploitation

Ant thread 3 terminating.Ant 14 : [4, 5, 3, 2, 1], 74

Exploitation
Ant 15 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.00185185166667
Ant 4 : [5, 4, 3, 2, 1, 0], 77
Update called by 4Exploration

Ant thread 4 terminating.avg = 0.00064564491823

p = 0.000841750841751
Ant 16 : [4, 5, 3, 2, 1], 74
Exploitation
```

```
Ant 17 : [2, 3, 4, 5, 1], 71
Exploitation
Ant 18 : [4, 5, 3, 2, 1], 74
Exploitation
Ant 19 : [5, 4, 3, 2, 1], 67
Exploration
avg = 0.00185185185
Ant 5 : [3, 4, 5, 2, 1, 0], 82
Update called by 5Exploration

Ant thread 5 terminating.avg = 0.00185185185183

Ant 6 : [2, 3, 4, 5, 1, 0], 81
Update called by 6Exploration

Ant thread 6 terminating.avg = 0.000805152978261

Ant 7 : [0, 1, 3, 4, 5, 2], 78
Update called by 7Exploration

Ant thread 7 terminating.avg = 0.00185185185185

Ant 8 : [2, 3, 4, 5, 1, 0], 81
Update called by 8Exploration

Ant thread 8 terminating.avg = 0.00185185185185

Ant 9 : [2, 3, 4, 5, 1, 0], 81
Update called by 9Exploration

Ant thread 9 terminating.avg = 0.00185185185185

Ant 10 : [3, 4, 5, 2, 1, 0], 82
Update called by 10Exploration

Ant thread 10 terminating.avg = 0.00185185185185

Ant 11 : [4, 5, 3, 2, 1, 0], 84
Update called by 11Exploration

Ant thread 11 terminating.avg = 0.00185185185185

Ant 12 : [3, 4, 5, 2, 1, 0], 82
Update called by 12Exploration

Ant thread 12 terminating.avg = 0.00185185185185

Ant 13 : [2, 3, 4, 5, 1, 0], 81
Update called by 13Exploration

Ant thread 13 terminating.avg = 0.00185185185185

Ant 14 : [4, 5, 3, 2, 1, 0], 84
Update called by 14Exploitation
```

Ant thread 14 terminating.Ant 15 : [2, 3, 4, 5, 1, 0], 81

Update called by 15Exploration

Ant thread 15 terminating.avg = 0.00185185185185

Ant 16 : [4, 5, 3, 2, 1, 0], 84
Update called by 16Exploration

Ant thread 16 terminating.avg = 0.00185185185185

Ant 17 : [2, 3, 4, 5, 1, 0], 81
Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [4, 5, 3, 2, 1, 0], 84

Update called by 18Exploitation

Ant thread 18 terminating.Ant 19 : [5, 4, 3, 2, 1, 0], 77

Update called by 19
Best: [4, 5, 3, 2, 1, 0], 104, 10, 108
Ant thread 19 terminating.iter_counter = 11

starting ant = 0
Exploitationstarting ant = 1

Ant 0 : [0, 1], 10starting ant = 2

Exploitationstarting ant = 3

Ant 1 : [1, 0], 10starting ant = 4

Explorationstarting ant = 5

avg = 0.000407064052043starting ant = 6

p = 0.00092498416666starting ant = 7

Ant 0 : [0, 1, 3], 28starting ant = 8

Exploitationstarting ant = 9

Ant 2 : [4, 5], 12starting ant = 10

Exploitationstarting ant = 11

Ant 3 : [3, 4], 15starting ant = 12

Explorationstarting ant = 13

avg = 0.000377783080053starting ant = 14

p = 0.00083332499925starting ant = 15

Ant 1 : [1, 0, 4], 30starting ant = 16

Explorationstarting ant = 17

avg = 0.000748544302486starting ant = 18

p = 0.000757575757576starting ant = 19

p = 0.00138887499875
Ant 4 : [5, 4], 12
Exploration
avg = 0.00061184647689
p = 0.000925925925926
p = 0.00123333333333
Ant 5 : [3, 4], 15
Exploitation
Ant 6 : [2, 3], 18
Exploration
avg = 0.000690558057189
p = 0.00184998304832
p = 0.000924999916659
Ant 7 : [0, 4], 20
Exploitation
Ant 0 : [0, 1, 3, 4], 43
Exploitation
Ant 8 : [2, 3], 18
Exploitation
Ant 9 : [2, 3], 18
Exploitation
Ant 2 : [4, 5, 3], 34
Exploitation
Ant 10 : [3, 4], 15
Exploitation
Ant 11 : [4, 5], 12
Exploitation
Ant 3 : [3, 4, 5], 27
Exploration
avg = 0.000612093390223
p = 0.000925925925926
p = 0.0012345679
Ant 12 : [3, 4], 15
Exploration
avg = 0.000544010657277
p = 0.000757575757576
p = 0.00102880648148
Ant 13 : [2, 3], 18
Exploitation
Ant 14 : [4, 5], 12
Exploration
avg = 0.000544010677648
p = 0.000757575757576
p = 0.00102880658333

```
Ant 15 : [2, 3], 18
Exploitation
Ant 1 : [1, 0, 4, 5], 42
Exploration
avg = 0.000677386390817
p = 0.001111099999
p = 0.00154320987653
Ant 16 : [4, 5], 12
Exploitation
Ant 17 : [2, 3], 18
Exploration
avg = 0.00067738639082
p = 0.001111099999
p = 0.00154320987654
Ant 18 : [4, 5], 12
Exploitation
Ant 19 : [5, 4], 12
Exploration
avg = 0.000460930519389
p = 0.001111099999
Ant 4 : [5, 4, 3], 27
Exploration
avg = 0.000568957988775
p = 0.00154320987654
Ant 5 : [3, 4, 5], 27
Exploitation
Ant 6 : [2, 3, 4], 33
Exploitation
Ant 7 : [0, 4, 5], 32
Exploitation
Ant 0 : [0, 1, 3, 4, 5], 55
Exploration
avg = 0.000533635256606
p = 0.00123456790123
Ant 8 : [2, 3, 4], 33
Exploration
avg = 0.000533635256606
p = 0.00123456790123
Ant 9 : [2, 3, 4], 33
Exploration
avg = 0.00051079956022
p = 0.000925925925926
Ant 2 : [4, 5, 3, 2], 52
Exploitation
Ant 10 : [3, 4, 5], 27
Exploration
avg = 0.000609294961754
p = 0.000641025641026
p = 0.000724637681152
p = 0.000840909090909
Ant 11 : [4, 5, 3], 34
Exploration
avg = 0.000532090252035
p = 0.000641025641026
```

```
p = 0.000724637681152
Ant 3 : [3, 4, 5, 2], 50
Exploration
avg = 0.000568957988775
p = 0.00154320987654
Ant 12 : [3, 4, 5], 27
Exploration
avg = 0.000533635256606
p = 0.00123456790123
Ant 13 : [2, 3, 4], 33
Exploration
avg = 0.000629430831321
p = 0.000641025641026
p = 0.000804347826087
p = 0.000841742424242
Ant 14 : [4, 5, 3], 34
Exploration
avg = 0.000533635256606
p = 0.00123456790123
Ant 15 : [2, 3, 4], 33
Exploration
avg = 0.000823049291831
p = 0.000841750757576
Ant 1 : [1, 0, 4, 5, 3], 64
Exploration
avg = 0.000629432935488
p = 0.000641025641026
p = 0.000804347826087
p = 0.000841750840909
Ant 16 : [4, 5, 3], 34
Exploration
avg = 0.000533635256606
p = 0.00123456790123
Ant 17 : [2, 3, 4], 33
Exploitation
Ant 18 : [4, 5, 3], 34
Exploitation
Ant 19 : [5, 4, 3], 27
Exploitation
Ant 4 : [5, 4, 3, 2], 45
Exploitation
Ant 5 : [3, 4, 5, 2], 50
Exploration
avg = 0.000675828495931
p = 0.00154320987654
Ant 6 : [2, 3, 4, 5], 45
Exploration
avg = 0.000762640470104
p = 0.000805144927536
p = 0.000841750841751
Ant 7 : [0, 4, 5, 3], 54
Exploration
avg = 0.000805144927536
Ant 0 : [0, 1, 3, 4, 5, 2], 78
```

ExplorationUpdate called by 0

avg = 0.000675828495931Ant thread 0 terminating.

p = 0.00154320987654
Ant 8 : [2, 3, 4, 5], 45
Exploration
avg = 0.000675828495931
p = 0.00154320987654
Ant 9 : [2, 3, 4, 5], 45
Exploration
avg = 0.000581080426407
p = 0.000757575757576
Ant 2 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.000558928657835
p = 0.000641025641026
p = 0.000805152898551
Ant 10 : [3, 4, 5, 2], 50
Exploration
avg = 0.000545089683677
p = 0.0010287962963
Ant 11 : [4, 5, 3, 2], 52
Exploitation
Ant 3 : [3, 4, 5, 2, 1], 72
Exploitation
Ant 12 : [3, 4, 5, 2], 50
Exploitation
Ant 13 : [2, 3, 4, 5], 45
Exploration
avg = 0.000545093078738
p = 0.00102880648148
Ant 14 : [4, 5, 3, 2], 52
Exploitation
Ant 15 : [2, 3, 4, 5], 45
Exploration
avg = 0.00102880658333
Ant 1 : [1, 0, 4, 5, 3, 2], 82
Update called by 1Exploitation

Ant thread 1 terminating.Ant 16 : [4, 5, 3, 2], 52

Exploration
avg = 0.000675828495931
p = 0.00154320987654
Ant 17 : [2, 3, 4, 5], 45
Exploration
avg = 0.000545093113032
p = 0.00102880658436
Ant 18 : [4, 5, 3, 2], 52
Exploitation
Ant 19 : [5, 4, 3, 2], 45
Exploitation
Ant 4 : [5, 4, 3, 2, 1], 67

```
Exploitation
Ant 5 : [3, 4, 5, 2, 1], 72
Exploitation
Ant 6 : [2, 3, 4, 5, 1], 71
Exploitation
Ant 7 : [0, 4, 5, 3, 2], 72
Exploitation
Ant 8 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.000471425511836
p = 0.000712243589744
Ant 9 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.00185
Ant 2 : [4, 5, 3, 2, 1, 0], 84
Update called by 2Exploration

Ant thread 2 terminating.avg = 0.000623167968074

p = 0.000841750840909
Ant 10 : [3, 4, 5, 2, 1], 72
Exploitation
Ant 11 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.00185183333333
Ant 3 : [3, 4, 5, 2, 1, 0], 82
ExplorationUpdate called by 3

avg = 0.000623167968495Ant thread 3 terminating.

p = 0.000841750841751
Ant 12 : [3, 4, 5, 2, 1], 72
Exploitation
Ant 13 : [2, 3, 4, 5, 1], 71
Exploitation
Ant 14 : [4, 5, 3, 2, 1], 74
Exploitation
Ant 15 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.000623167968495
p = 0.000841750841751
Ant 16 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.000471429073086
p = 0.000712250712244
Ant 17 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.000623167968495
p = 0.000841750841751
Ant 18 : [4, 5, 3, 2, 1], 74
Exploitation
Ant 19 : [5, 4, 3, 2, 1], 67
Exploitation
Ant 4 : [5, 4, 3, 2, 1, 0], 77
```

Update called by 4Exploitation

Ant thread 4 terminating.Ant 5 : [3, 4, 5, 2, 1, 0], 82

Update called by 5Exploration

Ant thread 5 terminating.avg = 0.00185185185183

Ant 6 : [2, 3, 4, 5, 1, 0], 81
Update called by 6Exploration

Ant thread 6 terminating.avg = 0.000841750841751

Ant 7 : [0, 4, 5, 3, 2, 1], 94
Update called by 7Exploration

Ant thread 7 terminating.avg = 0.00185185185185

Ant 8 : [2, 3, 4, 5, 1, 0], 81
Update called by 8Exploitation

Ant thread 8 terminating.Ant 9 : [2, 3, 4, 5, 1, 0], 81

Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [3, 4, 5, 2, 1, 0], 82

Update called by 10Exploration

Ant thread 10 terminating.avg = 0.00185185185185

Ant 11 : [4, 5, 3, 2, 1, 0], 84
Update called by 11Exploration

Ant thread 11 terminating.avg = 0.00185185185185

Ant 12 : [3, 4, 5, 2, 1, 0], 82
Update called by 12Exploration

Ant thread 12 terminating.avg = 0.00185185185185

Ant 13 : [2, 3, 4, 5, 1, 0], 81
Update called by 13Exploitation

Ant thread 13 terminating.Ant 14 : [4, 5, 3, 2, 1, 0], 84

ExplorationUpdate called by 14

avg = 0.00185185185185Ant thread 14 terminating.

Ant 15 : [2, 3, 4, 5, 1, 0], 81
Update called by 15Exploration

Ant thread 15 terminating.avg = 0.00185185185185

```
Ant 16 : [4, 5, 3, 2, 1, 0], 84
Update called by 16Exploration

Ant thread 16 terminating.avg = 0.00185185185185

Ant 17 : [2, 3, 4, 5, 1, 0], 81
Update called by 17Exploration

Ant thread 17 terminating.avg = 0.00185185185185

Ant 18 : [4, 5, 3, 2, 1, 0], 84
Update called by 18Exploitation

Ant thread 18 terminating.Ant 19 : [5, 4, 3, 2, 1, 0], 77

Update called by 19
Best: [4, 5, 3, 2, 1, 0], 104, 11, 108
Ant thread 19 terminating.iter_counter = 12

starting ant = 0
Explorationstarting ant = 1

avg = 0.000621667266321starting ant = 2

p = 0.00166498474349starting ant = 3

p = 0.00083332499925starting ant = 4

Ant 0 : [0, 4], 20starting ant = 5

Exploitationstarting ant = 6

Ant 1 : [1, 0], 10starting ant = 7

Explorationstarting ant = 8

avg = 0.000631869751718starting ant = 9

p = 0.001111099999starting ant = 10

p = 0.00138888888889starting ant = 11

Ant 2 : [4, 5], 12starting ant = 12

Explorationstarting ant = 13

avg = 0.000569402569941starting ant = 14

p = 0.000925925925926starting ant = 15

p = 0.00111111111111starting ant = 16

Ant 3 : [3, 4], 15starting ant = 17
```

```
Explorationstarting ant = 18

avg = 0.000743932153808starting ant = 19

p = 0.000757575757576
p = 0.00138887499875
Ant 4 : [5, 4], 12
Exploitation
Ant 0 : [0, 4, 5], 32
Exploitation
Ant 5 : [3, 4], 15
Exploration
avg = 0.00050476112522
p = 0.000757575757576
p = 0.000925925925926
Ant 6 : [2, 3], 18
Exploration
avg = 0.000383756626381
p = 0.000924999916659
Ant 1 : [1, 0, 4], 30
Exploitation
Ant 7 : [0, 1], 10
Exploitation
Ant 8 : [2, 3], 18
Exploration
avg = 0.000525335199294
p = 0.000757575757576
p = 0.0010287962963
Ant 9 : [2, 3], 18
Exploration
avg = 0.00059409145883
p = 0.000925925925926
p = 0.00123455555556
Ant 10 : [3, 4], 15
Exploration
avg = 0.000662730862829
p = 0.001111099999
p = 0.00154319444444
Ant 11 : [4, 5], 12
Exploration
avg = 0.000582696442572
p = 0.000641025641026
p = 0.000724637681152
p = 0.000757575757576
Ant 2 : [4, 5, 3], 34
Exploration
avg = 0.000594093903275
p = 0.000925925925926
p = 0.00123456777778
Ant 12 : [3, 4], 15
Exploitation
Ant 13 : [2, 3], 18
Exploration
```

```
avg = 0.000662733918385
p = 0.001111099999
p = 0.00154320972222
Ant 14 : [4, 5], 12
Exploitation
Ant 15 : [2, 3], 18
Exploration
avg = 0.00066273394894
p = 0.001111099999
p = 0.001543209875
Ant 16 : [4, 5], 12
Exploitation
Ant 3 : [3, 4, 5], 27
Exploitation
Ant 17 : [2, 3], 18
Exploration
avg = 0.000662733949249
p = 0.001111099999
p = 0.00154320987654
Ant 18 : [4, 5], 12
Exploration
avg = 0.000791157126278
p = 0.000840909090909
p = 0.00154166652777
Ant 19 : [5, 4], 12
Exploration
avg = 0.000442614967425
p = 0.001111099999
Ant 4 : [5, 4, 3], 27
Exploitation
Ant 0 : [0, 4, 5, 3], 54
Exploration
avg = 0.000550642436811
p = 0.00154320987654
Ant 5 : [3, 4, 5], 27
Exploitation
Ant 6 : [2, 3, 4], 33
Exploration
avg = 0.0010000183644
p = 0.00123333322221
p = 0.00154320987654
Ant 1 : [1, 0, 4, 5], 42
Exploitation
Ant 7 : [0, 1, 3], 28
Exploration
avg = 0.000511135928473
p = 0.00123456790122
Ant 8 : [2, 3, 4], 33
Exploitation
Ant 9 : [2, 3, 4], 33
Exploration
avg = 0.000550642436811
p = 0.00154320987654
Ant 10 : [3, 4, 5], 27
```

```
Exploitation
Ant 11 : [4, 5, 3], 34
Exploitation
Ant 2 : [4, 5, 3, 2], 52
Exploitation
Ant 12 : [3, 4, 5], 27
Exploration
avg = 0.000511135928476
p = 0.00123456790123
Ant 13 : [2, 3, 4], 33
Exploitation
Ant 14 : [4, 5, 3], 34
Exploitation
Ant 15 : [2, 3, 4], 33
Exploitation
Ant 16 : [4, 5, 3], 34
Exploration
avg = 0.000524403337571
p = 0.000641025641026
p = 0.000724637681152
Ant 3 : [3, 4, 5, 2], 50
Exploitation
Ant 17 : [2, 3, 4], 33
Exploitation
Ant 18 : [4, 5, 3], 34
Exploitation
Ant 19 : [5, 4, 3], 27
Exploitation
Ant 4 : [5, 4, 3, 2], 45
Exploration
avg = 0.000693580124311
p = 0.0010287962963
Ant 0 : [0, 4, 5, 3, 2], 72
Exploitation
Ant 5 : [3, 4, 5, 2], 50
Exploration
avg = 0.000659685975556
p = 0.00154320987654
Ant 6 : [2, 3, 4, 5], 45
Exploitation
Ant 1 : [1, 0, 4, 5, 3], 64
Exploration
avg = 0.000842508238708
p = 0.00102880648148
p = 0.00123456790123
Ant 7 : [0, 1, 3, 4], 43
Exploitation
Ant 8 : [2, 3, 4, 5], 45
Exploitation
Ant 9 : [2, 3, 4, 5], 45
Exploration
avg = 0.000551239086366
p = 0.000641025641026
p = 0.000805144927536
```

```
Ant 10 : [3, 4, 5, 2], 50
Exploration
avg = 0.000524877320247
p = 0.00102880648148
Ant 11 : [4, 5, 3, 2], 52
Exploration
avg = 0.000560851171645
p = 0.000757575757576
Ant 2 : [4, 5, 3, 2, 1], 74
Exploitation
Ant 12 : [3, 4, 5, 2], 50
Exploration
avg = 0.000659685975556
p = 0.00154320987654
Ant 13 : [2, 3, 4, 5], 45
Exploration
avg = 0.000524877354198
p = 0.00102880658333
Ant 14 : [4, 5, 3, 2], 52
Exploitation
Ant 15 : [2, 3, 4, 5], 45
Exploitation
Ant 16 : [4, 5, 3, 2], 52
Exploration
avg = 0.000602517838312
p = 0.000840909090909
Ant 3 : [3, 4, 5, 2, 1], 72
Exploitation
Ant 17 : [2, 3, 4, 5], 45
Exploration
avg = 0.000524877354541
p = 0.00102880658436
Ant 18 : [4, 5, 3, 2], 52
Exploitation
Ant 19 : [5, 4, 3, 2], 45
Exploitation
Ant 4 : [5, 4, 3, 2, 1], 67
Exploration
avg = 0.000841750757576
Ant 0 : [0, 4, 5, 3, 2, 1], 94
Update called by 0Exploitation

Ant thread 0 terminating.Ant 5 : [3, 4, 5, 2, 1], 72

Exploration
avg = 0.000424286165781
p = 0.000641025641026
Ant 6 : [2, 3, 4, 5, 1], 71
Exploitation
Ant 1 : [1, 0, 4, 5, 3, 2], 82
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.00088336084856
```

p = 0.00154320987654
Ant 7 : [0, 1, 3, 4, 5], 55
Exploitation
Ant 8 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.00045989514014
p = 0.000712243589744
Ant 9 : [2, 3, 4, 5, 1], 71
Exploitation
Ant 10 : [3, 4, 5, 2, 1], 72
Exploitation
Ant 11 : [4, 5, 3, 2, 1], 74
Exploitation
Ant 2 : [4, 5, 3, 2, 1, 0], 84
Update called by 2Exploitation

Ant thread 2 terminating.Ant 12 : [3, 4, 5, 2, 1], 72

Exploration
avg = 0.000459898665781
p = 0.000712250641026
Ant 13 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.000602938713733
p = 0.000841750841751
Ant 14 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.000459898701037
p = 0.000712250711538
Ant 15 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.000602938713733
p = 0.000841750841751
Ant 16 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.00185183333333
Ant 3 : [3, 4, 5, 2, 1, 0], 82
Update called by 3Exploration

Ant thread 3 terminating.avg = 0.00045989870139

p = 0.000712250712244
Ant 17 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.000602938713733
p = 0.000841750841751
Ant 18 : [4, 5, 3, 2, 1], 74
Exploitation
Ant 19 : [5, 4, 3, 2, 1], 67
Exploration
avg = 0.00185185166667
Ant 4 : [5, 4, 3, 2, 1, 0], 77
Update called by 4Exploration

Ant thread 4 terminating.avg = 0.00185185185

Ant 5 : [3, 4, 5, 2, 1, 0], 82
Update called by 5Exploitation

Ant thread 5 terminating.Ant 6 : [2, 3, 4, 5, 1, 0], 81

Update called by 6Exploration

Ant thread 6 terminating.avg = 0.000805152978261

Ant 7 : [0, 1, 3, 4, 5, 2], 78
Update called by 7Exploration

Ant thread 7 terminating.avg = 0.00185185185185

Ant 8 : [2, 3, 4, 5, 1, 0], 81
Update called by 8Exploration

Ant thread 8 terminating.avg = 0.00185185185185

Ant 9 : [2, 3, 4, 5, 1, 0], 81
Update called by 9Exploration

Ant thread 9 terminating.avg = 0.00185185185185

Ant 10 : [3, 4, 5, 2, 1, 0], 82
Update called by 10Exploration

Ant thread 10 terminating.avg = 0.00185185185185

Ant 11 : [4, 5, 3, 2, 1, 0], 84
Update called by 11Exploration

Ant thread 11 terminating.avg = 0.00185185185185

Ant 12 : [3, 4, 5, 2, 1, 0], 82
Update called by 12Exploitation

Ant thread 12 terminating.Ant 13 : [2, 3, 4, 5, 1, 0], 81

Update called by 13Exploration

Ant thread 13 terminating.avg = 0.00185185185185

Ant 14 : [4, 5, 3, 2, 1, 0], 84
Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [2, 3, 4, 5, 1, 0], 81

Update called by 15Exploration

Ant thread 15 terminating.avg = 0.00185185185185

Ant 16 : [4, 5, 3, 2, 1, 0], 84
Update called by 16Exploitation

Ant thread 16 terminating.Ant 17 : [2, 3, 4, 5, 1, 0], 81

Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [4, 5, 3, 2, 1, 0], 84

Update called by 18Exploration

Ant thread 18 terminating.avg = 0.00185185185185

Ant 19 : [5, 4, 3, 2, 1, 0], 77
Update called by 19
Best: [4, 5, 3, 2, 1, 0], 104, 12, 108
Ant thread 19 terminating.

                        Results

Best path = [4, 5, 3, 2, 1, 0]
('E ',)
('F ',)
('D ',)
('C ',)
('B ',)
('A ',)

Best path cost = 104

>>>
 RESTART: C:\Users\teleuser\Documents\Kantor\Kuliah\Master\Semester
3\Perencanaan
Jaringan\Tugas\program\Python\tsp-atncolony\Python-Ant-Colony-TSP-Solver-master\
pickled.py
>>>
 RESTART: C:\Users\teleuser\Documents\Kantor\Kuliah\Master\Semester
3\Perencanaan
Jaringan\Tugas\program\Python\tsp-atncolony\Python-Ant-Colony-TSP-Solver-master\
anttsp.py
[[0, 10, 30, 31, 20, 28, 44], [10, 0, 22, 18, 40, 26, 37], [30, 22, 0, 18, 26,
23, 50], [31, 18, 18, 0, 15, 22, 42], [20, 40, 26, 15, 0, 12, 10], [28, 26, 23,
22, 12, 0, 16], [44, 37, 50, 42, 10, 16, 0]]
7
Average = 22
Tau0 = 0.012987012987
iter_counter = 1
starting ant = 0
Explorationstarting ant = 1

avg = 0.000630949494586starting ant = 2

```
p = 0.0012987012987starting ant = 3

p = 0.000721500721501starting ant = 4

Ant 0 : [1, 3], 18starting ant = 5

Explorationstarting ant = 6

avg = 0.000554250700355starting ant = 7

p = 0.0012987012987starting ant = 8

p = 0.000811688311688starting ant = 9

Ant 1 : [6, 5], 16starting ant = 10

Exploitationstarting ant = 11

Ant 2 : [6, 4], 10starting ant = 12

Explorationstarting ant = 13

avg = 0.000630949494586starting ant = 14

p = 0.0012987012987starting ant = 15

p = 0.000721500721501starting ant = 16

Ant 3 : [1, 3], 18starting ant = 17

Explorationstarting ant = 18

avg = 0.000604545263113starting ant = 19

p = 0.000721500721501
p = 0.000721500721501
p = 0.000865800865801
Ant 4 : [3, 4], 15
Exploitation
Ant 0 : [1, 3, 4], 33
Exploitation
Ant 5 : [4, 6], 10
Exploration
avg = 0.000630949494586
p = 0.0012987012987
p = 0.000721500721501
Ant 6 : [1, 3], 18
Exploitation
Ant 7 : [4, 6], 10
Exploitation
Ant 8 : [3, 4], 15
Exploitation
Ant 9 : [0, 1], 10
Exploration
```

```
avg = 0.00064010899697
p = 0.00108225108225
Ant 1 : [6, 5, 4], 28
Exploration
avg = 0.000668705549423
p = 0.00108225108225
p = 0.000811688311688
Ant 10 : [5, 6], 16
Exploration
avg = 0.000668705549423
p = 0.00108225108225
p = 0.000811688311688
Ant 11 : [5, 6], 16
Exploitation
Ant 2 : [6, 4, 5], 22
Exploration
avg = 0.000554250700355
p = 0.0012987012987
p = 0.000811688311688
Ant 12 : [6, 5], 16
Exploitation
Ant 13 : [4, 6], 10
Exploitation
Ant 14 : [4, 6], 10
Exploitation
Ant 15 : [4, 6], 10
Exploration
avg = 0.000786713286713
p = 0.000865800865801
p = 0.00108225108225
p = 0.0012987012987
Ant 16 : [4, 6], 10
Exploitation
Ant 3 : [1, 3, 4], 33
Exploration
avg = 0.000593144927037
p = 0.0012987012987
p = 0.000649350649351
Ant 17 : [0, 4], 20
Exploration
avg = 0.000593144927037
p = 0.0012987012987
p = 0.000649350649351
Ant 18 : [0, 4], 20
Exploration
avg = 0.000604545263113
p = 0.000721500721501
p = 0.000721500721501
p = 0.000865800865801
Ant 19 : [3, 4], 15
Exploration
avg = 0.000770895770896
p = 0.00108225108225
p = 0.0012987012987
```

```
Ant 4 : [3, 4, 6], 25
Exploration
avg = 0.000882450882451
p = 0.00108225108225
p = 0.0012987012987
Ant 0 : [1, 3, 4, 6], 43
Exploration
avg = 0.000405360580685
p = 0.000811688311688
Ant 5 : [4, 6, 5], 26
Exploration
avg = 0.000581154171435
p = 0.000721500721501
p = 0.000865800865801
p = 0.000590318772137
Ant 6 : [1, 3, 5], 40
Exploitation
Ant 7 : [4, 6, 5], 26
Exploitation
Ant 8 : [3, 4, 6], 25
Exploitation
Ant 9 : [0, 1, 3], 28
Exploration
avg = 0.000584831834832
p = 0.000649350649351
p = 0.000865800865801
Ant 1 : [6, 5, 4, 3], 43
Exploitation
Ant 10 : [5, 6, 4], 26
Exploitation
Ant 11 : [5, 6, 4], 26
Exploitation
Ant 2 : [6, 4, 5, 3], 44
Exploitation
Ant 12 : [6, 5, 4], 28
Exploration
avg = 0.000405360580685
p = 0.000811688311688
Ant 13 : [4, 6, 5], 26
Exploration
avg = 0.000405360580685
p = 0.000811688311688
Ant 14 : [4, 6, 5], 26
Exploitation
Ant 15 : [4, 6, 5], 26
Exploitation
Ant 16 : [4, 6, 5], 26
Exploration
avg = 0.000882450882451
p = 0.00108225108225
p = 0.0012987012987
Ant 3 : [1, 3, 4, 6], 43
Exploitation
Ant 17 : [0, 4, 6], 30
```

```
Exploitation
Ant 18 : [0, 4, 6], 30
Exploitation
Ant 19 : [3, 4, 6], 25
Exploration
avg = 0.000429397077124
p = 0.000811688311688
Ant 4 : [3, 4, 6, 5], 41
Exploration
avg = 0.000455529319166
p = 0.000811688311688
Ant 0 : [1, 3, 4, 6, 5], 59
Exploration
avg = 0.000529573475649
p = 0.000564652738566
p = 0.000590318772137
Ant 5 : [4, 6, 5, 3], 48
Exploitation
Ant 6 : [1, 3, 5, 4], 52
Exploitation
Ant 7 : [4, 6, 5, 3], 48
Exploration
avg = 0.000429397077124
p = 0.000811688311688
Ant 8 : [3, 4, 6, 5], 41
Exploration
avg = 0.000621708738592
p = 0.000721500721501
p = 0.000865800865801
Ant 9 : [0, 1, 3, 4], 43
Exploration
avg = 0.000620645781936
p = 0.000721500721501
p = 0.000721500721501
Ant 1 : [6, 5, 4, 3, 2], 61
Exploration
avg = 0.000584831834832
p = 0.000649350649351
p = 0.000865800865801
Ant 10 : [5, 6, 4, 3], 41
Exploration
avg = 0.000584831834832
p = 0.000649350649351
p = 0.000865800865801
Ant 11 : [5, 6, 4, 3], 41
Exploration
avg = 0.000620645781936
p = 0.000721500721501
p = 0.000721500721501
Ant 2 : [6, 4, 5, 3, 2], 62
Exploration
avg = 0.000584831834832
p = 0.000649350649351
p = 0.000865800865801
```

```
Ant 12 : [6, 5, 4, 3], 43
Exploration
avg = 0.000529573475649
p = 0.000564652738566
p = 0.000590318772137
Ant 13 : [4, 6, 5, 3], 48
Exploration
avg = 0.000529573475649
p = 0.000564652738566
p = 0.000590318772137
Ant 14 : [4, 6, 5, 3], 48
Exploration
avg = 0.000529573475649
p = 0.000564652738566
p = 0.000590318772137
Ant 15 : [4, 6, 5, 3], 48
Exploration
avg = 0.000529573475649
p = 0.000564652738566
p = 0.000590318772137
Ant 16 : [4, 6, 5, 3], 48
Exploitation
Ant 3 : [1, 3, 4, 6, 5], 59
Exploration
avg = 0.000432910879339
p = 0.000811688311688
Ant 17 : [0, 4, 6, 5], 46
Exploration
avg = 0.000432910879339
p = 0.000811688311688
Ant 18 : [0, 4, 6, 5], 46
Exploration
avg = 0.000429397077124
p = 0.000811688311688
Ant 19 : [3, 4, 6, 5], 41
Exploration
avg = 0.000509325043487
p = 0.000564652738566
Ant 4 : [3, 4, 6, 5, 2], 64
Exploration
avg = 0.00051423731548
p = 0.000564652738566
Ant 0 : [1, 3, 4, 6, 5, 2], 82
Exploitation
Ant 5 : [4, 6, 5, 3, 1], 66
Exploitation
Ant 6 : [1, 3, 5, 4, 6], 62
Exploration
avg = 0.000620645781936
p = 0.000721500721501
p = 0.000721500721501
Ant 7 : [4, 6, 5, 3, 2], 66
Exploitation
Ant 8 : [3, 4, 6, 5, 2], 64
```

```
Exploration
avg = 0.000960150960151
p = 0.00108225108225
p = 0.0012987012987
Ant 9 : [0, 1, 3, 4, 6], 53
Exploration
avg = 0.000511609602519
p = 0.000590318772137
Ant 1 : [6, 5, 4, 3, 2, 1], 83
Exploitation
Ant 10 : [5, 6, 4, 3, 1], 59
Exploitation
Ant 11 : [5, 6, 4, 3, 1], 59
Exploration
avg = 0.000511609602519
p = 0.000590318772137
Ant 2 : [6, 4, 5, 3, 2, 1], 84
Exploitation
Ant 12 : [6, 5, 4, 3, 1], 61
Exploration
avg = 0.000620645781936
p = 0.000721500721501
p = 0.000721500721501
Ant 13 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.000620645781936
p = 0.000721500721501
p = 0.000721500721501
Ant 14 : [4, 6, 5, 3, 2], 66
Exploitation
Ant 15 : [4, 6, 5, 3, 1], 66
Exploitation
Ant 16 : [4, 6, 5, 3, 1], 66
Exploration
avg = 0.00051423731548
p = 0.000564652738566
Ant 3 : [1, 3, 4, 6, 5, 2], 82
Exploration
avg = 0.000551490670068
p = 0.000564652738566
p = 0.000590318772137
Ant 17 : [0, 4, 6, 5, 3], 68
Exploration
avg = 0.000551490670068
p = 0.000564652738566
p = 0.000590318772137
Ant 18 : [0, 4, 6, 5, 3], 68
Exploitation
Ant 19 : [3, 4, 6, 5, 2], 64
Exploitation
Ant 4 : [3, 4, 6, 5, 2, 1], 86
Exploration
avg = 0.0004329004329
Ant 0 : [1, 3, 4, 6, 5, 2, 0], 112
```

ExplorationUpdate called by 0

avg = 0.000944510035419Ant thread 0 terminating.

p = 0.0012987012987
Ant 5 : [4, 6, 5, 3, 1, 0], 76
Exploration
avg = 0.000277449822904
p = 0.000295159386068
Ant 6 : [1, 3, 5, 4, 6, 0], 106
Exploitation
Ant 7 : [4, 6, 5, 3, 2, 1], 88
Exploration
avg = 0.000511609602519
p = 0.000590318772137
Ant 8 : [3, 4, 6, 5, 2, 1], 86
Exploitation
Ant 9 : [0, 1, 3, 4, 6, 5], 69
Exploration
avg = 0.0012987012987
Ant 1 : [6, 5, 4, 3, 2, 1, 0], 93
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.000944510035419

p = 0.0012987012987
Ant 10 : [5, 6, 4, 3, 1, 0], 69
Exploration
avg = 0.000944510035419
p = 0.0012987012987
Ant 11 : [5, 6, 4, 3, 1, 0], 69
Exploration
avg = 0.0012987012987
Ant 2 : [6, 4, 5, 3, 2, 1, 0], 94
Update called by 2Exploration

Ant thread 2 terminating.avg = 0.000944510035419

p = 0.0012987012987
Ant 12 : [6, 5, 4, 3, 1, 0], 71
Exploration
avg = 0.000511609602519
p = 0.000590318772137
Ant 13 : [4, 6, 5, 3, 2, 1], 88
Exploration
avg = 0.000511609602519
p = 0.000590318772137
Ant 14 : [4, 6, 5, 3, 2, 1], 88
Exploration
avg = 0.000944510035419
p = 0.0012987012987
Ant 15 : [4, 6, 5, 3, 1, 0], 76
Exploration
avg = 0.000944510035419

p = 0.0012987012987
Ant 16 : [4, 6, 5, 3, 1, 0], 76
Exploitation
Ant 3 : [1, 3, 4, 6, 5, 2, 0], 112
Update called by 3Exploration

Ant thread 3 terminating.avg = 0.000721500721501

Ant 17 : [0, 4, 6, 5, 3, 2], 86
Exploitation
Ant 18 : [0, 4, 6, 5, 3, 1], 86
Exploration
avg = 0.000511609602519
p = 0.000590318772137
Ant 19 : [3, 4, 6, 5, 2, 1], 86
Exploration
avg = 0.0012987012987
Ant 4 : [3, 4, 6, 5, 2, 1, 0], 96
Update called by 4Exploration

Ant thread 4 terminating.avg = 0.0004329004329

Ant 5 : [4, 6, 5, 3, 1, 0, 2], 106
Update called by 5Exploration

Ant thread 5 terminating.avg = 0.0004329004329

Ant 6 : [1, 3, 5, 4, 6, 0, 2], 136
Update called by 6Exploitation

Ant thread 6 terminating.Ant 7 : [4, 6, 5, 3, 2, 1, 0], 98

Update called by 7Exploitation

Ant thread 7 terminating.Ant 8 : [3, 4, 6, 5, 2, 1, 0], 96

Update called by 8Exploitation

Ant thread 8 terminating.Ant 9 : [0, 1, 3, 4, 6, 5, 2], 92

Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [5, 6, 4, 3, 1, 0, 2], 99

Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [5, 6, 4, 3, 1, 0, 2], 99

Update called by 11Exploration

Ant thread 11 terminating.avg = 0.0004329004329

Ant 12 : [6, 5, 4, 3, 1, 0, 2], 101
Update called by 12Exploration

```
Ant thread 12 terminating.avg = 0.0012987012987

Ant 13 : [4, 6, 5, 3, 2, 1, 0], 98
Update called by 13Exploitation

Ant thread 13 terminating.Ant 14 : [4, 6, 5, 3, 2, 1, 0], 98

Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [4, 6, 5, 3, 1, 0, 2], 106

Update called by 15Exploitation

Ant thread 15 terminating.Ant 16 : [4, 6, 5, 3, 1, 0, 2], 106

Update called by 16Exploitation

Ant thread 16 terminating.Ant 17 : [0, 4, 6, 5, 3, 2, 1], 108

Update called by 17Exploration

Ant thread 17 terminating.avg = 0.000590318772137

Ant 18 : [0, 4, 6, 5, 3, 1, 2], 108
Update called by 18Exploration

Ant thread 18 terminating.avg = 0.0012987012987

Ant 19 : [3, 4, 6, 5, 2, 1, 0], 96
Update called by 19
Best: [4, 6, 5, 3, 2, 1, 0], 118, 1, 129
Ant thread 19 terminating.iter_counter = 2

starting ant = 0
Explorationstarting ant = 1

avg = 0.000567854545127starting ant = 2

p = 0.00116883116883starting ant = 3

p = 0.000649350649351starting ant = 4

Ant 0 : [1, 3], 18starting ant = 5

Exploitationstarting ant = 6

Ant 1 : [6, 4], 10starting ant = 7

Explorationstarting ant = 8

avg = 0.000520254201748starting ant = 9

p = 0.0012974025974starting ant = 10
```

p = 0.000730519480519starting ant = 11

Ant 2 : [6, 5], 16starting ant = 12

Exploitationstarting ant = 13

Ant 3 : [1, 0], 10starting ant = 14

Exploitationstarting ant = 15

Ant 4 : [3, 4], 15starting ant = 16

Exploitationstarting ant = 17

Ant 0 : [1, 3, 4], 33starting ant = 18

Explorationstarting ant = 19

avg = 0.000708041958042
p = 0.000779220779221
p = 0.000974025974026
p = 0.00116883116883
Ant 5 : [4, 6], 10
Exploration
avg = 0.000601187878461
p = 0.0012974025974
p = 0.000720779220779
Ant 6 : [1, 3], 18
Exploitation
Ant 1 : [6, 4, 5], 22
Exploitation
Ant 7 : [4, 6], 10
Exploitation
Ant 8 : [3, 4], 15
Exploitation
Ant 9 : [0, 1], 10
Exploitation
Ant 10 : [5, 4], 12
Exploitation
Ant 11 : [5, 4], 12
Exploration
avg = 0.000597740954415
p = 0.00108224025974
Ant 2 : [6, 5, 4], 28
Exploration
avg = 0.000533647058891
p = 0.0012974025974
p = 0.000810876623377
Ant 12 : [6, 5], 16
Exploitation
Ant 13 : [4, 6], 10
Exploration
avg = 0.000406830287434

```
p = 0.000584415584416
p = 0.000417439703154
Ant 3 : [1, 0, 5], 38
Exploration
avg = 0.000747544100899
p = 0.000779220779221
p = 0.00108116883117
p = 0.00129870116883
Ant 14 : [4, 6], 10
Exploration
avg = 0.000747544122328
p = 0.000779220779221
p = 0.00108116883117
p = 0.0012987012974
Ant 15 : [4, 6], 10
Exploitation
Ant 4 : [3, 4, 6], 25
Exploitation
Ant 16 : [4, 6], 10
Exploitation
Ant 17 : [0, 1], 10
Exploitation
Ant 0 : [1, 3, 4, 6], 43
Exploitation
Ant 18 : [0, 1], 10
Exploration
avg = 0.000558520736801
p = 0.000649350649351
p = 0.000649350649351
p = 0.000865800779221
Ant 19 : [3, 4], 15
Exploration
avg = 0.000381056665474
p = 0.000811680194805
Ant 5 : [4, 6, 5], 26
Exploration
avg = 0.000540354771434
p = 0.000649350649351
p = 0.000865800864935
Ant 6 : [1, 3, 4], 33
Exploration
avg = 0.000476616128084
p = 0.000508187464709
p = 0.000531286894923
Ant 1 : [6, 4, 5, 3], 44
Exploration
avg = 0.000381058272617
p = 0.000811688230519
Ant 7 : [4, 6, 5], 26
Exploration
avg = 0.000741208791209
p = 0.00108116883117
p = 0.0012987012987
Ant 8 : [3, 4, 6], 25
```

```
Exploration
avg = 0.000462087791815
p = 0.000531286894923
p = 0.000721493506494
Ant 9 : [0, 1, 3], 28
Exploration
avg = 0.000680819180819
p = 0.000779220779221
p = 0.0012987012987
Ant 10 : [5, 4, 6], 22
Exploration
avg = 0.000680819180819
p = 0.000779220779221
p = 0.0012987012987
Ant 11 : [5, 4, 6], 22
Exploitation
Ant 2 : [6, 5, 4, 3], 43
Exploration
avg = 0.000609431408961
p = 0.00108225097403
Ant 12 : [6, 5, 4], 28
Exploration
avg = 0.000381058288688
p = 0.000811688310877
Ant 13 : [4, 6, 5], 26
Exploitation
Ant 3 : [1, 0, 5, 4], 50
Exploration
avg = 0.000381058288849
p = 0.00081168831168
Ant 14 : [4, 6, 5], 26
Exploitation
Ant 15 : [4, 6, 5], 26
Exploration
avg = 0.000406749577204
p = 0.000811688311688
Ant 4 : [3, 4, 6, 5], 41
Exploitation
Ant 16 : [4, 6, 5], 26
Exploration
avg = 0.000462089220386
p = 0.000531286894923
p = 0.000721500649351
Ant 17 : [0, 1, 3], 28
Exploration
avg = 0.000437032664305
p = 0.000811688311688
Ant 0 : [1, 3, 4, 6, 5], 59
Exploration
avg = 0.000462089234672
p = 0.000531286894923
p = 0.000721500720779
Ant 18 : [0, 1, 3], 28
Exploration
```

```
avg = 0.000741208791209
p = 0.00108116883117
p = 0.0012987012987
Ant 19 : [3, 4, 6], 25
Exploitation
Ant 5 : [4, 6, 5, 3], 48
Exploitation
Ant 6 : [1, 3, 4, 6], 43
Exploitation
Ant 1 : [6, 4, 5, 3, 1], 62
Exploitation
Ant 7 : [4, 6, 5, 3], 48
Exploration
avg = 0.000406749577204
p = 0.000811688311688
Ant 8 : [3, 4, 6, 5], 41
Exploitation
Ant 9 : [0, 1, 3, 4], 43
Exploration
avg = 0.000273400783141
p = 0.0003159003159
p = 0.000278293135436
Ant 10 : [5, 4, 6, 3], 64
Exploitation
Ant 11 : [5, 4, 6, 1], 59
Exploration
avg = 0.000582390727552
p = 0.000720779220779
p = 0.000649350649351
Ant 2 : [6, 5, 4, 3, 2], 61
Exploration
avg = 0.000547777222777
p = 0.000584415584416
p = 0.000864935064935
Ant 12 : [6, 5, 4, 3], 43
Exploitation
Ant 13 : [4, 6, 5, 3], 48
Exploration
avg = 0.000871347985348
p = 0.0012987012987
Ant 3 : [1, 0, 5, 4, 6], 60
Exploitation
Ant 14 : [4, 6, 5, 3], 48
Exploitation
Ant 15 : [4, 6, 5, 3], 48
Exploration
avg = 0.000458392539138
p = 0.000508187464709
Ant 4 : [3, 4, 6, 5, 2], 64
Exploitation
Ant 16 : [4, 6, 5, 3], 48
Exploitation
Ant 17 : [0, 1, 3, 4], 43
Exploitation
```

```
Ant 0 : [1, 3, 4, 6, 5, 2], 82
Exploration
avg = 0.000599040029235
p = 0.000720779220779
p = 0.000865800865801
Ant 18 : [0, 1, 3, 4], 43
Exploration
avg = 0.000415436835891
p = 0.000811688311688
Ant 19 : [3, 4, 6, 5], 41
Exploitation
Ant 5 : [4, 6, 5, 3, 1], 66
Exploration
avg = 0.000437032664305
p = 0.000811688311688
Ant 6 : [1, 3, 4, 6, 5], 59
Exploitation
Ant 1 : [6, 4, 5, 3, 1, 0], 72
Exploration
avg = 0.0006064383466
p = 0.000721493506494
p = 0.000720779220779
Ant 7 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.000477212414914
p = 0.000564647092038
Ant 8 : [3, 4, 6, 5, 2], 64
Exploration
avg = 0.00094314019314
p = 0.00108116883117
p = 0.0012987012987
Ant 9 : [0, 1, 3, 4, 6], 53
Exploration
avg = 0.000606676441838
p = 0.000721493506494
p = 0.000721493506494
Ant 10 : [5, 4, 6, 3, 2], 82
Exploration
avg = 0.000850491976035
p = 0.00129868831169
Ant 11 : [5, 4, 6, 1, 0], 69
Exploitation
Ant 2 : [6, 5, 4, 3, 2, 1], 83
Exploration
avg = 0.00060667882279
p = 0.000721493506494
p = 0.000721500649351
Ant 12 : [6, 5, 4, 3, 2], 61
Exploitation
Ant 13 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.00027133580705
p = 0.000308905380334
Ant 3 : [1, 0, 5, 4, 6, 3], 102
```

Exploitation
Ant 14 : [4, 6, 5, 3, 2], 66
Exploitation
Ant 15 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.000489669421488
p = 0.000589728453365
Ant 4 : [3, 4, 6, 5, 2, 1], 86
Exploitation
Ant 16 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.00094314019314
p = 0.00108116883117
p = 0.0012987012987
Ant 17 : [0, 1, 3, 4, 6], 53
Exploitation
Ant 0 : [1, 3, 4, 6, 5, 2, 0], 112
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.00094314019314

p = 0.00108116883117
p = 0.0012987012987
Ant 18 : [0, 1, 3, 4, 6], 53
Exploration
avg = 0.000477214278268
p = 0.000564652682101
Ant 19 : [3, 4, 6, 5, 2], 64
Exploration
avg = 0.000914994031877
p = 0.00129870116883
Ant 5 : [4, 6, 5, 3, 1, 0], 76
Exploration
avg = 0.000491046220578
p = 0.000564652738001
Ant 6 : [1, 3, 4, 6, 5, 2], 82
Exploration
avg = 0.00038961038961
Ant 1 : [6, 4, 5, 3, 1, 0, 2], 102
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.000511390200708

p = 0.000590312868949
Ant 7 : [4, 6, 5, 3, 2, 1], 88
Exploration
avg = 0.000511393122786
p = 0.000590318713105
Ant 8 : [3, 4, 6, 5, 2, 1], 86
Exploitation
Ant 9 : [0, 1, 3, 4, 6, 5], 69
Exploration
avg = 0.000511393152007
p = 0.000590318771547

```
Ant 10 : [5, 4, 6, 3, 2, 1], 104
Exploitation
Ant 11 : [5, 4, 6, 1, 0, 2], 99
Exploration
avg = 0.0012987012974
Ant 2 : [6, 5, 4, 3, 2, 1, 0], 93
Update called by 2Exploitation

Ant thread 2 terminating.Ant 12 : [6, 5, 4, 3, 2, 1], 83

Exploitation
Ant 13 : [4, 6, 5, 3, 2, 1], 88
Exploration
avg = 0.000721500721501
Ant 3 : [1, 0, 5, 4, 6, 3, 2], 120
Update called by 3Exploitation

Ant thread 3 terminating.Ant 14 : [4, 6, 5, 3, 2, 1], 88

Exploration
avg = 0.000511393152302
p = 0.000590318772137
Ant 15 : [4, 6, 5, 3, 2, 1], 88
Exploration
avg = 0.00129870129869
Ant 4 : [3, 4, 6, 5, 2, 1, 0], 96
Update called by 4Exploration

Ant thread 4 terminating.avg = 0.000511393152302

p = 0.000590318772137
Ant 16 : [4, 6, 5, 3, 2, 1], 88
Exploitation
Ant 17 : [0, 1, 3, 4, 6, 5], 69
Exploitation
Ant 18 : [0, 1, 3, 4, 6, 5], 69
Exploitation
Ant 19 : [3, 4, 6, 5, 2, 1], 86
Exploitation
Ant 5 : [4, 6, 5, 3, 1, 0, 2], 106
Update called by 5Exploration

Ant thread 5 terminating.avg = 0.000432467532468

Ant 6 : [1, 3, 4, 6, 5, 2, 0], 112
Update called by 6Exploitation

Ant thread 6 terminating.Ant 7 : [4, 6, 5, 3, 2, 1, 0], 98

Update called by 7Exploitation

Ant thread 7 terminating.Ant 8 : [3, 4, 6, 5, 2, 1, 0], 96

Update called by 8Exploitation
```

Ant thread 8 terminating.Ant 9 : [0, 1, 3, 4, 6, 5, 2], 92

Update called by 9Exploration

Ant thread 9 terminating.avg = 0.0012987012987

Ant 10 : [5, 4, 6, 3, 2, 1, 0], 114
Update called by 10Exploration

Ant thread 10 terminating.avg = 0.000649350649351

Ant 11 : [5, 4, 6, 1, 0, 2, 3], 117
Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [6, 5, 4, 3, 2, 1, 0], 93

Update called by 12Exploitation

Ant thread 12 terminating.Ant 13 : [4, 6, 5, 3, 2, 1, 0], 98

Update called by 13Exploitation

Ant thread 13 terminating.Ant 14 : [4, 6, 5, 3, 2, 1, 0], 98

Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [4, 6, 5, 3, 2, 1, 0], 98

Update called by 15Exploitation

Ant thread 15 terminating.Ant 16 : [4, 6, 5, 3, 2, 1, 0], 98

Update called by 16Exploitation

Ant thread 16 terminating.Ant 17 : [0, 1, 3, 4, 6, 5, 2], 92

Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [0, 1, 3, 4, 6, 5, 2], 92

ExploitationUpdate called by 18

Ant 19 : [3, 4, 6, 5, 2, 1, 0], 96Ant thread 18 terminating.

Update called by 19
Best: [4, 6, 5, 3, 2, 1, 0], 118, 2, 128
Ant thread 19 terminating.iter_counter = 3

starting ant = 0
Exploitationstarting ant = 1

Ant 0 : [1, 0], 10starting ant = 2

Exploitationstarting ant = 3

Ant 1 : [6, 4], 10starting ant = 4

Exploitationstarting ant = 5

Ant 0 : [1, 0, 4], 30starting ant = 6

Exploitationstarting ant = 7

Ant 2 : [6, 4], 10starting ant = 8

Explorationstarting ant = 9

avg = 0.000562800692345starting ant = 10

p = 0.0012974025974starting ant = 11

p = 0.000649350649344starting ant = 12

Ant 3 : [1, 3], 18starting ant = 13

Explorationstarting ant = 14

avg = 0.000589164275724starting ant = 15

p = 0.000779212987013starting ant = 16

p = 0.000973051948052starting ant = 17

Ant 1 : [6, 4, 5], 22starting ant = 18

Exploitationstarting ant = 19

Ant 4 : [3, 4], 15
Exploitation
Ant 5 : [4, 6], 10
Exploration
avg = 0.00089059251998
p = 0.00108115909091
p = 0.0012974025974
Ant 0 : [1, 0, 4, 6], 40
Exploitation
Ant 6 : [1, 0], 10
Exploration
avg = 0.000725436138861
p = 0.000779212987013
p = 0.00108115909091
p = 0.00129868831169
Ant 7 : [4, 6], 10
Exploration
avg = 0.000610785704296
p = 0.000779212987013
p = 0.00108115909091

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Ant 2 : [6, 4, 5], 22
Exploration
avg = 0.000538598329788
p = 0.000649344155844
p = 0.000649350649351
p = 0.000864935064935
Ant 8 : [3, 4], 15
Exploration
avg = 0.000533666288859
p = 0.00116883105195
p = 0.000648116883117
Ant 9 : [0, 4], 20
Exploitation
Ant 10 : [5, 4], 12
Exploration
avg = 0.000593066976784
p = 0.00108116883117
p = 0.000657467532468
Ant 11 : [5, 6], 16
Exploitation
Ant 12 : [6, 4], 10
Exploration
avg = 0.000516620593148
p = 0.000649350649351
p = 0.000865792207792
Ant 3 : [1, 3, 4], 33
Exploration
avg = 0.00072561846029
p = 0.000779212987013
p = 0.00108224016234
p = 0.00129870116883
Ant 13 : [4, 6], 10
Exploration
avg = 0.000725618481718
p = 0.000779212987013
p = 0.00108224016234
p = 0.0012987012974
Ant 14 : [4, 6], 10
Exploitation
Ant 15 : [4, 6], 10
Exploitation
Ant 16 : [4, 6], 10
Exploration
avg = 0.000533869860288
p = 0.00116883105195
p = 0.000649338311688
Ant 17 : [0, 4], 20
Exploitation
Ant 1 : [6, 4, 5, 3], 44
Exploitation
Ant 18 : [0, 1], 10
Exploitation
Ant 19 : [3, 4], 15
Exploitation
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Ant 4 : [3, 4, 6], 25
Exploration
avg = 0.000354772592343
p = 0.000730519480519
Ant 5 : [4, 6, 5], 26
Exploration
avg = 0.000433185528757
p = 0.000810876623377
Ant 0 : [1, 0, 4, 6, 5], 56
Exploration
avg = 0.000406880064813
p = 0.000649350525974
p = 0.000417022263451
Ant 6 : [1, 0, 5], 38
Exploration
avg = 0.0003710047352
p = 0.000811680194805
Ant 7 : [4, 6, 5], 26
Exploitation
Ant 2 : [6, 4, 5, 3], 44
Exploitation
Ant 8 : [3, 4, 6], 25
Exploitation
Ant 9 : [0, 4, 6], 30
Exploration
avg = 0.000654294145854
p = 0.000779212987013
p = 0.0012987012987
Ant 10 : [5, 4, 6], 22
Exploration
avg = 0.000468408929771
p = 0.00129870116766
Ant 11 : [5, 6, 4], 26
Exploration
avg = 0.000611001918581
p = 0.000779212987013
p = 0.00108224016234
Ant 12 : [6, 4, 5], 22
Exploration
avg = 0.000827880425581
p = 0.00108225097305
p = 0.0012987012987
Ant 3 : [1, 3, 4, 6], 43
Exploration
avg = 0.000371006342343
p = 0.000811688230519
Ant 13 : [4, 6, 5], 26
Exploitation
Ant 14 : [4, 6, 5], 26
Exploitation
Ant 15 : [4, 6, 5], 26
Exploitation
Ant 16 : [4, 6, 5], 26
Exploitation
```

Ant 17 : [0, 4, 6], 30
Exploitation
Ant 1 : [6, 4, 5, 3, 2], 62
Exploration
avg = 0.000430166025621
p = 0.000478158205431
p = 0.000720779220779
Ant 18 : [0, 1, 3], 28
Exploration
avg = 0.000714901743062
p = 0.00108225097305
p = 0.0012987012987
Ant 19 : [3, 4, 6], 25
Exploration
avg = 0.000394185360094
p = 0.000811688311688
Ant 4 : [3, 4, 6, 5], 41
Exploitation
Ant 5 : [4, 6, 5, 3], 48
Exploration
avg = 0.000549253088907
p = 0.000590318713105
Ant 0 : [1, 0, 4, 6, 5, 3], 78
Exploitation
Ant 6 : [1, 0, 5, 4], 50
Exploration
avg = 0.000469699343422
p = 0.000508187464709
p = 0.000590318771547
Ant 7 : [4, 6, 5, 3], 48
Exploration
avg = 0.000569820485966
p = 0.000649344155844
p = 0.000720779220779
Ant 2 : [6, 4, 5, 3, 2], 62
Exploration
avg = 0.000394185360094
p = 0.000811688311688
Ant 8 : [3, 4, 6, 5], 41
Exploitation
Ant 9 : [0, 4, 6, 5], 46
Exploitation
Ant 10 : [5, 4, 6, 1], 59
Exploration
avg = 0.000493192357642
p = 0.000525974025974
p = 0.000779212987013
Ant 11 : [5, 6, 4, 3], 41
Exploitation
Ant 12 : [6, 4, 5, 3], 44
Exploitation
Ant 3 : [1, 3, 4, 6, 5], 59
Exploration
avg = 0.00046969934357

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p = 0.000508187464709
p = 0.000590318772137
Ant 13 : [4, 6, 5, 3], 48
Exploration
avg = 0.00046969934357
p = 0.000508187464709
p = 0.000590318772137
Ant 14 : [4, 6, 5, 3], 48
Exploitation
Ant 15 : [4, 6, 5, 3], 48
Exploitation
Ant 16 : [4, 6, 5, 3], 48
Exploration
avg = 0.000412753616557
p = 0.000811688311688
Ant 17 : [0, 4, 6, 5], 46
Exploration
avg = 0.000460446694215
p = 0.000531286894923
Ant 1 : [6, 4, 5, 3, 2, 1], 84
Exploration
avg = 0.000578979099688
p = 0.000721493506494
p = 0.000865800864935
Ant 18 : [0, 1, 3, 4], 43
Exploitation
Ant 19 : [3, 4, 6, 5], 41
Exploitation
Ant 4 : [3, 4, 6, 5, 2], 64
Exploitation
Ant 5 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.000721500649351
Ant 0 : [1, 0, 4, 6, 5, 3, 2], 96
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.000856077230103

p = 0.000864934987013
p = 0.0012987012987
Ant 6 : [1, 0, 5, 4, 6], 60
Exploration
avg = 0.000570060985966
p = 0.000649344155844
p = 0.000721500720779
Ant 7 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.000489667473436
p = 0.000589728453365
Ant 2 : [6, 4, 5, 3, 2, 1], 84
Exploration
avg = 0.000448126407754
p = 0.000564088085827
Ant 8 : [3, 4, 6, 5, 2], 64
```

```
Exploration
avg = 0.000519853756257
p = 0.000564647092038
p = 0.000590318772137
Ant 9 : [0, 4, 6, 5, 3], 68
Exploitation
Ant 10 : [5, 4, 6, 1, 0], 69
Exploration
avg = 0.000570060986204
p = 0.000649344155844
p = 0.000721500721494
Ant 11 : [5, 6, 4, 3, 2], 59
Exploitation
Ant 12 : [6, 4, 5, 3, 2], 62
Exploitation
Ant 3 : [1, 3, 4, 6, 5, 2], 82
Exploitation
Ant 13 : [4, 6, 5, 3, 2], 66
Exploitation
Ant 14 : [4, 6, 5, 3, 2], 66
Exploitation
Ant 15 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.000570060986206
p = 0.000649344155844
p = 0.000721500721501
Ant 16 : [4, 6, 5, 3, 2], 66
Exploitation
Ant 17 : [0, 4, 6, 5, 3], 68
Exploitation
Ant 1 : [6, 4, 5, 3, 2, 1, 0], 94
Update called by 1Exploitation

Ant thread 1 terminating.Ant 18 : [0, 1, 3, 4, 6], 53

Exploitation
Ant 19 : [3, 4, 6, 5, 2], 64
Exploitation
Ant 4 : [3, 4, 6, 5, 2, 1], 86
Exploration
avg = 0.000489962603306
p = 0.000590318713105
Ant 5 : [4, 6, 5, 3, 2, 1], 88
Exploration
avg = 0.000244339981447
p = 0.000278290352505
Ant 6 : [1, 0, 5, 4, 6, 3], 102
Exploration
avg = 0.000489962632527
p = 0.000590318771547
Ant 7 : [4, 6, 5, 3, 2, 1], 88
Exploration
avg = 0.0012987012974
Ant 2 : [6, 4, 5, 3, 2, 1, 0], 94
```

Update called by 2Exploitation

Ant thread 2 terminating.Ant 8 : [3, 4, 6, 5, 2, 1], 86

Exploration
avg = 0.000685422438672
p = 0.000721500721501
Ant 9 : [0, 4, 6, 5, 3, 2], 86
Exploration
avg = 0.000364474215961
p = 0.000389610350649
Ant 10 : [5, 4, 6, 1, 0, 2], 99
Exploitation
Ant 11 : [5, 6, 4, 3, 2, 1], 81
Exploration
avg = 0.000489962632822
p = 0.000590318772137
Ant 12 : [6, 4, 5, 3, 2, 1], 84
Exploitation
Ant 3 : [1, 3, 4, 6, 5, 2, 0], 112
Update called by 3Exploration

Ant thread 3 terminating.avg = 0.000511393132822

p = 0.000590318772137
Ant 13 : [4, 6, 5, 3, 2, 1], 88
Exploration
avg = 0.000511393132822
p = 0.000590318772137
Ant 14 : [4, 6, 5, 3, 2, 1], 88
Exploitation
Ant 15 : [4, 6, 5, 3, 2, 1], 88
Exploration
avg = 0.000511393132822
p = 0.000590318772137
Ant 16 : [4, 6, 5, 3, 2, 1], 88
Exploration
avg = 0.000685422438672
p = 0.000721500721501
Ant 17 : [0, 4, 6, 5, 3, 2], 86
Exploitation
Ant 18 : [0, 1, 3, 4, 6, 5], 69
Exploitation
Ant 19 : [3, 4, 6, 5, 2, 1], 86
Exploitation
Ant 4 : [3, 4, 6, 5, 2, 1, 0], 96
Update called by 4Exploitation

Ant thread 4 terminating.Ant 5 : [4, 6, 5, 3, 2, 1, 0], 98

Update called by 5Exploration

Ant thread 5 terminating.avg = 0.000721500721501

```
Ant 6 : [1, 0, 5, 4, 6, 3, 2], 120
Update called by 6Exploitation

Ant thread 6 terminating.Ant 7 : [4, 6, 5, 3, 2, 1, 0], 98

Update called by 7Exploitation

Ant thread 7 terminating.Ant 8 : [3, 4, 6, 5, 2, 1, 0], 96

Update called by 8Exploitation

Ant thread 8 terminating.Ant 9 : [0, 4, 6, 5, 3, 2, 1], 108

Update called by 9Exploration

Ant thread 9 terminating.avg = 0.000648701298701

Ant 10 : [5, 4, 6, 1, 0, 2, 3], 117
Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [5, 6, 4, 3, 2, 1, 0], 91

Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [6, 4, 5, 3, 2, 1, 0], 94

Update called by 12Exploitation

Ant thread 12 terminating.Ant 13 : [4, 6, 5, 3, 2, 1, 0], 98

Update called by 13Exploration

Ant thread 13 terminating.avg = 0.0012987012987

Ant 14 : [4, 6, 5, 3, 2, 1, 0], 98
Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [4, 6, 5, 3, 2, 1, 0], 98

Update called by 15Exploitation

Ant thread 15 terminating.Ant 16 : [4, 6, 5, 3, 2, 1, 0], 98

Update called by 16Exploration

Ant thread 16 terminating.avg = 0.000590318772137

Ant 17 : [0, 4, 6, 5, 3, 2, 1], 108
ExplorationUpdate called by 17

avg = 0.000564652738001Ant thread 17 terminating.

Ant 18 : [0, 1, 3, 4, 6, 5, 2], 92
Update called by 18Exploration
```

Ant thread 18 terminating.avg = 0.0012987012987

Ant 19 : [3, 4, 6, 5, 2, 1, 0], 96
Update called by 19
Best: [4, 6, 5, 3, 2, 1, 0], 118, 3, 125
Ant thread 19 terminating.iter_counter = 4

starting ant = 0
Explorationstarting ant = 1

avg = 0.000517536856878starting ant = 2

p = 0.00116883116883starting ant = 3

p = 0.000649344155844starting ant = 4

Ant 0 : [1, 3], 18starting ant = 5

Explorationstarting ant = 6

avg = 0.00048291147995starting ant = 7

p = 0.00116883116765starting ant = 8

p = 0.000730519480519starting ant = 9

Ant 1 : [6, 5], 16starting ant = 10

Explorationstarting ant = 11

avg = 0.000496304337093starting ant = 12

p = 0.00116883116765starting ant = 13

p = 0.000810876623377starting ant = 14

Ant 2 : [6, 5], 16starting ant = 15

Exploitationstarting ant = 16

Ant 3 : [1, 0], 10starting ant = 17

Exploitationstarting ant = 18

Ant 4 : [3, 4], 15starting ant = 19

Exploitation
Ant 0 : [1, 3, 4], 33
Exploitation
Ant 5 : [4, 6], 10
Exploration
avg = 0.00055087126164
p = 0.0012974025974

```
p = 0.000720779155844
Ant 6 : [1, 3], 18
Exploration
avg = 0.000687345126777
p = 0.000778441488312
p = 0.000974025875747
p = 0.0012974025974
Ant 7 : [4, 6], 10
Exploitation
Ant 8 : [3, 4], 15
Exploitation
Ant 9 : [0, 1], 10
Exploitation
Ant 1 : [6, 5, 4], 28
Exploration
avg = 0.000592006101765
p = 0.00108116873377
p = 0.000729131493506
Ant 10 : [5, 6], 16
Exploitation
Ant 11 : [5, 4], 12
Exploitation
Ant 12 : [6, 4], 10
Exploitation
Ant 13 : [4, 6], 10
Exploration
avg = 0.000687561555348
p = 0.000778441488312
p = 0.000974025875747
p = 0.00129870116883
Ant 14 : [4, 6], 10
Exploitation
Ant 2 : [6, 5, 4], 28
Exploitation
Ant 15 : [4, 6], 10
Exploration
avg = 0.000687561576991
p = 0.000778441488312
p = 0.000974025875747
p = 0.00129870129869
Ant 16 : [4, 6], 10
Exploitation
Ant 3 : [1, 0, 4], 30
Exploitation
Ant 17 : [0, 1], 10
Exploitation
Ant 18 : [0, 1], 10
Exploration
avg = 0.00066938559473
p = 0.000974025875747
p = 0.0012987012987
Ant 4 : [3, 4, 6], 25
Exploitation
Ant 19 : [3, 4], 15
```

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Exploitation
Ant 0 : [1, 3, 4, 6], 43
Exploration
avg = 0.000361959685267
p = 0.000811680194805
Ant 5 : [4, 6, 5], 26
Exploitation
Ant 6 : [1, 3, 4], 33
Exploitation
Ant 7 : [4, 6, 5], 26
Exploitation
Ant 8 : [3, 4, 6], 25
Exploitation
Ant 9 : [0, 1, 3], 28
Exploitation
Ant 1 : [6, 5, 4, 3], 43
Exploitation
Ant 10 : [5, 6, 4], 26
Exploration
avg = 0.000647565873986
p = 0.000864927272026
p = 0.0012987012987
Ant 11 : [5, 4, 6], 22
Exploration
avg = 0.000582630789395
p = 0.000864927272026
p = 0.000974025875747
Ant 12 : [6, 4, 5], 22
Exploitation
Ant 13 : [4, 6, 5], 26
Exploration
avg = 0.000361961308642
p = 0.00081168831168
Ant 14 : [4, 6, 5], 26
Exploitation
Ant 2 : [6, 5, 4, 3], 43
Exploitation
Ant 15 : [4, 6, 5], 26
Exploitation
Ant 16 : [4, 6, 5], 26
Exploitation
Ant 3 : [1, 0, 4, 6], 40
Exploration
avg = 0.000401709293187
p = 0.000430342384888
p = 0.000721500649344
Ant 17 : [0, 1, 3], 28
Exploitation
Ant 18 : [0, 1, 3], 28
Exploration
avg = 0.000382947931491
p = 0.000811688311688
Ant 4 : [3, 4, 6, 5], 41
Exploration
```

```
avg = 0.000690814185618
p = 0.00108116883019
p = 0.0012987012987
Ant 19 : [3, 4, 6], 25
Exploration
avg = 0.000405403384494
p = 0.000811688311688
Ant 0 : [1, 3, 4, 6, 5], 59
Exploitation
Ant 5 : [4, 6, 5, 3], 48
Exploitation
Ant 6 : [1, 3, 4, 6], 43
Exploration
avg = 0.00045004448544
p = 0.000508187464704
p = 0.000589728453365
Ant 7 : [4, 6, 5, 3], 48
Exploration
avg = 0.000382947931491
p = 0.000811688311688
Ant 8 : [3, 4, 6, 5], 41
Exploration
avg = 0.000542727834933
p = 0.000649350649351
p = 0.000865800865792
Ant 9 : [0, 1, 3, 4], 43
Exploration
avg = 0.000513054887586
p = 0.0005844097402
p = 0.000649350649351
Ant 1 : [6, 5, 4, 3, 2], 61
Exploitation
Ant 10 : [5, 6, 4, 3], 41
Exploration
avg = 0.000249529557883
p = 0.000315581572482
p = 0.000278014817254
Ant 11 : [5, 4, 6, 3], 64
Exploration
avg = 0.000450190589336
p = 0.000508187464704
p = 0.000590312868949
Ant 12 : [6, 4, 5, 3], 44
Exploitation
Ant 13 : [4, 6, 5, 3], 48
Exploitation
Ant 14 : [4, 6, 5, 3], 48
Exploitation
Ant 2 : [6, 5, 4, 3, 2], 61
Exploration
avg = 0.000450192065131
p = 0.000508187464704
p = 0.000590318772131
Ant 15 : [4, 6, 5, 3], 48
```

```
Exploitation
Ant 16 : [4, 6, 5, 3], 48
Exploration
avg = 0.000436647186064
p = 0.000811688311688
Ant 3 : [1, 0, 4, 6, 5], 56
Exploration
avg = 0.000560763549221
p = 0.000721493506494
p = 0.000865800865801
Ant 17 : [0, 1, 3, 4], 43
Exploration
avg = 0.000560763549221
p = 0.000721493506494
p = 0.000865800865801
Ant 18 : [0, 1, 3, 4], 43
Exploitation
Ant 4 : [3, 4, 6, 5, 2], 64
Exploitation
Ant 19 : [3, 4, 6, 5], 41
Exploration
avg = 0.000451107122691
p = 0.000564088085827
Ant 0 : [1, 3, 4, 6, 5, 2], 82
Exploitation
Ant 5 : [4, 6, 5, 3, 2], 66
Exploitation
Ant 6 : [1, 3, 4, 6, 5], 59
Exploration
avg = 0.000537104887586
p = 0.00058440974026
p = 0.000721500649351
Ant 7 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.000422303038576
p = 0.000564647092038
Ant 8 : [3, 4, 6, 5, 2], 64
Exploration
avg = 0.000914668664341
p = 0.00108116883019
p = 0.0012987012987
Ant 9 : [0, 1, 3, 4, 6], 53
Exploration
avg = 0.00046025381954
p = 0.000531286894923
Ant 1 : [6, 5, 4, 3, 2, 1], 83
Exploration
avg = 0.000537104911395
p = 0.00058440974026
p = 0.000721500720779
Ant 10 : [5, 6, 4, 3, 2], 59
Exploitation
Ant 11 : [5, 4, 6, 3, 2], 82
Exploitation
```

```
Ant 12 : [6, 4, 5, 3, 2], 62
Exploration
avg = 0.000537104911636
p = 0.00058440974026
p = 0.000721500721501
Ant 13 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.000537104911636
p = 0.00058440974026
p = 0.000721500721501
Ant 14 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.00048947459876
p = 0.000589728453365
Ant 2 : [6, 5, 4, 3, 2, 1], 83
Exploitation
Ant 15 : [4, 6, 5, 3, 2], 66
Exploitation
Ant 16 : [4, 6, 5, 3, 2], 66
Exploitation
Ant 3 : [1, 0, 4, 6, 5, 3], 78
Exploitation
Ant 17 : [0, 1, 3, 4, 6], 53
Exploration
avg = 0.000914668664341
p = 0.00108116883019
p = 0.0012987012987
Ant 18 : [0, 1, 3, 4, 6], 53
Exploration
avg = 0.000489766806553
p = 0.000590312868949
Ant 4 : [3, 4, 6, 5, 2, 1], 86
Exploitation
Ant 19 : [3, 4, 6, 5, 2], 64
Exploitation
Ant 0 : [1, 3, 4, 6, 5, 2, 0], 112
Update called by 0Exploitation

Ant thread 0 terminating.Ant 5 : [4, 6, 5, 3, 2, 1], 88

Exploration
avg = 0.000451389448778
p = 0.000564652738001
Ant 6 : [1, 3, 4, 6, 5, 2], 82
Exploration
avg = 0.00051139120378
p = 0.000590318771547
Ant 7 : [4, 6, 5, 3, 2, 1], 88
Exploitation
Ant 8 : [3, 4, 6, 5, 2, 1], 86
Exploitation
Ant 9 : [0, 1, 3, 4, 6, 5], 69
Exploration
avg = 0.0012974025974
```

```
Ant 1 : [6, 5, 4, 3, 2, 1, 0], 93
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.000511391204075

p = 0.000590318772137
Ant 10 : [5, 6, 4, 3, 2, 1], 81
Exploitation
Ant 11 : [5, 4, 6, 3, 2, 1], 104
Exploration
avg = 0.000511391204075
p = 0.000590318772137
Ant 12 : [6, 4, 5, 3, 2, 1], 84
Exploitation
Ant 13 : [4, 6, 5, 3, 2, 1], 88
Exploration
avg = 0.000511391204075
p = 0.000590318772137
Ant 14 : [4, 6, 5, 3, 2, 1], 88
Exploration
avg = 0.00129868831169
Ant 2 : [6, 5, 4, 3, 2, 1, 0], 93
Update called by 2Exploitation

Ant thread 2 terminating.Ant 15 : [4, 6, 5, 3, 2, 1], 88

Exploration
avg = 0.000511391204075
p = 0.000590318772137
Ant 16 : [4, 6, 5, 3, 2, 1], 88
Exploitation
Ant 3 : [1, 0, 4, 6, 5, 3, 2], 96
Update called by 3Exploration

Ant thread 3 terminating.avg = 0.000500519480519

p = 0.000811688311688
Ant 17 : [0, 1, 3, 4, 6, 5], 69
Exploitation
Ant 18 : [0, 1, 3, 4, 6, 5], 69
Exploitation
Ant 4 : [3, 4, 6, 5, 2, 1, 0], 96
Update called by 4Exploitation

Ant thread 4 terminating.Ant 19 : [3, 4, 6, 5, 2, 1], 86

Exploitation
Ant 5 : [4, 6, 5, 3, 2, 1, 0], 98
Update called by 5Exploitation

Ant thread 5 terminating.Ant 6 : [1, 3, 4, 6, 5, 2, 0], 112

ExplorationUpdate called by 6
```

avg = 0.00129870129869Ant thread 6 terminating.

Ant 7 : [4, 6, 5, 3, 2, 1, 0], 98
Update called by 7Exploitation

Ant thread 7 terminating.Ant 8 : [3, 4, 6, 5, 2, 1, 0], 96

Update called by 8Exploitation

Ant thread 8 terminating.Ant 9 : [0, 1, 3, 4, 6, 5, 2], 92

Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [5, 6, 4, 3, 2, 1, 0], 91

Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [5, 4, 6, 3, 2, 1, 0], 114

Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [6, 4, 5, 3, 2, 1, 0], 94

Update called by 12Exploration

Ant thread 12 terminating.avg = 0.0012987012987

Ant 13 : [4, 6, 5, 3, 2, 1, 0], 98
Update called by 13Exploration

Ant thread 13 terminating.avg = 0.0012987012987

Ant 14 : [4, 6, 5, 3, 2, 1, 0], 98
Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [4, 6, 5, 3, 2, 1, 0], 98

Update called by 15Exploration

Ant thread 15 terminating.avg = 0.0012987012987

Ant 16 : [4, 6, 5, 3, 2, 1, 0], 98
Update called by 16Exploration

Ant thread 16 terminating.avg = 0.000564652738566

Ant 17 : [0, 1, 3, 4, 6, 5, 2], 92
Update called by 17Exploration

Ant thread 17 terminating.avg = 0.000564652738566

Ant 18 : [0, 1, 3, 4, 6, 5, 2], 92
Update called by 18Exploitation

Ant thread 18 terminating.Ant 19 : [3, 4, 6, 5, 2, 1, 0], 96

Update called by 19
Best: [4, 6, 5, 3, 2, 1, 0], 118, 4, 124
Ant thread 19 terminating.iter_counter = 5

starting ant = 0
Exploitationstarting ant = 1

Ant 0 : [1, 0], 10starting ant = 2

Exploitationstarting ant = 3

Ant 1 : [6, 4], 10starting ant = 4

Exploitationstarting ant = 5

Ant 0 : [1, 0, 4], 30starting ant = 6

Exploitationstarting ant = 7

Ant 2 : [6, 4], 10starting ant = 8

Explorationstarting ant = 9

avg = 0.000517515746946starting ant = 10

p = 0.0012974025974starting ant = 11

p = 0.000649350649344starting ant = 12

Ant 3 : [1, 3], 18starting ant = 13

Explorationstarting ant = 14

avg = 0.000543810673409starting ant = 15

p = 0.000779220700597starting ant = 16

p = 0.000973051947167starting ant = 17

Ant 1 : [6, 4, 5], 22starting ant = 18

Exploitationstarting ant = 19

Ant 4 : [3, 4], 15
Exploration
avg = 0.000665998613268
p = 0.000779220700597
p = 0.0010811590909
p = 0.00116883116883
Ant 5 : [4, 6], 10
Exploitation
Ant 0 : [1, 0, 4, 6], 40

```
Exploitation
Ant 6 : [1, 0], 10
Exploration
avg = 0.000687641470411
p = 0.000779220700597
p = 0.0010811590909
p = 0.00129868831169
Ant 7 : [4, 6], 10
Exploitation
Ant 2 : [6, 4, 5], 22
Exploration
avg = 0.00048421702808
p = 0.000525968766234
p = 0.000649350649351
p = 0.000864935064935
Ant 8 : [3, 4], 15
Exploration
avg = 0.000501943296882
p = 0.0011688310509
p = 0.000648695454535
Ant 9 : [0, 4], 20
Exploitation
Ant 10 : [5, 4], 12
Exploitation
Ant 11 : [5, 4], 12
Exploration
avg = 0.000492552200221
p = 0.00129868831052
p = 0.000730519480519
Ant 12 : [6, 5], 16
Exploitation
Ant 3 : [1, 3, 4], 33
Exploitation
Ant 13 : [4, 6], 10
Exploration
avg = 0.00068782381327
p = 0.000779220700597
p = 0.00108224016234
p = 0.0012987012974
Ant 14 : [4, 6], 10
Exploitation
Ant 15 : [4, 6], 10
Exploitation
Ant 16 : [4, 6], 10
Exploration
avg = 0.000502051404026
p = 0.0011688310509
p = 0.000649344097402
Ant 17 : [0, 4], 20
Exploitation
Ant 1 : [6, 4, 5, 3], 44
Exploration
avg = 0.000502052485098
p = 0.0011688310509
```

```
p = 0.000649350583831
Ant 18 : [0, 4], 20
Exploitation
Ant 19 : [3, 4], 15
Exploration
avg = 0.000669544436064
p = 0.00108224016234
p = 0.0012987012987
Ant 4 : [3, 4, 6], 25
Exploitation
Ant 5 : [4, 6, 5], 26
Exploitation
Ant 0 : [1, 0, 4, 6, 5], 56
Exploration
avg = 0.000368696784911
p = 0.000649350648695
p = 0.000375316655844
Ant 6 : [1, 0, 5], 38
Exploitation
Ant 7 : [4, 6, 5], 26
Exploration
avg = 0.000432487934849
p = 0.000508187464709
p = 0.000589728453365
Ant 2 : [6, 4, 5, 3], 44
Exploration
avg = 0.000669544436064
p = 0.00108224016234
p = 0.0012987012987
Ant 8 : [3, 4, 6], 25
Exploration
avg = 0.000740180783976
p = 0.000779220700597
p = 0.00108224016234
p = 0.0012987012987
Ant 9 : [0, 4, 6], 30
Exploitation
Ant 10 : [5, 4, 6], 22
Exploitation
Ant 11 : [5, 4, 6], 22
Exploration
avg = 0.000562555282942
p = 0.000590312868949
p = 0.00108224025973
Ant 12 : [6, 5, 4], 28
Exploitation
Ant 3 : [1, 3, 4, 6], 43
Exploitation
Ant 13 : [4, 6, 5], 26
Exploration
avg = 0.000347558744393
p = 0.00081168831168
Ant 14 : [4, 6, 5], 26
Exploitation
```

```
Ant 15 : [4, 6, 5], 26
Exploration
avg = 0.000347558744395
p = 0.000811688311688
Ant 16 : [4, 6, 5], 26
Exploration
avg = 0.000740180783976
p = 0.000779220700597
p = 0.00108224016234
p = 0.0012987012987
Ant 17 : [0, 4, 6], 30
Exploitation
Ant 1 : [6, 4, 5, 3, 2], 62
Exploration
avg = 0.000740180783976
p = 0.000779220700597
p = 0.00108224016234
p = 0.0012987012987
Ant 18 : [0, 4, 6], 30
Exploration
avg = 0.000669544436064
p = 0.00108224016234
p = 0.0012987012987
Ant 19 : [3, 4, 6], 25
Exploration
avg = 0.000364945346134
p = 0.000811688311688
Ant 4 : [3, 4, 6, 5], 41
Exploration
avg = 0.000432634038745
p = 0.000508187464709
p = 0.000590312868949
Ant 5 : [4, 6, 5, 3], 48
Exploration
avg = 0.000549253088907
p = 0.000590318713105
Ant 0 : [1, 0, 4, 6, 5, 3], 78
Exploration
avg = 0.000727633419859
p = 0.00108225097403
p = 0.000729776469156
Ant 6 : [1, 0, 5, 6], 54
Exploration
avg = 0.000432635514394
p = 0.000508187464709
p = 0.000590318771547
Ant 7 : [4, 6, 5, 3], 48
Exploitation
Ant 2 : [6, 4, 5, 3, 2], 62
Exploitation
Ant 8 : [3, 4, 6, 5], 41
Exploitation
Ant 9 : [0, 4, 6, 5], 46
Exploitation
```

```
Ant 10 : [5, 4, 6, 1], 59
Exploitation
Ant 11 : [5, 4, 6, 1], 59
Exploration
avg = 0.00043650035497
p = 0.000779220700597
Ant 12 : [6, 5, 4, 3], 43
Exploration
avg = 0.000391919323101
p = 0.000811688311688
Ant 3 : [1, 3, 4, 6, 5], 59
Exploration
avg = 0.00043263551454
p = 0.000508187464709
p = 0.000590318772131
Ant 13 : [4, 6, 5, 3], 48
Exploration
avg = 0.000432635514542
p = 0.000508187464709
p = 0.000590318772137
Ant 14 : [4, 6, 5, 3], 48
Exploitation
Ant 15 : [4, 6, 5, 3], 48
Exploration
avg = 0.000432635514542
p = 0.000508187464709
p = 0.000590318772137
Ant 16 : [4, 6, 5, 3], 48
Exploration
avg = 0.000402777471712
p = 0.000811688311688
Ant 17 : [0, 4, 6, 5], 46
Exploration
avg = 0.000460446676681
p = 0.000531286894923
Ant 1 : [6, 4, 5, 3, 2, 1], 84
Exploitation
Ant 18 : [0, 4, 6, 5], 46
Exploitation
Ant 19 : [3, 4, 6, 5], 41
Exploitation
Ant 4 : [3, 4, 6, 5, 2], 64
Exploration
avg = 0.00050744203952
p = 0.000525968766234
p = 0.000721493506494
Ant 5 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.000721500649351
Ant 0 : [1, 0, 4, 6, 5, 3, 2], 96
Update called by 0Exploitation

Ant thread 0 terminating.Ant 6 : [1, 0, 5, 6, 4], 64
```

```
Exploitation
Ant 7 : [4, 6, 5, 3, 2], 66
Exploitation
Ant 2 : [6, 4, 5, 3, 2, 1], 84
Exploration
avg = 0.00039870796905
p = 0.000564088085827
Ant 8 : [3, 4, 6, 5, 2], 64
Exploration
avg = 0.000494229380633
p = 0.000564647092038
p = 0.000590318772137
Ant 9 : [0, 4, 6, 5, 3], 68
Exploitation
Ant 10 : [5, 4, 6, 1, 0], 69
Exploitation
Ant 11 : [5, 4, 6, 1, 0], 69
Exploration
avg = 0.00050744444452
p = 0.000525968766234
p = 0.000721500721494
Ant 12 : [6, 5, 4, 3, 2], 61
Exploitation
Ant 3 : [1, 3, 4, 6, 5, 2], 82
Exploration
avg = 0.000507444444522
p = 0.000525968766234
p = 0.000721500721501
Ant 13 : [4, 6, 5, 3, 2], 66
Exploitation
Ant 14 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.000507444444522
p = 0.000525968766234
p = 0.000721500721501
Ant 15 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.000507444444522
p = 0.000525968766234
p = 0.000721500721501
Ant 16 : [4, 6, 5, 3, 2], 66
Exploitation
Ant 17 : [0, 4, 6, 5, 3], 68
Exploration
avg = 0.0012987012974
Ant 1 : [6, 4, 5, 3, 2, 1, 0], 94
Update called by 1Exploitation

Ant thread 1 terminating.Ant 18 : [0, 4, 6, 5, 3], 68

Exploration
avg = 0.000398896167807
p = 0.000564652682101
Ant 19 : [3, 4, 6, 5, 2], 64
```

```
Exploration
avg = 0.000489959663694
p = 0.000590312868949
Ant 4 : [3, 4, 6, 5, 2, 1], 86
Exploration
avg = 0.000489962585772
p = 0.000590318713105
Ant 5 : [4, 6, 5, 3, 2, 1], 88
Exploitation
Ant 6 : [1, 0, 5, 6, 4, 3], 79
Exploitation
Ant 7 : [4, 6, 5, 3, 2, 1], 88
Exploration
avg = 0.00129870129869
Ant 2 : [6, 4, 5, 3, 2, 1, 0], 94
Update called by 2Exploitation

Ant thread 2 terminating.Ant 8 : [3, 4, 6, 5, 2, 1], 86

Exploitation
Ant 9 : [0, 4, 6, 5, 3, 2], 86
Exploitation
Ant 10 : [5, 4, 6, 1, 0, 2], 99
Exploration
avg = 0.000353469130706
p = 0.000432074415581
Ant 11 : [5, 4, 6, 1, 0, 2], 99
Exploration
avg = 0.000489962615288
p = 0.000590318772137
Ant 12 : [6, 5, 4, 3, 2, 1], 83
Exploitation
Ant 3 : [1, 3, 4, 6, 5, 2, 0], 112
Update called by 3Exploration

Ant thread 3 terminating.avg = 0.000511393132646

p = 0.000590318772137
Ant 13 : [4, 6, 5, 3, 2, 1], 88
Exploitation
Ant 14 : [4, 6, 5, 3, 2, 1], 88
Exploitation
Ant 15 : [4, 6, 5, 3, 2, 1], 88
Exploitation
Ant 16 : [4, 6, 5, 3, 2, 1], 88
Exploitation
Ant 17 : [0, 4, 6, 5, 3, 2], 86
Exploration
avg = 0.000623734743867
p = 0.000721500721501
Ant 18 : [0, 4, 6, 5, 3, 2], 86
Exploitation
Ant 19 : [3, 4, 6, 5, 2, 1], 86
Exploitation
```

```
Ant 4 : [3, 4, 6, 5, 2, 1, 0], 96
Update called by 4Exploration

Ant thread 4 terminating.avg = 0.0012987012987

Ant 5 : [4, 6, 5, 3, 2, 1, 0], 98
Update called by 5Exploration

Ant thread 5 terminating.avg = 0.000721500721501

Ant 6 : [1, 0, 5, 6, 4, 3, 2], 97
Update called by 6Exploitation

Ant thread 6 terminating.Ant 7 : [4, 6, 5, 3, 2, 1, 0], 98

Update called by 7Exploitation

Ant thread 7 terminating.Ant 8 : [3, 4, 6, 5, 2, 1, 0], 96

Update called by 8Exploration

Ant thread 8 terminating.avg = 0.000590318772137

Ant 9 : [0, 4, 6, 5, 3, 2, 1], 108
Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [5, 4, 6, 1, 0, 2, 3], 117

Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [5, 4, 6, 1, 0, 2, 3], 117

Update called by 11Exploration

Ant thread 11 terminating.avg = 0.0012987012987

Ant 12 : [6, 5, 4, 3, 2, 1, 0], 93
Update called by 12Exploration

Ant thread 12 terminating.avg = 0.0012987012987

Ant 13 : [4, 6, 5, 3, 2, 1, 0], 98
Update called by 13Exploitation

Ant thread 13 terminating.Ant 14 : [4, 6, 5, 3, 2, 1, 0], 98

Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [4, 6, 5, 3, 2, 1, 0], 98

Update called by 15Exploration

Ant thread 15 terminating.avg = 0.0012987012987
```

```
Ant 16 : [4, 6, 5, 3, 2, 1, 0], 98
Update called by 16Exploration

Ant thread 16 terminating.avg = 0.000590318772137

Ant 17 : [0, 4, 6, 5, 3, 2, 1], 108
Update called by 17Exploration

Ant thread 17 terminating.avg = 0.000590318772137

Ant 18 : [0, 4, 6, 5, 3, 2, 1], 108
Update called by 18Exploration

Ant thread 18 terminating.avg = 0.0012987012987

Ant 19 : [3, 4, 6, 5, 2, 1, 0], 96
Update called by 19
Best: [4, 6, 5, 3, 2, 1, 0], 118, 5, 124
Ant thread 19 terminating.
 iter_counter = 6
starting ant = 0
Explorationstarting ant = 1

avg = 0.000476673263162starting ant = 2

p = 0.00116883116883starting ant = 3

p = 0.000648701298701starting ant = 4

Ant 0 : [1, 3], 18starting ant = 5

Explorationstarting ant = 6

avg = 0.00046551976933starting ant = 7

p = 0.00116883105194starting ant = 8

p = 0.000730519480519starting ant = 9

Ant 1 : [6, 5], 16starting ant = 10

Explorationstarting ant = 11

avg = 0.000478912626473starting ant = 12

p = 0.00116883105194starting ant = 13

p = 0.000810876623377starting ant = 14

Ant 2 : [6, 5], 16starting ant = 15

Exploitationstarting ant = 16

Ant 3 : [1, 0], 10starting ant = 17
```

```
Explorationstarting ant = 18

avg = 0.000446747706095starting ant = 19

p = 0.00047337188961
p = 0.000649350649351
p = 0.000779220778442
Ant 4 : [3, 4], 15
Exploration
avg = 0.000458565726689
p = 0.000649350649351
p = 0.000864935064927
Ant 0 : [1, 3, 4], 33
Exploitation
Ant 5 : [4, 6], 10
Exploitation
Ant 6 : [1, 0], 10
Exploration
avg = 0.000653455729644
p = 0.000779212987006
p = 0.000974016146104
p = 0.0012974025974
Ant 7 : [4, 6], 10
Exploration
avg = 0.000461176277653
p = 0.00047337188961
p = 0.000649350649351
p = 0.000865792207792
Ant 8 : [3, 4], 15
Exploration
avg = 0.000477379294707
p = 0.00105194794581
p = 0.000584415583826
Ant 9 : [0, 4], 20
Exploration
avg = 0.000516466494987
p = 0.000531286894923
p = 0.000974025876623
Ant 1 : [6, 5, 4], 28
Exploitation
Ant 10 : [5, 4], 12
Exploration
avg = 0.00057005485533
p = 0.00108224025973
p = 0.000729782273937
Ant 11 : [5, 6], 16
Exploitation
Ant 12 : [6, 4], 10
Exploration
avg = 0.000653670015358
p = 0.000779212987006
p = 0.000974016146104
p = 0.00129868831169
```

Ant 13 : [4, 6], 10
Exploitation
Ant 14 : [4, 6], 10
Exploitation
Ant 2 : [6, 5, 4], 28
Exploitation
Ant 15 : [4, 6], 10
Exploration
avg = 0.000653672179858
p = 0.000779212987006
p = 0.000974016146104
p = 0.00129870129869
Ant 16 : [4, 6], 10
Exploitation
Ant 3 : [1, 0, 4], 30
Exploration
avg = 0.000488200723376
p = 0.00105194794581
p = 0.000649344155844
Ant 17 : [0, 4], 20
Exploration
avg = 0.000488201794805
p = 0.00105194794581
p = 0.000649350584416
Ant 18 : [0, 4], 20
Exploration
avg = 0.000461177706225
p = 0.00047337188961
p = 0.000649350649351
p = 0.000865800779221
Ant 19 : [3, 4], 15
Exploration
avg = 0.000628564018432
p = 0.000974016146104
p = 0.0012987012987
Ant 4 : [3, 4, 6], 25
Exploration
avg = 0.000737775639923
p = 0.000974016146104
p = 0.0012987012987
Ant 0 : [1, 3, 4, 6], 43
Exploration
avg = 0.000341089655666
p = 0.000811680194805
Ant 5 : [4, 6, 5], 26
Exploration
avg = 0.000375452577462
p = 0.000389602955455
p = 0.000649350648701
p = 0.000416643156025
Ant 6 : [1, 0, 5], 38
Exploitation
Ant 7 : [4, 6, 5], 26
Exploration

```
avg = 0.000628564018432
p = 0.000974016146104
p = 0.0012987012987
Ant 8 : [3, 4, 6], 25
Exploration
avg = 0.000707719602846
p = 0.000779212987006
p = 0.000974016146104
p = 0.0012987012987
Ant 9 : [0, 4, 6], 30
Exploitation
Ant 1 : [6, 5, 4, 3], 43
Exploitation
Ant 10 : [5, 4, 6], 22
Exploration
avg = 0.000438234135951
p = 0.00129740259623
Ant 11 : [5, 6, 4], 26
Exploration
avg = 0.000541810756094
p = 0.000864934987013
p = 0.000974016146104
Ant 12 : [6, 4, 5], 22
Exploitation
Ant 13 : [4, 6, 5], 26
Exploration
avg = 0.000341091279041
p = 0.00081168831168
Ant 14 : [4, 6, 5], 26
Exploitation
Ant 2 : [6, 5, 4, 3], 43
Exploration
avg = 0.000341091279042
p = 0.000811688311688
Ant 15 : [4, 6, 5], 26
Exploration
avg = 0.000341091279042
p = 0.000811688311688
Ant 16 : [4, 6, 5], 26
Exploitation
Ant 3 : [1, 0, 4, 6], 40
Exploration
avg = 0.000746465964204
p = 0.000865792207013
p = 0.00108116873289
p = 0.0012987012987
Ant 17 : [0, 4, 6], 30
Exploitation
Ant 18 : [0, 4, 6], 30
Exploration
avg = 0.000649994535789
p = 0.00108116873289
p = 0.0012987012987
Ant 19 : [3, 4, 6], 25
```

```
Exploration
avg = 0.00036381132288
p = 0.000811688311688
Ant 4 : [3, 4, 6, 5], 41
Exploitation
Ant 0 : [1, 3, 4, 6, 5], 59
Exploration
avg = 0.000402076649578
p = 0.000508187464201
p = 0.000531286894923
Ant 5 : [4, 6, 5, 3], 48
Exploitation
Ant 6 : [1, 0, 5, 4], 50
Exploitation
Ant 7 : [4, 6, 5, 3], 48
Exploration
avg = 0.00036381132288
p = 0.000811688311688
Ant 8 : [3, 4, 6, 5], 41
Exploration
avg = 0.000382791932333
p = 0.000811688311688
Ant 9 : [0, 4, 6, 5], 46
Exploitation
Ant 1 : [6, 5, 4, 3, 2], 61
Exploration
avg = 0.000223442020881
p = 0.000315894287976
p = 0.000250211103693
Ant 10 : [5, 4, 6, 3], 64
Exploration
avg = 0.000433973713591
p = 0.000865792207013
Ant 11 : [5, 6, 4, 3], 41
Exploration
avg = 0.000416833143085
p = 0.000508187464201
p = 0.000590312868949
Ant 12 : [6, 4, 5, 3], 44
Exploitation
Ant 13 : [4, 6, 5, 3], 48
Exploration
avg = 0.000416834618734
p = 0.000508187464201
p = 0.000590318771547
Ant 14 : [4, 6, 5, 3], 48
Exploration
avg = 0.000480509523879
p = 0.000720779220779
Ant 2 : [6, 5, 4, 3, 2], 61
Exploration
avg = 0.00041683461888
p = 0.000508187464201
p = 0.000590318772131
```

Ant 15 : [4, 6, 5, 3], 48
Exploitation
Ant 16 : [4, 6, 5, 3], 48
Exploration
avg = 0.000424562299226
p = 0.000811688311688
Ant 3 : [1, 0, 4, 6, 5], 56
Exploration
avg = 0.000397395296414
p = 0.000811688311688
Ant 17 : [0, 4, 6, 5], 46
Exploitation
Ant 18 : [0, 4, 6, 5], 46
Exploration
avg = 0.00036381132288
p = 0.000811688311688
Ant 19 : [3, 4, 6, 5], 41
Exploration
avg = 0.000359006567797
p = 0.000508187464201
Ant 4 : [3, 4, 6, 5, 2], 64
Exploitation
Ant 0 : [1, 3, 4, 6, 5, 2], 82
Exploitation
Ant 5 : [4, 6, 5, 3, 2], 66
Exploitation
Ant 6 : [1, 0, 5, 4, 6], 60
Exploitation
Ant 7 : [4, 6, 5, 3, 2], 66
Exploitation
Ant 8 : [3, 4, 6, 5, 2], 64
Exploitation
Ant 9 : [0, 4, 6, 5, 3], 68
Exploration
avg = 0.000460253819382
p = 0.000531286894923
Ant 1 : [6, 5, 4, 3, 2, 1], 83
Exploitation
Ant 10 : [5, 4, 6, 3, 2], 82
Exploitation
Ant 11 : [5, 6, 4, 3, 2], 59
Exploitation
Ant 12 : [6, 4, 5, 3, 2], 62
Exploitation
Ant 13 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.00048075002412
p = 0.000721500721501
Ant 14 : [4, 6, 5, 3, 2], 66
Exploitation
Ant 2 : [6, 5, 4, 3, 2, 1], 83
Exploration
avg = 0.00048075002412
p = 0.000721500721501

```
Ant 15 : [4, 6, 5, 3, 2], 66
Exploitation
Ant 16 : [4, 6, 5, 3, 2], 66
Exploitation
Ant 3 : [1, 0, 4, 6, 5, 3], 78
Exploitation
Ant 17 : [0, 4, 6, 5, 3], 68
Exploration
avg = 0.000483307168063
p = 0.000564652682101
p = 0.000590318772137
Ant 18 : [0, 4, 6, 5, 3], 68
Exploitation
Ant 19 : [3, 4, 6, 5, 2], 64
Exploration
avg = 0.000489766806395
p = 0.000590312868949
Ant 4 : [3, 4, 6, 5, 2, 1], 86
Exploitation
Ant 0 : [1, 3, 4, 6, 5, 2, 0], 112
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.000511391174557

p = 0.000590318713105
Ant 5 : [4, 6, 5, 3, 2, 1], 88
Exploration
avg = 0.000230999292995
p = 0.000308624560017
Ant 6 : [1, 0, 5, 4, 6, 3], 102
Exploitation
Ant 7 : [4, 6, 5, 3, 2, 1], 88
Exploration
avg = 0.00051139120407
p = 0.000590318772131
Ant 8 : [3, 4, 6, 5, 2, 1], 86
Exploration
avg = 0.000597436305556
p = 0.000721500721501
Ant 9 : [0, 4, 6, 5, 3, 2], 86
Exploitation
Ant 1 : [6, 5, 4, 3, 2, 1, 0], 93
Update called by 1Exploitation

Ant thread 1 terminating.Ant 10 : [5, 4, 6, 3, 2, 1], 104

Exploitation
Ant 11 : [5, 6, 4, 3, 2, 1], 81
Exploitation
Ant 12 : [6, 4, 5, 3, 2, 1], 84
Exploitation
Ant 13 : [4, 6, 5, 3, 2, 1], 88
Exploration
avg = 0.000511391204073
```

```
p = 0.000590318772137
Ant 14 : [4, 6, 5, 3, 2, 1], 88
Exploitation
Ant 2 : [6, 5, 4, 3, 2, 1, 0], 93
Update called by 2Exploration

Ant thread 2 terminating.avg = 0.000511391204073

p = 0.000590318772137
Ant 15 : [4, 6, 5, 3, 2, 1], 88
Exploration
avg = 0.000511391204073
p = 0.000590318772137
Ant 16 : [4, 6, 5, 3, 2, 1], 88
Exploration
avg = 0.000721500721501
Ant 3 : [1, 0, 4, 6, 5, 3, 2], 96
Update called by 3Exploitation

Ant thread 3 terminating.Ant 17 : [0, 4, 6, 5, 3, 2], 86

Exploration
avg = 0.000597436305556
p = 0.000721500721501
Ant 18 : [0, 4, 6, 5, 3, 2], 86
Exploitation
Ant 19 : [3, 4, 6, 5, 2, 1], 86
Exploration
avg = 0.0012987012974
Ant 4 : [3, 4, 6, 5, 2, 1, 0], 96
Update called by 4Exploitation

Ant thread 4 terminating.Ant 5 : [4, 6, 5, 3, 2, 1, 0], 98

Update called by 5Exploitation

Ant thread 5 terminating.Ant 6 : [1, 0, 5, 4, 6, 3, 2], 120

Update called by 6Exploitation

Ant thread 6 terminating.Ant 7 : [4, 6, 5, 3, 2, 1, 0], 98

Update called by 7Exploration

Ant thread 7 terminating.avg = 0.0012987012987

Ant 8 : [3, 4, 6, 5, 2, 1, 0], 96
Update called by 8Exploitation

Ant thread 8 terminating.Ant 9 : [0, 4, 6, 5, 3, 2, 1], 108

Update called by 9Exploration

Ant thread 9 terminating.avg = 0.0012987012987
```

```
Ant 10 : [5, 4, 6, 3, 2, 1, 0], 114
Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [5, 6, 4, 3, 2, 1, 0], 91

Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [6, 4, 5, 3, 2, 1, 0], 94

Update called by 12Exploration

Ant thread 12 terminating.avg = 0.0012987012987

Ant 13 : [4, 6, 5, 3, 2, 1, 0], 98
Update called by 13Exploration

Ant thread 13 terminating.avg = 0.0012987012987

Ant 14 : [4, 6, 5, 3, 2, 1, 0], 98
Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [4, 6, 5, 3, 2, 1, 0], 98

Update called by 15Exploration

Ant thread 15 terminating.avg = 0.0012987012987

Ant 16 : [4, 6, 5, 3, 2, 1, 0], 98
Update called by 16Exploitation

Ant thread 16 terminating.Ant 17 : [0, 4, 6, 5, 3, 2, 1], 108

Update called by 17Exploration

Ant thread 17 terminating.avg = 0.000590318772137

Ant 18 : [0, 4, 6, 5, 3, 2, 1], 108
Update called by 18Exploration

Ant thread 18 terminating.avg = 0.0012987012987

Ant 19 : [3, 4, 6, 5, 2, 1, 0], 96
Update called by 19
Best: [4, 6, 5, 3, 2, 1, 0], 118, 6, 124
Ant thread 19 terminating.iter_counter = 7

starting ant = 0
Exploitationstarting ant = 1

Ant 0 : [1, 0], 10starting ant = 2

Exploitationstarting ant = 3
```

Ant 1 : [6, 4], 10starting ant = 4

Explorationstarting ant = 5

avg = 0.000346314570536starting ant = 6

p = 0.000350642659909starting ant = 7

p = 0.000584415583831starting ant = 8

p = 0.000417015094527starting ant = 9

Ant 0 : [1, 0, 5], 38starting ant = 10

Explorationstarting ant = 11

avg = 0.000480901844668starting ant = 12

p = 0.00129740248052starting ant = 13

p = 0.000730519480519starting ant = 14

Ant 2 : [6, 5], 16starting ant = 15

Explorationstarting ant = 16

avg = 0.000480725742041starting ant = 17

p = 0.0012974025974starting ant = 18

p = 0.000648695454545starting ant = 19

Ant 3 : [1, 3], 18
Exploitation
Ant 1 : [6, 4, 5], 22
Exploitation
Ant 4 : [3, 4], 15
Exploitation
Ant 5 : [4, 6], 10
Exploitation
Ant 6 : [1, 0], 10
Exploration
avg = 0.000656812461889
p = 0.000779220701292
p = 0.00108115909002
p = 0.0012974025974
Ant 7 : [4, 6], 10
Exploitation
Ant 8 : [3, 4], 15
Exploration
avg = 0.000454110788966
p = 0.000946753151226
p = 0.000584415583831
p = 0.000463353824415

```
Ant 9 : [0, 5], 28
Exploitation
Ant 0 : [1, 0, 5, 4], 50
Exploration
avg = 0.000560395755289
p = 0.00108116883116
p = 0.00072978232618
Ant 10 : [5, 6], 16
Exploration
avg = 0.000573910242898
p = 0.00108116883116
p = 0.000810869251833
Ant 11 : [5, 6], 16
Exploration
avg = 0.000494294701811
p = 0.00129740248052
p = 0.000810876623377
Ant 12 : [6, 5], 16
Exploitation
Ant 13 : [4, 6], 10
Exploration
avg = 0.000657028890461
p = 0.000779220701292
p = 0.00108115909002
p = 0.00129870116883
Ant 14 : [4, 6], 10
Exploration
avg = 0.000526518441111
p = 0.000531286894923
p = 0.00108116883116
Ant 2 : [6, 5, 4], 28
Exploitation
Ant 15 : [4, 6], 10
Exploration
avg = 0.000657028912104
p = 0.000779220701292
p = 0.00108115909002
p = 0.00129870129869
Ant 16 : [4, 6], 10
Exploitation
Ant 17 : [0, 1], 10
Exploration
avg = 0.000512259464516
p = 0.00129518181723
p = 0.000584415583831
Ant 18 : [0, 4], 20
Exploitation
Ant 19 : [3, 4], 15
Exploitation
Ant 3 : [1, 3, 4], 33
Exploration
avg = 0.000387855843599
p = 0.000508187464201
p = 0.000531286894923
```

```
Ant 1 : [6, 4, 5, 3], 44
Exploitation
Ant 4 : [3, 4, 6], 25
Exploration
avg = 0.000333833860355
p = 0.000811680194805
Ant 5 : [4, 6, 5], 26
Exploitation
Ant 6 : [1, 0, 4], 30
Exploitation
Ant 7 : [4, 6, 5], 26
Exploitation
Ant 8 : [3, 4, 6], 25
Exploration
avg = 0.00065145826867
p = 0.00108224025974
p = 0.00081168012109
Ant 9 : [0, 5, 6], 44
Exploitation
Ant 0 : [1, 0, 5, 4, 6], 60
Exploitation
Ant 10 : [5, 6, 4], 26
Exploitation
Ant 11 : [5, 6, 4], 26
Exploration
avg = 0.000538421038515
p = 0.000589728453365
p = 0.00108224025974
Ant 12 : [6, 5, 4], 28
Exploitation
Ant 13 : [4, 6, 5], 26
Exploration
avg = 0.00033383548373
p = 0.00081168831168
Ant 14 : [4, 6, 5], 26
Exploration
avg = 0.000390578270977
p = 0.000779220701292
Ant 2 : [6, 5, 4, 3], 43
Exploration
avg = 0.000333835483731
p = 0.000811688311688
Ant 15 : [4, 6, 5], 26
Exploration
avg = 0.000333835483731
p = 0.000811688311688
Ant 16 : [4, 6, 5], 26
Exploration
avg = 0.000331805813825
p = 0.000720772668831
Ant 17 : [0, 1, 3], 28
Exploration
avg = 0.000736559255411
p = 0.000864935064156
```

```
p = 0.00108115909002
p = 0.0012987012987
Ant 18 : [0, 4, 6], 30
Exploration
avg = 0.000632590554269
p = 0.00108115909002
p = 0.0012987012987
Ant 19 : [3, 4, 6], 25
Exploration
avg = 0.000747601748031
p = 0.00108115909002
p = 0.0012987012987
Ant 3 : [1, 3, 4, 6], 43
Exploration
avg = 0.000432675021708
p = 0.000649350649351
Ant 1 : [6, 4, 5, 3, 2], 62
Exploration
avg = 0.000347722398384
p = 0.000811688311688
Ant 4 : [3, 4, 6, 5], 41
Exploitation
Ant 5 : [4, 6, 5, 3], 48
Exploration
avg = 0.000877562624459
p = 0.00108115909002
p = 0.0012987012987
Ant 6 : [1, 0, 4, 6], 40
Exploration
avg = 0.000402612337105
p = 0.000508187464201
p = 0.000590312868949
Ant 7 : [4, 6, 5, 3], 48
Exploration
avg = 0.000347722398384
p = 0.000811688311688
Ant 8 : [3, 4, 6, 5], 41
Exploration
avg = 0.000499832619124
p = 0.00129870116882
Ant 9 : [0, 5, 6, 4], 54
Exploration
avg = 0.000208162224249
p = 0.000278287825122
Ant 0 : [1, 0, 5, 4, 6, 3], 102
Exploration
avg = 0.000412006861693
p = 0.000864935064156
Ant 10 : [5, 6, 4, 3], 41
Exploration
avg = 0.0004122211476
p = 0.000865792207784
Ant 11 : [5, 6, 4, 3], 41
Exploitation
```

```
Ant 12 : [6, 5, 4, 3], 43
Exploration
avg = 0.000402613798144
p = 0.000508187464201
p = 0.000590318713105
Ant 13 : [4, 6, 5, 3], 48
Exploration
avg = 0.000402613812755
p = 0.000508187464201
p = 0.000590318771547
Ant 14 : [4, 6, 5, 3], 48
Exploitation
Ant 2 : [6, 5, 4, 3, 2], 61
Exploration
avg = 0.000402613812901
p = 0.000508187464201
p = 0.000590318772131
Ant 15 : [4, 6, 5, 3], 48
Exploration
avg = 0.000402613812902
p = 0.000508187464201
p = 0.000590318772137
Ant 16 : [4, 6, 5, 3], 48
Exploration
avg = 0.000516335820889
p = 0.000721493506494
p = 0.000865800864935
Ant 17 : [0, 1, 3, 4], 43
Exploration
avg = 0.000385733780369
p = 0.000811688311688
Ant 18 : [0, 4, 6, 5], 46
Exploration
avg = 0.000347722398384
p = 0.000811688311688
Ant 19 : [3, 4, 6, 5], 41
Exploration
avg = 0.000368861578119
p = 0.000811688311688
Ant 3 : [1, 3, 4, 6, 5], 59
Exploration
avg = 0.000460252083666
p = 0.000531286894923
Ant 1 : [6, 4, 5, 3, 2, 1], 84
Exploration
avg = 0.000340045493157
p = 0.000508187464201
Ant 4 : [3, 4, 6, 5, 2], 64
Exploration
avg = 0.000456722640755
p = 0.000721493506494
Ant 5 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.000419543420765
```

```
p = 0.000811688311688
Ant 6 : [1, 0, 4, 6, 5], 56
Exploration
avg = 0.000456725021708
p = 0.000721500649351
Ant 7 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.000358679033698
p = 0.000564088085822
Ant 8 : [3, 4, 6, 5, 2], 64
Exploration
avg = 0.000434600563037
p = 0.000865800864935
Ant 9 : [0, 5, 6, 4, 3], 69
Exploration
avg = 0.000721500720779
Ant 0 : [1, 0, 5, 4, 6, 3, 2], 120
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.000456725045755

p = 0.000721500721494
Ant 10 : [5, 6, 4, 3, 2], 59
Exploitation
Ant 11 : [5, 6, 4, 3, 2], 59
Exploitation
Ant 12 : [6, 5, 4, 3, 2], 61
Exploration
avg = 0.000456725045758
p = 0.000721500721501
Ant 13 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.000456725045758
p = 0.000721500721501
Ant 14 : [4, 6, 5, 3, 2], 66
Exploitation
Ant 2 : [6, 5, 4, 3, 2, 1], 83
Exploration
avg = 0.000456725045758
p = 0.000721500721501
Ant 15 : [4, 6, 5, 3, 2], 66
Exploitation
Ant 16 : [4, 6, 5, 3, 2], 66
Exploitation
Ant 17 : [0, 1, 3, 4, 6], 53
Exploitation
Ant 18 : [0, 4, 6, 5, 3], 68
Exploitation
Ant 19 : [3, 4, 6, 5, 2], 64
Exploitation
Ant 3 : [1, 3, 4, 6, 5, 2], 82
Exploration
avg = 0.00129868831169
Ant 1 : [6, 4, 5, 3, 2, 1, 0], 94
```

```
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.000489765070679

p = 0.000590312868949
Ant 4 : [3, 4, 6, 5, 2, 1], 86
Exploitation
Ant 5 : [4, 6, 5, 3, 2, 1], 88
Exploitation
Ant 6 : [1, 0, 4, 6, 5, 3], 78
Exploitation
Ant 7 : [4, 6, 5, 3, 2, 1], 88
Exploration
avg = 0.00048976802227
p = 0.000590318772131
Ant 8 : [3, 4, 6, 5, 2, 1], 86
Exploration
avg = 0.000573767711075
p = 0.000721500721501
Ant 9 : [0, 5, 6, 4, 3, 2], 87
Exploitation
Ant 10 : [5, 6, 4, 3, 2, 1], 81
Exploitation
Ant 11 : [5, 6, 4, 3, 2, 1], 81
Exploration
avg = 0.000489768022273
p = 0.000590318772137
Ant 12 : [6, 5, 4, 3, 2, 1], 83
Exploration
avg = 0.000489768022273
p = 0.000590318772137
Ant 13 : [4, 6, 5, 3, 2, 1], 88
Exploitation
Ant 14 : [4, 6, 5, 3, 2, 1], 88
Exploration
avg = 0.00129870116883
Ant 2 : [6, 5, 4, 3, 2, 1, 0], 93
Update called by 2Exploitation

Ant thread 2 terminating.Ant 15 : [4, 6, 5, 3, 2, 1], 88

Exploration
avg = 0.000489768022273
p = 0.000590318772137
Ant 16 : [4, 6, 5, 3, 2, 1], 88
Exploration
avg = 0.000474862467532
p = 0.000811688311688
Ant 17 : [0, 1, 3, 4, 6, 5], 69
Exploration
avg = 0.000573767711075
p = 0.000721500721501
Ant 18 : [0, 4, 6, 5, 3, 2], 86
Exploitation
```

```
Ant 19 : [3, 4, 6, 5, 2, 1], 86
Exploitation
Ant 3 : [1, 3, 4, 6, 5, 2, 0], 112
Update called by 3Exploration

Ant thread 3 terminating.avg = 0.0012987012974

Ant 4 : [3, 4, 6, 5, 2, 1, 0], 96
Update called by 4Exploration

Ant thread 4 terminating.avg = 0.00129870129869

Ant 5 : [4, 6, 5, 3, 2, 1, 0], 98
Update called by 5Exploitation

Ant thread 5 terminating.Ant 6 : [1, 0, 4, 6, 5, 3, 2], 96

Update called by 6Exploration

Ant thread 6 terminating.avg = 0.0012987012987

Ant 7 : [4, 6, 5, 3, 2, 1, 0], 98
Update called by 7Exploration

Ant thread 7 terminating.avg = 0.0012987012987

Ant 8 : [3, 4, 6, 5, 2, 1, 0], 96
Update called by 8Exploration

Ant thread 8 terminating.avg = 0.000590318772137

Ant 9 : [0, 5, 6, 4, 3, 2, 1], 109
Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [5, 6, 4, 3, 2, 1, 0], 91

Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [5, 6, 4, 3, 2, 1, 0], 91

Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [6, 5, 4, 3, 2, 1, 0], 93

Update called by 12Exploration

Ant thread 12 terminating.avg = 0.0012987012987

Ant 13 : [4, 6, 5, 3, 2, 1, 0], 98
Update called by 13Exploration

Ant thread 13 terminating.avg = 0.0012987012987

Ant 14 : [4, 6, 5, 3, 2, 1, 0], 98
```

Update called by 14Exploration

Ant thread 14 terminating.avg = 0.0012987012987

Ant 15 : [4, 6, 5, 3, 2, 1, 0], 98
Update called by 15Exploitation

Ant thread 15 terminating.Ant 16 : [4, 6, 5, 3, 2, 1, 0], 98

Update called by 16Exploitation

Ant thread 16 terminating.Ant 17 : [0, 1, 3, 4, 6, 5, 2], 92

Update called by 17Exploration

Ant thread 17 terminating.avg = 0.000590318772137

Ant 18 : [0, 4, 6, 5, 3, 2, 1], 108
Update called by 18Exploration

Ant thread 18 terminating.avg = 0.0012987012987

Ant 19 : [3, 4, 6, 5, 2, 1, 0], 96
Update called by 19
Best: [4, 6, 5, 3, 2, 1, 0], 118, 7, 124
Ant thread 19 terminating.iter_counter = 8

starting ant = 0
Exploitationstarting ant = 1

Ant 0 : [1, 0], 10starting ant = 2

Explorationstarting ant = 3

avg = 0.000449774432725starting ant = 4

p = 0.00116883116766starting ant = 5

p = 0.000730519480519starting ant = 6

Ant 1 : [6, 5], 16starting ant = 7

Explorationstarting ant = 8

avg = 0.000331794637539starting ant = 9

p = 0.00058440974026starting ant = 10

p = 0.000417435490542starting ant = 11

Ant 0 : [1, 0, 5], 38starting ant = 12

Explorationstarting ant = 13

avg = 0.000463167289868starting ant = 14

p = 0.00116883116766starting ant = 15

p = 0.000810876623377starting ant = 16

Ant 2 : [6, 5], 16starting ant = 17

Exploitationstarting ant = 18

Ant 3 : [1, 0], 10starting ant = 19

Exploration
avg = 0.000407103737279
p = 0.000649350649351
p = 0.000779220779213
Ant 4 : [3, 4], 15
Exploration
avg = 0.00060431304557
p = 0.000779220779213
p = 0.000973043181022
p = 0.00116883116883
Ant 5 : [4, 6], 10
Exploration
avg = 0.000465410528138
p = 0.00129868831169
p = 0.000649344096877
Ant 6 : [1, 3], 18
Exploration
avg = 0.000494850869999
p = 0.000508187464704
p = 0.000531286894923
p = 0.000974025876623
Ant 1 : [6, 5, 4], 28
Exploitation
Ant 7 : [4, 6], 10
Exploration
avg = 0.000421389451566
p = 0.000649350649351
p = 0.000864935064935
Ant 8 : [3, 4], 15
Exploration
avg = 0.000478426560172
p = 0.0011656636355
p = 0.0005844097402 6
Ant 9 : [0, 4], 20
Exploitation
Ant 10 : [5, 4], 12
Exploitation
Ant 11 : [5, 4], 12
Exploration
avg = 0.000713061185114
p = 0.00108225097403
p = 0.000730519406804

Ant 0 : [1, 0, 5, 6], 54
Exploration
avg = 0.00046330121844
p = 0.00116883116766
p = 0.000811680194805
Ant 12 : [6, 5], 16
Exploitation
Ant 13 : [4, 6], 10
Exploration
avg = 0.00062595804557
p = 0.000779220779213
p = 0.000973043181022
p = 0.00129870116883
Ant 14 : [4, 6], 10
Exploitation
Ant 15 : [4, 6], 10
Exploitation
Ant 16 : [4, 6], 10
Exploration
avg = 0.000516495889479
p = 0.000531286894923
p = 0.00108225097403
Ant 2 : [6, 5, 4], 28
Exploitation
Ant 17 : [0, 1], 10
Exploitation
Ant 18 : [0, 1], 10
Exploration
avg = 0.000353837445105
p = 0.00064870124026
p = 0.000463358028375
Ant 3 : [1, 0, 5], 38
Exploration
avg = 0.000421532308709
p = 0.000649350649351
p = 0.000865792207792
Ant 19 : [3, 4], 15
Exploration
avg = 0.000595305524816
p = 0.000973043181022
p = 0.0012987012987
Ant 4 : [3, 4, 6], 25
Exploitation
Ant 5 : [4, 6, 5], 26
Exploration
avg = 0.000429154238619
p = 0.000649350649351
p = 0.000865800779221
Ant 6 : [1, 3, 4], 33
Exploitation
Ant 1 : [6, 5, 4, 3], 43
Exploitation
Ant 7 : [4, 6, 5], 26
Exploitation

Ant 8 : [3, 4, 6], 25
Exploitation
Ant 9 : [0, 4, 6], 30
Exploitation
Ant 10 : [5, 4, 6], 22
Exploration
avg = 0.000573683901598
p = 0.000864935064935
p = 0.0012987012987
Ant 11 : [5, 4, 6], 22
Exploration
avg = 0.000523692974403
p = 0.00116883116766
Ant 0 : [1, 0, 5, 6, 4], 64
Exploration
avg = 0.000516495910908
p = 0.000531286894923
p = 0.00108225108117
Ant 12 : [6, 5, 4], 28
Exploitation
Ant 13 : [4, 6, 5], 26
Exploitation
Ant 14 : [4, 6, 5], 26
Exploitation
Ant 15 : [4, 6, 5], 26
Exploitation
Ant 16 : [4, 6, 5], 26
Exploitation
Ant 2 : [6, 5, 4, 3], 43
Exploitation
Ant 17 : [0, 1, 3], 28
Exploitation
Ant 18 : [0, 1, 3], 28
Exploration
avg = 0.000733150516127
p = 0.00108225108224
p = 0.000810876622639
Ant 3 : [1, 0, 5, 6], 54
Exploration
avg = 0.000595305524816
p = 0.000973043181022
p = 0.0012987012987
Ant 19 : [3, 4, 6], 25
Exploitation
Ant 4 : [3, 4, 6, 5], 41
Exploitation
Ant 5 : [4, 6, 5, 3], 48
Exploration
avg = 0.000705309105695
p = 0.000973043181022
p = 0.0012987012987
Ant 6 : [1, 3, 4, 6], 43
Exploitation
Ant 1 : [6, 5, 4, 3, 2], 61

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Exploitation
Ant 7 : [4, 6, 5, 3], 48
Exploration
avg = 0.000333242366338
p = 0.000811688311688
Ant 8 : [3, 4, 6, 5], 41
Exploitation
Ant 9 : [0, 4, 6, 5], 46
Exploitation
Ant 10 : [5, 4, 6, 3], 64
Exploration
avg = 0.000207545937647
p = 0.000255874373261
p = 0.000308902596925
Ant 11 : [5, 4, 6, 3], 64
Exploitation
Ant 0 : [1, 0, 5, 6, 4, 3], 79
Exploitation
Ant 12 : [6, 5, 4, 3], 43
Exploitation
Ant 13 : [4, 6, 5, 3], 48
Exploration
avg = 0.000389815072888
p = 0.000508187464704
p = 0.000590318713105
Ant 14 : [4, 6, 5, 3], 48
Exploitation
Ant 15 : [4, 6, 5, 3], 48
Exploitation
Ant 16 : [4, 6, 5, 3], 48
Exploration
avg = 0.000434862064992
p = 0.000720779220779
Ant 2 : [6, 5, 4, 3, 2], 61
Exploitation
Ant 17 : [0, 1, 3, 4], 43
Exploration
avg = 0.0005043845983
p = 0.000721493506494
p = 0.000865800865792
Ant 18 : [0, 1, 3, 4], 43
Exploration
avg = 0.000576949011126
p = 0.00129740259739
Ant 3 : [1, 0, 5, 6, 4], 64
Exploration
avg = 0.000333242366338
p = 0.000811688311688
Ant 19 : [3, 4, 6, 5], 41
Exploitation
Ant 4 : [3, 4, 6, 5, 2], 64
Exploitation
Ant 5 : [4, 6, 5, 3, 2], 66
Exploration
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avg = 0.000359031697363
p = 0.000811688311688
Ant 6 : [1, 3, 4, 6, 5], 59
Exploitation
Ant 1 : [6, 5, 4, 3, 2, 1], 83
Exploration
avg = 0.000435102541182
p = 0.000721500649351
Ant 7 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.000341614066524
p = 0.000564088085827
Ant 8 : [3, 4, 6, 5, 2], 64
Exploration
avg = 0.000464625134878
p = 0.000564647092038
p = 0.000590318772137
Ant 9 : [0, 4, 6, 5, 3], 68
Exploitation
Ant 10 : [5, 4, 6, 3, 2], 82
Exploitation
Ant 11 : [5, 4, 6, 3, 2], 82
Exploitation
Ant 0 : [1, 0, 5, 6, 4, 3, 2], 97
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.000435102565232

p = 0.000721500721501
Ant 12 : [6, 5, 4, 3, 2], 61
Exploitation
Ant 13 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.000435102565232
p = 0.000721500721501
Ant 14 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.000435102565232
p = 0.000721500721501
Ant 15 : [4, 6, 5, 3, 2], 66
Exploitation
Ant 16 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.000489472847265
p = 0.000589728453365
Ant 2 : [6, 5, 4, 3, 2, 1], 83
Exploitation
Ant 17 : [0, 1, 3, 4, 6], 53
Exploration
avg = 0.000836884673394
p = 0.000973043181022
p = 0.0012987012987
Ant 18 : [0, 1, 3, 4, 6], 53
Exploration
```

```
avg = 0.000552355202697
p = 0.000865800864935
Ant 3 : [1, 0, 5, 6, 4, 3], 79
Exploitation
Ant 19 : [3, 4, 6, 5, 2], 64
Exploitation
Ant 4 : [3, 4, 6, 5, 2, 1], 86
Exploration
avg = 0.000489767977136
p = 0.000590318713105
Ant 5 : [4, 6, 5, 3, 2, 1], 88
Exploration
avg = 0.000393248627692
p = 0.000564652682101
Ant 6 : [1, 3, 4, 6, 5, 2], 82
Exploitation
Ant 1 : [6, 5, 4, 3, 2, 1, 0], 93
Update called by 1Exploitation

Ant thread 1 terminating.Ant 7 : [4, 6, 5, 3, 2, 1], 88

Exploration
avg = 0.000489768006649
p = 0.000590318772131
Ant 8 : [3, 4, 6, 5, 2, 1], 86
Exploration
avg = 0.000552465976043
p = 0.000721500721501
Ant 9 : [0, 4, 6, 5, 3, 2], 86
Exploration
avg = 0.000489768006651
p = 0.000590318772137
Ant 10 : [5, 4, 6, 3, 2, 1], 104
Exploitation
Ant 11 : [5, 4, 6, 3, 2, 1], 104
Exploration
avg = 0.000489768006651
p = 0.000590318772137
Ant 12 : [6, 5, 4, 3, 2, 1], 83
Exploration
avg = 0.000489768006651
p = 0.000590318772137
Ant 13 : [4, 6, 5, 3, 2, 1], 88
Exploration
avg = 0.000489768006651
p = 0.000590318772137
Ant 14 : [4, 6, 5, 3, 2, 1], 88
Exploitation
Ant 15 : [4, 6, 5, 3, 2, 1], 88
Exploration
avg = 0.000489768006651
p = 0.000590318772137
Ant 16 : [4, 6, 5, 3, 2, 1], 88
Exploitation
```

```
Ant 2 : [6, 5, 4, 3, 2, 1, 0], 93
Update called by 2Exploitation

Ant thread 2 terminating.Ant 17 : [0, 1, 3, 4, 6, 5], 69

Exploitation
Ant 18 : [0, 1, 3, 4, 6, 5], 69
Exploration
avg = 0.000721500721501
Ant 3 : [1, 0, 5, 6, 4, 3, 2], 97
Update called by 3Exploitation

Ant thread 3 terminating.Ant 19 : [3, 4, 6, 5, 2, 1], 86

Exploitation
Ant 4 : [3, 4, 6, 5, 2, 1, 0], 96
Update called by 4Exploration

Ant thread 4 terminating.avg = 0.00129870129869

Ant 5 : [4, 6, 5, 3, 2, 1, 0], 98
Update called by 5Exploration

Ant thread 5 terminating.avg = 0.000389217241166

Ant 6 : [1, 3, 4, 6, 5, 2, 0], 112
Update called by 6Exploitation

Ant thread 6 terminating.Ant 7 : [4, 6, 5, 3, 2, 1, 0], 98

Update called by 7Exploration

Ant thread 7 terminating.avg = 0.0012987012987

Ant 8 : [3, 4, 6, 5, 2, 1, 0], 96
Update called by 8Exploration

Ant thread 8 terminating.avg = 0.000590318772137

Ant 9 : [0, 4, 6, 5, 3, 2, 1], 108
Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [5, 4, 6, 3, 2, 1, 0], 114

Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [5, 4, 6, 3, 2, 1, 0], 114

Update called by 11Exploration

Ant thread 11 terminating.avg = 0.0012987012987

Ant 12 : [6, 5, 4, 3, 2, 1, 0], 93
Update called by 12Exploration
```

Ant thread 12 terminating.avg = 0.0012987012987

Ant 13 : [4, 6, 5, 3, 2, 1, 0], 98
Update called by 13Exploitation

Ant thread 13 terminating.Ant 14 : [4, 6, 5, 3, 2, 1, 0], 98

Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [4, 6, 5, 3, 2, 1, 0], 98

Update called by 15Exploitation

Ant thread 15 terminating.Ant 16 : [4, 6, 5, 3, 2, 1, 0], 98

Update called by 16Exploration

Ant thread 16 terminating.avg = 0.000564652738001

Ant 17 : [0, 1, 3, 4, 6, 5, 2], 92
Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [0, 1, 3, 4, 6, 5, 2], 92

Update called by 18Exploitation

Ant thread 18 terminating.Ant 19 : [3, 4, 6, 5, 2, 1, 0], 96

Update called by 19
Best: [4, 6, 5, 3, 2, 1, 0], 118, 8, 125
Ant thread 19 terminating.iter_counter = 9

starting ant = 0
Explorationstarting ant = 1

avg = 0.000429694906247starting ant = 2

p = 0.00116883116883starting ant = 3

p = 0.00064935058441starting ant = 4

Ant 0 : [1, 3], 18starting ant = 5

Exploitationstarting ant = 6

Ant 1 : [6, 4], 10starting ant = 7

Explorationstarting ant = 8

avg = 0.000462560887798starting ant = 9

p = 0.00129740248052starting ant = 10

p = 0.000730519480519starting ant = 11

Ant 2 : [6, 5], 16starting ant = 12

Exploitationstarting ant = 13

Ant 3 : [1, 0], 10starting ant = 14

Explorationstarting ant = 15

avg = 0.000390202887362starting ant = 16

p = 0.000649350649351starting ant = 17

p = 0.000779220779221starting ant = 18

Ant 4 : [3, 4], 15starting ant = 19

Exploration
avg = 0.000416368700472
p = 0.000649350649351
p = 0.000864935064935
Ant 0 : [1, 3, 4], 33
Exploration
avg = 0.000576349273481
p = 0.000779220779213
p = 0.00087573886292
p = 0.00116883116883
Ant 5 : [4, 6], 10
Exploration
avg = 0.000463028250295
p = 0.0012974025974
p = 0.00072077922013
Ant 6 : [1, 3], 18
Exploitation
Ant 1 : [6, 4, 5], 22
Exploration
avg = 0.000631852361099
p = 0.000779220779213
p = 0.00108018596006
p = 0.0012974025974
Ant 7 : [4, 6], 10
Exploitation
Ant 8 : [3, 4], 15
Exploitation
Ant 9 : [0, 1], 10
Exploration
avg = 0.000526448535223
p = 0.000531286894923
p = 0.000974025974016
p = 0.000730512175318
Ant 10 : [5, 6], 16
Exploitation
Ant 11 : [5, 4], 12

```
Exploitation
Ant 2 : [6, 5, 4], 28
Exploration
avg = 0.000475953744941
p = 0.00129740248052
p = 0.000810876623377
Ant 12 : [6, 5], 16
Exploitation
Ant 13 : [4, 6], 10
Exploration
avg = 0.000318536361163
p = 0.000583831116234
p = 0.000417435528378
Ant 3 : [1, 0, 5], 38
Exploitation
Ant 14 : [4, 6], 10
Exploitation
Ant 15 : [4, 6], 10
Exploitation
Ant 16 : [4, 6], 10
Exploration
avg = 0.000489334463976
p = 0.00129740247767
p = 0.000583831116234
Ant 17 : [0, 4], 20
Exploitation
Ant 18 : [0, 1], 10
Exploration
avg = 0.000602638417736
p = 0.00108018596006
p = 0.0012987012987
Ant 4 : [3, 4, 6], 25
Exploitation
Ant 19 : [3, 4], 15
Exploration
avg = 0.000718357501878
p = 0.00108018596006
p = 0.0012987012987
Ant 0 : [1, 3, 4, 6], 43
Exploration
avg = 0.000311824712111
p = 0.000811680194805
Ant 5 : [4, 6, 5], 26
Exploitation
Ant 6 : [1, 3, 4], 33
Exploration
avg = 0.0003635382655
p = 0.000508187464709
p = 0.000531286894923
Ant 1 : [6, 4, 5, 3], 44
Exploration
avg = 0.000311826319254
p = 0.000811688230519
Ant 7 : [4, 6, 5], 26
```

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Exploitation
Ant 8 : [3, 4, 6], 25
Exploitation
Ant 9 : [0, 1, 3], 28
Exploration
avg = 0.000408969169254
p = 0.00129740248052
Ant 10 : [5, 6, 4], 26
Exploitation
Ant 11 : [5, 4, 6], 22
Exploration
avg = 0.000353381402283
p = 0.000779220779213
Ant 2 : [6, 5, 4, 3], 43
Exploitation
Ant 12 : [6, 5, 4], 28
Exploration
avg = 0.000311826335325
p = 0.000811688310877
Ant 13 : [4, 6, 5], 26
Exploitation
Ant 3 : [1, 0, 5, 4], 50
Exploration
avg = 0.000311826335486
p = 0.00081168831168
Ant 14 : [4, 6, 5], 26
Exploration
avg = 0.000311826335488
p = 0.000811688311688
Ant 15 : [4, 6, 5], 26
Exploitation
Ant 16 : [4, 6, 5], 26
Exploitation
Ant 17 : [0, 4, 6], 30
Exploration
avg = 0.000296297666718
p = 0.000721500649351
Ant 18 : [0, 1, 3], 28
Exploration
avg = 0.000320210337496
p = 0.000811688311688
Ant 4 : [3, 4, 6, 5], 41
Exploration
avg = 0.000602638417736
p = 0.00108018596006
p = 0.0012987012987
Ant 19 : [3, 4, 6], 25
Exploitation
Ant 0 : [1, 3, 4, 6, 5], 59
Exploitation
Ant 5 : [4, 6, 5, 3], 48
Exploitation
Ant 6 : [1, 3, 4, 6], 43
Exploration
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```
avg = 0.000391592308709
p = 0.000649350649351
Ant 1 : [6, 4, 5, 3, 2], 62
Exploitation
Ant 7 : [4, 6, 5, 3], 48
Exploitation
Ant 8 : [3, 4, 6, 5], 41
Exploitation
Ant 9 : [0, 1, 3, 4], 43
Exploration
avg = 0.000374809973714
p = 0.000864935064935
Ant 10 : [5, 6, 4, 3], 41
Exploitation
Ant 11 : [5, 4, 6, 3], 64
Exploration
avg = 0.000415401832518
p = 0.000720779220779
Ant 2 : [6, 5, 4, 3, 2], 61
Exploitation
Ant 12 : [6, 5, 4, 3], 43
Exploitation
Ant 13 : [4, 6, 5, 3], 48
Exploitation
Ant 3 : [1, 0, 5, 4, 6], 60
Exploration
avg = 0.000378296234656
p = 0.000508187464709
p = 0.000590318771547
Ant 14 : [4, 6, 5, 3], 48
Exploitation
Ant 15 : [4, 6, 5, 3], 48
Exploration
avg = 0.000378296234804
p = 0.000508187464709
p = 0.000590318772137
Ant 16 : [4, 6, 5, 3], 48
Exploration
avg = 0.000365672566203
p = 0.000811688311688
Ant 17 : [0, 4, 6, 5], 46
Exploitation
Ant 18 : [0, 1, 3, 4], 43
Exploitation
Ant 4 : [3, 4, 6, 5, 2], 64
Exploitation
Ant 19 : [3, 4, 6, 5], 41
Exploitation
Ant 0 : [1, 3, 4, 6, 5, 2], 82
Exploration
avg = 0.000415639927757
p = 0.000721493506494
Ant 5 : [4, 6, 5, 3, 2], 66
Exploration
```

avg = 0.000350184804683
p = 0.000811688311688
Ant 6 : [1, 3, 4, 6, 5], 59
Exploration
avg = 0.000460252067904
p = 0.000531286894923
Ant 1 : [6, 4, 5, 3, 2, 1], 84
Exploration
avg = 0.000415642308709
p = 0.000721500649351
Ant 7 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.000326441931469
p = 0.000564647092038
Ant 8 : [3, 4, 6, 5, 2], 64
Exploration
avg = 0.000864635281724
p = 0.00108018596006
p = 0.0012987012987
Ant 9 : [0, 1, 3, 4, 6], 53
Exploration
avg = 0.000415642332518
p = 0.000721500720779
Ant 10 : [5, 6, 4, 3, 2], 59
Exploitation
Ant 11 : [5, 4, 6, 3, 2], 82
Exploration
avg = 0.000489472847125
p = 0.000589728453365
Ant 2 : [6, 5, 4, 3, 2, 1], 83
Exploitation
Ant 12 : [6, 5, 4, 3, 2], 61
Exploration
avg = 0.000415642332759
p = 0.000721500721501
Ant 13 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.000210357508595
p = 0.000308905352254
Ant 3 : [1, 0, 5, 4, 6, 3], 102
Exploitation
Ant 14 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.000415642332759
p = 0.000721500721501
Ant 15 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.000415642332759
p = 0.000721500721501
Ant 16 : [4, 6, 5, 3, 2], 66
Exploitation
Ant 17 : [0, 4, 6, 5, 3], 68
Exploitation
Ant 18 : [0, 1, 3, 4, 6], 53

Exploitation
Ant 4 : [3, 4, 6, 5, 2, 1], 86
Exploitation
Ant 19 : [3, 4, 6, 5, 2], 64
Exploration
avg = 0.000389217240885
Ant 0 : [1, 3, 4, 6, 5, 2, 0], 112
Update called by 0Exploitation

Ant thread 0 terminating.Ant 5 : [4, 6, 5, 3, 2, 1], 88

Exploration
avg = 0.000382156426978
p = 0.000564652738001
Ant 6 : [1, 3, 4, 6, 5, 2], 82
Exploitation
Ant 1 : [6, 4, 5, 3, 2, 1, 0], 94
Update called by 1Exploitation

Ant thread 1 terminating.Ant 7 : [4, 6, 5, 3, 2, 1], 88

Exploitation
Ant 8 : [3, 4, 6, 5, 2, 1], 86
Exploitation
Ant 9 : [0, 1, 3, 4, 6, 5], 69
Exploration
avg = 0.000511391186559
p = 0.000590318772137
Ant 10 : [5, 6, 4, 3, 2, 1], 81
Exploration
avg = 0.000511391186559
p = 0.000590318772137
Ant 11 : [5, 4, 6, 3, 2, 1], 104
Exploitation
Ant 2 : [6, 5, 4, 3, 2, 1, 0], 93
Update called by 2Exploitation

Ant thread 2 terminating.Ant 12 : [6, 5, 4, 3, 2, 1], 83

Exploration
avg = 0.000511391186559
p = 0.000590318772137
Ant 13 : [4, 6, 5, 3, 2, 1], 88
Exploration
avg = 0.000721500721501
Ant 3 : [1, 0, 5, 4, 6, 3, 2], 120
Update called by 3Exploitation

Ant thread 3 terminating.Ant 14 : [4, 6, 5, 3, 2, 1], 88

Exploitation
Ant 15 : [4, 6, 5, 3, 2, 1], 88
Exploitation
Ant 16 : [4, 6, 5, 3, 2, 1], 88

```
Exploitation
Ant 17 : [0, 4, 6, 5, 3, 2], 86
Exploration
avg = 0.000461748988312
p = 0.000811688311688
Ant 18 : [0, 1, 3, 4, 6, 5], 69
Exploitation
Ant 4 : [3, 4, 6, 5, 2, 1, 0], 96
Update called by 4Exploitation

Ant thread 4 terminating.Ant 19 : [3, 4, 6, 5, 2, 1], 86

Exploration
avg = 0.0012987012974
Ant 5 : [4, 6, 5, 3, 2, 1, 0], 98
ExplorationUpdate called by 5

avg = 0.00043246360098Ant thread 5 terminating.

Ant 6 : [1, 3, 4, 6, 5, 2, 0], 112
Update called by 6Exploration

Ant thread 6 terminating.avg = 0.00129870129869

Ant 7 : [4, 6, 5, 3, 2, 1, 0], 98
Update called by 7Exploration

Ant thread 7 terminating.avg = 0.0012987012987

Ant 8 : [3, 4, 6, 5, 2, 1, 0], 96
Update called by 8Exploration

Ant thread 8 terminating.avg = 0.00056465273856

Ant 9 : [0, 1, 3, 4, 6, 5, 2], 92
Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [5, 6, 4, 3, 2, 1, 0], 91

Update called by 10Exploration

Ant thread 10 terminating.avg = 0.0012987012987

Ant 11 : [5, 4, 6, 3, 2, 1, 0], 114
Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [6, 5, 4, 3, 2, 1, 0], 93

Update called by 12Exploration

Ant thread 12 terminating.avg = 0.0012987012987

Ant 13 : [4, 6, 5, 3, 2, 1, 0], 98
Update called by 13Exploitation
```

Ant thread 13 terminating.Ant 14 : [4, 6, 5, 3, 2, 1, 0], 98

Update called by 14Exploration

Ant thread 14 terminating.avg = 0.0012987012987

Ant 15 : [4, 6, 5, 3, 2, 1, 0], 98
Update called by 15Exploration

Ant thread 15 terminating.avg = 0.0012987012987

Ant 16 : [4, 6, 5, 3, 2, 1, 0], 98
Update called by 16Exploitation

Ant thread 16 terminating.Ant 17 : [0, 4, 6, 5, 3, 2, 1], 108

Update called by 17Exploration

Ant thread 17 terminating.avg = 0.000564652738566

Ant 18 : [0, 1, 3, 4, 6, 5, 2], 92
Update called by 18Exploration

Ant thread 18 terminating.avg = 0.0012987012987

Ant 19 : [3, 4, 6, 5, 2, 1, 0], 96
Update called by 19
Best: [4, 6, 5, 3, 2, 1, 0], 118, 9, 125
Ant thread 19 terminating.iter_counter = 10

starting ant = 0
Explorationstarting ant = 1

avg = 0.000417028455558starting ant = 2

p = 0.00116883116883starting ant = 3

p = 0.000649350648701starting ant = 4

Ant 0 : [1, 3], 18starting ant = 5

Exploitationstarting ant = 6

Ant 1 : [6, 4], 10starting ant = 7

Explorationstarting ant = 8

avg = 0.000454741674624starting ant = 9

p = 0.00129740248051starting ant = 10

p = 0.000730519480519starting ant = 11

```
Ant 2 : [6, 5], 16starting ant = 12

Exploitationstarting ant = 13

Ant 3 : [1, 0], 10starting ant = 14

Explorationstarting ant = 15

avg = 0.000374992122435starting ant = 16

p = 0.000649350649351starting ant = 17

p = 0.000779220779221starting ant = 18

Ant 4 : [3, 4], 15starting ant = 19

Exploitation
Ant 0 : [1, 3, 4], 33
Exploration
avg = 0.000581848930185
p = 0.000779220701299
p = 0.000972167364052
p = 0.00116883116883
Ant 5 : [4, 6], 10
Exploitation
Ant 6 : [1, 0], 10
Exploitation
Ant 1 : [6, 4, 5], 22
Exploitation
Ant 7 : [4, 6], 10
Exploitation
Ant 8 : [3, 4], 15
Exploitation
Ant 9 : [0, 1], 10
Exploitation
Ant 10 : [5, 4], 12
Exploration
avg = 0.000537273819703
p = 0.00108116883116
p = 0.000729788895292
Ant 11 : [5, 6], 16
Exploration
avg = 0.000498770804585
p = 0.000508187464709
p = 0.000531286894923
p = 0.00108116883116
Ant 2 : [6, 5, 4], 28
Exploration
avg = 0.000468134531767
p = 0.00129740248051
p = 0.000810876623377
Ant 12 : [6, 5], 16
Exploitation
Ant 13 : [4, 6], 10
```

```
Exploitation
Ant 3 : [1, 0, 4], 30
Exploration
avg = 0.000621657743688
p = 0.000779220701299
p = 0.00108115024507
p = 0.00129870116883
Ant 14 : [4, 6], 10
Exploitation
Ant 15 : [4, 6], 10
Exploitation
Ant 16 : [4, 6], 10
Exploration
avg = 0.000482565625569
p = 0.00129740248051
p = 0.000648695401943
Ant 17 : [0, 4], 20
Exploitation
Ant 18 : [0, 1], 10
Exploitation
Ant 4 : [3, 4, 6], 25
Exploitation
Ant 19 : [3, 4], 15
Exploitation
Ant 0 : [1, 3, 4, 6], 43
Exploration
avg = 0.000302441656305
p = 0.000811680194805
Ant 5 : [4, 6, 5], 26
Exploitation
Ant 6 : [1, 0, 4], 30
Exploration
avg = 0.000353171297941
p = 0.000508187464709
p = 0.000531286894923
Ant 1 : [6, 4, 5, 3], 44
Exploitation
Ant 7 : [4, 6, 5], 26
Exploitation
Ant 8 : [3, 4, 6], 25
Exploration
avg = 0.000280953627318
p = 0.000720779220773
Ant 9 : [0, 1, 3], 28
Exploitation
Ant 10 : [5, 4, 6], 22
Exploitation
Ant 11 : [5, 6, 4], 26
Exploration
avg = 0.000337523762057
p = 0.000779220701299
Ant 2 : [6, 5, 4, 3], 43
Exploration
avg = 0.000510673401989
```

```
p = 0.000589728453365
p = 0.00108224025974
Ant 12 : [6, 5, 4], 28
Exploitation
Ant 13 : [4, 6, 5], 26
Exploitation
Ant 3 : [1, 0, 4, 6], 40
Exploration
avg = 0.00030244327968
p = 0.00081168831168
Ant 14 : [4, 6, 5], 26
Exploitation
Ant 15 : [4, 6, 5], 26
Exploitation
Ant 16 : [4, 6, 5], 26
Exploration
avg = 0.00071281784175
p = 0.000864935064156
p = 0.00108115024507
p = 0.0012987012987
Ant 17 : [0, 4, 6], 30
Exploitation
Ant 18 : [0, 1, 3], 28
Exploration
avg = 0.000308481511539
p = 0.000811688311688
Ant 4 : [3, 4, 6, 5], 41
Exploration
avg = 0.00059014517814
p = 0.00108115024507
p = 0.0012987012987
Ant 19 : [3, 4, 6], 25
Exploration
avg = 0.000342222601271
p = 0.000811688311688
Ant 0 : [1, 3, 4, 6, 5], 59
Exploration
avg = 0.000367781687552
p = 0.000508187464709
p = 0.000589728453365
Ant 5 : [4, 6, 5, 3], 48
Exploration
avg = 0.000859575833925
p = 0.000864935064156
p = 0.00108115024507
p = 0.0012987012987
Ant 6 : [1, 0, 4, 6], 40
Exploration
avg = 0.000374078099483
p = 0.000649350649351
Ant 1 : [6, 4, 5, 3, 2], 62
Exploration
avg = 0.000367927791448
p = 0.000508187464709
```

```
p = 0.000590312868949
Ant 7 : [4, 6, 5, 3], 48
Exploitation
Ant 8 : [3, 4, 6, 5], 41
Exploitation
Ant 9 : [0, 1, 3, 4], 43
Exploitation
Ant 10 : [5, 4, 6, 3], 64
Exploitation
Ant 11 : [5, 6, 4, 3], 41
Exploitation
Ant 2 : [6, 5, 4, 3, 2], 61
Exploitation
Ant 12 : [6, 5, 4, 3], 43
Exploitation
Ant 13 : [4, 6, 5, 3], 48
Exploration
avg = 0.000407074120877
p = 0.000811688311688
Ant 3 : [1, 0, 4, 6, 5], 56
Exploration
avg = 0.000367929267097
p = 0.000508187464709
p = 0.000590318771547
Ant 14 : [4, 6, 5, 3], 48
Exploitation
Ant 15 : [4, 6, 5, 3], 48
Exploration
avg = 0.000367929267245
p = 0.000508187464709
p = 0.000590318772137
Ant 16 : [4, 6, 5, 3], 48
Exploration
avg = 0.000357120151243
p = 0.000811688311688
Ant 17 : [0, 4, 6, 5], 46
Exploration
avg = 0.000483948007307
p = 0.000721493506494
p = 0.000865800865792
Ant 18 : [0, 1, 3, 4], 43
Exploration
avg = 0.00029379943228
p = 0.000508187464709
Ant 4 : [3, 4, 6, 5, 2], 64
Exploration
avg = 0.000308481511539
p = 0.000811688311688
Ant 19 : [3, 4, 6, 5], 41
Exploitation
Ant 0 : [1, 3, 4, 6, 5, 2], 82
Exploitation
Ant 5 : [4, 6, 5, 3, 2], 66
Exploitation
```

Ant 6 : [1, 0, 4, 6, 5], 56
Exploration
avg = 0.000460446676523
p = 0.000531286894923
Ant 1 : [6, 4, 5, 3, 2, 1], 84
Exploitation
Ant 7 : [4, 6, 5, 3, 2], 66
Exploitation
Ant 8 : [3, 4, 6, 5, 2], 64
Exploration
avg = 0.000857789423848
p = 0.00108115024507
p = 0.0012987012987
Ant 9 : [0, 1, 3, 4, 6], 53
Exploration
avg = 0.000398128123293
p = 0.000721500720779
Ant 10 : [5, 4, 6, 3, 2], 82
Exploitation
Ant 11 : [5, 6, 4, 3, 2], 59
Exploration
avg = 0.000489667455744
p = 0.000589728453365
Ant 2 : [6, 5, 4, 3, 2, 1], 83
Exploitation
Ant 12 : [6, 5, 4, 3, 2], 61
Exploitation
Ant 13 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.000577485727119
p = 0.000590318772137
Ant 3 : [1, 0, 4, 6, 5, 3], 78
Exploitation
Ant 14 : [4, 6, 5, 3, 2], 66
Exploitation
Ant 15 : [4, 6, 5, 3, 2], 66
Exploitation
Ant 16 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.00044949606067
p = 0.000564652682101
p = 0.000590318772137
Ant 17 : [0, 4, 6, 5, 3], 68
Exploitation
Ant 18 : [0, 1, 3, 4, 6], 53
Exploration
avg = 0.000489959663536
p = 0.000590312868949
Ant 4 : [3, 4, 6, 5, 2, 1], 86
Exploration
avg = 0.000312621171411
p = 0.000564652682101
Ant 19 : [3, 4, 6, 5, 2], 64
Exploitation

```
Ant 0 : [1, 3, 4, 6, 5, 2, 0], 112
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.000511393103129

p = 0.000590318713105
Ant 5 : [4, 6, 5, 3, 2, 1], 88
Exploitation
Ant 6 : [1, 0, 4, 6, 5, 3], 78
Exploitation
Ant 1 : [6, 4, 5, 3, 2, 1, 0], 94
ExploitationUpdate called by 1

Ant 7 : [4, 6, 5, 3, 2, 1], 88Ant thread 1 terminating.

Exploration
avg = 0.000511393132642
p = 0.000590318772131
Ant 8 : [3, 4, 6, 5, 2, 1], 86
Exploitation
Ant 9 : [0, 1, 3, 4, 6, 5], 69
Exploitation
Ant 10 : [5, 4, 6, 3, 2, 1], 104
Exploration
avg = 0.000511393132645
p = 0.000590318772137
Ant 11 : [5, 6, 4, 3, 2, 1], 81
Exploitation
Ant 2 : [6, 5, 4, 3, 2, 1, 0], 93
Update called by 2Exploitation

Ant thread 2 terminating.Ant 12 : [6, 5, 4, 3, 2, 1], 83

Exploration
avg = 0.000511393132645
p = 0.000590318772137
Ant 13 : [4, 6, 5, 3, 2, 1], 88
Exploitation
Ant 3 : [1, 0, 4, 6, 5, 3, 2], 96
Update called by 3Exploitation

Ant thread 3 terminating.Ant 14 : [4, 6, 5, 3, 2, 1], 88

Exploitation
Ant 15 : [4, 6, 5, 3, 2, 1], 88
Exploration
avg = 0.000511393132645
p = 0.000590318772137
Ant 16 : [4, 6, 5, 3, 2, 1], 88
Exploitation
Ant 17 : [0, 4, 6, 5, 3, 2], 86
Exploitation
Ant 18 : [0, 1, 3, 4, 6, 5], 69
Exploration
```

avg = 0.0012987012974
Ant 4 : [3, 4, 6, 5, 2, 1, 0], 96
Update called by 4Exploitation

Ant thread 4 terminating.Ant 19 : [3, 4, 6, 5, 2, 1], 86

Exploration
avg = 0.00129870129869
Ant 5 : [4, 6, 5, 3, 2, 1, 0], 98
Update called by 5Exploration

Ant thread 5 terminating.avg = 0.000721500721501

Ant 6 : [1, 0, 4, 6, 5, 3, 2], 96
Update called by 6Exploration

Ant thread 6 terminating.avg = 0.0012987012987

Ant 7 : [4, 6, 5, 3, 2, 1, 0], 98
Update called by 7Exploitation

Ant thread 7 terminating.Ant 8 : [3, 4, 6, 5, 2, 1, 0], 96

Update called by 8Exploration

Ant thread 8 terminating.avg = 0.000564652738001

Ant 9 : [0, 1, 3, 4, 6, 5, 2], 92
Update called by 9Exploration

Ant thread 9 terminating.avg = 0.0012987012987

Ant 10 : [5, 4, 6, 3, 2, 1, 0], 114
Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [5, 6, 4, 3, 2, 1, 0], 91

Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [6, 5, 4, 3, 2, 1, 0], 93

ExplorationUpdate called by 12

avg = 0.0012987012987Ant thread 12 terminating.

Ant 13 : [4, 6, 5, 3, 2, 1, 0], 98
Update called by 13Exploration

Ant thread 13 terminating.avg = 0.0012987012987

Ant 14 : [4, 6, 5, 3, 2, 1, 0], 98
Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [4, 6, 5, 3, 2, 1, 0], 98

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Update called by 15Exploration

Ant thread 15 terminating.avg = 0.0012987012987

Ant 16 : [4, 6, 5, 3, 2, 1, 0], 98
Update called by 16Exploration

Ant thread 16 terminating.avg = 0.000590318772137

Ant 17 : [0, 4, 6, 5, 3, 2, 1], 108
Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [0, 1, 3, 4, 6, 5, 2], 92

Update called by 18Exploration

Ant thread 18 terminating.avg = 0.0012987012987

Ant 19 : [3, 4, 6, 5, 2, 1, 0], 96
Update called by 19
Best: [4, 6, 5, 3, 2, 1, 0], 118, 10, 124
Ant thread 19 terminating.iter_counter = 11

starting ant = 0
Exploitationstarting ant = 1

Ant 0 : [1, 0], 10starting ant = 2

Explorationstarting ant = 3

avg = 0.000426227956376starting ant = 4

p = 0.00116881947947starting ant = 5

p = 0.000730519480519starting ant = 6

Ant 1 : [6, 5], 16starting ant = 7

Exploitationstarting ant = 8

Ant 0 : [1, 0, 4], 30starting ant = 9

Explorationstarting ant = 10

avg = 0.000439620813519starting ant = 11

p = 0.00116881947947starting ant = 12

p = 0.000810876623377starting ant = 13

Ant 2 : [6, 5], 16starting ant = 14

Exploitationstarting ant = 15
```

Ant 3 : [1, 0], 10starting ant = 16

Explorationstarting ant = 17

avg = 0.000361302434001starting ant = 18

p = 0.000649350649351starting ant = 19

p = 0.000779220779221
Ant 4 : [3, 4], 15
Exploration
avg = 0.000572479000488
p = 0.000779220701299
p = 0.000973035220562
p = 0.00116883116883
Ant 5 : [4, 6], 10
Exploration
avg = 0.000427271486723
p = 0.00129868831169
p = 0.000649350584416
Ant 6 : [1, 3], 18
Exploration
avg = 0.000469877997035
p = 0.000508187464709
p = 0.000531286894923
p = 0.000974025876623
Ant 1 : [6, 5, 4], 28
Exploitation
Ant 7 : [4, 6], 10
Exploration
avg = 0.000375588148287
p = 0.000649350649351
p = 0.000864935064935
Ant 8 : [3, 4], 15
Exploitation
Ant 0 : [1, 0, 4, 6], 40
Exploitation
Ant 9 : [0, 1], 10
Exploitation
Ant 10 : [5, 4], 12
Exploration
avg = 0.000531231125676
p = 0.000531286894923
p = 0.00108224025973
p = 0.000729782385772
Ant 11 : [5, 6], 16
Exploration
avg = 0.000439754742091
p = 0.00116881947947
p = 0.000811680194805
Ant 12 : [6, 5], 16
Exploration
avg = 0.000594124000488

```
p = 0.000779220701299
p = 0.000973035220562
p = 0.00129870116883
Ant 13 : [4, 6], 10
Exploration
avg = 0.000491520873656
p = 0.000508187464709
p = 0.000531286894923
p = 0.00108224025973
Ant 2 : [6, 5, 4], 28
Exploitation
Ant 14 : [4, 6], 10
Exploration
avg = 0.000594124022131
p = 0.000779220701299
p = 0.000973035220562
p = 0.00129870129869
Ant 15 : [4, 6], 10
Exploration
avg = 0.000300613516395
p = 0.000648701298112
p = 0.00037532000329
Ant 3 : [1, 0, 5], 38
Exploitation
Ant 16 : [4, 6], 10
Exploitation
Ant 17 : [0, 1], 10
Exploration
avg = 0.000481562127118
p = 0.00129868831052
p = 0.000648701298112
Ant 18 : [0, 4], 20
Exploration
avg = 0.00037573100543
p = 0.000649350649351
p = 0.000865792207792
Ant 19 : [3, 4], 15
Exploration
avg = 0.0005571046863
p = 0.000973035220562
p = 0.0012987012987
Ant 4 : [3, 4, 6], 25
Exploration
avg = 0.000293943401758
p = 0.000811688230519
Ant 5 : [4, 6, 5], 26
Exploration
avg = 0.000394974647382
p = 0.000649350649351
p = 0.000865800779221
Ant 6 : [1, 3, 4], 33
Exploration
avg = 0.000323251903383
p = 0.000779220701299
```

```
Ant 1 : [6, 5, 4, 3], 43
Exploration
avg = 0.00029394341783
p = 0.000811688310877
Ant 7 : [4, 6, 5], 26
Exploitation
Ant 8 : [3, 4, 6], 25
Exploration
avg = 0.000393422985843
p = 0.00081168831168
Ant 0 : [1, 0, 4, 6, 5], 56
Exploitation
Ant 9 : [0, 1, 3], 28
Exploration
avg = 0.000535484655018
p = 0.000864935064156
p = 0.0012987012987
Ant 10 : [5, 4, 6], 22
Exploitation
Ant 11 : [5, 6, 4], 26
Exploration
avg = 0.000491523016515
p = 0.000508187464709
p = 0.000531286894923
p = 0.00108225097403
Ant 12 : [6, 5, 4], 28
Exploitation
Ant 13 : [4, 6, 5], 26
Exploration
avg = 0.000344680494098
p = 0.000864935064156
Ant 2 : [6, 5, 4, 3], 43
Exploration
avg = 0.000293943417992
p = 0.000811688311688
Ant 14 : [4, 6, 5], 26
Exploration
avg = 0.000293943417992
p = 0.000811688311688
Ant 15 : [4, 6, 5], 26
Exploration
avg = 0.000733148673308
p = 0.00108225108117
p = 0.000810869252429
Ant 3 : [1, 0, 5, 6], 54
Exploitation
Ant 16 : [4, 6, 5], 26
Exploitation
Ant 17 : [0, 1, 3], 28
Exploration
avg = 0.000684980213558
p = 0.000865792207784
p = 0.000973035220562
p = 0.0012987012987
```

```
Ant 18 : [0, 4, 6], 30
Exploration
avg = 0.0005571046863
p = 0.000973035220562
p = 0.0012987012987
Ant 19 : [3, 4, 6], 25
Exploitation
Ant 4 : [3, 4, 6, 5], 41
Exploitation
Ant 5 : [4, 6, 5, 3], 48
Exploration
avg = 0.000668079036438
p = 0.000973035220562
p = 0.0012987012987
Ant 6 : [1, 3, 4, 6], 43
Exploitation
Ant 1 : [6, 5, 4, 3, 2], 61
Exploitation
Ant 7 : [4, 6, 5, 3], 48
Exploitation
Ant 8 : [3, 4, 6, 5], 41
Exploitation
Ant 0 : [1, 0, 4, 6, 5, 3], 78
Exploitation
Ant 9 : [0, 1, 3, 4], 43
Exploration
avg = 0.000164507194568
p = 0.000186532418107
p = 0.000278014817252
Ant 10 : [5, 4, 6, 3], 64
Exploration
avg = 0.000344894780005
p = 0.000865792207784
Ant 11 : [5, 6, 4, 3], 41
Exploration
avg = 0.000344896922864
p = 0.000865800779221
Ant 12 : [6, 5, 4, 3], 43
Exploration
avg = 0.000358598981683
p = 0.000508187464709
p = 0.000590318713105
Ant 13 : [4, 6, 5, 3], 48
Exploitation
Ant 2 : [6, 5, 4, 3, 2], 61
Exploitation
Ant 14 : [4, 6, 5, 3], 48
Exploration
avg = 0.00035859899644
p = 0.000508187464709
p = 0.000590318772131
Ant 15 : [4, 6, 5, 3], 48
Exploitation
Ant 3 : [1, 0, 5, 6, 4], 64
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```
Exploitation
Ant 16 : [4, 6, 5, 3], 48
Exploration
avg = 0.000475235565883
p = 0.000721493506494
p = 0.000865800865792
Ant 17 : [0, 1, 3, 4], 43
Exploitation
Ant 18 : [0, 4, 6, 5], 46
Exploration
avg = 0.000297925568177
p = 0.000811688311688
Ant 19 : [3, 4, 6, 5], 41
Exploration
avg = 0.000281359071209
p = 0.000508187464709
Ant 4 : [3, 4, 6, 5, 2], 64
Exploitation
Ant 5 : [4, 6, 5, 3, 2], 66
Exploitation
Ant 6 : [1, 3, 4, 6, 5], 59
Exploitation
Ant 1 : [6, 5, 4, 3, 2, 1], 83
Exploitation
Ant 7 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.000299992611582
p = 0.000564088085827
Ant 8 : [3, 4, 6, 5, 2], 64
Exploitation
Ant 0 : [1, 0, 4, 6, 5, 3, 2], 96
Update called by 0Exploitation

Ant thread 0 terminating.Ant 9 : [0, 1, 3, 4, 6], 53

Exploration
avg = 0.000382365335227
p = 0.000721500721494
Ant 10 : [5, 4, 6, 3, 2], 82
Exploration
avg = 0.00038236533523
p = 0.000721500721501
Ant 11 : [5, 6, 4, 3, 2], 59
Exploration
avg = 0.00038236533523
p = 0.000721500721501
Ant 12 : [6, 5, 4, 3, 2], 61
Exploration
avg = 0.00038236533523
p = 0.000721500721501
Ant 13 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.000489474598601
p = 0.000589728453365
```

```
Ant 2 : [6, 5, 4, 3, 2, 1], 83
Exploration
avg = 0.00038236533523
p = 0.000721500721501
Ant 14 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.00038236533523
p = 0.000721500721501
Ant 15 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.000519982959965
p = 0.000865800864935
Ant 3 : [1, 0, 5, 6, 4, 3], 79
Exploitation
Ant 16 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.000815300524753
p = 0.000973035220562
p = 0.0012987012987
Ant 17 : [0, 1, 3, 4, 6], 53
Exploitation
Ant 18 : [0, 4, 6, 5, 3], 68
Exploration
avg = 0.000300178946986
p = 0.000564647092038
Ant 19 : [3, 4, 6, 5, 2], 64
Exploration
avg = 0.000489766806393
p = 0.000590312868949
Ant 4 : [3, 4, 6, 5, 2, 1], 86
Exploitation
Ant 5 : [4, 6, 5, 3, 2, 1], 88
Exploration
avg = 0.000363188688012
p = 0.000564652682101
Ant 6 : [1, 3, 4, 6, 5, 2], 82
Exploration
avg = 0.00129868831169
Ant 1 : [6, 5, 4, 3, 2, 1, 0], 93
Update called by 1Exploitation

Ant thread 1 terminating.Ant 7 : [4, 6, 5, 3, 2, 1], 88

Exploration
avg = 0.000489769757984
p = 0.000590318772131
Ant 8 : [3, 4, 6, 5, 2, 1], 86
Exploitation
Ant 9 : [0, 1, 3, 4, 6, 5], 69
Exploration
avg = 0.000489769757987
p = 0.000590318772137
Ant 10 : [5, 4, 6, 3, 2, 1], 104
Exploration
```

avg = 0.000489769757987
p = 0.000590318772137
Ant 11 : [5, 6, 4, 3, 2, 1], 81
Exploration
avg = 0.000489769757987
p = 0.000590318772137
Ant 12 : [6, 5, 4, 3, 2, 1], 83
Exploration
avg = 0.000489769757987
p = 0.000590318772137
Ant 13 : [4, 6, 5, 3, 2, 1], 88
Exploration
avg = 0.00129870116883
Ant 2 : [6, 5, 4, 3, 2, 1, 0], 93
Update called by 2Exploration

Ant thread 2 terminating.avg = 0.000489769757987

p = 0.000590318772137
Ant 14 : [4, 6, 5, 3, 2, 1], 88
Exploitation
Ant 15 : [4, 6, 5, 3, 2, 1], 88
Exploration
avg = 0.000721500721501
Ant 3 : [1, 0, 5, 6, 4, 3, 2], 97
Update called by 3Exploration

Ant thread 3 terminating.avg = 0.000489769757987

p = 0.000590318772137
Ant 16 : [4, 6, 5, 3, 2, 1], 88
Exploitation
Ant 17 : [0, 1, 3, 4, 6, 5], 69
Exploitation
Ant 18 : [0, 4, 6, 5, 3, 2], 86
Exploitation
Ant 19 : [3, 4, 6, 5, 2, 1], 86
Exploration
avg = 0.0012987012974
Ant 4 : [3, 4, 6, 5, 2, 1, 0], 96
ExplorationUpdate called by 4

avg = 0.00129870129869Ant thread 4 terminating.

Ant 5 : [4, 6, 5, 3, 2, 1, 0], 98
Update called by 5Exploration

Ant thread 5 terminating.avg = 0.000389220743837

Ant 6 : [1, 3, 4, 6, 5, 2, 0], 112
Update called by 6Exploitation

Ant thread 6 terminating.Ant 7 : [4, 6, 5, 3, 2, 1, 0], 98

Update called by 7Exploration

Ant thread 7 terminating.avg = 0.0012987012987

Ant 8 : [3, 4, 6, 5, 2, 1, 0], 96
Update called by 8Exploration

Ant thread 8 terminating.avg = 0.000564652738001

Ant 9 : [0, 1, 3, 4, 6, 5, 2], 92
Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [5, 4, 6, 3, 2, 1, 0], 114

Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [5, 6, 4, 3, 2, 1, 0], 91

Update called by 11Exploration

Ant thread 11 terminating.avg = 0.0012987012987

Ant 12 : [6, 5, 4, 3, 2, 1, 0], 93
Update called by 12Exploration

Ant thread 12 terminating.avg = 0.0012987012987

Ant 13 : [4, 6, 5, 3, 2, 1, 0], 98
Update called by 13Exploitation

Ant thread 13 terminating.Ant 14 : [4, 6, 5, 3, 2, 1, 0], 98

Update called by 14Exploration

Ant thread 14 terminating.avg = 0.0012987012987

Ant 15 : [4, 6, 5, 3, 2, 1, 0], 98
Update called by 15Exploitation

Ant thread 15 terminating.Ant 16 : [4, 6, 5, 3, 2, 1, 0], 98

Update called by 16Exploration

Ant thread 16 terminating.avg = 0.00056465273856

Ant 17 : [0, 1, 3, 4, 6, 5, 2], 92
Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [0, 4, 6, 5, 3, 2, 1], 108

Update called by 18Exploration

Ant thread 18 terminating.avg = 0.0012987012987

```
Ant 19 : [3, 4, 6, 5, 2, 1, 0], 96
Update called by 19
Best: [4, 6, 5, 3, 2, 1, 0], 118, 11, 124
Ant thread 19 terminating.iter_counter = 12

starting ant = 0
Exploitationstarting ant = 1

Ant 0 : [1, 0], 10starting ant = 2

Explorationstarting ant = 3

avg = 0.000419893977057starting ant = 4

p = 0.00116881947947starting ant = 5

p = 0.000730519480519starting ant = 6

Ant 1 : [6, 5], 16starting ant = 7

Exploitationstarting ant = 8

Ant 0 : [1, 0, 4], 30starting ant = 9

Explorationstarting ant = 10

avg = 0.0004332868342starting ant = 11

p = 0.00116881947947starting ant = 12

p = 0.000810876623377starting ant = 13

Ant 2 : [6, 5], 16starting ant = 14

Exploitationstarting ant = 15

Ant 3 : [1, 0], 10starting ant = 16

Explorationstarting ant = 17

avg = 0.00034898171441starting ant = 18

p = 0.000649350649351starting ant = 19

p = 0.000779220779221
Ant 4 : [3, 4], 15
Exploration
avg = 0.000547698644594
p = 0.000779220779213
p = 0.000875731698506
p = 0.00116883116883
Ant 5 : [4, 6], 10
Exploitation
Ant 6 : [1, 0], 10
```

```
Exploitation
Ant 1 : [6, 5, 4], 28
Exploration
avg = 0.000569127216022
p = 0.000779220779213
p = 0.000875731698506
p = 0.0012974025974
Ant 7 : [4, 6], 10
Exploration
avg = 0.000363267428696
p = 0.000649350649351
p = 0.000864935064935
Ant 8 : [3, 4], 15
Exploitation
Ant 0 : [1, 0, 4, 6], 40
Exploitation
Ant 9 : [0, 1], 10
Exploration
avg = 0.000525576012301
p = 0.000531286894923
p = 0.00108116883116
p = 0.000730512108986
Ant 10 : [5, 6], 16
Exploration
avg = 0.000538970085747
p = 0.00108116883116
p = 0.000810876549661
Ant 11 : [5, 6], 16
Exploration
avg = 0.000433420762771
p = 0.00116881947947
p = 0.000811680194805
Ant 12 : [6, 5], 16
Exploration
avg = 0.000569343644594
p = 0.000779220779213
p = 0.000875731698506
p = 0.00129870116883
Ant 13 : [4, 6], 10
Exploration
avg = 0.000484588792964
p = 0.000508187464709
p = 0.000531286894923
p = 0.00108116883116
Ant 2 : [6, 5, 4], 28
Exploitation
Ant 14 : [4, 6], 10
Exploration
avg = 0.000569343666237
p = 0.000779220779213
p = 0.000875731698506
p = 0.00129870129869
Ant 15 : [4, 6], 10
Exploitation
```

```
Ant 3 : [1, 0, 4], 30
Exploration
avg = 0.000569343666239
p = 0.000779220779213
p = 0.000875731698506
p = 0.0012987012987
Ant 16 : [4, 6], 10
Exploitation
Ant 17 : [0, 1], 10
Exploitation
Ant 18 : [0, 1], 10
Exploration
avg = 0.000363410285839
p = 0.000649350649351
p = 0.000865792207792
Ant 19 : [3, 4], 15
Exploitation
Ant 4 : [3, 4, 6], 25
Exploitation
Ant 5 : [4, 6, 5], 26
Exploration
avg = 0.000299425798786
p = 0.00064934415526
p = 0.000416643186152
Ant 6 : [1, 0, 5], 38
Exploitation
Ant 1 : [6, 5, 4, 3], 43
Exploitation
Ant 7 : [4, 6, 5], 26
Exploitation
Ant 8 : [3, 4, 6], 25
Exploitation
Ant 0 : [1, 0, 4, 6, 5], 56
Exploitation
Ant 9 : [0, 1, 3], 28
Exploration
avg = 0.000357768876364
p = 0.00116881947947
Ant 10 : [5, 6, 4], 26
Exploration
avg = 0.000383485476573
p = 0.00129740248051
Ant 11 : [5, 6, 4], 26
Exploration
avg = 0.0004848030786806
p = 0.000508187464709
p = 0.000531286894923
p = 0.00108224025974
Ant 12 : [6, 5, 4], 28
Exploitation
Ant 13 : [4, 6, 5], 26
Exploitation
Ant 2 : [6, 5, 4, 3], 43
Exploitation
```

Ant 14 : [4, 6, 5], 26
Exploration
avg = 0.000286342642809
p = 0.000811688311688
Ant 15 : [4, 6, 5], 26
Exploitation
Ant 3 : [1, 0, 4, 6], 40
Exploitation
Ant 16 : [4, 6, 5], 26
Exploitation
Ant 17 : [0, 1, 3], 28
Exploitation
Ant 18 : [0, 1, 3], 28
Exploration
avg = 0.000527368243644
p = 0.000875731698506
p = 0.0012987012987
Ant 19 : [3, 4, 6], 25
Exploration
avg = 0.000288425219151
p = 0.000811688311688
Ant 4 : [3, 4, 6, 5], 41
Exploration
avg = 0.000335443783415
p = 0.000508187464709
p = 0.000531286894923
Ant 5 : [4, 6, 5, 3], 48
Exploration
avg = 0.000747961771542
p = 0.00108225097403
p = 0.000811680194068
Ant 6 : [1, 0, 5, 6], 54
Exploitation
Ant 1 : [6, 5, 4, 3, 2], 61
Exploitation
Ant 7 : [4, 6, 5, 3], 48
Exploitation
Ant 8 : [3, 4, 6, 5], 41
Exploitation
Ant 0 : [1, 0, 4, 6, 5, 3], 78
Exploration
avg = 0.00046721577553
p = 0.000720779220779
p = 0.000865800779221
Ant 9 : [0, 1, 3, 4], 43
Exploitation
Ant 10 : [5, 6, 4, 3], 41
Exploration
avg = 0.000332052250058
p = 0.000865800779221
Ant 11 : [5, 6, 4, 3], 41
Exploration
avg = 0.000332052271487
p = 0.000865800864935

```
Ant 12 : [6, 5, 4, 3], 43
Exploration
avg = 0.00035020173796
p = 0.000508187464709
p = 0.000590318713105
Ant 13 : [4, 6, 5, 3], 48
Exploitation
Ant 2 : [6, 5, 4, 3, 2], 61
Exploration
avg = 0.000350201752571
p = 0.000508187464709
p = 0.000590318771547
Ant 14 : [4, 6, 5, 3], 48
Exploration
avg = 0.000350201752717
p = 0.000508187464709
p = 0.000590318772131
Ant 15 : [4, 6, 5, 3], 48
Exploitation
Ant 3 : [1, 0, 4, 6, 5], 56
Exploration
avg = 0.000350201752718
p = 0.000508187464709
p = 0.000590318772137
Ant 16 : [4, 6, 5, 3], 48
Exploitation
Ant 17 : [0, 1, 3, 4], 43
Exploration
avg = 0.000467394368602
p = 0.000721493506494
p = 0.000865800865792
Ant 18 : [0, 1, 3, 4], 43
Exploitation
Ant 19 : [3, 4, 6, 5], 41
Exploration
avg = 0.000270162746245
p = 0.000508187464709
Ant 4 : [3, 4, 6, 5, 2], 64
Exploitation
Ant 5 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.000552736631231
p = 0.00129868831052
Ant 6 : [1, 0, 5, 6, 4], 64
Exploration
avg = 0.000460252083666
p = 0.000531286894923
Ant 1 : [6, 5, 4, 3, 2, 1], 83
Exploration
avg = 0.000368178801707
p = 0.000721500649351
Ant 7 : [4, 6, 5, 3, 2], 66
Exploitation
Ant 8 : [3, 4, 6, 5, 2], 64
```

```
Exploration
avg = 0.000721500720779
Ant 0 : [1, 0, 4, 6, 5, 3, 2], 96
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.000777060515568

p = 0.000875731698506
p = 0.0012987012987
Ant 9 : [0, 1, 3, 4, 6], 53
Exploitation
Ant 10 : [5, 6, 4, 3, 2], 59
Exploration
avg = 0.000368178825757
p = 0.000721500721501
Ant 11 : [5, 6, 4, 3, 2], 59
Exploitation
Ant 12 : [6, 5, 4, 3, 2], 61
Exploitation
Ant 13 : [4, 6, 5, 3, 2], 66
Exploitation
Ant 2 : [6, 5, 4, 3, 2, 1], 83
Exploitation
Ant 14 : [4, 6, 5, 3, 2], 66
Exploitation
Ant 15 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.000577482932088
p = 0.000590318772137
Ant 3 : [1, 0, 4, 6, 5, 3], 78
Exploration
avg = 0.000368178825757
p = 0.000721500721501
Ant 16 : [4, 6, 5, 3, 2], 66
Exploration
avg = 0.000777060515568
p = 0.000875731698506
p = 0.0012987012987
Ant 17 : [0, 1, 3, 4, 6], 53
Exploitation
Ant 18 : [0, 1, 3, 4, 6], 53
Exploration
avg = 0.000288982622022
p = 0.000564647092038
Ant 19 : [3, 4, 6, 5, 2], 64
Exploration
avg = 0.000489765070679
p = 0.000590312868949
Ant 4 : [3, 4, 6, 5, 2, 1], 86
Exploration
avg = 0.000489767992757
p = 0.000590318713105
Ant 5 : [4, 6, 5, 3, 2, 1], 88
Exploitation
```

```
Ant 6 : [1, 0, 5, 6, 4, 3], 79
Exploration
avg = 0.00129870116883
Ant 1 : [6, 5, 4, 3, 2, 1, 0], 93
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.000489768021978

p = 0.000590318771547
Ant 7 : [4, 6, 5, 3, 2, 1], 88
Exploration
avg = 0.00048976802227
p = 0.000590318772131
Ant 8 : [3, 4, 6, 5, 2, 1], 86
Exploration
avg = 0.000446598778713
p = 0.000811688311688
Ant 9 : [0, 1, 3, 4, 6, 5], 69
Exploitation
Ant 10 : [5, 6, 4, 3, 2, 1], 81
Exploration
avg = 0.000489768022273
p = 0.000590318772137
Ant 11 : [5, 6, 4, 3, 2, 1], 81
Exploitation
Ant 12 : [6, 5, 4, 3, 2, 1], 83
Exploitation
Ant 13 : [4, 6, 5, 3, 2, 1], 88
Exploitation
Ant 2 : [6, 5, 4, 3, 2, 1, 0], 93
Update called by 2Exploitation

Ant thread 2 terminating.Ant 14 : [4, 6, 5, 3, 2, 1], 88

Exploration
avg = 0.000489768022273
p = 0.000590318772137
Ant 15 : [4, 6, 5, 3, 2, 1], 88
Exploration
avg = 0.000721500721501
Ant 3 : [1, 0, 4, 6, 5, 3, 2], 96
Update called by 3Exploration

Ant thread 3 terminating.avg = 0.000489768022273

p = 0.000590318772137
Ant 16 : [4, 6, 5, 3, 2, 1], 88
Exploitation
Ant 17 : [0, 1, 3, 4, 6, 5], 69
Exploration
avg = 0.000446598778713
p = 0.000811688311688
Ant 18 : [0, 1, 3, 4, 6, 5], 69
Exploration
```

avg = 0.000489768022273
p = 0.000590318772137
Ant 19 : [3, 4, 6, 5, 2, 1], 86
Exploitation
Ant 4 : [3, 4, 6, 5, 2, 1, 0], 96
Update called by 4Exploitation

Ant thread 4 terminating.Ant 5 : [4, 6, 5, 3, 2, 1, 0], 98

Update called by 5Exploitation

Ant thread 5 terminating.Ant 6 : [1, 0, 5, 6, 4, 3, 2], 97

Update called by 6Exploitation

Ant thread 6 terminating.Ant 7 : [4, 6, 5, 3, 2, 1, 0], 98

Update called by 7Exploration

Ant thread 7 terminating.avg = 0.0012987012987

Ant 8 : [3, 4, 6, 5, 2, 1, 0], 96
Update called by 8Exploration

Ant thread 8 terminating.avg = 0.000564652682101

Ant 9 : [0, 1, 3, 4, 6, 5, 2], 92
Update called by 9Exploration

Ant thread 9 terminating.avg = 0.0012987012987

Ant 10 : [5, 6, 4, 3, 2, 1, 0], 91
Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [5, 6, 4, 3, 2, 1, 0], 91

Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [6, 5, 4, 3, 2, 1, 0], 93

Update called by 12Exploration

Ant thread 12 terminating.avg = 0.0012987012987

Ant 13 : [4, 6, 5, 3, 2, 1, 0], 98
Update called by 13Exploration

Ant thread 13 terminating.avg = 0.0012987012987

Ant 14 : [4, 6, 5, 3, 2, 1, 0], 98
Update called by 14Exploration

Ant thread 14 terminating.avg = 0.0012987012987

```
Ant 15 : [4, 6, 5, 3, 2, 1, 0], 98
Update called by 15Exploitation

Ant thread 15 terminating.Ant 16 : [4, 6, 5, 3, 2, 1, 0], 98

Update called by 16Exploration

Ant thread 16 terminating.avg = 0.000564652738001

Ant 17 : [0, 1, 3, 4, 6, 5, 2], 92
Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [0, 1, 3, 4, 6, 5, 2], 92

Update called by 18Exploration

Ant thread 18 terminating.avg = 0.0012987012987

Ant 19 : [3, 4, 6, 5, 2, 1, 0], 96
Update called by 19
Best: [4, 6, 5, 3, 2, 1, 0], 118, 12, 122
Ant thread 19 terminating.
--------------------------------------------------------------

                        Results
--------------------------------------------------------------

Best path = [4, 6, 5, 3, 2, 1, 0]
('E ',)
('G ',)
('F ',)
('D ',)
('C ',)
('B ',)
('A ',)

Best path cost = 118

>>>
```