

```

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 = 0.0017361111111111starting 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

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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 = 0.001736111111111

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 = 0.001736111111111Ant thread 16 terminating.

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

Ant thread 17 terminating.avg = 0.001736111111111

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 = 0.001041666666563  
Ant 15 : [1, 0, 2], 40  
Exploitation  
Ant 16 : [2, 3, 1], 36  
Exploration  
avg = 0.000974462365586  
p = 0.001041666666666  
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 = 0.001736111111111  
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  
Exploitation  
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 = 0.0017361111111111Ant 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

Exploitation

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 = 0.001041666666666  
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 = 0.001736111111109

Ant 14 : [0, 1, 3], 28

Exploration

avg = 0.000788696740071

p = 0.001041666666563

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 = 0.001736111111111

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 = 0.001736111111111

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 = 0.001736111111111

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 = 0.001736111111111

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 = 0.001041666666563  
Ant 15 : [1, 0, 2], 40  
Exploration  
avg = 0.00106332797944  
p = 0.00173611111109  
Ant 16 : [2, 3, 1], 36  
Exploration  
avg = 0.000716105757219  
p = 0.001041666666666  
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 = 0.001736111111111

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 = 0.001736111111111

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

Ant thread 17 terminating.avg = 0.001736111111111

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 = 0.001736111111111  
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 = 0.001736111111111  
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 = 0.001041666666563  
Ant 15 : [1, 0, 2], 40  
Exploitation  
Ant 16 : [2, 3, 1], 36  
Exploration  
avg = 0.00067900399668  
p = 0.001041666666666  
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 = 0.001041666666667  
Ant 18 : [1, 0, 2], 40  
Exploration  
avg = 0.00102622621891  
p = 0.001736111111111  
Ant 19 : [2, 3, 1], 36  
Exploitation  
Ant 5 : [0, 1, 3, 2], 46  
Update called by 5Exploration

Ant thread 5 terminating.avg = 0.001736111111111

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 = 0.001736111111111

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 = 0.02222222222222  
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 = 0.001111111111111  
Ant 15 : [1, 0, 4], 30  
Exploitation  
Ant 16 : [1, 0, 4], 30  
Exploration  
avg = 0.000856232576663  
p = 0.001111111111111  
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 = 0.002222222222222  
Ant 5 : [3, 4, 0, 1], 45  
Exploration  
avg = 0.00148148148148  
p = 0.002222222222222  
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 = 0.0013333333333333starting 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 = 0.0011111111111111

p = 0.0011111111111111

p = 0.00148146666667

Ant 5 : [3, 4], 15

Exploration

avg = 0.00108721621147

p = 0.0011111111111111

p = 0.0011111111111111

p = 0.00148148133333

Ant 6 : [3, 4], 15

Exploration

avg = 0.000955794504182

p = 0.0011111111111111

p = 0.0011111111111111

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 = 0.002222222222

Ant 11 : [0, 1], 10

Exploitation

Ant 12 : [1, 0], 10

Exploration

avg = 0.000840067340067

p = 0.000909090909091

p = 0.0011111111111111

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 = 0.001111111111111  
p = 0.001233333333333  
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 = 0.001111111111  
Ant 10 : [3, 4, 0], 35  
Exploration  
avg = 0.001444444444444  
p = 0.002222222222222  
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 = 0.00222222  
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 = 0.0007407333333333

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

Ant thread 17 terminating.avg = 0.002222222222222

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 = 0.001111111111starting ant = 3

p = 0.0013333333333333starting 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 = 0.001111111111starting 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 = 0.001111111111

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 = 0.002222222222  
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 = 0.0011111111  
Ant 14 : [2, 3], 18  
Exploration  
avg = 0.000776410256408  
p = 0.00111  
Ant 2 : [3, 4, 0], 35  
Exploration  
avg = 0.00117310050505  
p = 0.00222222  
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 = 0.002222222222  
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 = 0.00111111  
Ant 5 : [3, 4, 0], 35  
Exploration  
avg = 0.000776780589741  
p = 0.0011111111  
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 = 0.002222222222  
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 = 0.001111111111111

Ant 17 : [1, 3, 4, 0], 53

Exploitation

Ant 18 : [2, 3, 4, 0], 53

Exploration

avg = 0.000780555555556

p = 0.001111111111111

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 = 0.0011111111111111starting 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 = 0.00144409999997

p = 0.0022222

Ant 0 : [3, 4, 0, 1], 45

Exploration

avg = 0.00103434882796

p = 0.0012333333333333

p = 0.0014814813333333

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 = 0.00111111

p = 0.00148

Ant 8 : [4, 3], 15

Exploration

avg = 0.00110270071589

p = 0.002222222222

Ant 9 : [0, 1], 10

Exploration

avg = 0.00103434886462

p = 0.0012333333333333

p = 0.00148148148

Ant 10 : [3, 4], 15

Exploration

avg = 0.00110270071644

p = 0.00222222222222

Ant 11 : [0, 1], 10  
Exploration  
avg = 0.000808400673398  
p = 0.000909090909082  
p = 0.001111111111111  
Ant 3 : [0, 1, 3], 28  
Exploration  
avg = 0.0011368560606  
p = 0.002  
p = 0.001233333333333  
Ant 12 : [1, 3], 18  
Exploration  
avg = 0.00113716161616  
p = 0.002  
p = 0.001234555555556  
Ant 13 : [1, 3], 18  
Exploitation  
Ant 14 : [2, 3], 18  
Exploration  
avg = 0.00113716467171  
p = 0.002  
p = 0.00123456777778  
Ant 15 : [1, 3], 18  
Exploration  
avg = 0.00113716470227  
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 = 0.001233333333222  
Ant 18 : [2, 3], 18  
Exploration  
avg = 0.000849552936768  
p = 0.0009090909082  
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 = 0.0011111111

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 = 0.001111111111  
Ant 13 : [1, 3, 4, 0], 53

Exploration  
avg = 0.000758055555555  
p = 0.001111111111111  
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 = 0.001481466666667  
Ant 17 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.0007580555555556  
p = 0.001111111111111  
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 = 0.002222222222  
  
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 = 0.00066599999994

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 = 0.002222222222222

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 = 0.001234555555556

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 = 0.001333333333333starting 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 = 0.0011111111starting 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 = 0.001999999999998  
p = 0.001111111111111  
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 = 0.001233333333333  
Ant 3 : [0, 1, 3], 28  
Exploration  
avg = 0.00118259209343  
p = 0.002222222  
p = 0.001234555555556  
Ant 17 : [1, 3], 18  
Exploitation  
Ant 18 : [2, 3], 18  
Exploration  
avg = 0.000797603923624  
p = 0.000909090908182  
p = 0.001234555555554  
Ant 19 : [2, 3], 18  
Exploration  
avg = 0.00083605286532  
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 = 0.002222222222  
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 = 0.00111111  
Ant 17 : [1, 3, 4, 0], 53  
Exploration  
avg = 0.0007378055  
p = 0.0011111111  
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 = 0.00111111111111starting 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 = 0.00111111111111starting 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 = 0.00111111111111

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 = 0.0022222222

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 = 0.002222222222

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 = 0.001233333333333  
Ant 13 : [1, 3], 18  
Exploration  
avg = 0.000793595763973  
p = 0.000818181736364  
p = 0.001234555555556  
Ant 3 : [0, 1, 3], 28  
Exploration  
avg = 0.000740573554196  
p = 0.000909090909091  
p = 0.0011111111  
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 = 0.001234555555554  
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 = 0.001233333333333  
Ant 8 : [4, 3, 2], 33  
Exploitation  
Ant 9 : [0, 1, 3], 28  
Exploration  
avg = 0.000764335717949  
p = 0.0011111111  
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 = 0.001234555555556  
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 = 0.001444441111111  
p = 0.002222222222222  
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 = 0.002222222222

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 = 0.000666666

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 = 0.0022222222222222

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 = 0.001111111111starting ant = 3

p = 0.001333333333333starting 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 = 0.001111111111

p = 0.00148146666667

Ant 5 : [3, 4], 15

Exploration



avg = 0.000907413433414  
p = 0.001111111111  
p = 0.00148148133333  
Ant 6 : [3, 4], 15  
Exploration  
avg = 0.000716057466774  
p = 0.001111111111  
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 = 0.001233333333332  
p = 0.00148148148  
Ant 10 : [3, 4], 15  
Exploitation  
Ant 11 : [0, 1], 10  
Exploration  
avg = 0.00107886171187  
p = 0.002  
p = 0.001111111111111  
Ant 12 : [1, 3], 18  
Exploration  
avg = 0.000812556356566  
p = 0.000909090736364  
p = 0.001233333333333  
Ant 3 : [0, 1, 3], 28  
Exploration  
avg = 0.00110972282298  
p = 0.002  
p = 0.001234555555556  
Ant 13 : [1, 3], 18  
Exploration  
avg = 0.000717021246276  
p = 0.000909090908182  
p = 0.0011111111  
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 = 0.00222222222222  
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 = 0.002222222222  
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 = 0.00111111  
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 = 0.00222222222222

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 = 0.00222222222222

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 = 0.002222222222222

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 = 0.001111111111starting ant = 3

p = 0.001333333333333starting ant = 4

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

Explorationstarting ant = 6

avg = 0.000842071150308starting ant = 7

p = 0.001starting ant = 8

p = 0.0013333333332starting ant = 9

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

Explorationstarting ant = 11

avg = 0.000881116567823starting ant = 12

p = 0.001111111111starting 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 = 0.001111111111  
p = 0.00148146666667  
Ant 5 : [3, 4], 15  
Exploration  
avg = 0.000881486901156  
p = 0.001111111111  
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 = 0.00222222222222  
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 = 0.00111111111111  
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 = 0.0022222222

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 = 0.001233333333333  
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 = 0.000999999999999  
Ant 12 : [1, 0, 4], 30  
Exploitation  
Ant 13 : [1, 0, 4], 30  
Exploitation  
Ant 14 : [2, 3, 4], 33  
Exploration  
avg = 0.0010082052274

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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 = 0.00111111
Ant 17 : [1, 0, 4], 30
Exploration
avg = 0.0014111110811
p = 0.00222222222222
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 = 0.00222222222222
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 = 0.00222222222222
Ant 2 : [3, 4, 2, 1, 0], 73
Update called by 2Exploration

Ant thread 2 terminating.avg = 0.00141111108111

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p = 0.0022222222222222
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 = 0.0011111111
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 = 0.0011111111111111
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 = 0.0022222222222222

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

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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 = 0.001234555555556

Ant 12 : [1, 0, 4, 3, 2], 63

Update called by 12Exploration

Ant thread 12 terminating.avg = 0.001234567777778

Ant 13 : [1, 0, 4, 3, 2], 63

Update called by 13Exploration

Ant thread 13 terminating.avg = 0.002222222222222

Ant 14 : [2, 3, 4, 0, 1], 63

Update called by 14Exploration

Ant thread 14 terminating.avg = 0.000599999994

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 = 0.002222222222222

Ant 18 : [2, 3, 4, 0, 1], 63

Update called by 18Exploration

Ant thread 18 terminating.avg = 0.002222222222222

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 = 0.00111111111111starting 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 = 0.00111111111111

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 = 0.0022222222  
Ant 9 : [0, 1], 10  
Exploration  
avg = 0.000622376263915  
p = 0.00111111111111  
Ant 1 : [4, 3, 2], 33  
Exploration  
avg = 0.000867708123495  
p = 0.001233333333333  
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 = 0.001233333333333  
Ant 13 : [1, 3], 18  
Exploration  
avg = 0.000786293326246  
p = 0.000909090818182  
p = 0.001234555555556  
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 = 0.001233333333333  
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 = 0.001234555555556  
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 = 0.001111111111starting 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 = 0.001111111111

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 = 0.001111110999999  
Ant 11 : [0, 4], 20  
Exploration  
avg = 0.00105325079324  
p = 0.002  
p = 0.001111111111111  
Ant 12 : [1, 3], 18  
Exploitation  
Ant 13 : [1, 0], 10  
Exploration  
avg = 0.00084328973962  
p = 0.000854692307692  
p = 0.001481466666667  
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 = 0.001233333333333  
Ant 16 : [1, 3], 18  
Exploitation  
Ant 17 : [1, 0], 10  
Exploration  
avg = 0.000674680082021  
p = 0.000909090909091  
p = 0.001233333333222  
Ant 18 : [2, 3], 18  
Exploitation  
Ant 4 : [0, 4, 3], 35  
Exploration  
avg = 0.000674985637851  
p = 0.000909090909091  
p = 0.001234555555554  
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



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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 = 0.00111111111111
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

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avg = 0.002222222222  
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 = 0.002222222222  
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 = 0.001111111111  
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 = 0.002222222222

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

Ant thread 18 terminating.avg = 0.002222222222

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 = 0.001333333333333starting 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 = 0.001233333333222  
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 = 0.001233333333222

Ant 18 : [2, 3], 18  
Exploitation  
Ant 19 : [2, 3], 18  
Exploration  
avg = 0.000684889996171  
p = 0.00111111  
p = 0.000769230768462  
Ant 5 : [3, 4, 2], 41  
Exploration  
avg = 0.000713095124629  
p = 0.00111111  
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 = 0.00111111  
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 = 0.00111111  
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 = 0.00111111  
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 = 0.001111111111  
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 = 0.001111111111111  
Ant 19 : [2, 3, 4, 0], 53  
Exploration  
avg = 0.002222222222  
Ant 5 : [3, 4, 2, 1, 0], 73  
Update called by 5Exploration

Ant thread 5 terminating.avg = 0.00222222222222

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

Ant thread 6 terminating.avg = 0.001010101010101

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

Ant thread 7 terminating.avg = 0.002222222222222

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 = 0.0006666599999994

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 = 0.0007399999933333

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 = 0.002222222222222

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 = 0.001111111111111  
p = 0.00154320972222  
Ant 14 : [4, 5], 12  
Exploitation  
Ant 15 : [2, 3], 18  
Exploration  
avg = 0.000909069325427  
p = 0.001111111111111  
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 = 0.001111111111111  
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 = 0.001233333333333  
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 = 0.001027777777778
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 = 0.001666666666667
Ant 2 : [4, 5, 3, 1, 0], 62
Exploration
avg = 0.000864396654719
p = 0.001027777777778
p = 0.001027777777778
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 = 0.001027777777778
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 = 0.001851833333333  
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 = 0.00111111starting 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 = 0.00111111

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 = 0.001851833333333

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 = 0.001027777777778  
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 = 0.001851833333333  
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

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 = 0.001027777777778
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 = 0.0013888888889starting 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 = 0.001233333333333

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 = 0.001027777777778

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 = 0.001234555555556

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 = 0.001666666666667starting 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 = 0.001233333333333

Ant 5 : [3, 4], 15

Exploitation

Ant 6 : [2, 3], 18

Exploration

avg = 0.000731322533127

p = 0.000925925925926

p = 0.001234555555556

Ant 1 : [1, 3, 4], 33

Exploitation

Ant 7 : [0, 1], 10

Exploration

avg = 0.000629161996804

p = 0.000757575757576

p = 0.001027777777778

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 = 0.001666666666667  
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 = 0.001851833333333  
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 = 0.0015416666667starting 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 = 0.001233333333333  
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 = 0.0011110999999  
p = 0.001543194444444  
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 = 0.0013888888889starting 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 = 0.001233333333333

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 = 0.001233333333333

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 = 0.0011110999999  
p = 0.00154320987653  
Ant 16 : [4, 5], 12  
Exploitation  
Ant 17 : [2, 3], 18  
Exploration  
avg = 0.00067738639082  
p = 0.0011110999999  
p = 0.00154320987654  
Ant 18 : [4, 5], 12  
Exploitation  
Ant 19 : [5, 4], 12  
Exploration  
avg = 0.000460930519389  
p = 0.0011110999999  
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 = 0.001851833333333  
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 = 0.001234555555556

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 = 0.00100001830644  
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 = 0.001851833333333  
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



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

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

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

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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

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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

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 = 0.00058440974026  
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

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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
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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 = 0.00058440974026

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

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

```
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
Exploitation
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

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

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



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

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 = 0.00048480307868  
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

>>>

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

Explorationstarting ant = 1

avg = 0.000975783475783starting ant = 2

p = 0.00123456790123  
p = 0.00154320987654starting ant = 3  
  
Ant 0 : [4, 5], 12starting ant = 4  
  
Explorationstarting ant = 5  
  
avg = 0.000979524590636starting ant = 6  
  
p = 0.00185185185185starting ant = 7  
  
p = 0.00102880658436starting ant = 8  
  
Ant 1 : [1, 3], 18starting ant = 9  
  
Explorationstarting ant = 10  
  
avg = 0.000801049013609starting ant = 11  
  
p = 0.000841750841751starting ant = 12  
  
p = 0.00102880658436starting ant = 13  
  
p = 0.000805152979066starting ant = 14  
  
Ant 2 : [2, 5], 23starting ant = 15  
  
Exploitationstarting ant = 16  
  
Ant 3 : [0, 1], 10starting ant = 17  
  
Exploitationstarting ant = 18  
  
Ant 0 : [4, 5, 3], 34starting ant = 19  
  
Exploration  
avg = 0.000975783475783  
p = 0.00123456790123  
p = 0.00154320987654  
Ant 4 : [4, 5], 12  
Exploitation  
Ant 5 : [3, 4], 15  
Exploitation  
Ant 6 : [4, 5], 12  
Exploration  
avg = 0.000979524590636  
p = 0.00185185185185  
p = 0.00102880658436  
Ant 7 : [1, 3], 18  
Exploration  
avg = 0.000975783475783  
p = 0.00123456790123  
p = 0.00154320987654  
Ant 8 : [4, 5], 12

Exploitation  
Ant 1 : [1, 3, 4], 33  
Exploitation  
Ant 9 : [3, 4], 15  
Exploration  
avg = 0.000979524590636  
p = 0.00185185185185  
p = 0.00102880658436  
Ant 10 : [1, 3], 18  
Exploration  
avg = 0.000912748014197  
p = 0.00154320987654  
Ant 11 : [5, 4], 12  
Exploration  
avg = 0.000930761790977  
p = 0.00185185185185  
Ant 12 : [0, 1], 10  
Exploitation  
Ant 13 : [5, 4], 12  
Exploration  
avg = 0.000801049013609  
p = 0.000841750841751  
p = 0.00102880658436  
p = 0.000805152979066  
Ant 14 : [2, 5], 23  
Exploration  
avg = 0.00093964677298  
p = 0.00154320987654  
Ant 2 : [2, 5, 4], 35  
Exploration  
avg = 0.000975783475783  
p = 0.00123456790123  
p = 0.00154320987654  
Ant 15 : [4, 5], 12  
Exploration  
avg = 0.000979524590636  
p = 0.00185185185185  
p = 0.00102880658436  
Ant 16 : [1, 3], 18  
Exploitation  
Ant 3 : [0, 1, 3], 28  
Exploitation  
Ant 17 : [5, 4], 12  
Exploration  
avg = 0.000912748014197  
p = 0.00154320987654  
Ant 18 : [5, 4], 12  
Exploration  
avg = 0.000884994911279  
p = 0.00102880658436  
p = 0.00102880658436  
Ant 0 : [4, 5, 3, 2], 52  
Exploitation  
Ant 19 : [5, 4], 12

Exploration  
avg = 0.000755132548611  
p = 0.000805152979066  
p = 0.000841750841751  
Ant 4 : [4, 5, 3], 34  
Exploitation  
Ant 5 : [3, 4, 5], 27  
Exploitation  
Ant 6 : [4, 5, 3], 34  
Exploration  
avg = 0.000925624223115  
p = 0.00102880658436  
p = 0.00123456790123  
Ant 7 : [1, 3, 4], 33  
Exploration  
avg = 0.000755132548611  
p = 0.000805152979066  
p = 0.000841750841751  
Ant 8 : [4, 5, 3], 34  
Exploration  
avg = 0.00106046217157  
p = 0.00154320987654  
Ant 1 : [1, 3, 4, 5], 45  
Exploitation  
Ant 9 : [3, 4, 5], 27  
Exploration  
avg = 0.000925624223115  
p = 0.00102880658436  
p = 0.00123456790123  
Ant 10 : [1, 3, 4], 33  
Exploitation  
Ant 11 : [5, 4, 3], 27  
Exploitation  
Ant 12 : [0, 1, 3], 28  
Exploitation  
Ant 13 : [5, 4, 3], 27  
Exploration  
avg = 0.00093964677298  
p = 0.00154320987654  
Ant 14 : [2, 5, 4], 35  
Exploration  
avg = 0.000874485596708  
p = 0.000925925925926  
p = 0.00123456790123  
Ant 2 : [2, 5, 4, 3], 50  
Exploitation  
Ant 15 : [4, 5, 3], 34  
Exploration  
avg = 0.000925624223115  
p = 0.00102880658436  
p = 0.00123456790123  
Ant 16 : [1, 3, 4], 33  
Exploration  
avg = 0.00103504177578

p = 0.00123456790123  
Ant 3 : [0, 1, 3, 4], 43  
Exploitation  
Ant 17 : [5, 4, 3], 27  
Exploration  
avg = 0.000833926875594  
p = 0.000925925925926  
p = 0.00123456790123  
Ant 18 : [5, 4, 3], 27  
Exploration  
avg = 0.000729517396184  
p = 0.000841750841751  
Ant 0 : [4, 5, 3, 2, 1], 74  
Exploitation  
Ant 19 : [5, 4, 3], 27  
Exploitation  
Ant 4 : [4, 5, 3, 1], 52  
Exploitation  
Ant 5 : [3, 4, 5, 2], 50  
Exploration  
avg = 0.000884994911279  
p = 0.00102880658436  
p = 0.00102880658436  
Ant 6 : [4, 5, 3, 2], 52  
Exploitation  
Ant 7 : [1, 3, 4, 5], 45  
Exploitation  
Ant 8 : [4, 5, 3, 1], 52  
Exploitation  
Ant 1 : [1, 3, 4, 5, 2], 68  
Exploitation  
Ant 9 : [3, 4, 5, 2], 50  
Exploitation  
Ant 10 : [1, 3, 4, 5], 45  
Exploitation  
Ant 11 : [5, 4, 3, 1], 45  
Exploitation  
Ant 12 : [0, 1, 3, 4], 43  
Exploration  
avg = 0.000884994911279  
p = 0.00102880658436  
p = 0.00102880658436  
Ant 13 : [5, 4, 3, 2], 45  
Exploitation  
Ant 14 : [2, 5, 4, 3], 50  
Exploitation  
Ant 2 : [2, 5, 4, 3, 1], 68  
Exploration  
avg = 0.000884994911279  
p = 0.00102880658436  
p = 0.00102880658436  
Ant 15 : [4, 5, 3, 2], 52  
Exploration  
avg = 0.00106046217157

p = 0.00154320987654  
Ant 16 : [1, 3, 4, 5], 45  
Exploitation  
Ant 3 : [0, 1, 3, 4, 5], 55  
Exploration  
avg = 0.000884994911279  
p = 0.00102880658436  
p = 0.00102880658436  
Ant 17 : [5, 4, 3, 2], 45  
Exploration  
avg = 0.000884994911279  
p = 0.00102880658436  
p = 0.00102880658436  
Ant 18 : [5, 4, 3, 2], 45  
Exploitation  
Ant 0 : [4, 5, 3, 2, 1, 0], 84  
Update called by 0Exploitation

Ant thread 0 terminating.Ant 19 : [5, 4, 3, 1], 45

Exploitation  
Ant 4 : [4, 5, 3, 1, 0], 62  
Exploitation  
Ant 5 : [3, 4, 5, 2, 1], 72  
Exploitation  
Ant 6 : [4, 5, 3, 2, 1], 74  
Exploration  
avg = 0.000733264320221  
p = 0.000805152979066  
Ant 7 : [1, 3, 4, 5, 2], 68  
Exploitation  
Ant 8 : [4, 5, 3, 1, 0], 62  
Exploration  
avg = 0.000617283950617  
Ant 1 : [1, 3, 4, 5, 2, 0], 98  
Update called by 1Exploitation

Ant thread 1 terminating.Ant 9 : [3, 4, 5, 2, 1], 72

Exploration  
avg = 0.000733264320221  
p = 0.000805152979066  
Ant 10 : [1, 3, 4, 5, 2], 68  
Exploitation  
Ant 11 : [5, 4, 3, 1, 0], 55  
Exploration  
avg = 0.0011277302944  
p = 0.00154320987654  
Ant 12 : [0, 1, 3, 4, 5], 55  
Exploitation  
Ant 13 : [5, 4, 3, 2, 1], 67  
Exploitation  
Ant 14 : [2, 5, 4, 3, 1], 68  
Exploration

avg = 0.00185185185185  
Ant 2 : [2, 5, 4, 3, 1, 0], 78  
Update called by 2Exploration

Ant thread 2 terminating.avg = 0.000729517396184

p = 0.000841750841751  
Ant 15 : [4, 5, 3, 2, 1], 74  
Exploitation  
Ant 16 : [1, 3, 4, 5, 2], 68  
Exploration  
avg = 0.000805152979066  
Ant 3 : [0, 1, 3, 4, 5, 2], 78  
Update called by 3Exploitation

Ant thread 3 terminating.Ant 17 : [5, 4, 3, 2, 1], 67

Exploration  
avg = 0.000729517396184  
p = 0.000841750841751  
Ant 18 : [5, 4, 3, 2, 1], 67  
Exploration  
avg = 0.0013468013468  
p = 0.00185185185185  
Ant 19 : [5, 4, 3, 1, 0], 55  
Exploration  
avg = 0.000617283950617  
Ant 4 : [4, 5, 3, 1, 0, 2], 92  
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 : [4, 5, 3, 2, 1, 0], 84

Update called by 6Exploitation

Ant thread 6 terminating.Ant 7 : [1, 3, 4, 5, 2, 0], 98

Update called by 7Exploration

Ant thread 7 terminating.avg = 0.000617283950617

Ant 8 : [4, 5, 3, 1, 0, 2], 92  
Update called by 8Exploration

Ant thread 8 terminating.avg = 0.00185185185185

Ant 9 : [3, 4, 5, 2, 1, 0], 82  
Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [1, 3, 4, 5, 2, 0], 98



Update called by 10Exploration

Ant thread 10 terminating.avg = 0.000617283950617

Ant 11 : [5, 4, 3, 1, 0, 2], 85  
Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [0, 1, 3, 4, 5, 2], 78

Update called by 12Exploration

Ant thread 12 terminating.avg = 0.00185185185185

Ant 13 : [5, 4, 3, 2, 1, 0], 77  
Update called by 13Exploration

Ant thread 13 terminating.avg = 0.00185185185185

Ant 14 : [2, 5, 4, 3, 1, 0], 78  
Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [4, 5, 3, 2, 1, 0], 84

Update called by 15Exploration

Ant thread 15 terminating.avg = 0.000617283950617

Ant 16 : [1, 3, 4, 5, 2, 0], 98  
Update called by 16Exploration

Ant thread 16 terminating.avg = 0.00185185185185

Ant 17 : [5, 4, 3, 2, 1, 0], 77  
Update called by 17Exploration

Ant thread 17 terminating.avg = 0.00185185185185

Ant 18 : [5, 4, 3, 2, 1, 0], 77  
Update called by 18Exploitation

Ant thread 18 terminating.Ant 19 : [5, 4, 3, 1, 0, 2], 85

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 = 0.000878205128205starting ant = 2

p = 0.001111111111111starting ant = 3

p = 0.001388888888889starting ant = 4

Ant 0 : [4, 5], 12starting ant = 5

Explorationstarting ant = 6

avg = 0.000881572131572starting ant = 7

p = 0.001666666666667starting ant = 8

p = 0.000925925925926starting ant = 9

Ant 1 : [1, 3], 18starting ant = 10

Explorationstarting ant = 11

avg = 0.000720944112248starting ant = 12

p = 0.000757575757576starting ant = 13

p = 0.000925925925926starting ant = 14

p = 0.000724637681159starting ant = 15

Ant 2 : [2, 5], 23starting ant = 16

Explorationstarting ant = 17

avg = 0.000837685611879starting ant = 18

p = 0.001666666666667starting ant = 19

Ant 3 : [0, 1], 10

Exploitation

Ant 4 : [4, 5], 12

Exploration

avg = 0.00067961929375

p = 0.000724637681159

p = 0.000757575757576

Ant 0 : [4, 5, 3], 34

Exploration

avg = 0.000851634625828

p = 0.000925925925926

p = 0.000925925925926

p = 0.001111111111111

Ant 5 : [3, 4], 15

Exploitation

Ant 6 : [4, 5], 12

Exploitation

Ant 7 : [1, 0], 10

Exploration

avg = 0.0009090909294872

p = 0.001111111111111

p = 0.00154320972222

Ant 8 : [4, 5], 12

Exploitation  
Ant 9 : [3, 4], 15  
Exploration  
avg = 0.000863922911915  
p = 0.000925925925926  
p = 0.001234555555556  
Ant 1 : [1, 3, 4], 33  
Exploitation  
Ant 10 : [1, 0], 10  
Exploitation  
Ant 11 : [5, 4], 12  
Exploration  
avg = 0.000874352278546  
p = 0.00185  
Ant 12 : [0, 1], 10  
Exploitation  
Ant 13 : [5, 4], 12  
Exploration  
avg = 0.000736886141234  
p = 0.000757575757576  
p = 0.000925925925926  
p = 0.000804347826087  
Ant 14 : [2, 5], 23  
Exploration  
avg = 0.000909069325427  
p = 0.001111111111111  
p = 0.001543209875  
Ant 15 : [4, 5], 12  
Exploitation  
Ant 2 : [2, 5, 4], 35  
Exploitation  
Ant 16 : [1, 0], 10  
Exploration  
avg = 0.000869004046111  
p = 0.00154320972222  
Ant 17 : [5, 4], 12  
Exploitation  
Ant 18 : [5, 4], 12  
Exploration  
avg = 0.000869004076972  
p = 0.00154320987653  
Ant 19 : [5, 4], 12  
Exploitation  
Ant 3 : [0, 1, 3], 28  
Exploitation  
Ant 4 : [4, 5, 3], 34  
Exploration  
avg = 0.000796495420151  
p = 0.000925925925926  
p = 0.000925925925926  
Ant 0 : [4, 5, 3, 2], 52  
Exploration  
avg = 0.000858558879388  
p = 0.00154320987653

Ant 5 : [3, 4, 5], 27  
Exploration  
avg = 0.000700660960416  
p = 0.000724637681159  
p = 0.000841742424242  
Ant 6 : [4, 5, 3], 34  
Exploration  
avg = 0.000630440348182  
p = 0.0008333333333333  
Ant 7 : [1, 0, 4], 30  
Exploration  
avg = 0.00070066304375  
p = 0.000724637681159  
p = 0.000841750757576  
Ant 8 : [4, 5, 3], 34  
Exploration  
avg = 0.000858558879392  
p = 0.00154320987654  
Ant 9 : [3, 4, 5], 27  
Exploitation  
Ant 1 : [1, 3, 4, 5], 45  
Exploitation  
Ant 10 : [1, 0, 4], 30  
Exploitation  
Ant 11 : [5, 4, 3], 27  
Exploitation  
Ant 12 : [0, 1, 3], 28  
Exploitation  
Ant 13 : [5, 4, 3], 27  
Exploitation  
Ant 14 : [2, 5, 4], 35  
Exploration  
avg = 0.000700663064583  
p = 0.000724637681159  
p = 0.000841750840909  
Ant 15 : [4, 5, 3], 34  
Exploration  
avg = 0.000828185185185  
p = 0.0008333333333333  
p = 0.001234555555556  
Ant 2 : [2, 5, 4, 3], 50  
Exploration  
avg = 0.000653586181516  
p = 0.000925916666667  
Ant 16 : [1, 0, 4], 30  
Exploitation  
Ant 17 : [5, 4, 3], 27  
Exploration  
avg = 0.000781398385256  
p = 0.0008333333333333  
p = 0.0012345679  
Ant 18 : [5, 4, 3], 27  
Exploitation  
Ant 19 : [5, 4, 3], 27

Exploration  
avg = 0.00100664043771  
p = 0.00102777777778  
p = 0.00123456777778  
Ant 3 : [0, 1, 3, 4], 43  
Exploration  
avg = 0.000830446037435  
p = 0.000925925925926  
p = 0.00102777777778  
Ant 4 : [4, 5, 3, 2], 52  
Exploitation  
Ant 0 : [4, 5, 3, 2, 1], 74  
Exploration  
avg = 0.000653633805808  
p = 0.000724637681159  
Ant 5 : [3, 4, 5, 2], 50  
Exploitation  
Ant 6 : [4, 5, 3, 2], 52  
Exploration  
avg = 0.0011396011396  
p = 0.00123456790123  
p = 0.00154320987654  
Ant 7 : [1, 0, 4, 5], 42  
Exploitation  
Ant 8 : [4, 5, 3, 2], 52  
Exploration  
avg = 0.000680203854117  
p = 0.000804347826087  
Ant 9 : [3, 4, 5, 2], 50  
Exploration  
avg = 0.000700191511387  
p = 0.000805144927536  
Ant 1 : [1, 3, 4, 5, 2], 68  
Exploitation  
Ant 10 : [1, 0, 4, 5], 42  
Exploration  
avg = 0.00083078897262  
p = 0.000925925925926  
p = 0.00102880658333  
Ant 11 : [5, 4, 3, 2], 45  
Exploration  
avg = 0.00100698341398  
p = 0.00102880658435  
p = 0.0012345679  
Ant 12 : [0, 1, 3, 4], 43  
Exploitation  
Ant 13 : [5, 4, 3, 2], 45  
Exploitation  
Ant 14 : [2, 5, 4, 3], 50  
Exploitation  
Ant 15 : [4, 5, 3, 2], 52  
Exploitation  
Ant 2 : [2, 5, 4, 3, 1], 68  
Exploration

```
avg = 0.0011396011396
p = 0.00123456790123
p = 0.00154320987654
Ant 16 : [1, 0, 4, 5], 42
Exploration
avg = 0.000864739590247
p = 0.00102777777778
p = 0.00102880658436
Ant 17 : [5, 4, 3, 2], 45
Exploration
avg = 0.000864739590247
p = 0.00102777777778
p = 0.00102880658436
Ant 18 : [5, 4, 3, 2], 45
Exploitation
Ant 19 : [5, 4, 3, 2], 45
Exploration
avg = 0.00109211775878
p = 0.00154320987654
Ant 3 : [0, 1, 3, 4, 5], 55
Exploitation
Ant 4 : [4, 5, 3, 2, 1], 74
Exploitation
Ant 0 : [4, 5, 3, 2, 1, 0], 84
Update called by 0Exploration
```

Ant thread 0 terminating.avg = 0.000698648989899

```
p = 0.000841742424242
Ant 5 : [3, 4, 5, 2, 1], 72
Exploration
avg = 0.000698653156566
p = 0.000841750757576
Ant 6 : [4, 5, 3, 2, 1], 74
Exploitation
Ant 7 : [1, 0, 4, 5, 3], 64
Exploration
avg = 0.000698653198232
p = 0.000841750840909
Ant 8 : [4, 5, 3, 2, 1], 74
Exploitation
Ant 9 : [3, 4, 5, 2, 1], 72
Exploration
avg = 0.000555555555556
Ant 1 : [1, 3, 4, 5, 2, 0], 98
Update called by 1Exploitation
```

Ant thread 1 terminating.Ant 10 : [1, 0, 4, 5, 3], 64

```
Exploitation
Ant 11 : [5, 4, 3, 2, 1], 67
Exploitation
Ant 12 : [0, 1, 3, 4, 5], 55
Exploitation
```

Ant 13 : [5, 4, 3, 2, 1], 67  
Exploitation  
Ant 14 : [2, 5, 4, 3, 1], 68  
Exploitation  
Ant 15 : [4, 5, 3, 2, 1], 74  
Exploitation  
Ant 2 : [2, 5, 4, 3, 1, 0], 78  
Update called by 2Exploration

Ant thread 2 terminating.avg = 0.000823451870151

p = 0.000841750841751  
Ant 16 : [1, 0, 4, 5, 3], 64  
Exploration  
avg = 0.000729208754209  
p = 0.000841750841751  
Ant 17 : [5, 4, 3, 2, 1], 67  
Exploration  
avg = 0.000729208754209  
p = 0.000841750841751  
Ant 18 : [5, 4, 3, 2, 1], 67  
Exploitation  
Ant 19 : [5, 4, 3, 2, 1], 67  
Exploration  
avg = 0.000805152898551  
Ant 3 : [0, 1, 3, 4, 5, 2], 78  
Update called by 3Exploitation

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

Update called by 4Exploration

Ant thread 4 terminating.avg = 0.00185185185185

Ant 5 : [3, 4, 5, 2, 1, 0], 82  
Update called by 5Exploration

Ant thread 5 terminating.avg = 0.00185185185185

Ant 6 : [4, 5, 3, 2, 1, 0], 84  
Update called by 6Exploitation

Ant thread 6 terminating.Ant 7 : [1, 0, 4, 5, 3, 2], 82

Update called by 7Exploitation

Ant thread 7 terminating.Ant 8 : [4, 5, 3, 2, 1, 0], 84

Update called by 8Exploitation

Ant thread 8 terminating.Ant 9 : [3, 4, 5, 2, 1, 0], 82

Update called by 9Exploration

Ant thread 9 terminating.avg = 0.00102880658436

Ant 10 : [1, 0, 4, 5, 3, 2], 82  
Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [5, 4, 3, 2, 1, 0], 77

Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [0, 1, 3, 4, 5, 2], 78

Update called by 12Exploration

Ant thread 12 terminating.avg = 0.00185185185185

Ant 13 : [5, 4, 3, 2, 1, 0], 77  
Update called by 13Exploration

Ant thread 13 terminating.avg = 0.00185185185185

Ant 14 : [2, 5, 4, 3, 1, 0], 78  
Update called by 14Exploration

Ant thread 14 terminating.avg = 0.00185185185185

Ant 15 : [4, 5, 3, 2, 1, 0], 84  
Update called by 15Exploitation

Ant thread 15 terminating.Ant 16 : [1, 0, 4, 5, 3, 2], 82

Update called by 16Exploration

Ant thread 16 terminating.avg = 0.00185185185185

Ant 17 : [5, 4, 3, 2, 1, 0], 77  
Update called by 17Exploration

Ant thread 17 terminating.avg = 0.00185185185185

Ant 18 : [5, 4, 3, 2, 1, 0], 77  
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, 2, 106  
Ant thread 19 terminating.iter\_counter = 3

starting ant = 0  
Exploitationstarting ant = 1

Ant 0 : [4, 5], 12starting ant = 2



Exploitationstarting ant = 3

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

Exploitationstarting ant = 5

Ant 0 : [4, 5, 3], 34starting ant = 6

Explorationstarting ant = 7

avg = 0.000689492520523starting ant = 8

p = 0.000757575757576starting ant = 9

p = 0.000833333333333starting ant = 10

p = 0.000724630434783starting ant = 11

Ant 2 : [2, 5], 23starting ant = 12

Exploitationstarting ant = 13

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

Explorationstarting ant = 15

avg = 0.000588229625864starting ant = 16

p = 0.00083333325starting ant = 17

Ant 1 : [1, 0, 4], 30starting ant = 18

Explorationstarting ant = 19

avg = 0.00087094017094

p = 0.001111111111111

p = 0.001541666666667

Ant 4 : [4, 5], 12

Exploitation

Ant 5 : [3, 4], 15

Exploration

avg = 0.000778571186778

p = 0.000925916666667

p = 0.000925925925926

Ant 0 : [4, 5, 3, 2], 52

Exploitation

Ant 6 : [4, 5], 12

Exploitation

Ant 7 : [1, 0], 10

Exploration

avg = 0.000871248782051

p = 0.001111111111111

p = 0.00154320972222

Ant 8 : [4, 5], 12

Exploration  
avg = 0.000870543385468  
p = 0.000925916666667  
p = 0.001027777777778  
p = 0.001233333333333  
Ant 9 : [3, 4], 15  
Exploration  
avg = 0.000882300085082  
p = 0.001851833333333  
p = 0.000925925833333  
Ant 10 : [1, 3], 18  
Exploitation  
Ant 11 : [5, 4], 12  
Exploitation  
Ant 2 : [2, 5, 4], 35  
Exploitation  
Ant 12 : [0, 1], 10  
Exploitation  
Ant 13 : [5, 4], 12  
Exploration  
avg = 0.000665379758898  
p = 0.000681818181818  
p = 0.001027777777685  
Ant 3 : [0, 1, 3], 28  
Exploitation  
Ant 14 : [2, 3], 18  
Exploration  
avg = 0.000871248812607  
p = 0.001111111111111  
p = 0.001543209875  
Ant 15 : [4, 5], 12  
Exploration  
avg = 0.000902874177672  
p = 0.001851833333333  
p = 0.00102879629629  
Ant 16 : [1, 3], 18  
Exploration  
avg = 0.000844278771384  
p = 0.00154320972222  
Ant 17 : [5, 4], 12  
Exploration  
avg = 0.00107708135485  
p = 0.001111111111111  
p = 0.00154320987653  
Ant 1 : [1, 0, 4, 5], 42  
Exploration  
avg = 0.00084427880194  
p = 0.001543209875  
Ant 18 : [5, 4], 12  
Exploration  
avg = 0.000844278802245  
p = 0.00154320987653  
Ant 19 : [5, 4], 12  
Exploitation

Ant 4 : [4, 5, 3], 34  
Exploitation  
Ant 5 : [3, 4, 5], 27  
Exploration  
avg = 0.000656287878788  
p = 0.000757575757576  
Ant 0 : [4, 5, 3, 2, 1], 74  
Exploration  
avg = 0.000669754367008  
p = 0.000724637681152  
p = 0.000841742424242  
Ant 6 : [4, 5, 3], 34  
Exploration  
avg = 0.000611146313156  
p = 0.000924999999167  
Ant 7 : [1, 0, 4], 30  
Exploitation  
Ant 8 : [4, 5, 3], 34  
Exploitation  
Ant 9 : [3, 4, 5], 27  
Exploitation  
Ant 10 : [1, 3, 4], 33  
Exploration  
avg = 0.000703258547009  
p = 0.00075  
p = 0.001111111111111  
Ant 11 : [5, 4, 3], 27  
Exploration  
avg = 0.000786111111111  
p = 0.001233333333333  
Ant 2 : [2, 5, 4, 3], 50  
Exploration  
avg = 0.000665636935056  
p = 0.000681818181818  
p = 0.00102880648148  
Ant 12 : [0, 1, 3], 28  
Exploitation  
Ant 13 : [5, 4, 3], 27  
Exploitation  
Ant 3 : [0, 1, 3, 4], 43  
Exploitation  
Ant 14 : [2, 3, 4], 33  
Exploitation  
Ant 15 : [4, 5, 3], 34  
Exploitation  
Ant 16 : [1, 3, 4], 33  
Exploration  
avg = 0.000734122713675  
p = 0.00075  
p = 0.001234567777778  
Ant 17 : [5, 4, 3], 27  
Exploitation  
Ant 1 : [1, 0, 4, 5, 3], 64  
Exploitation

Ant 18 : [5, 4, 3], 27  
Exploration  
avg = 0.000734122744536  
p = 0.00075  
p = 0.00123456790122  
Ant 19 : [5, 4, 3], 27  
Exploration  
avg = 0.000812521804062  
p = 0.000925916666667  
p = 0.00102777777778  
Ant 4 : [4, 5, 3, 2], 52  
Exploitation  
Ant 5 : [3, 4, 5, 2], 50  
Exploration  
avg = 0.00185183333333  
Ant 0 : [4, 5, 3, 2, 1, 0], 84  
ExploitationUpdate called by 0

Ant 6 : [4, 5, 3, 2], 52Ant thread 0 terminating.

Exploration  
avg = 0.00111823361823  
p = 0.00123456790123  
p = 0.00154320987654  
Ant 7 : [1, 0, 4, 5], 42  
Exploration  
avg = 0.000812864705297  
p = 0.000925916666667  
p = 0.00102880648148  
Ant 8 : [4, 5, 3, 2], 52  
Exploitation  
Ant 9 : [3, 4, 5, 2], 50  
Exploration  
avg = 0.000956710984489  
p = 0.00154320987654  
Ant 10 : [1, 3, 4, 5], 45  
Exploitation  
Ant 11 : [5, 4, 3, 2], 45  
Exploration  
avg = 0.000704893817204  
p = 0.000925916666667  
Ant 2 : [2, 5, 4, 3, 1], 68  
Exploitation  
Ant 12 : [0, 1, 3, 4], 43  
Exploitation  
Ant 13 : [5, 4, 3, 2], 45  
Exploitation  
Ant 3 : [0, 1, 3, 4, 5], 55  
Exploitation  
Ant 14 : [2, 3, 4, 5], 45  
Exploration  
avg = 0.00084681841243  
p = 0.00102777768519  
p = 0.00102880658436

Ant 15 : [4, 5, 3, 2], 52  
Exploitation  
Ant 16 : [1, 3, 4, 5], 45  
Exploitation  
Ant 17 : [5, 4, 3, 2], 45  
Exploration  
avg = 0.00102880658436  
Ant 1 : [1, 0, 4, 5, 3, 2], 82  
Update called by 1Exploration  
  
Ant thread 1 terminating.avg = 0.00084681841243

p = 0.00102777768519  
p = 0.00102880658436  
Ant 18 : [5, 4, 3, 2], 45  
Exploitation  
Ant 19 : [5, 4, 3, 2], 45  
Exploration  
avg = 0.000697954545455  
p = 0.000840909090909  
Ant 4 : [4, 5, 3, 2, 1], 74  
Exploration  
avg = 0.000698371212121  
p = 0.000841742424242  
Ant 5 : [3, 4, 5, 2, 1], 72  
Exploration  
avg = 0.000698375378788  
p = 0.000841750757576  
Ant 6 : [4, 5, 3, 2, 1], 74  
Exploration  
avg = 0.000823447884643  
p = 0.000841750841751  
Ant 7 : [1, 0, 4, 5, 3], 64  
Exploration  
avg = 0.000698375420455  
p = 0.000841750840909  
Ant 8 : [4, 5, 3, 2, 1], 74  
Exploitation  
Ant 9 : [3, 4, 5, 2, 1], 72  
Exploration  
avg = 0.000670429606625  
p = 0.000805144927536  
Ant 10 : [1, 3, 4, 5, 2], 68  
Exploitation  
Ant 11 : [5, 4, 3, 2, 1], 67  
Exploitation  
Ant 2 : [2, 5, 4, 3, 1, 0], 78  
ExplorationUpdate called by 2  
  
avg = 0.00106006647673Ant thread 2 terminating.  
  
p = 0.00154320987654  
Ant 12 : [0, 1, 3, 4, 5], 55  
Exploitation

Ant 13 : [5, 4, 3, 2, 1], 67

Exploitation

Ant 3 : [0, 1, 3, 4, 5, 2], 78

Update called by 3Exploitation

Ant thread 3 terminating.Ant 14 : [2, 3, 4, 5, 1], 71

Exploration

avg = 0.000698375420875

p = 0.000841750841751

Ant 15 : [4, 5, 3, 2, 1], 74

Exploitation

Ant 16 : [1, 3, 4, 5, 2], 68

Exploitation

Ant 17 : [5, 4, 3, 2, 1], 67

Exploration

avg = 0.000698375420875

p = 0.000841750841751

Ant 18 : [5, 4, 3, 2, 1], 67

Exploitation

Ant 19 : [5, 4, 3, 2, 1], 67

Exploration

avg = 0.00185185185

Ant 4 : [4, 5, 3, 2, 1, 0], 84

Update called by 4Exploration

Ant thread 4 terminating.avg = 0.00185185185183

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

Update called by 5Exploration

Ant thread 5 terminating.avg = 0.00185185185185

Ant 6 : [4, 5, 3, 2, 1, 0], 84

Update called by 6Exploration

Ant thread 6 terminating.avg = 0.00102880658436

Ant 7 : [1, 0, 4, 5, 3, 2], 82

Update called by 7Exploration

Ant thread 7 terminating.avg = 0.00185185185185

Ant 8 : [4, 5, 3, 2, 1, 0], 84

Update called by 8Exploration

Ant thread 8 terminating.avg = 0.00185185185185

Ant 9 : [3, 4, 5, 2, 1, 0], 82

Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [1, 3, 4, 5, 2, 0], 98

Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [5, 4, 3, 2, 1, 0], 77

Update called by 11Exploration

Ant thread 11 terminating.avg = 0.000805152979058

Ant 12 : [0, 1, 3, 4, 5, 2], 78

Update called by 12Exploitation

Ant thread 12 terminating.Ant 13 : [5, 4, 3, 2, 1, 0], 77

Update called by 13Exploration

Ant thread 13 terminating.avg = 0.00185185185185

Ant 14 : [2, 3, 4, 5, 1, 0], 81

Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [4, 5, 3, 2, 1, 0], 84

Update called by 15Exploration

Ant thread 15 terminating.avg = 0.000616661111111

Ant 16 : [1, 3, 4, 5, 2, 0], 98

Update called by 16Exploration

Ant thread 16 terminating.avg = 0.00185185185185

Ant 17 : [5, 4, 3, 2, 1, 0], 77

Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [5, 4, 3, 2, 1, 0], 77

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, 106

Ant thread 19 terminating.iter\_counter = 4

starting ant = 0

Exploitationstarting ant = 1

Ant 0 : [4, 5], 12starting ant = 2

Exploitationstarting ant = 3

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

Explorationstarting ant = 5

avg = 0.000651040997046starting ant = 6

p = 0.000724637681159starting ant = 7

p = 0.000757575757576starting ant = 8

Ant 0 : [4, 5, 3], 34starting ant = 9

Exploitationstarting ant = 10

Ant 2 : [2, 3], 18starting ant = 11

Exploitationstarting ant = 12

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

Explorationstarting ant = 14

avg = 0.000550237932026starting ant = 15

p = 0.000833324999993starting ant = 16

Ant 1 : [1, 0, 4], 30starting ant = 17

Explorationstarting ant = 18

avg = 0.000836901709402starting ant = 19

p = 0.001111111111111

p = 0.001541666666667

Ant 4 : [4, 5], 12

Exploration

avg = 0.000802231437662

p = 0.000924999916667

p = 0.000925925925926

p = 0.001111111111111

Ant 5 : [3, 4], 15

Exploration

avg = 0.000837207264957

p = 0.001111111111111

p = 0.001543194444444

Ant 6 : [4, 5], 12

Exploitation

Ant 7 : [1, 0], 10

Exploration

avg = 0.000837210320513

p = 0.001111111111111

p = 0.00154320972222

Ant 8 : [4, 5], 12

Exploitation

Ant 0 : [4, 5, 3, 2], 52

Exploitation

Ant 9 : [3, 4], 15

Exploitation



Ant 10 : [1, 0], 10  
Exploitation  
Ant 2 : [2, 3, 4], 33  
Exploration  
avg = 0.000815277242082  
p = 0.000840909090909  
p = 0.001388888888889  
Ant 11 : [5, 4], 12  
Exploration  
avg = 0.000828525295619  
p = 0.00184999983332  
p = 0.000924999916667  
Ant 12 : [0, 4], 20  
Exploration  
avg = 0.000599073264467  
p = 0.000613636363636  
p = 0.000925925925  
Ant 3 : [0, 1, 3], 28  
Exploitation  
Ant 13 : [5, 4], 12  
Exploitation  
Ant 14 : [2, 3], 18  
Exploitation  
Ant 15 : [4, 5], 12  
Exploration  
avg = 0.00086999931546  
p = 0.00185185166667  
p = 0.00102777777777  
Ant 16 : [1, 3], 18  
Exploitation  
Ant 1 : [1, 0, 4, 5], 42  
Exploitation  
Ant 17 : [5, 4], 12  
Exploitation  
Ant 18 : [5, 4], 12  
Exploration  
avg = 0.000846141439304  
p = 0.001543209875  
Ant 19 : [5, 4], 12  
Exploitation  
Ant 4 : [4, 5, 3], 34  
Exploitation  
Ant 5 : [3, 4, 5], 27  
Exploitation  
Ant 6 : [4, 5, 3], 34  
Exploration  
avg = 0.000573385848486  
p = 0.000925916665833  
Ant 7 : [1, 0, 4], 30  
Exploration  
avg = 0.000672084747046  
p = 0.000724637681159  
p = 0.000841750757576  
Ant 8 : [4, 5, 3], 34

Exploitation  
Ant 0 : [4, 5, 3, 2, 1], 74  
Exploitation  
Ant 9 : [3, 4, 5], 27  
Exploration  
avg = 0.000573388140359  
p = 0.000925925833325  
Ant 10 : [1, 0, 4], 30  
Exploitation  
Ant 2 : [2, 3, 4, 5], 45  
Exploitation  
Ant 11 : [5, 4, 3], 27  
Exploitation  
Ant 12 : [0, 4, 5], 32  
Exploitation  
Ant 3 : [0, 1, 3, 4], 43  
Exploration  
avg = 0.000691266025641  
p = 0.001233333333333  
Ant 13 : [5, 4, 3], 27  
Exploitation  
Ant 14 : [2, 3, 4], 33  
Exploitation  
Ant 15 : [4, 5, 3], 34  
Exploitation  
Ant 16 : [1, 3, 4], 33  
Exploitation  
Ant 1 : [1, 0, 4, 5, 3], 64  
Exploitation  
Ant 17 : [5, 4, 3], 27  
Exploration  
avg = 0.000691574636752  
p = 0.001234567777778  
Ant 18 : [5, 4, 3], 27  
Exploitation  
Ant 19 : [5, 4, 3], 27  
Exploration  
avg = 0.000796087188471  
p = 0.000924999916667  
p = 0.001027777777778  
Ant 4 : [4, 5, 3, 2], 52  
Exploitation  
Ant 5 : [3, 4, 5, 2], 50  
Exploitation  
Ant 6 : [4, 5, 3, 2], 52  
Exploration  
avg = 0.001099002849  
p = 0.00123456790122  
p = 0.00154320987654  
Ant 7 : [1, 0, 4, 5], 42  
Exploitation  
Ant 8 : [4, 5, 3, 2], 52  
Exploitation  
Ant 0 : [4, 5, 3, 2, 1, 0], 84

Update called by 0Exploration

Ant thread 0 terminating.avg = 0.000642099458513

p = 0.000804347826087

Ant 9 : [3, 4, 5, 2], 50

Exploitation

Ant 10 : [1, 0, 4, 5], 42

Exploitation

Ant 2 : [2, 3, 4, 5, 1], 71

Exploitation

Ant 11 : [5, 4, 3, 2], 45

Exploration

avg = 0.000786140683779

p = 0.000805144927536

p = 0.000841750841751

Ant 12 : [0, 4, 5, 3], 54

Exploration

avg = 0.00103122032289

p = 0.00154320987654

Ant 3 : [0, 1, 3, 4, 5], 55

Exploitation

Ant 13 : [5, 4, 3, 2], 45

Exploitation

Ant 14 : [2, 3, 4, 5], 45

Exploitation

Ant 15 : [4, 5, 3, 2], 52

Exploration

avg = 0.000912480215258

p = 0.00154320987654

Ant 16 : [1, 3, 4, 5], 45

Exploitation

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

Update called by 1Exploitation

Ant thread 1 terminating.Ant 17 : [5, 4, 3, 2], 45

Exploitation

Ant 18 : [5, 4, 3, 2], 45

Exploitation

Ant 19 : [5, 4, 3, 2], 45

Exploration

avg = 0.000698229520455

p = 0.000840909090909

Ant 4 : [4, 5, 3, 2, 1], 74

Exploration

avg = 0.000698646187121

p = 0.000841742424242

Ant 5 : [3, 4, 5, 2, 1], 72

Exploration

avg = 0.000698650353788

p = 0.000841750757576

Ant 6 : [4, 5, 3, 2, 1], 74

Exploration

avg = 0.000823447884644  
p = 0.000841750841751  
Ant 7 : [1, 0, 4, 5, 3], 64  
Exploration  
avg = 0.000698650395455  
p = 0.000841750840909  
Ant 8 : [4, 5, 3, 2, 1], 74  
Exploration  
avg = 0.000698650395871  
p = 0.000841750841742  
Ant 9 : [3, 4, 5, 2, 1], 72  
Exploitation  
Ant 10 : [1, 0, 4, 5, 3], 64  
Exploitation  
Ant 2 : [2, 3, 4, 5, 1, 0], 81  
Update called by 2Exploration

Ant thread 2 terminating.avg = 0.000698650395875

p = 0.000841750841751  
Ant 11 : [5, 4, 3, 2, 1], 67  
Exploration  
avg = 0.000976903250514  
p = 0.00102880658436  
Ant 12 : [0, 4, 5, 3, 2], 72  
Exploration  
avg = 0.000805144927536  
Ant 3 : [0, 1, 3, 4, 5, 2], 78  
Update called by 3Exploitation

Ant thread 3 terminating.Ant 13 : [5, 4, 3, 2, 1], 67

Exploitation  
Ant 14 : [2, 3, 4, 5, 1], 71  
Exploitation  
Ant 15 : [4, 5, 3, 2, 1], 74  
Exploration  
avg = 0.000643647877847  
p = 0.000805152898551  
Ant 16 : [1, 3, 4, 5, 2], 68  
Exploration  
avg = 0.000698650395875  
p = 0.000841750841751  
Ant 17 : [5, 4, 3, 2, 1], 67  
Exploration  
avg = 0.000698650395875  
p = 0.000841750841751  
Ant 18 : [5, 4, 3, 2, 1], 67  
Exploration  
avg = 0.000698650395875  
p = 0.000841750841751  
Ant 19 : [5, 4, 3, 2, 1], 67  
Exploitation  
Ant 4 : [4, 5, 3, 2, 1, 0], 84

Update called by 4Exploitation

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

ExplorationUpdate called by 5

avg = 0.00185185185185Ant thread 5 terminating.

Ant 6 : [4, 5, 3, 2, 1, 0], 84

Update called by 6Exploration

Ant thread 6 terminating.avg = 0.00102880658436

Ant 7 : [1, 0, 4, 5, 3, 2], 82

Update called by 7Exploitation

Ant thread 7 terminating.Ant 8 : [4, 5, 3, 2, 1, 0], 84

Update called by 8Exploitation

Ant thread 8 terminating.Ant 9 : [3, 4, 5, 2, 1, 0], 82

Update called by 9Exploitation

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

Update called by 10Exploration

Ant thread 10 terminating.avg = 0.00185185185185

Ant 11 : [5, 4, 3, 2, 1, 0], 77

Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [0, 4, 5, 3, 2, 1], 94

Update called by 12Exploitation

Ant thread 12 terminating.Ant 13 : [5, 4, 3, 2, 1, 0], 77

Update called by 13Exploration

Ant thread 13 terminating.avg = 0.00185185185185

Ant 14 : [2, 3, 4, 5, 1, 0], 81

Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [4, 5, 3, 2, 1, 0], 84

Update called by 15Exploitation

Ant thread 15 terminating.Ant 16 : [1, 3, 4, 5, 2, 0], 98

Update called by 16Exploration

Ant thread 16 terminating.avg = 0.00185185185185

Ant 17 : [5, 4, 3, 2, 1, 0], 77  
Update called by 17Exploration

Ant thread 17 terminating.avg = 0.00185185185185

Ant 18 : [5, 4, 3, 2, 1, 0], 77  
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, 4, 106  
Ant thread 19 terminating.iter\_counter = 5

starting ant = 0  
Exploitationstarting ant = 1

Ant 0 : [4, 5], 12starting ant = 2

Explorationstarting ant = 3

avg = 0.000783182750583starting ant = 4

p = 0.001666666666667starting ant = 5

p = 0.000925916666667starting ant = 6

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

Exploitationstarting ant = 8

Ant 0 : [4, 5, 3], 34starting ant = 9

Explorationstarting ant = 10

avg = 0.00067146431764starting ant = 11

p = 0.000757575757576starting ant = 12

p = 0.000925916508333starting ant = 13

Ant 2 : [2, 3], 18starting ant = 14

Explorationstarting ant = 15

avg = 0.000745839447557starting ant = 16

p = 0.001664999849999starting ant = 17

p = 0.00083333333325starting ant = 18

Ant 3 : [0, 4], 20starting ant = 19

Exploration  
avg = 0.000806267094015  
p = 0.00111111111111  
p = 0.001541666666667  
Ant 4 : [4, 5], 12  
Exploitation  
Ant 5 : [3, 4], 15  
Exploration  
avg = 0.00080657264957  
p = 0.00111111111111  
p = 0.001543194444444  
Ant 6 : [4, 5], 12  
Exploration  
avg = 0.000775866867601  
p = 0.000925925925926  
p = 0.001233333333333  
Ant 1 : [1, 3, 4], 33  
Exploration  
avg = 0.000803554954286  
p = 0.001666666666667  
p = 0.00102777768519  
Ant 7 : [1, 3], 18  
Exploitation  
Ant 8 : [4, 5], 12  
Exploration  
avg = 0.000716787111599  
p = 0.000832499925  
p = 0.000925925925926  
Ant 0 : [4, 5, 3, 2], 52  
Exploration  
avg = 0.000807808293895  
p = 0.000832499925  
p = 0.001027777777778  
p = 0.001234555555556  
Ant 9 : [3, 4], 15  
Exploitation  
Ant 10 : [1, 0], 10  
Exploration  
avg = 0.00080587667056  
p = 0.000840909090909  
p = 0.001388888888888  
Ant 11 : [5, 4], 12  
Exploration  
avg = 0.000764172781056  
p = 0.00166499984999  
p = 0.000924999999992  
Ant 12 : [0, 4], 20  
Exploitation  
Ant 13 : [5, 4], 12  
Exploitation  
Ant 2 : [2, 3, 4], 33  
Exploration  
avg = 0.000691836552694

p = 0.000757575757576  
p = 0.0010277776836  
Ant 14 : [2, 3], 18  
Exploitation  
Ant 15 : [4, 5], 12  
Exploration  
avg = 0.00084042534299  
p = 0.00185  
p = 0.00102879629537  
Ant 16 : [1, 3], 18  
Exploitation  
Ant 17 : [5, 4], 12  
Exploitation  
Ant 18 : [5, 4], 12  
Exploitation  
Ant 3 : [0, 4, 5], 32  
Exploration  
avg = 0.000836740867785  
p = 0.000840909090909  
p = 0.001543209875  
Ant 19 : [5, 4], 12  
Exploration  
avg = 0.000660123615982  
p = 0.000724637680435  
p = 0.000840909090909  
Ant 4 : [4, 5, 3], 34  
Exploitation  
Ant 5 : [3, 4, 5], 27  
Exploitation  
Ant 6 : [4, 5, 3], 34  
Exploitation  
Ant 1 : [1, 3, 4, 5], 45  
Exploration  
avg = 0.00080163847223  
p = 0.00102777777778  
p = 0.0012345679  
Ant 7 : [1, 3, 4], 33  
Exploitation  
Ant 8 : [4, 5, 3], 34  
Exploration  
avg = 0.000656287853563  
p = 0.000757575757576  
Ant 0 : [4, 5, 3, 2, 1], 74  
Exploitation  
Ant 9 : [3, 4, 5], 27  
Exploration  
avg = 0.000539195180492  
p = 0.000925916666667  
Ant 10 : [1, 0, 4], 30  
Exploitation  
Ant 11 : [5, 4, 3], 27  
Exploration  
avg = 0.000886900225546  
p = 0.001233333333333



p = 0.00154320987654  
Ant 12 : [0, 4, 5], 32  
Exploitation  
Ant 13 : [5, 4, 3], 27  
Exploitation  
Ant 2 : [2, 3, 4, 5], 45  
Exploration  
avg = 0.000752819009341  
p = 0.000832499925  
p = 0.00123456790122  
Ant 14 : [2, 3, 4], 33  
Exploitation  
Ant 15 : [4, 5, 3], 34  
Exploitation  
Ant 16 : [1, 3, 4], 33  
Exploration  
avg = 0.000653278311966  
p = 0.00123455555556  
Ant 17 : [5, 4, 3], 27  
Exploration  
avg = 0.000653281367521  
p = 0.00123456777778  
Ant 18 : [5, 4, 3], 27  
Exploration  
avg = 0.000735802547777  
p = 0.000841750841742  
Ant 3 : [0, 4, 5, 3], 54  
Exploitation  
Ant 19 : [5, 4, 3], 27  
Exploration  
avg = 0.000750737728883  
p = 0.000832499925  
p = 0.00102777777778  
Ant 4 : [4, 5, 3, 2], 52  
Exploration  
avg = 0.000599861791006  
p = 0.000641019121154  
p = 0.000724637680435  
Ant 5 : [3, 4, 5, 2], 50  
Exploration  
avg = 0.000751077235056  
p = 0.000832499925  
p = 0.0010287962963  
Ant 6 : [4, 5, 3, 2], 52  
Exploitation  
Ant 1 : [1, 3, 4, 5, 2], 68  
Exploration  
avg = 0.00087267252295  
p = 0.00154320987654  
Ant 7 : [1, 3, 4, 5], 45  
Exploitation  
Ant 8 : [4, 5, 3, 2], 52  
Exploitation  
Ant 0 : [4, 5, 3, 2, 1, 0], 84

Update called by 0Exploitation

Ant thread 0 terminating.Ant 9 : [3, 4, 5, 2], 50

Exploitation

Ant 10 : [1, 0, 4, 5], 42

Exploitation

Ant 11 : [5, 4, 3, 2], 45

Exploitation

Ant 12 : [0, 4, 5, 3], 54

Exploitation

Ant 13 : [5, 4, 3, 2], 45

Exploitation

Ant 2 : [2, 3, 4, 5, 1], 71

Exploitation

Ant 14 : [2, 3, 4, 5], 45

Exploration

avg = 0.000751080664411

p = 0.000832499925

p = 0.00102880658436

Ant 15 : [4, 5, 3, 2], 52

Exploration

avg = 0.00087267252295

p = 0.00154320987654

Ant 16 : [1, 3, 4, 5], 45

Exploration

avg = 0.000751080664411

p = 0.000832499925

p = 0.00102880658436

Ant 17 : [5, 4, 3, 2], 45

Exploitation

Ant 18 : [5, 4, 3, 2], 45

Exploitation

Ant 3 : [0, 4, 5, 3, 2], 72

Exploration

avg = 0.000751080664411

p = 0.000832499925

p = 0.00102880658436

Ant 19 : [5, 4, 3, 2], 45

Exploration

avg = 0.00069795452023

p = 0.000840909090909

Ant 4 : [4, 5, 3, 2, 1], 74

Exploration

avg = 0.000698371186896

p = 0.000841742424242

Ant 5 : [3, 4, 5, 2, 1], 72

Exploitation

Ant 6 : [4, 5, 3, 2, 1], 74

Exploration

avg = 0.00055499994955

Ant 1 : [1, 3, 4, 5, 2, 0], 98

Update called by 1Exploration

Ant thread 1 terminating.avg = 0.00061954073499

p = 0.000805152898551

Ant 7 : [1, 3, 4, 5, 2], 68

Exploration

avg = 0.000729205975758

p = 0.000841750840909

Ant 8 : [4, 5, 3, 2, 1], 74

Exploitation

Ant 9 : [3, 4, 5, 2, 1], 72

Exploitation

Ant 10 : [1, 0, 4, 5, 3], 64

Exploitation

Ant 11 : [5, 4, 3, 2, 1], 67

Exploration

avg = 0.000930653254681

p = 0.00102880658436

Ant 12 : [0, 4, 5, 3, 2], 72

Exploitation

Ant 13 : [5, 4, 3, 2, 1], 67

Exploitation

Ant 2 : [2, 3, 4, 5, 1, 0], 81

Update called by 2Exploration

Ant thread 2 terminating.avg = 0.000572733483884

p = 0.00071153839634

Ant 14 : [2, 3, 4, 5, 1], 71

Exploitation

Ant 15 : [4, 5, 3, 2, 1], 74

Exploitation

Ant 16 : [1, 3, 4, 5, 2], 68

Exploration

avg = 0.000729205976179

p = 0.000841750841751

Ant 17 : [5, 4, 3, 2, 1], 67

Exploration

avg = 0.000729205976179

p = 0.000841750841751

Ant 18 : [5, 4, 3, 2, 1], 67

Exploration

avg = 0.000841750841751

Ant 3 : [0, 4, 5, 3, 2, 1], 94

Update called by 3Exploitation

Ant thread 3 terminating.Ant 19 : [5, 4, 3, 2, 1], 67

Exploration

avg = 0.00185185166667

Ant 4 : [4, 5, 3, 2, 1, 0], 84

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 : [4, 5, 3, 2, 1, 0], 84

Update called by 6Exploration

Ant thread 6 terminating.avg = 0.000616661110607

Ant 7 : [1, 3, 4, 5, 2, 0], 98

Update called by 7Exploration

Ant thread 7 terminating.avg = 0.00185185185185

Ant 8 : [4, 5, 3, 2, 1, 0], 84

Update called by 8Exploration

Ant thread 8 terminating.avg = 0.00185185185185

Ant 9 : [3, 4, 5, 2, 1, 0], 82

Update called by 9Exploration

Ant thread 9 terminating.avg = 0.00102880658436

Ant 10 : [1, 0, 4, 5, 3, 2], 82

Update called by 10Exploration

Ant thread 10 terminating.avg = 0.00185185185185

Ant 11 : [5, 4, 3, 2, 1, 0], 77

Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [0, 4, 5, 3, 2, 1], 94

Update called by 12Exploitation

Ant thread 12 terminating.Ant 13 : [5, 4, 3, 2, 1, 0], 77

Update called by 13Exploration

Ant thread 13 terminating.avg = 0.00185185185185

Ant 14 : [2, 3, 4, 5, 1, 0], 81

Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [4, 5, 3, 2, 1, 0], 84

Update called by 15Exploitation

Ant thread 15 terminating.Ant 16 : [1, 3, 4, 5, 2, 0], 98

Update called by 16Exploration

Ant thread 16 terminating.avg = 0.00185185185185

Ant 17 : [5, 4, 3, 2, 1, 0], 77  
Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [5, 4, 3, 2, 1, 0], 77

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, 5, 106  
Ant thread 19 terminating.iter\_counter = 6

starting ant = 0  
Exploitationstarting ant = 1

Ant 0 : [4, 5], 12starting ant = 2

Exploitationstarting ant = 3

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

Explorationstarting ant = 5

avg = 0.000628442095799starting ant = 6

p = 0.000641019230182starting ant = 7

p = 0.000724637681152starting ant = 8

p = 0.000757575757576starting ant = 9

Ant 0 : [4, 5, 3], 34starting ant = 10

Explorationstarting ant = 11

avg = 0.000649198871673starting ant = 12

p = 0.000757575757576starting ant = 13

p = 0.000925916665819starting ant = 14

Ant 2 : [2, 3], 18starting ant = 15

Exploitationstarting ant = 16

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

Exploitationstarting ant = 18

Ant 1 : [1, 0, 4], 30starting ant = 19

Exploration

avg = 0.000778695940169  
p = 0.00111111111111  
p = 0.001541666666667  
Ant 4 : [4, 5], 12  
Exploration  
avg = 0.000727214871913  
p = 0.0007492499325  
p = 0.000925925925926  
p = 0.001111111111111  
Ant 5 : [3, 4], 15  
Exploitation  
Ant 6 : [4, 5], 12  
Exploration  
avg = 0.000793384642189  
p = 0.00185  
p = 0.000925925833325  
Ant 7 : [1, 3], 18  
Exploration  
avg = 0.00077900455128  
p = 0.00111111111111  
p = 0.00154320972222  
Ant 8 : [4, 5], 12  
Exploration  
avg = 0.000751659316358  
p = 0.000925925925926  
p = 0.00123333333333  
Ant 9 : [3, 4], 15  
Exploration  
avg = 0.00067597259797  
p = 0.0007492499325  
p = 0.000925925925926  
Ant 0 : [4, 5, 3, 2], 52  
Exploration  
avg = 0.000813755030895  
p = 0.00185  
p = 0.00102777777685  
Ant 10 : [1, 3], 18  
Exploration  
avg = 0.000797198121081  
p = 0.000840909090909  
p = 0.00138888888888  
Ant 11 : [5, 4], 12  
Exploration  
avg = 0.000776219196184  
p = 0.00184831833198  
p = 0.000924999999167  
Ant 12 : [0, 4], 20  
Exploitation  
Ant 13 : [5, 4], 12  
Exploitation  
Ant 14 : [2, 3], 18  
Exploitation  
Ant 2 : [2, 3, 4], 33  
Exploitation

Ant 15 : [4, 5], 12  
Exploration  
avg = 0.000813958734782  
p = 0.00185  
p = 0.00102879629629  
Ant 16 : [1, 3], 18  
Exploration  
avg = 0.000554950964776  
p = 0.00102880648148  
Ant 3 : [0, 1, 3], 28  
Exploitation  
Ant 17 : [5, 4], 12  
Exploitation  
Ant 18 : [5, 4], 12  
Exploration  
avg = 0.00102496597023  
p = 0.00111111111111  
p = 0.00154320987653  
Ant 1 : [1, 0, 4, 5], 42  
Exploitation  
Ant 19 : [5, 4], 12  
Exploitation  
Ant 4 : [4, 5, 3], 34  
Exploration  
avg = 0.000695977949905  
p = 0.00154320987654  
Ant 5 : [3, 4, 5], 27  
Exploitation  
Ant 6 : [4, 5, 3], 34  
Exploitation  
Ant 7 : [1, 3, 4], 33  
Exploitation  
Ant 8 : [4, 5, 3], 34  
Exploration  
avg = 0.000695977949905  
p = 0.00154320987654  
Ant 9 : [3, 4, 5], 27  
Exploitation  
Ant 0 : [4, 5, 3, 2, 1], 74  
Exploration  
avg = 0.000778033266952  
p = 0.00102777777778  
p = 0.0012345679  
Ant 10 : [1, 3, 4], 33  
Exploration  
avg = 0.000587953258544  
p = 0.00111111111111  
Ant 11 : [5, 4, 3], 27  
Exploitation  
Ant 12 : [0, 4, 5], 32  
Exploration  
avg = 0.000618508814103  
p = 0.00123333333333  
Ant 13 : [5, 4, 3], 27

```
Exploitation
Ant 14 : [2, 3, 4], 33
Exploration
avg = 0.000787778292181
p = 0.00154320987654
Ant 2 : [2, 3, 4, 5], 45
Exploitation
Ant 15 : [4, 5, 3], 34
Exploration
avg = 0.00077803326726
p = 0.00102777777778
p = 0.00123456790123
Ant 16 : [1, 3, 4], 33
Exploration
avg = 0.000919797044519
p = 0.00102777777778
p = 0.00123456790123
Ant 3 : [0, 1, 3, 4], 43
Exploitation
Ant 17 : [5, 4, 3], 27
Exploitation
Ant 18 : [5, 4, 3], 27
Exploitation
Ant 1 : [1, 0, 4, 5, 3], 64
Exploitation
Ant 19 : [5, 4, 3], 27
Exploitation
Ant 4 : [4, 5, 3, 2], 52
Exploration
avg = 0.000585397541873
p = 0.000641019230182
p = 0.000724637681152
Ant 5 : [3, 4, 5, 2], 50
Exploration
avg = 0.000710262721427
p = 0.0007492499325
p = 0.0010287962963
Ant 6 : [4, 5, 3, 2], 52
Exploration
avg = 0.000836845599873
p = 0.00154320987654
Ant 7 : [1, 3, 4, 5], 45
Exploitation
Ant 8 : [4, 5, 3, 2], 52
Exploitation
Ant 9 : [3, 4, 5, 2], 50
Exploration
avg = 0.00185
Ant 0 : [4, 5, 3, 2, 1, 0], 84
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.000836845599873

p = 0.00154320987654
```



```
Ant 10 : [1, 3, 4, 5], 45
Exploitation
Ant 11 : [5, 4, 3, 2], 45
Exploration
avg = 0.000762638333156
p = 0.000805144927536
p = 0.000841750841751
Ant 12 : [0, 4, 5, 3], 54
Exploration
avg = 0.000710266150779
p = 0.0007492499325
p = 0.00102880658435
Ant 13 : [5, 4, 3, 2], 45
Exploration
avg = 0.000787778292181
p = 0.00154320987654
Ant 14 : [2, 3, 4, 5], 45
Exploitation
Ant 2 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.000710266150782
p = 0.0007492499325
p = 0.00102880658436
Ant 15 : [4, 5, 3, 2], 52
Exploitation
Ant 16 : [1, 3, 4, 5], 45
Exploitation
Ant 3 : [0, 1, 3, 4, 5], 55
Exploration
avg = 0.000710266150782
p = 0.0007492499325
p = 0.00102880658436
Ant 17 : [5, 4, 3, 2], 45
Exploitation
Ant 18 : [5, 4, 3, 2], 45
Exploitation
Ant 1 : [1, 0, 4, 5, 3, 2], 82
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.000710266150782

p = 0.0007492499325
p = 0.00102880658436
Ant 19 : [5, 4, 3, 2], 45
Exploitation
Ant 4 : [4, 5, 3, 2, 1], 74
Exploitation
Ant 5 : [3, 4, 5, 2, 1], 72
Exploration
avg = 0.000698653128538
p = 0.000841750757576
Ant 6 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.000597840320911
```

```

p = 0.000805144927536
Ant 7 : [1, 3, 4, 5, 2], 68
Exploration
avg = 0.000698653170205
p = 0.000841750840909
Ant 8 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.000698653170621
p = 0.000841750841742
Ant 9 : [3, 4, 5, 2, 1], 72
Exploitation
Ant 10 : [1, 3, 4, 5, 2], 68
Exploration
avg = 0.000698653170625
p = 0.000841750841751
Ant 11 : [5, 4, 3, 2, 1], 67
Exploitation
Ant 12 : [0, 4, 5, 3, 2], 72
Exploration
avg = 0.000698653170625
p = 0.000841750841751
Ant 13 : [5, 4, 3, 2, 1], 67
Exploitation
Ant 14 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.001851833333333
Ant 2 : [2, 3, 4, 5, 1, 0], 81
Update called by 2Exploitation

Ant thread 2 terminating.Ant 15 : [4, 5, 3, 2, 1], 74

Exploration
avg = 0.000597844346273
p = 0.000805152978261
Ant 16 : [1, 3, 4, 5, 2], 68
Exploitation
Ant 3 : [0, 1, 3, 4, 5, 2], 78
Update called by 3Exploration

Ant thread 3 terminating.avg = 0.000698653170625

p = 0.000841750841751
Ant 17 : [5, 4, 3, 2, 1], 67
Exploitation
Ant 18 : [5, 4, 3, 2, 1], 67
Exploration
avg = 0.000698653170625
p = 0.000841750841751
Ant 19 : [5, 4, 3, 2, 1], 67
Exploration
avg = 0.00185185166667
Ant 4 : [4, 5, 3, 2, 1, 0], 84
Update called by 4Exploitation

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Ant thread 4 terminating.Ant 5 : [3, 4, 5, 2, 1, 0], 82  
Update called by 5Exploitation  
Ant thread 5 terminating.Ant 6 : [4, 5, 3, 2, 1, 0], 84  
ExplorationUpdate called by 6  
avg = 0.0005555554995Ant thread 6 terminating.  
Ant 7 : [1, 3, 4, 5, 2, 0], 98  
Update called by 7Exploration  
Ant thread 7 terminating.avg = 0.00185185185185  
Ant 8 : [4, 5, 3, 2, 1, 0], 84  
Update called by 8Exploitation  
Ant thread 8 terminating.Ant 9 : [3, 4, 5, 2, 1, 0], 82  
Update called by 9Exploration  
Ant thread 9 terminating.avg = 0.0006166666666106  
Ant 10 : [1, 3, 4, 5, 2, 0], 98  
Update called by 10Exploitation  
Ant thread 10 terminating.Ant 11 : [5, 4, 3, 2, 1, 0], 77  
Update called by 11Exploration  
Ant thread 11 terminating.avg = 0.000841750841751  
Ant 12 : [0, 4, 5, 3, 2, 1], 94  
Update called by 12Exploitation  
Ant thread 12 terminating.Ant 13 : [5, 4, 3, 2, 1, 0], 77  
Update called by 13Exploration  
Ant thread 13 terminating.avg = 0.00185185185185  
Ant 14 : [2, 3, 4, 5, 1, 0], 81  
Update called by 14Exploitation  
Ant thread 14 terminating.Ant 15 : [4, 5, 3, 2, 1, 0], 84  
Update called by 15Exploration  
Ant thread 15 terminating.avg = 0.000617277777772  
Ant 16 : [1, 3, 4, 5, 2, 0], 98  
Update called by 16Exploration

Ant thread 16 terminating.avg = 0.00185185185185

Ant 17 : [5, 4, 3, 2, 1, 0], 77  
Update called by 17Exploration

Ant thread 17 terminating.avg = 0.00185185185185

Ant 18 : [5, 4, 3, 2, 1, 0], 77  
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, 6, 106  
Ant thread 19 terminating.iter\_counter = 7

starting ant = 0  
Explorationstarting ant = 1

avg = 0.000723326346152starting ant = 2

p = 0.00111111111111starting ant = 3

p = 0.00138888888889starting ant = 4

Ant 0 : [4, 5], 12starting ant = 5

Explorationstarting ant = 6

avg = 0.000732898046305starting ant = 7

p = 0.00166666666667starting ant = 8

p = 0.000925925925starting ant = 9

Ant 1 : [1, 3], 18starting ant = 10

Exploitationstarting ant = 11

Ant 2 : [2, 3], 18starting ant = 12

Explorationstarting ant = 13

avg = 0.000698762276714starting ant = 14

p = 0.00166348649878starting ant = 15

p = 0.000833324999993starting ant = 16

Ant 3 : [0, 4], 20starting ant = 17

Explorationstarting ant = 18

avg = 0.000753881901707starting ant = 19

p = 0.00111111111111  
p = 0.001541666666667  
Ant 4 : [4, 5], 12  
Exploitation  
Ant 0 : [4, 5, 3], 34  
Exploitation  
Ant 5 : [3, 4], 15  
Exploration  
avg = 0.000754187457263  
p = 0.00111111111111  
p = 0.001543194444444  
Ant 6 : [4, 5], 12  
Exploitation  
Ant 7 : [1, 0], 10  
Exploitation  
Ant 8 : [4, 5], 12  
Exploration  
avg = 0.000719678569907  
p = 0.000925925925926  
p = 0.001233333333333  
Ant 9 : [3, 4], 15  
Exploitation  
Ant 1 : [1, 3, 4], 33  
Exploitation  
Ant 10 : [1, 0], 10  
Exploitation  
Ant 11 : [5, 4], 12  
Exploration  
avg = 0.000668425342014  
p = 0.00067432493925  
p = 0.001234567777778  
Ant 2 : [2, 3, 4], 33  
Exploration  
avg = 0.000717097260049  
p = 0.00166348649878  
p = 0.000924999916667  
Ant 12 : [0, 4], 20  
Exploration  
avg = 0.000819942962357  
p = 0.000840909090909  
p = 0.001541666666667  
Ant 13 : [5, 4], 12  
Exploration  
avg = 0.000649432146935  
p = 0.000757575757576  
p = 0.00102777768518  
Ant 14 : [2, 3], 18  
Exploitation  
Ant 15 : [4, 5], 12  
Exploitation  
Ant 16 : [1, 0], 10  
Exploitation  
Ant 3 : [0, 4, 5], 32

Exploitation  
Ant 17 : [5, 4], 12  
Exploration  
avg = 0.000820251573468  
p = 0.000840909090909  
p = 0.00154320972222  
Ant 18 : [5, 4], 12  
Exploitation  
Ant 19 : [5, 4], 12  
Exploration  
avg = 0.000639512036279  
p = 0.000641019230192  
p = 0.000724637681159  
p = 0.000840909090909  
Ant 4 : [4, 5, 3], 34  
Exploitation  
Ant 0 : [4, 5, 3, 2], 52  
Exploitation  
Ant 5 : [3, 4, 5], 27  
Exploitation  
Ant 6 : [4, 5, 3], 34  
Exploration  
avg = 0.000480729137656  
p = 0.000925916665833  
Ant 7 : [1, 0, 4], 30  
Exploration  
avg = 0.000639722452946  
p = 0.000641019230192  
p = 0.000724637681159  
p = 0.000841750757576  
Ant 8 : [4, 5, 3], 34  
Exploitation  
Ant 9 : [3, 4, 5], 27  
Exploration  
avg = 0.000804601369104  
p = 0.00154320987654  
Ant 1 : [1, 3, 4, 5], 45  
Exploration  
avg = 0.000480731429529  
p = 0.000925925833325  
Ant 10 : [1, 0, 4], 30  
Exploration  
avg = 0.000556935710467  
p = 0.00111111111111  
Ant 11 : [5, 4, 3], 27  
Exploration  
avg = 0.000760440792181  
p = 0.00154320987654  
Ant 2 : [2, 3, 4, 5], 45  
Exploitation  
Ant 12 : [0, 4, 5], 32  
Exploitation  
Ant 13 : [5, 4, 3], 27  
Exploitation

Ant 14 : [2, 3, 4], 33  
Exploration  
avg = 0.000639722473779  
p = 0.000641019230192  
p = 0.000724637681159  
p = 0.000841750840909  
Ant 15 : [4, 5, 3], 34  
Exploration  
avg = 0.000480731452448  
p = 0.000925925925  
Ant 16 : [1, 0, 4], 30  
Exploration  
avg = 0.000735802584365  
p = 0.000841750841742  
Ant 3 : [0, 4, 5, 3], 54  
Exploration  
avg = 0.000587796821581  
p = 0.00123455555556  
Ant 17 : [5, 4, 3], 27  
Exploitation  
Ant 18 : [5, 4, 3], 27  
Exploration  
avg = 0.000587799907692  
p = 0.0012345679  
Ant 19 : [5, 4, 3], 27  
Exploration  
avg = 0.000673190152988  
p = 0.00067432493925  
p = 0.00102777777778  
Ant 4 : [4, 5, 3, 2], 52  
Exploitation  
Ant 0 : [4, 5, 3, 2, 1], 74  
Exploration  
avg = 0.000572379684736  
p = 0.000641019230192  
p = 0.000724637681159  
Ant 5 : [3, 4, 5, 2], 50  
Exploitation  
Ant 6 : [4, 5, 3, 2], 52  
Exploration  
avg = 0.00105209900284  
p = 0.00123456790122  
p = 0.00154320987654  
Ant 7 : [1, 0, 4, 5], 42  
Exploration  
avg = 0.000673533054222  
p = 0.00067432493925  
p = 0.00102880648148  
Ant 8 : [4, 5, 3, 2], 52  
Exploitation  
Ant 9 : [3, 4, 5, 2], 50  
Exploitation  
Ant 1 : [1, 3, 4, 5, 2], 68  
Exploration

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avg = 0.00105209900284
p = 0.00123456790122
p = 0.00154320987654
Ant 10 : [1, 0, 4, 5], 42
Exploitation
Ant 11 : [5, 4, 3, 2], 45
Exploration
avg = 0.000496250686525
p = 0.000641019230192
Ant 2 : [2, 3, 4, 5, 1], 71
Exploitation
Ant 12 : [0, 4, 5, 3], 54
Exploitation
Ant 13 : [5, 4, 3, 2], 45
Exploration
avg = 0.000760440792181
p = 0.00154320987654
Ant 14 : [2, 3, 4, 5], 45
Exploitation
Ant 15 : [4, 5, 3, 2], 52
Exploitation
Ant 16 : [1, 0, 4, 5], 42
Exploitation
Ant 3 : [0, 4, 5, 3, 2], 72
Exploration
avg = 0.000673533088516
p = 0.00067432493925
p = 0.00102880658436
Ant 17 : [5, 4, 3, 2], 45
Exploration
avg = 0.000673533088516
p = 0.00067432493925
p = 0.00102880658436
Ant 18 : [5, 4, 3, 2], 45
Exploitation
Ant 19 : [5, 4, 3, 2], 45
Exploration
avg = 0.000698232295455
p = 0.000840909090909
Ant 4 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.00185185166667
Ant 0 : [4, 5, 3, 2, 1, 0], 84
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.000698648962121

p = 0.000841742424242
Ant 5 : [3, 4, 5, 2, 1], 72
Exploration
avg = 0.000698653128788
p = 0.000841750757576
Ant 6 : [4, 5, 3, 2, 1], 74
Exploration

```



avg = 0.000823451870151  
p = 0.000841750841751  
Ant 7 : [1, 0, 4, 5, 3], 64  
Exploitation  
Ant 8 : [4, 5, 3, 2, 1], 74  
Exploitation  
Ant 9 : [3, 4, 5, 2, 1], 72  
Exploration  
avg = 0.00055555555  
Ant 1 : [1, 3, 4, 5, 2, 0], 98  
Update called by 1Exploitation

Ant thread 1 terminating.Ant 10 : [1, 0, 4, 5, 3], 64

Exploration  
avg = 0.000729208753931  
p = 0.000841750841751  
Ant 11 : [5, 4, 3, 2, 1], 67  
Exploration  
avg = 0.00185185185  
Ant 2 : [2, 3, 4, 5, 1, 0], 81  
Update called by 2Exploration

Ant thread 2 terminating.avg = 0.000851565761806

p = 0.00102880658436  
Ant 12 : [0, 4, 5, 3, 2], 72  
Exploration  
avg = 0.000729208753931  
p = 0.000841750841751  
Ant 13 : [5, 4, 3, 2, 1], 67  
Exploitation  
Ant 14 : [2, 3, 4, 5, 1], 71  
Exploration  
avg = 0.000729208753931  
p = 0.000841750841751  
Ant 15 : [4, 5, 3, 2, 1], 74  
Exploitation  
Ant 16 : [1, 0, 4, 5, 3], 64  
Exploration  
avg = 0.000841750841751  
Ant 3 : [0, 4, 5, 3, 2, 1], 94  
Update called by 3Exploitation

Ant thread 3 terminating.Ant 17 : [5, 4, 3, 2, 1], 67

Exploitation  
Ant 18 : [5, 4, 3, 2, 1], 67  
Exploration  
avg = 0.000729208753931  
p = 0.000841750841751  
Ant 19 : [5, 4, 3, 2, 1], 67  
Exploitation  
Ant 4 : [4, 5, 3, 2, 1, 0], 84

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 = 0.00185185185185

Ant 6 : [4, 5, 3, 2, 1, 0], 84

Update called by 6Exploitation

Ant thread 6 terminating.Ant 7 : [1, 0, 4, 5, 3, 2], 82

Update called by 7Exploration

Ant thread 7 terminating.avg = 0.00185185185185

Ant 8 : [4, 5, 3, 2, 1, 0], 84

Update called by 8Exploitation

Ant thread 8 terminating.Ant 9 : [3, 4, 5, 2, 1, 0], 82

Update called by 9Exploration

Ant thread 9 terminating.avg = 0.00102880658436

Ant 10 : [1, 0, 4, 5, 3, 2], 82

Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [5, 4, 3, 2, 1, 0], 77

Update called by 11Exploration

Ant thread 11 terminating.avg = 0.000841750841751

Ant 12 : [0, 4, 5, 3, 2, 1], 94

Update called by 12Exploration

Ant thread 12 terminating.avg = 0.00185185185185

Ant 13 : [5, 4, 3, 2, 1, 0], 77

Update called by 13Exploitation

Ant thread 13 terminating.Ant 14 : [2, 3, 4, 5, 1, 0], 81

Update called by 14Exploration

Ant thread 14 terminating.avg = 0.00185185185185

Ant 15 : [4, 5, 3, 2, 1, 0], 84

Update called by 15Exploration

Ant thread 15 terminating.avg = 0.00102880658436

Ant 16 : [1, 0, 4, 5, 3, 2], 82  
Update called by 16Exploration

Ant thread 16 terminating.avg = 0.00185185185185

Ant 17 : [5, 4, 3, 2, 1, 0], 77  
Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [5, 4, 3, 2, 1, 0], 77  
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, 7, 106  
Ant thread 19 terminating.iter\_counter = 8

starting ant = 0  
Explorationstarting ant = 1

avg = 0.000700993711536starting ant = 2

p = 0.00111111111111starting ant = 3

p = 0.00138888888889starting ant = 4

Ant 0 : [4, 5], 12starting ant = 5

Explorationstarting ant = 6

avg = 0.000711274908506starting ant = 7

p = 0.00166666666667starting ant = 8

p = 0.000924999999992starting ant = 9

Ant 1 : [1, 3], 18starting ant = 10

Explorationstarting ant = 11

avg = 0.000610823807128starting ant = 12

p = 0.000757575757576starting ant = 13

p = 0.000925916665833starting ant = 14

Ant 2 : [2, 3], 18starting ant = 15

Explorationstarting ant = 16

avg = 0.000645554215709starting ant = 17

p = 0.00149713784891starting ant = 18

p = 0.0008333333333325starting ant = 19

Ant 3 : [0, 4], 20

Exploration

avg = 0.000731549267092

p = 0.00111111111111

p = 0.001541666666667

Ant 4 : [4, 5], 12

Exploitation

Ant 0 : [4, 5, 3], 34

Exploitation

Ant 5 : [3, 4], 15

Exploitation

Ant 6 : [4, 5], 12

Exploration

avg = 0.000731828612212

p = 0.001666666666667

p = 0.00102776851852

Ant 7 : [1, 3], 18

Exploitation

Ant 8 : [4, 5], 12

Exploitation

Ant 9 : [3, 4], 15

Exploitation

Ant 1 : [1, 3, 4], 33

Exploration

avg = 0.000732034149249

p = 0.001666666666667

p = 0.0010287962037

Ant 10 : [1, 3], 18

Exploitation

Ant 11 : [5, 4], 12

Exploration

avg = 0.000663887549044

p = 0.00149713784891

p = 0.000925

Ant 12 : [0, 4], 20

Exploration

avg = 0.000812913305007

p = 0.000840909090909

p = 0.001541666666667

Ant 13 : [5, 4], 12

Exploitation

Ant 14 : [2, 3], 18

Exploitation

Ant 2 : [2, 3, 4], 33

Exploration

avg = 0.000731857908758

p = 0.00111111111111

p = 0.001543209875

Ant 15 : [4, 5], 12

Exploration

avg = 0.000732036204619

p = 0.001666666666667  
p = 0.00102880648056  
Ant 16 : [1, 3], 18  
Exploitation  
Ant 17 : [5, 4], 12  
Exploration  
avg = 0.000813221916118  
p = 0.000840909090909  
p = 0.00154320972222  
Ant 18 : [5, 4], 12  
Exploitation  
Ant 19 : [5, 4], 12  
Exploitation  
Ant 3 : [0, 4, 5], 32  
Exploitation  
Ant 4 : [4, 5, 3], 34  
Exploitation  
Ant 0 : [4, 5, 3, 2], 52  
Exploration  
avg = 0.000637044608559  
p = 0.00154320987654  
Ant 5 : [3, 4, 5], 27  
Exploration  
avg = 0.000630933297925  
p = 0.000641019230192  
p = 0.000724637608696  
p = 0.000841742424242  
Ant 6 : [4, 5, 3], 34  
Exploration  
avg = 0.000737668365925  
p = 0.001027777777778  
p = 0.0012345679  
Ant 7 : [1, 3, 4], 33  
Exploration  
avg = 0.000630935381259  
p = 0.000641019230192  
p = 0.000724637608696  
p = 0.000841750757576  
Ant 8 : [4, 5, 3], 34  
Exploitation  
Ant 9 : [3, 4, 5], 27  
Exploitation  
Ant 1 : [1, 3, 4, 5], 45  
Exploration  
avg = 0.000737668366231  
p = 0.001027777777778  
p = 0.00123456790122  
Ant 10 : [1, 3, 4], 33  
Exploration  
avg = 0.000529019917198  
p = 0.001111111111111  
Ant 11 : [5, 4, 3], 27  
Exploitation  
Ant 12 : [0, 4, 5], 32

Exploitation  
Ant 13 : [5, 4, 3], 27  
Exploration  
avg = 0.000632447033121  
p = 0.00123456790123  
Ant 14 : [2, 3, 4], 33  
Exploitation  
Ant 2 : [2, 3, 4, 5], 45  
Exploration  
avg = 0.000630935402092  
p = 0.000641019230192  
p = 0.000724637608696  
p = 0.000841750840909  
Ant 15 : [4, 5, 3], 34  
Exploration  
avg = 0.000737668366234  
p = 0.00102777777778  
p = 0.00123456790123  
Ant 16 : [1, 3, 4], 33  
Exploration  
avg = 0.000559881028312  
p = 0.00123455555556  
Ant 17 : [5, 4, 3], 27  
Exploitation  
Ant 18 : [5, 4, 3], 27  
Exploitation  
Ant 19 : [5, 4, 3], 27  
Exploitation  
Ant 3 : [0, 4, 5, 3], 54  
Exploitation  
Ant 4 : [4, 5, 3, 2], 52  
Exploitation  
Ant 0 : [4, 5, 3, 2, 1], 74  
Exploitation  
Ant 5 : [3, 4, 5, 2], 50  
Exploitation  
Ant 6 : [4, 5, 3, 2], 52  
Exploration  
avg = 0.000775581561412  
p = 0.00154320987654  
Ant 7 : [1, 3, 4, 5], 45  
Exploitation  
Ant 8 : [4, 5, 3, 2], 52  
Exploitation  
Ant 9 : [3, 4, 5, 2], 50  
Exploitation  
Ant 1 : [1, 3, 4, 5, 2], 68  
Exploration  
avg = 0.000775581561412  
p = 0.00154320987654  
Ant 10 : [1, 3, 4, 5], 45  
Exploitation  
Ant 11 : [5, 4, 3, 2], 45  
Exploitation

Ant 12 : [0, 4, 5, 3], 54  
Exploration  
avg = 0.000640473332473  
p = 0.00102880658435  
Ant 13 : [5, 4, 3, 2], 45  
Exploitation  
Ant 14 : [2, 3, 4, 5], 45  
Exploitation  
Ant 2 : [2, 3, 4, 5, 1], 71  
Exploitation  
Ant 15 : [4, 5, 3, 2], 52  
Exploitation  
Ant 16 : [1, 3, 4, 5], 45  
Exploitation  
Ant 17 : [5, 4, 3, 2], 45  
Exploitation  
Ant 18 : [5, 4, 3, 2], 45  
Exploitation  
Ant 19 : [5, 4, 3, 2], 45  
Exploitation  
Ant 3 : [0, 4, 5, 3, 2], 72  
Exploitation  
Ant 4 : [4, 5, 3, 2, 1], 74  
Exploitation  
Ant 0 : [4, 5, 3, 2, 1, 0], 84  
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.000698371211871

p = 0.000841742424242  
Ant 5 : [3, 4, 5, 2, 1], 72  
Exploitation  
Ant 6 : [4, 5, 3, 2, 1], 74  
Exploration  
avg = 0.000560743413561  
p = 0.000805152898551  
Ant 7 : [1, 3, 4, 5, 2], 68  
Exploration  
avg = 0.000698375420205  
p = 0.000841750840909  
Ant 8 : [4, 5, 3, 2, 1], 74  
Exploration  
avg = 0.000698375420621  
p = 0.000841750841742  
Ant 9 : [3, 4, 5, 2, 1], 72  
Exploration  
avg = 0.0005549999995  
Ant 1 : [1, 3, 4, 5, 2, 0], 98  
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.000560743453416

p = 0.000805152978261  
Ant 10 : [1, 3, 4, 5, 2], 68

Exploitation  
Ant 11 : [5, 4, 3, 2, 1], 67  
Exploitation  
Ant 12 : [0, 4, 5, 3, 2], 72  
Exploration  
avg = 0.000729205976428  
p = 0.000841750841751  
Ant 13 : [5, 4, 3, 2, 1], 67  
Exploration  
avg = 0.000513936163001  
p = 0.00071153839743  
Ant 14 : [2, 3, 4, 5, 1], 71  
Exploration  
avg = 0.00185  
Ant 2 : [2, 3, 4, 5, 1, 0], 81  
Update called by 2Exploration  
  
Ant thread 2 terminating.avg = 0.000729205976428

p = 0.000841750841751  
Ant 15 : [4, 5, 3, 2, 1], 74  
Exploration  
avg = 0.000560743453815  
p = 0.000805152979058  
Ant 16 : [1, 3, 4, 5, 2], 68  
Exploitation  
Ant 17 : [5, 4, 3, 2, 1], 67  
Exploitation  
Ant 18 : [5, 4, 3, 2, 1], 67  
Exploitation  
Ant 19 : [5, 4, 3, 2, 1], 67  
Exploration  
avg = 0.000841750841751  
Ant 3 : [0, 4, 5, 3, 2, 1], 94  
Update called by 3Exploration  
  
Ant thread 3 terminating.avg = 0.001851833333333

Ant 4 : [4, 5, 3, 2, 1, 0], 84  
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 : [4, 5, 3, 2, 1, 0], 84  
Update called by 6Exploration  
  
Ant thread 6 terminating.avg = 0.000616661111106

Ant 7 : [1, 3, 4, 5, 2, 0], 98  
Update called by 7Exploitation



Ant thread 7 terminating.Ant 8 : [4, 5, 3, 2, 1, 0], 84  
Update called by 8Exploration  
Ant thread 8 terminating.avg = 0.00185185185185  
Ant 9 : [3, 4, 5, 2, 1, 0], 82  
Update called by 9Exploration  
Ant thread 9 terminating.avg = 0.000617277722222  
Ant 10 : [1, 3, 4, 5, 2, 0], 98  
Update called by 10Exploitation  
Ant thread 10 terminating.Ant 11 : [5, 4, 3, 2, 1, 0], 77  
Update called by 11Exploitation  
Ant thread 11 terminating.Ant 12 : [0, 4, 5, 3, 2, 1], 94  
Update called by 12Exploration  
Ant thread 12 terminating.avg = 0.00185185185185  
Ant 13 : [5, 4, 3, 2, 1, 0], 77  
Update called by 13Exploration  
Ant thread 13 terminating.avg = 0.00185185185185  
Ant 14 : [2, 3, 4, 5, 1, 0], 81  
Update called by 14Exploration  
Ant thread 14 terminating.avg = 0.00185185185185  
Ant 15 : [4, 5, 3, 2, 1, 0], 84  
Update called by 15Exploitation  
Ant thread 15 terminating.Ant 16 : [1, 3, 4, 5, 2, 0], 98  
Update called by 16Exploitation  
Ant thread 16 terminating.Ant 17 : [5, 4, 3, 2, 1, 0], 77  
Update called by 17Exploration  
Ant thread 17 terminating.avg = 0.00185185185185  
Ant 18 : [5, 4, 3, 2, 1, 0], 77  
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, 8, 106  
Ant thread 19 terminating.iter\_counter = 9

starting ant = 0

Exploitationstarting ant = 1

Ant 0 : [4, 5], 12starting ant = 2

Exploitationstarting ant = 3

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

Exploitationstarting ant = 5

Ant 0 : [4, 5, 3], 34starting ant = 6

Explorationstarting ant = 7

avg = 0.000594622385972starting ant = 8

p = 0.000757575757576starting ant = 9

p = 0.000925916665833starting ant = 10

Ant 2 : [2, 3], 18starting ant = 11

Explorationstarting ant = 12

avg = 0.00059766379414starting ant = 13

p = 0.00134742406402starting ant = 14

p = 0.000833325starting ant = 15

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

Explorationstarting ant = 17

avg = 0.000433142455837starting ant = 18

p = 0.000924999916667starting ant = 19

Ant 1 : [1, 0, 4], 30

Exploration

avg = 0.000711449895938

p = 0.00111111111111

p = 0.00154166666667

Ant 4 : [4, 5], 12

Exploitation

Ant 5 : [3, 4], 15

Exploitation

Ant 0 : [4, 5, 3, 2], 52

Exploration

avg = 0.000711755451494

p = 0.00111111111111  
p = 0.00154319444444  
Ant 6 : [4, 5], 12  
Exploitation  
Ant 7 : [1, 0], 10  
Exploration  
avg = 0.000711758507049  
p = 0.00111111111111  
p = 0.00154320972222  
Ant 8 : [4, 5], 12  
Exploitation  
Ant 9 : [3, 4], 15  
Exploration  
avg = 0.000729199269322  
p = 0.00185183333333  
p = 0.000925925924992  
Ant 10 : [1, 3], 18  
Exploration  
avg = 0.00060006344092  
p = 0.00123455555556  
Ant 2 : [2, 3, 4], 33  
Exploration  
avg = 0.00077603108537  
p = 0.000840909090909  
p = 0.00138888888888  
Ant 11 : [5, 4], 12  
Exploration  
avg = 0.000616182127306  
p = 0.00134742406402  
p = 0.000925916665833  
Ant 12 : [0, 4], 20  
Exploration  
avg = 0.000806586640928  
p = 0.000840909090909  
p = 0.00154166666667  
Ant 13 : [5, 4], 12  
Exploitation  
Ant 14 : [2, 3], 18  
Exploitation  
Ant 15 : [4, 5], 12  
Exploitation  
Ant 3 : [0, 4, 5], 32  
Exploration  
avg = 0.000749569639878  
p = 0.00185183333333  
p = 0.00102777777777  
Ant 16 : [1, 3], 18  
Exploitation  
Ant 17 : [5, 4], 12  
Exploitation  
Ant 18 : [5, 4], 12  
Exploitation  
Ant 19 : [5, 4], 12  
Exploitation

Ant 1 : [1, 0, 4, 5], 42  
Exploitation  
Ant 4 : [4, 5, 3], 34  
Exploration  
avg = 0.000611920394617  
p = 0.00154320987654  
Ant 5 : [3, 4, 5], 27  
Exploration  
avg = 0.000656565656285  
p = 0.000757575757576  
Ant 0 : [4, 5, 3, 2, 1], 74  
Exploration  
avg = 0.000623024967827  
p = 0.000641019230192  
p = 0.000724637681159  
p = 0.000841742424242  
Ant 6 : [4, 5, 3], 34  
Exploitation  
Ant 7 : [1, 0, 4], 30  
Exploitation  
Ant 8 : [4, 5, 3], 34  
Exploration  
avg = 0.000611920394617  
p = 0.00154320987654  
Ant 9 : [3, 4, 5], 27  
Exploitation  
Ant 10 : [1, 3, 4], 33  
Exploitation  
Ant 2 : [2, 3, 4, 5], 45  
Exploration  
avg = 0.000503895703256  
p = 0.001111111111111  
Ant 11 : [5, 4, 3], 27  
Exploitation  
Ant 12 : [0, 4, 5], 32  
Exploration  
avg = 0.000534451258814  
p = 0.001233333333333  
Ant 13 : [5, 4, 3], 27  
Exploration  
avg = 0.000600066527031  
p = 0.0012345679  
Ant 14 : [2, 3, 4], 33  
Exploration  
avg = 0.000623027071994  
p = 0.000641019230192  
p = 0.000724637681159  
p = 0.000841750840909  
Ant 15 : [4, 5, 3], 34  
Exploitation  
Ant 3 : [0, 4, 5, 3], 54  
Exploitation  
Ant 16 : [1, 3, 4], 33  
Exploration

```
avg = 0.00053475681437
p = 0.00123455555556
Ant 17 : [5, 4, 3], 27
Exploitation
Ant 18 : [5, 4, 3], 27
Exploration
avg = 0.000534759900481
p = 0.0012345679
Ant 19 : [5, 4, 3], 27
Exploration
avg = 0.000783194261455
p = 0.000841750841751
Ant 1 : [1, 0, 4, 5, 3], 64
Exploration
avg = 0.000610376616513
p = 0.00102777777778
Ant 4 : [4, 5, 3, 2], 52
Exploitation
Ant 5 : [3, 4, 5, 2], 50
Exploitation
Ant 0 : [4, 5, 3, 2, 1, 0], 84
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.000610716122686
```

```
p = 0.0010287962963
Ant 6 : [4, 5, 3, 2], 52
Exploration
avg = 0.00102812611823
p = 0.00123456790122
p = 0.00154320987654
Ant 7 : [1, 0, 4, 5], 42
Exploration
avg = 0.000610719517747
p = 0.00102880648148
Ant 8 : [4, 5, 3, 2], 52
Exploitation
Ant 9 : [3, 4, 5, 2], 50
Exploration
avg = 0.000749463734489
p = 0.00154320987654
Ant 10 : [1, 3, 4, 5], 45
Exploitation
Ant 2 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.000610719551698
p = 0.00102880658333
Ant 11 : [5, 4, 3, 2], 45
Exploitation
Ant 12 : [0, 4, 5, 3], 54
Exploitation
Ant 13 : [5, 4, 3, 2], 45
Exploration
avg = 0.000713693667181
```

p = 0.00154320987654  
Ant 14 : [2, 3, 4, 5], 45  
Exploitation  
Ant 15 : [4, 5, 3, 2], 52  
Exploitation  
Ant 3 : [0, 4, 5, 3, 2], 72  
Exploration  
avg = 0.000749463734489  
p = 0.00154320987654  
Ant 16 : [1, 3, 4, 5], 45  
Exploitation  
Ant 17 : [5, 4, 3, 2], 45  
Exploitation  
Ant 18 : [5, 4, 3, 2], 45  
Exploration  
avg = 0.000610719552041  
p = 0.00102880658436  
Ant 19 : [5, 4, 3, 2], 45  
Exploitation  
Ant 1 : [1, 0, 4, 5, 3, 2], 82  
Update called by 1Exploration  
  
Ant thread 1 terminating.avg = 0.000698232322952

p = 0.000840909090909  
Ant 4 : [4, 5, 3, 2, 1], 74  
Exploitation  
Ant 5 : [3, 4, 5, 2, 1], 72  
Exploitation  
Ant 6 : [4, 5, 3, 2, 1], 74  
Exploration  
avg = 0.000823447884644  
p = 0.000841750841751  
Ant 7 : [1, 0, 4, 5, 3], 64  
Exploration  
avg = 0.000698653197952  
p = 0.000841750840909  
Ant 8 : [4, 5, 3, 2, 1], 74  
Exploitation  
Ant 9 : [3, 4, 5, 2, 1], 72  
Exploration  
avg = 0.000544922731625  
p = 0.000805144927536  
Ant 10 : [1, 3, 4, 5, 2], 68  
Exploration  
avg = 0.00185185166667  
Ant 2 : [2, 3, 4, 5, 1, 0], 81  
Update called by 2Exploitation  
  
Ant thread 2 terminating.Ant 11 : [5, 4, 3, 2, 1], 67  
  
Exploitation  
Ant 12 : [0, 4, 5, 3, 2], 72  
Exploration

avg = 0.000698653198373  
p = 0.000841750841751  
Ant 13 : [5, 4, 3, 2, 1], 67  
Exploitation  
Ant 14 : [2, 3, 4, 5, 1], 71  
Exploration  
avg = 0.000698653198373  
p = 0.000841750841751  
Ant 15 : [4, 5, 3, 2, 1], 74  
Exploitation  
Ant 3 : [0, 4, 5, 3, 2, 1], 94  
Update called by 3Exploration

Ant thread 3 terminating.avg = 0.000544926717133

p = 0.000805152898551  
Ant 16 : [1, 3, 4, 5, 2], 68  
Exploration  
avg = 0.000698653198373  
p = 0.000841750841751  
Ant 17 : [5, 4, 3, 2, 1], 67  
Exploitation  
Ant 18 : [5, 4, 3, 2, 1], 67  
Exploration  
avg = 0.000698653198373  
p = 0.000841750841751  
Ant 19 : [5, 4, 3, 2, 1], 67  
Exploitation  
Ant 4 : [4, 5, 3, 2, 1, 0], 84  
Update called by 4Exploitation

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

ExplorationUpdate called by 5

avg = 0.00185185185185Ant thread 5 terminating.

Ant 6 : [4, 5, 3, 2, 1, 0], 84  
Update called by 6Exploration

Ant thread 6 terminating.avg = 0.00102880658436

Ant 7 : [1, 0, 4, 5, 3, 2], 82  
Update called by 7Exploration

Ant thread 7 terminating.avg = 0.00185185185185

Ant 8 : [4, 5, 3, 2, 1, 0], 84  
Update called by 8Exploration

Ant thread 8 terminating.avg = 0.00185185185185

Ant 9 : [3, 4, 5, 2, 1, 0], 82  
Update called by 9Exploration

Ant thread 9 terminating.avg = 0.000555555554995

Ant 10 : [1, 3, 4, 5, 2, 0], 98  
Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [5, 4, 3, 2, 1, 0], 77  
Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [0, 4, 5, 3, 2, 1], 94  
Update called by 12Exploration

Ant thread 12 terminating.avg = 0.00185185185185

Ant 13 : [5, 4, 3, 2, 1, 0], 77  
Update called by 13Exploitation

Ant thread 13 terminating.Ant 14 : [2, 3, 4, 5, 1, 0], 81  
Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [4, 5, 3, 2, 1, 0], 84  
Update called by 15Exploration

Ant thread 15 terminating.avg = 0.000616666666661

Ant 16 : [1, 3, 4, 5, 2, 0], 98  
Update called by 16Exploitation

Ant thread 16 terminating.Ant 17 : [5, 4, 3, 2, 1, 0], 77  
Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [5, 4, 3, 2, 1, 0], 77  
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, 106  
Ant thread 19 terminating.  
    iter\_counter = 10  
    starting ant = 0  
Exploitationstarting ant = 1

Ant 0 : [4, 5], 12starting ant = 2

Explorationstarting ant = 3

avg = 0.000674799342558starting ant = 4



p = 0.00166666666667starting ant = 5  
p = 0.000925916666667starting ant = 6  
Ant 1 : [1, 3], 18starting ant = 7  
Explorationstarting ant = 8  
avg = 0.000594865787586starting ant = 9  
p = 0.000641019230192starting ant = 10  
p = 0.000724637680435starting ant = 11  
p = 0.000757575757576starting ant = 12  
Ant 0 : [4, 5, 3], 34starting ant = 13  
Explorationstarting ant = 14  
avg = 0.000579939995944starting ant = 15  
p = 0.000757575757576starting ant = 16  
p = 0.000925916665833starting ant = 17  
Ant 2 : [2, 3], 18starting ant = 18  
Exploitationstarting ant = 19  
Ant 3 : [0, 1], 10  
Exploitation  
Ant 4 : [4, 5], 12  
Exploitation  
Ant 5 : [3, 4], 15  
Exploitation  
Ant 6 : [4, 5], 12  
Exploitation  
Ant 1 : [1, 3, 4], 33  
Exploration  
avg = 0.000695171546262  
p = 0.00166666666667  
p = 0.00102777768519  
Ant 7 : [1, 3], 18  
Exploration  
avg = 0.000693669073011  
p = 0.00111111111111  
p = 0.00154320972222  
Ant 8 : [4, 5], 12  
Exploration  
avg = 0.000641921973759  
p = 0.000925925925926  
p = 0.00123455555556

Ant 9 : [3, 4], 15  
Exploration  
avg = 0.000695375268299  
p = 0.001666666666667  
p = 0.00102879629537  
Ant 10 : [1, 3], 18  
Exploitation  
Ant 11 : [5, 4], 12  
Exploration  
avg = 0.000681121279685  
p = 0.00184546014991  
p = 0.00083333333325  
Ant 12 : [0, 4], 20  
Exploitation  
Ant 0 : [4, 5, 3, 2], 52  
Exploitation  
Ant 13 : [5, 4], 12  
Exploration  
avg = 0.000600312199813  
p = 0.000757575757576  
p = 0.00102777768518  
Ant 14 : [2, 3], 18  
Exploitation  
Ant 15 : [4, 5], 12  
Exploration  
avg = 0.000695377305519  
p = 0.001666666666667  
p = 0.00102880648147  
Ant 16 : [1, 3], 18  
Exploration  
avg = 0.000801198185625  
p = 0.000840909090909  
p = 0.00154319444444  
Ant 17 : [5, 4], 12  
Exploration  
avg = 0.000570924041272  
p = 0.00123456777778  
Ant 2 : [2, 3, 4], 33  
Exploitation  
Ant 18 : [5, 4], 12  
Exploration  
avg = 0.000801201271736  
p = 0.000840909090909  
p = 0.001543209875  
Ant 19 : [5, 4], 12  
Exploration  
avg = 0.000452554990698  
p = 0.00102880658333  
Ant 3 : [0, 1, 3], 28  
Exploitation  
Ant 4 : [4, 5, 3], 34  
Exploration  
avg = 0.000589308602065  
p = 0.00154320987653

Ant 5 : [3, 4, 5], 27  
Exploitation  
Ant 6 : [4, 5, 3], 34  
Exploitation  
Ant 1 : [1, 3, 4, 5], 45  
Exploitation  
Ant 7 : [1, 3, 4], 33  
Exploration  
avg = 0.000615909537586  
p = 0.000641019230192  
p = 0.000724637680435  
p = 0.000841750757576  
Ant 8 : [4, 5, 3], 34  
Exploration  
avg = 0.000589308602068  
p = 0.00154320987654  
Ant 9 : [3, 4, 5], 27  
Exploration  
avg = 0.0007049727964  
p = 0.001027777777778  
p = 0.00123456790122  
Ant 10 : [1, 3, 4], 33  
Exploitation  
Ant 11 : [5, 4, 3], 27  
Exploration  
avg = 0.000807961266652  
p = 0.001233333333333  
p = 0.00154320987654  
Ant 12 : [0, 4, 5], 32  
Exploration  
avg = 0.000656562878788  
p = 0.000757575757576  
Ant 0 : [4, 5, 3, 2, 1], 74  
Exploration  
avg = 0.000511839466266  
p = 0.001233333333333  
Ant 13 : [5, 4, 3], 27  
Exploration  
avg = 0.000570924072136  
p = 0.00123456790123  
Ant 14 : [2, 3, 4], 33  
Exploitation  
Ant 15 : [4, 5, 3], 34  
Exploration  
avg = 0.000704972796403  
p = 0.001027777777778  
p = 0.00123456790123  
Ant 16 : [1, 3, 4], 33  
Exploitation  
Ant 17 : [5, 4, 3], 27  
Exploration  
avg = 0.000693764629681  
p = 0.00154320987654  
Ant 2 : [2, 3, 4, 5], 45

```

Exploitation
Ant 18 : [5, 4, 3], 27
Exploitation
Ant 19 : [5, 4, 3], 27
Exploration
avg = 0.000862819067247
p = 0.001027777777778
p = 0.00123456790123
Ant 3 : [0, 1, 3, 4], 43
Exploration
avg = 0.000583598214121
p = 0.001027777777778
Ant 4 : [4, 5, 3, 2], 52
Exploitation
Ant 5 : [3, 4, 5, 2], 50
Exploration
avg = 0.000583937720294
p = 0.0010287962963
Ant 6 : [4, 5, 3, 2], 52
Exploitation
Ant 1 : [1, 3, 4, 5, 2], 68
Exploration
avg = 0.000725957690258
p = 0.00154320987654
Ant 7 : [1, 3, 4, 5], 45
Exploitation
Ant 8 : [4, 5, 3, 2], 52
Exploitation
Ant 9 : [3, 4, 5, 2], 50
Exploration
avg = 0.000725957690258
p = 0.00154320987654
Ant 10 : [1, 3, 4, 5], 45
Exploitation
Ant 11 : [5, 4, 3, 2], 45
Exploitation
Ant 12 : [0, 4, 5, 3], 54
Exploitation
Ant 0 : [4, 5, 3, 2, 1, 0], 84
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.000583941149645

p = 0.00102880658435
Ant 13 : [5, 4, 3, 2], 45
Exploration
avg = 0.000693764629681
p = 0.00154320987654
Ant 14 : [2, 3, 4, 5], 45
Exploration
avg = 0.000583941149649
p = 0.00102880658436
Ant 15 : [4, 5, 3, 2], 52
Exploration

```

```
avg = 0.000725957690258
p = 0.00154320987654
Ant 16 : [1, 3, 4, 5], 45
Exploitation
Ant 17 : [5, 4, 3, 2], 45
Exploration
avg = 0.000448624856168
p = 0.000641019230192
Ant 2 : [2, 3, 4, 5, 1], 71
Exploitation
avg = 0.000583941149649
p = 0.00102880658436
Ant 18 : [5, 4, 3, 2], 45
Exploration
avg = 0.000583941149649
p = 0.00102880658436
Ant 19 : [5, 4, 3, 2], 45
Exploitation
Ant 3 : [0, 1, 3, 4, 5], 55
Exploration
avg = 0.000698229545455
p = 0.000840909090909
Ant 4 : [4, 5, 3, 2, 1], 74
Exploitation
Ant 5 : [3, 4, 5, 2, 1], 72
Exploitation
Ant 6 : [4, 5, 3, 2, 1], 74
Exploration
avg = 0.00055555
Ant 1 : [1, 3, 4, 5, 2, 0], 98
ExploitationUpdate called by 1

Ant 7 : [1, 3, 4, 5, 2], 68Ant thread 1 terminating.
```

```
Exploitation
Ant 8 : [4, 5, 3, 2, 1], 74
Exploitation
Ant 9 : [3, 4, 5, 2, 1], 72
Exploration
avg = 0.000530691730202
p = 0.000805152978261
Ant 10 : [1, 3, 4, 5, 2], 68
Exploitation
Ant 11 : [5, 4, 3, 2, 1], 67
Exploration
avg = 0.000760194732538
p = 0.00102880658436
Ant 12 : [0, 4, 5, 3, 2], 72
Exploration
avg = 0.000729208726431
p = 0.000841750841751
Ant 13 : [5, 4, 3, 2, 1], 67
Exploration
avg = 0.000483884439786
```

p = 0.00071153839743  
Ant 14 : [2, 3, 4, 5, 1], 71  
Exploitation  
Ant 15 : [4, 5, 3, 2, 1], 74  
Exploration  
avg = 0.0005306917306  
p = 0.000805152979058  
Ant 16 : [1, 3, 4, 5, 2], 68  
Exploitation  
Ant 17 : [5, 4, 3, 2, 1], 67  
Exploitation  
Ant 2 : [2, 3, 4, 5, 1, 0], 81  
Update called by 2Exploitation  
  
Ant thread 2 terminating.Ant 18 : [5, 4, 3, 2, 1], 67  
  
Exploitation  
Ant 19 : [5, 4, 3, 2, 1], 67  
Exploitation  
Ant 3 : [0, 1, 3, 4, 5, 2], 78  
ExploitationUpdate called by 3  
  
Ant 4 : [4, 5, 3, 2, 1, 0], 84Ant thread 3 terminating.  
  
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 : [4, 5, 3, 2, 1, 0], 84  
Update called by 6Exploitation  
  
Ant thread 6 terminating.Ant 7 : [1, 3, 4, 5, 2, 0], 98  
  
Update called by 7Exploitation  
  
Ant thread 7 terminating.Ant 8 : [4, 5, 3, 2, 1, 0], 84  
  
Update called by 8Exploration  
  
Ant thread 8 terminating.avg = 0.00185185185185  
  
Ant 9 : [3, 4, 5, 2, 1, 0], 82  
Update called by 9Exploration  
  
Ant thread 9 terminating.avg = 0.000617277777222  
  
Ant 10 : [1, 3, 4, 5, 2, 0], 98  
Update called by 10Exploitation  
  
Ant thread 10 terminating.Ant 11 : [5, 4, 3, 2, 1, 0], 77

Update called by 11Exploration  
Ant thread 11 terminating.avg = 0.000841750841751  
Ant 12 : [0, 4, 5, 3, 2, 1], 94  
Update called by 12Exploitation  
Ant thread 12 terminating.Ant 13 : [5, 4, 3, 2, 1, 0], 77  
ExploitationUpdate called by 13  
Ant 14 : [2, 3, 4, 5, 1, 0], 81Ant thread 13 terminating.  
Update called by 14Exploration  
Ant thread 14 terminating.avg = 0.00185185185185  
Ant 15 : [4, 5, 3, 2, 1, 0], 84  
Update called by 15Exploitation  
Ant thread 15 terminating.Ant 16 : [1, 3, 4, 5, 2, 0], 98  
Update called by 16Exploitation  
Ant thread 16 terminating.Ant 17 : [5, 4, 3, 2, 1, 0], 77  
Update called by 17Exploration  
Ant thread 17 terminating.avg = 0.00185185185185  
Ant 18 : [5, 4, 3, 2, 1, 0], 77  
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, 106  
Ant thread 19 terminating.iter\_counter = 11  
  
starting ant = 0  
Explorationstarting ant = 1  
  
avg = 0.000646524415709starting ant = 2  
  
p = 0.00111111111111starting ant = 3  
  
p = 0.00138888888889starting ant = 4  
  
Ant 0 : [4, 5], 12starting ant = 5  
  
Explorationstarting ant = 6  
  
avg = 0.000659172926819starting ant = 7

p = 0.00166666666667starting ant = 8  
p = 0.000925925925917starting ant = 9  
Ant 1 : [1, 3], 18starting ant = 10  
Explorationstarting ant = 11  
avg = 0.000566727955818starting ant = 12  
p = 0.000757575757576starting ant = 13  
p = 0.000925916665833starting ant = 14  
Ant 2 : [2, 3], 18starting ant = 15  
Explorationstarting ant = 16  
avg = 0.000629509151865starting ant = 17  
p = 0.00166091413492starting ant = 18  
p = 0.00083249999992starting ant = 19  
Ant 3 : [0, 4], 20  
Exploitation  
Ant 4 : [4, 5], 12  
Exploration  
avg = 0.000588460025714  
p = 0.000641019230192  
p = 0.000724637681159  
p = 0.000757575757576  
Ant 0 : [4, 5, 3], 34  
Exploitation  
Ant 5 : [3, 4], 15  
Exploitation  
Ant 6 : [4, 5], 12  
Exploitation  
Ant 7 : [1, 0], 10  
Exploration  
avg = 0.000677388582376  
p = 0.00111111111111  
p = 0.00154320972222  
Ant 8 : [4, 5], 12  
Exploitation  
Ant 9 : [3, 4], 15  
Exploitation  
Ant 1 : [1, 3, 4], 33  
Exploration  
avg = 0.000716209963858  
p = 0.00185  
p = 0.00102777777778  
Ant 10 : [1, 3], 18



Exploitation  
Ant 11 : [5, 4], 12  
Exploitation  
Ant 12 : [0, 1], 10  
Exploration  
avg = 0.000795768020571  
p = 0.000840909090909  
p = 0.001541666666667  
Ant 13 : [5, 4], 12  
Exploitation  
Ant 14 : [2, 3], 18  
Exploration  
avg = 0.00054469583159  
p = 0.00123456777778  
Ant 2 : [2, 3, 4], 33  
Exploitation  
Ant 15 : [4, 5], 12  
Exploitation  
Ant 16 : [1, 0], 10  
Exploration  
avg = 0.000796073576127  
p = 0.000840909090909  
p = 0.001543194444444  
Ant 17 : [5, 4], 12  
Exploitation  
Ant 18 : [5, 4], 12  
Exploitation  
Ant 19 : [5, 4], 12  
Exploitation  
Ant 3 : [0, 4, 5], 32  
Exploration  
avg = 0.000609293359047  
p = 0.000641019230192  
p = 0.000724637681159  
p = 0.000840909090909  
Ant 4 : [4, 5, 3], 34  
Exploration  
avg = 0.000525547034684  
p = 0.000925925925926  
Ant 0 : [4, 5, 3, 2], 52  
Exploitation  
Ant 5 : [3, 4, 5], 27  
Exploration  
avg = 0.000609501692381  
p = 0.000641019230192  
p = 0.000724637681159  
p = 0.000841742424242  
Ant 6 : [4, 5, 3], 34  
Exploration  
avg = 0.00039478082277  
p = 0.000924991666667  
Ant 7 : [1, 0, 4], 30  
Exploration  
avg = 0.000609503775714

p = 0.000641019230192  
p = 0.000724637681159  
p = 0.000841750757576  
Ant 8 : [4, 5, 3], 34  
Exploitation  
Ant 9 : [3, 4, 5], 27  
Exploration  
avg = 0.00070480225045  
p = 0.00154320987654  
Ant 1 : [1, 3, 4, 5], 45  
Exploitation  
Ant 10 : [1, 3, 4], 33  
Exploration  
avg = 0.000460933297414  
p = 0.001111111111111  
Ant 11 : [5, 4, 3], 27  
Exploration  
avg = 0.000433017084452  
p = 0.0010287962963  
Ant 12 : [0, 1, 3], 28  
Exploration  
avg = 0.000491488852973  
p = 0.001233333333333  
Ant 13 : [5, 4, 3], 27  
Exploitation  
Ant 14 : [2, 3, 4], 33  
Exploration  
avg = 0.000675828495931  
p = 0.00154320987654  
Ant 2 : [2, 3, 4, 5], 45  
Exploration  
avg = 0.000609503796547  
p = 0.000641019230192  
p = 0.000724637681159  
p = 0.000841750840909  
Ant 15 : [4, 5, 3], 34  
Exploration  
avg = 0.000395012051936  
p = 0.000925916583333  
Ant 16 : [1, 0, 4], 30  
Exploitation  
Ant 17 : [5, 4, 3], 27  
Exploration  
avg = 0.000491797464084  
p = 0.00123456777778  
Ant 18 : [5, 4, 3], 27  
Exploration  
avg = 0.000491797494639  
p = 0.0012345679  
Ant 19 : [5, 4, 3], 27  
Exploration  
avg = 0.000735802584365  
p = 0.000841750841742  
Ant 3 : [0, 4, 5, 3], 54

Exploitation  
Ant 4 : [4, 5, 3, 2], 52  
Exploration  
avg = 0.000656565656288  
p = 0.000757575757576  
Ant 0 : [4, 5, 3, 2, 1], 74  
Exploration  
avg = 0.000532088115093  
p = 0.000641019230192  
p = 0.000724637681159  
Ant 5 : [3, 4, 5, 2], 50  
Exploration  
avg = 0.000559837158141  
p = 0.0010287962963  
Ant 6 : [4, 5, 3, 2], 52  
Exploration  
avg = 0.00100870808169  
p = 0.00123456790122  
p = 0.00154320987654  
Ant 7 : [1, 0, 4, 5], 42  
Exploration  
avg = 0.000559840553202  
p = 0.00102880648148  
Ant 8 : [4, 5, 3, 2], 52  
Exploration  
avg = 0.000558658163403  
p = 0.000641019230192  
p = 0.000804347826087  
Ant 9 : [3, 4, 5, 2], 50  
Exploitation  
Ant 1 : [1, 3, 4, 5, 2], 68  
Exploration  
avg = 0.00070480225045  
p = 0.00154320987654  
Ant 10 : [1, 3, 4, 5], 45  
Exploration  
avg = 0.000559840587153  
p = 0.00102880658333  
Ant 11 : [5, 4, 3, 2], 45  
Exploitation  
Ant 12 : [0, 1, 3, 4], 43  
Exploitation  
Ant 13 : [5, 4, 3, 2], 45  
Exploitation  
Ant 14 : [2, 3, 4, 5], 45  
Exploration  
avg = 0.00043581333206  
p = 0.000641019230192  
Ant 2 : [2, 3, 4, 5, 1], 71  
Exploitation  
Ant 15 : [4, 5, 3, 2], 52  
Exploration  
avg = 0.00100870808169  
p = 0.00123456790122

p = 0.00154320987654  
Ant 16 : [1, 0, 4, 5], 42  
Exploration  
avg = 0.000559840587496  
p = 0.00102880658436  
Ant 17 : [5, 4, 3, 2], 45  
Exploration  
avg = 0.000559840587496  
p = 0.00102880658436  
Ant 18 : [5, 4, 3, 2], 45  
Exploitation  
Ant 19 : [5, 4, 3, 2], 45  
Exploration  
avg = 0.000735615588502  
p = 0.00102880658436  
Ant 3 : [0, 4, 5, 3, 2], 72  
Exploration  
avg = 0.000698232322955  
p = 0.000840909090909  
Ant 4 : [4, 5, 3, 2, 1], 74  
Exploitation  
Ant 0 : [4, 5, 3, 2, 1, 0], 84  
Update called by 0Exploration  
  
Ant thread 0 terminating.avg = 0.000698648989621

p = 0.000841742424242  
Ant 5 : [3, 4, 5, 2, 1], 72  
Exploitation  
Ant 6 : [4, 5, 3, 2, 1], 74  
Exploration  
avg = 0.000823451870151  
p = 0.000841750841751  
Ant 7 : [1, 0, 4, 5, 3], 64  
Exploration  
avg = 0.000698653197955  
p = 0.000841750840909  
Ant 8 : [4, 5, 3, 2, 1], 74  
Exploitation  
Ant 9 : [3, 4, 5, 2, 1], 72  
Exploitation  
Ant 1 : [1, 3, 4, 5, 2, 0], 98  
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.00051788016624

p = 0.000805152898551  
Ant 10 : [1, 3, 4, 5, 2], 68  
Exploration  
avg = 0.000729208754206  
p = 0.000841750841751  
Ant 11 : [5, 4, 3, 2, 1], 67  
Exploitation  
Ant 12 : [0, 1, 3, 4, 5], 55

Exploration  
avg = 0.000729208754206  
p = 0.000841750841751  
Ant 13 : [5, 4, 3, 2, 1], 67  
Exploration  
avg = 0.000471072915679  
p = 0.00071153839743  
Ant 14 : [2, 3, 4, 5, 1], 71  
Exploration  
avg = 0.00185185166667  
Ant 2 : [2, 3, 4, 5, 1, 0], 81  
Update called by 2Exploration

Ant thread 2 terminating.avg = 0.000729208754206

p = 0.000841750841751  
Ant 15 : [4, 5, 3, 2, 1], 74  
Exploitation  
Ant 16 : [1, 0, 4, 5, 3], 64  
Exploitation  
Ant 17 : [5, 4, 3, 2, 1], 67  
Exploitation  
Ant 18 : [5, 4, 3, 2, 1], 67  
Exploration  
avg = 0.000729208754206  
p = 0.000841750841751  
Ant 19 : [5, 4, 3, 2, 1], 67  
Exploitation  
Ant 3 : [0, 4, 5, 3, 2, 1], 94  
Update called by 3Exploration

Ant thread 3 terminating.avg = 0.00185185185

Ant 4 : [4, 5, 3, 2, 1, 0], 84  
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 = 0.00185185185185

Ant 6 : [4, 5, 3, 2, 1, 0], 84  
Update called by 6Exploration

Ant thread 6 terminating.avg = 0.00102880658436

Ant 7 : [1, 0, 4, 5, 3, 2], 82  
Update called by 7Exploration

Ant thread 7 terminating.avg = 0.00185185185185

Ant 8 : [4, 5, 3, 2, 1, 0], 84  
Update called by 8Exploration

Ant thread 8 terminating.avg = 0.00185185185185

Ant 9 : [3, 4, 5, 2, 1, 0], 82

Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [1, 3, 4, 5, 2, 0], 98

Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [5, 4, 3, 2, 1, 0], 77

Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [0, 1, 3, 4, 5, 2], 78

Update called by 12Exploitation

Ant thread 12 terminating.Ant 13 : [5, 4, 3, 2, 1, 0], 77

Update called by 13Exploration

Ant thread 13 terminating.avg = 0.00185185185185

Ant 14 : [2, 3, 4, 5, 1, 0], 81

Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [4, 5, 3, 2, 1, 0], 84

Update called by 15Exploration

Ant thread 15 terminating.avg = 0.00102880658436

Ant 16 : [1, 0, 4, 5, 3, 2], 82

Update called by 16Exploration

Ant thread 16 terminating.avg = 0.00185185185185

Ant 17 : [5, 4, 3, 2, 1, 0], 77

Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [5, 4, 3, 2, 1, 0], 77

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, 106

Ant thread 19 terminating.iter\_counter = 12

starting ant = 0

Explorationstarting ant = 1

avg = 0.000631871974138starting ant = 2  
p = 0.00111111111111starting ant = 3  
p = 0.00138888888889starting ant = 4  
Ant 0 : [4, 5], 12starting ant = 5  
Explorationstarting ant = 6  
avg = 0.000645107467472starting ant = 7  
p = 0.00166666666667starting ant = 8  
p = 0.000925925833333starting ant = 9  
Ant 1 : [1, 3], 18starting ant = 10  
Explorationstarting ant = 11  
avg = 0.000554835008804starting ant = 12  
p = 0.000555555starting ant = 13  
p = 0.000757575757576starting ant = 14  
p = 0.000925916665833starting ant = 15  
Ant 2 : [2, 3], 18starting ant = 16  
Exploitationstarting ant = 17  
Ant 3 : [0, 1], 10starting ant = 18  
Exploitationstarting ant = 19  
  
Ant 4 : [4, 5], 12  
Exploration  
avg = 0.000582694839864  
p = 0.000641019230192  
p = 0.000724637681152  
p = 0.000757575757576  
Ant 0 : [4, 5, 3], 34  
Exploration  
avg = 0.000577366206152  
p = 0.000925925925926  
p = 0.00111111111111  
Ant 5 : [3, 4], 15  
Exploration  
avg = 0.000662733085249  
p = 0.00111111111111  
p = 0.00154319444444  
Ant 6 : [4, 5], 12  
Exploitation

Ant 7 : [1, 0], 10  
Exploration  
avg = 0.000662736140805  
p = 0.00111111111111  
p = 0.00154320972222  
Ant 8 : [4, 5], 12  
Exploitation  
Ant 9 : [3, 4], 15  
Exploitation  
Ant 1 : [1, 3, 4], 33  
Exploration  
avg = 0.000702144522843  
p = 0.00185  
p = 0.00102777777685  
Ant 10 : [1, 3], 18  
Exploitation  
Ant 11 : [5, 4], 12  
Exploration  
avg = 0.000654406905365  
p = 0.00184998281561  
p = 0.00083333324925  
Ant 12 : [0, 4], 20  
Exploitation  
Ant 13 : [5, 4], 12  
Exploration  
avg = 0.000575207212673  
p = 0.000757575757576  
p = 0.00102777768518  
Ant 14 : [2, 3], 18  
Exploitation  
Ant 15 : [4, 5], 12  
Exploitation  
Ant 2 : [2, 3, 4], 33  
Exploration  
avg = 0.00070234822673  
p = 0.00185  
p = 0.00102879629629  
Ant 16 : [1, 3], 18  
Exploitation  
Ant 17 : [5, 4], 12  
Exploration  
avg = 0.000415437829711  
p = 0.00102880648148  
Ant 3 : [0, 1, 3], 28  
Exploration  
avg = 0.000791464483002  
p = 0.000840909090909  
p = 0.00154320972222  
Ant 18 : [5, 4], 12  
Exploration  
avg = 0.000791464513558  
p = 0.000840909090909  
p = 0.001543209875  
Ant 19 : [5, 4], 12



Exploration  
avg = 0.000603528173197  
p = 0.000641019230192  
p = 0.000724637681152  
p = 0.000840909090909  
Ant 4 : [4, 5, 3], 34  
Exploitation  
Ant 0 : [4, 5, 3, 2], 52  
Exploration  
avg = 0.000550642436807  
p = 0.00154320987653  
Ant 5 : [3, 4, 5], 27  
Exploitation  
Ant 6 : [4, 5, 3], 34  
Exploitation  
Ant 7 : [1, 0, 4], 30  
Exploitation  
Ant 8 : [4, 5, 3], 34  
Exploitation  
Ant 9 : [3, 4, 5], 27  
Exploration  
avg = 0.000685762354623  
p = 0.00154320987654  
Ant 1 : [1, 3, 4, 5], 45  
Exploitation  
Ant 10 : [1, 3, 4], 33  
Exploration  
avg = 0.00044261774545  
p = 0.00111111111111  
Ant 11 : [5, 4, 3], 27  
Exploration  
avg = 0.000786334428457  
p = 0.00123333333333  
p = 0.00154320987654  
Ant 12 : [0, 4, 5], 32  
Exploitation  
Ant 13 : [5, 4, 3], 27  
Exploration  
avg = 0.000521090473736  
p = 0.00123456790122  
Ant 14 : [2, 3, 4], 33  
Exploitation  
Ant 15 : [4, 5, 3], 34  
Exploitation  
Ant 2 : [2, 3, 4, 5], 45  
Exploration  
avg = 0.000678489384839  
p = 0.00102777777778  
p = 0.00123456790123  
Ant 16 : [1, 3, 4], 33  
Exploitation  
Ant 17 : [5, 4, 3], 27  
Exploitation  
Ant 3 : [0, 1, 3, 4], 43

Exploration  
avg = 0.00047348191212  
p = 0.00123456777778  
Ant 18 : [5, 4, 3], 27  
Exploration  
avg = 0.000473481942675  
p = 0.0012345679  
Ant 19 : [5, 4, 3], 27  
Exploitation  
Ant 4 : [4, 5, 3, 2], 52  
Exploitation  
Ant 0 : [4, 5, 3, 2, 1], 74  
Exploration  
avg = 0.000524401200627  
p = 0.000641019230192  
p = 0.000724637681152  
Ant 5 : [3, 4, 5, 2], 50  
Exploration  
avg = 0.000538146652203  
p = 0.0010287962963  
Ant 6 : [4, 5, 3, 2], 52  
Exploration  
avg = 0.00100042986611  
p = 0.00123456790122  
p = 0.00154320987654  
Ant 7 : [1, 0, 4, 5], 42  
Exploration  
avg = 0.000538150047265  
p = 0.00102880648148  
Ant 8 : [4, 5, 3, 2], 52  
Exploration  
avg = 0.000550971248938  
p = 0.000641019230192  
p = 0.000804347826087  
Ant 9 : [3, 4, 5, 2], 50  
Exploration  
avg = 0.000506345809036  
p = 0.000805144927536  
Ant 1 : [1, 3, 4, 5, 2], 68  
Exploitation  
Ant 10 : [1, 3, 4, 5], 45  
Exploration  
avg = 0.000538150081216  
p = 0.00102880658333  
Ant 11 : [5, 4, 3, 2], 45  
Exploitation  
Ant 12 : [0, 4, 5, 3], 54  
Exploration  
avg = 0.000538150081555  
p = 0.00102880658435  
Ant 13 : [5, 4, 3, 2], 45  
Exploration  
avg = 0.000659685975556  
p = 0.00154320987654

Ant 14 : [2, 3, 4, 5], 45  
Exploration  
avg = 0.000538150081558  
p = 0.00102880658436  
Ant 15 : [4, 5, 3, 2], 52  
Exploitation  
Ant 2 : [2, 3, 4, 5, 1], 71  
Exploration  
avg = 0.000685762354623  
p = 0.00154320987654  
Ant 16 : [1, 3, 4, 5], 45  
Exploitation  
Ant 17 : [5, 4, 3, 2], 45  
Exploration  
avg = 0.00088336084856  
p = 0.00154320987654  
Ant 3 : [0, 1, 3, 4, 5], 55  
Exploration  
avg = 0.000538150081558  
p = 0.00102880658436  
Ant 18 : [5, 4, 3, 2], 45  
Exploitation  
Ant 19 : [5, 4, 3, 2], 45  
Exploration  
avg = 0.000698229545455  
p = 0.000840909090909  
Ant 4 : [4, 5, 3, 2, 1], 74  
Exploitation  
Ant 0 : [4, 5, 3, 2, 1, 0], 84  
Update called by 0Exploration  
  
Ant thread 0 terminating.avg = 0.000698646212121  
  
p = 0.000841742424242  
Ant 5 : [3, 4, 5, 2, 1], 72  
Exploration  
avg = 0.000698650378788  
p = 0.000841750757576  
Ant 6 : [4, 5, 3, 2, 1], 74  
Exploitation  
Ant 7 : [1, 0, 4, 5, 3], 64  
Exploitation  
Ant 8 : [4, 5, 3, 2, 1], 74  
Exploration  
avg = 0.000698650420871  
p = 0.000841750841742  
Ant 9 : [3, 4, 5, 2, 1], 72  
Exploration  
avg = 0.000555555  
Ant 1 : [1, 3, 4, 5, 2, 0], 98  
Update called by 1Exploration  
  
Ant thread 1 terminating.avg = 0.000506349794543

```
p = 0.000805152898551
Ant 10 : [1, 3, 4, 5, 2], 68
Exploration
avg = 0.000729208726431
p = 0.000841750841751
Ant 11 : [5, 4, 3, 2, 1], 67
Exploration
avg = 0.00071349435887
p = 0.00102880658436
Ant 12 : [0, 4, 5, 3, 2], 72
Exploration
avg = 0.000729208726431
p = 0.000841750841751
Ant 13 : [5, 4, 3, 2, 1], 67
Exploration
avg = 0.000459542543983
p = 0.00071153839743
Ant 14 : [2, 3, 4, 5, 1], 71
Exploration
avg = 0.000729208726431
p = 0.000841750841751
Ant 15 : [4, 5, 3, 2, 1], 74
Exploitation
Ant 2 : [2, 3, 4, 5, 1, 0], 81
Update called by 2Exploitation

Ant thread 2 terminating.Ant 16 : [1, 3, 4, 5, 2], 68

Exploitation
Ant 17 : [5, 4, 3, 2, 1], 67
Exploration
avg = 0.000805152979058
Ant 3 : [0, 1, 3, 4, 5, 2], 78
Update called by 3Exploitation

Ant thread 3 terminating.Ant 18 : [5, 4, 3, 2, 1], 67

Exploitation
Ant 19 : [5, 4, 3, 2, 1], 67
Exploration
avg = 0.00185185166667
Ant 4 : [4, 5, 3, 2, 1, 0], 84
Update called by 4Exploitation

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

ExploitationUpdate called by 5

Ant 6 : [4, 5, 3, 2, 1, 0], 84Ant thread 5 terminating.

Update called by 6Exploration

Ant thread 6 terminating.avg = 0.00102880658436
```

Ant 7 : [1, 0, 4, 5, 3, 2], 82  
Update called by 7Exploration

Ant thread 7 terminating.avg = 0.00185185185185

Ant 8 : [4, 5, 3, 2, 1, 0], 84  
Update called by 8Exploration

Ant thread 8 terminating.avg = 0.00185185185185

Ant 9 : [3, 4, 5, 2, 1, 0], 82  
Update called by 9Exploration

Ant thread 9 terminating.avg = 0.0006166666611111

Ant 10 : [1, 3, 4, 5, 2, 0], 98  
Update called by 10Exploration

Ant thread 10 terminating.avg = 0.00185185185185

Ant 11 : [5, 4, 3, 2, 1, 0], 77  
Update called by 11Exploration

Ant thread 11 terminating.avg = 0.000841750841751

Ant 12 : [0, 4, 5, 3, 2, 1], 94  
Update called by 12Exploration

Ant thread 12 terminating.avg = 0.00185185185185

Ant 13 : [5, 4, 3, 2, 1, 0], 77  
Update called by 13Exploitation

Ant thread 13 terminating.Ant 14 : [2, 3, 4, 5, 1, 0], 81  
Update called by 14Exploration

Ant thread 14 terminating.avg = 0.00185185185185

Ant 15 : [4, 5, 3, 2, 1, 0], 84  
Update called by 15Exploration

Ant thread 15 terminating.avg = 0.000617277777222

Ant 16 : [1, 3, 4, 5, 2, 0], 98  
Update called by 16Exploration

Ant thread 16 terminating.avg = 0.00185185185185

Ant 17 : [5, 4, 3, 2, 1, 0], 77  
Update called by 17Exploration

Ant thread 17 terminating.avg = 0.00185185185185

Ant 18 : [5, 4, 3, 2, 1, 0], 77  
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, 106  
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\  
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 = 0.02222222222222

iter\_counter = 1

starting ant = 0

Exploitationstarting ant = 1

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

Explorationstarting ant = 3

avg = 0.00125561167228starting ant = 4

p = 0.00222222222222starting ant = 5

Ant 1 : [1, 0], 10starting ant = 6

Explorationstarting ant = 7

avg = 0.000856232576663starting ant = 8

p = 0.00111111111111starting ant = 9

Ant 0 : [1, 0, 4], 30starting ant = 10

Exploitationstarting ant = 11

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

Exploitationstarting ant = 13

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

Exploitationstarting ant = 15

Ant 4 : [4, 3], 15starting ant = 16

Exploitationstarting ant = 17

Ant 5 : [3, 4], 15starting ant = 18

Explorationstarting ant = 19

avg = 0.000856232576663

p = 0.001111111111111

Ant 1 : [1, 0, 4], 30

Exploitation

Ant 6 : [1, 0], 10

Exploitation

Ant 7 : [3, 4], 15

Exploration

avg = 0.00100071225071

p = 0.001111111111111

p = 0.00148148148148

Ant 8 : [4, 3], 15

Exploration

avg = 0.00100071225071

p = 0.001111111111111

p = 0.00148148148148

Ant 9 : [4, 3], 15

Exploitation

Ant 0 : [1, 0, 4, 3], 45

Exploration

avg = 0.00125561167228

p = 0.00222222222222

Ant 10 : [1, 0], 10

Exploitation

Ant 11 : [2, 3], 18

Exploitation

Ant 2 : [4, 3, 1], 33

Exploration

avg = 0.000960027626694

p = 0.001010101010101

p = 0.00123456790123

Ant 12 : [2, 3], 18

Exploitation

Ant 13 : [1, 0], 10

```

Exploration
avg = 0.000856232576663
p = 0.001111111111111
Ant 3 : [1, 0, 4], 30
Exploitation
Ant 14 : [1, 0], 10
Exploitation
Ant 15 : [1, 0], 10
Exploitation
Ant 4 : [4, 3, 1], 33
Exploration
avg = 0.000960027626694
p = 0.001010101010101
p = 0.00123456790123
Ant 16 : [2, 3], 18
Exploitation
Ant 17 : [3, 4], 15
Exploitation
Ant 5 : [3, 4, 0], 35
Exploitation
Ant 18 : [1, 0], 10
Exploitation
Ant 19 : [1, 0], 10
Exploration
avg = 0.00116809116809
p = 0.00148148148148
Ant 1 : [1, 0, 4, 3], 45
Exploration
avg = 0.000856232576663
p = 0.001111111111111
Ant 6 : [1, 0, 4], 30
Exploration
avg = 0.000840455840456
p = 0.001111111111111
p = 0.000854700854701
Ant 7 : [3, 4, 2], 41
Exploitation
Ant 8 : [4, 3, 1], 33
Exploitation
Ant 9 : [4, 3, 1], 33
Exploration
avg = 0.00123456790123
Ant 0 : [1, 0, 4, 3, 2], 63
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.000856232576663

p = 0.001111111111111
Ant 10 : [1, 0, 4], 30
Exploration
avg = 0.00114429842028
p = 0.00123456790123
p = 0.00148148148148
Ant 11 : [2, 3, 4], 33

```



Exploration  
avg = 0.00161616161616  
p = 0.00222222222222  
Ant 2 : [4, 3, 1, 0], 43  
Exploitation  
Ant 12 : [2, 3, 4], 33  
Exploitation  
Ant 13 : [1, 0, 4], 30  
Exploration  
avg = 0.00116809116809  
p = 0.00148148148148  
Ant 3 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.000856232576663  
p = 0.00111111111111  
Ant 14 : [1, 0, 4], 30  
Exploration  
avg = 0.000856232576663  
p = 0.00111111111111  
Ant 15 : [1, 0, 4], 30  
Exploitation  
Ant 4 : [4, 3, 1, 0], 43  
Exploration  
avg = 0.00114429842028  
p = 0.00123456790123  
p = 0.00148148148148  
Ant 16 : [2, 3, 4], 33  
Exploration  
avg = 0.000840455840456  
p = 0.00111111111111  
p = 0.000854700854701  
Ant 17 : [3, 4, 2], 41  
Exploration  
avg = 0.00148148148148  
p = 0.00222222222222  
Ant 5 : [3, 4, 0, 1], 45  
Exploitation  
Ant 18 : [1, 0, 4], 30  
Exploitation  
Ant 19 : [1, 0, 4], 30  
Exploration  
avg = 0.00123456790123  
Ant 1 : [1, 0, 4, 3, 2], 63  
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.00116809116809

p = 0.00148148148148  
Ant 6 : [1, 0, 4, 3], 45  
Exploitation  
Ant 7 : [3, 4, 2, 1], 63  
Exploitation  
Ant 8 : [4, 3, 1, 0], 43  
Exploration

avg = 0.0016161616161616  
p = 0.0022222222222222  
Ant 9 : [4, 3, 1, 0], 43  
Exploration  
avg = 0.00116809116809  
p = 0.00148148148148  
Ant 10 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.0008333333333333  
p = 0.0011111111111111  
Ant 11 : [2, 3, 4, 0], 53  
Exploitation  
Ant 2 : [4, 3, 1, 0, 2], 73  
Update called by 2Exploitation

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

Exploitation  
Ant 13 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.00123456790123  
Ant 3 : [1, 0, 4, 3, 2], 63  
Update called by 3Exploitation

Ant thread 3 terminating.Ant 14 : [1, 0, 4, 3], 45

Exploitation  
Ant 15 : [1, 0, 4, 3], 45  
Exploitation  
Ant 4 : [4, 3, 1, 0, 2], 73  
Update called by 4Exploration

Ant thread 4 terminating.avg = 0.0008333333333333

p = 0.0011111111111111  
Ant 16 : [2, 3, 4, 0], 53  
Exploitation  
Ant 17 : [3, 4, 2, 1], 63  
Exploration  
avg = 0.0010101010101  
Ant 5 : [3, 4, 0, 1, 2], 67  
Update called by 5Exploitation

Ant thread 5 terminating.Ant 18 : [1, 0, 4, 3], 45

Exploitation  
Ant 19 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.00123456790123  
Ant 6 : [1, 0, 4, 3, 2], 63  
Update called by 6Exploitation

Ant thread 6 terminating.Ant 7 : [3, 4, 2, 1, 0], 73

Update called by 7Exploitation

Ant thread 7 terminating.Ant 8 : [4, 3, 1, 0, 2], 73

ExplorationUpdate called by 8

avg = 0.000740740740741Ant thread 8 terminating.

Ant 9 : [4, 3, 1, 0, 2], 73

Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [1, 0, 4, 3, 2], 63

Update called by 10Exploration

Ant thread 10 terminating.avg = 0.002222222222222

Ant 11 : [2, 3, 4, 0, 1], 63

Update called by 11Exploration

Ant thread 11 terminating.avg = 0.002222222222222

Ant 12 : [2, 3, 4, 0, 1], 63

Update called by 12Exploitation

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

Update called by 13Exploration

Ant thread 13 terminating.avg = 0.00123456790123

Ant 14 : [1, 0, 4, 3, 2], 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 : [2, 3, 4, 0, 1], 63

Update called by 16Exploitation

Ant thread 16 terminating.Ant 17 : [3, 4, 2, 1, 0], 73

Update called by 17Exploration

Ant thread 17 terminating.avg = 0.00123456790123

Ant 18 : [1, 0, 4, 3, 2], 63

Update called by 18Exploration

Ant thread 18 terminating.avg = 0.00123456790123

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

starting ant = 0  
Exploitationstarting ant = 1

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

Exploitationstarting ant = 3

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

Exploitationstarting ant = 5

Ant 0 : [1, 0, 4], 30starting ant = 6

Explorationstarting ant = 7

avg = 0.000900641025641starting ant = 8

p = 0.001starting ant = 9

p = 0.0013333333333333starting ant = 10

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

Explorationstarting ant = 12

avg = 0.00118560050505starting ant = 13

p = 0.0022222starting ant = 14

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

Exploitationstarting ant = 16

Ant 1 : [1, 0, 4], 30starting ant = 17

Explorationstarting ant = 18

avg = 0.000937307692308starting ant = 19

p = 0.001

p = 0.00148

Ant 4 : [4, 3], 15

Exploration

avg = 0.00105017921147

p = 0.0011111111111111

p = 0.0011111111111111

p = 0.0013333333333333

Ant 5 : [3, 4], 15

Exploitation

Ant 0 : [1, 0, 4, 3], 45  
Exploitation  
Ant 6 : [1, 0], 10  
Exploitation  
Ant 7 : [3, 4], 15  
Exploration  
avg = 0.000937678025641  
p = 0.001  
p = 0.00148148133333  
Ant 8 : [4, 3], 15  
Exploitation  
Ant 9 : [4, 3], 15  
Exploration  
avg = 0.00118560606005  
p = 0.002222222222  
Ant 10 : [1, 0], 10  
Exploration  
avg = 0.000955794504182  
p = 0.00111111111111  
p = 0.00111111111111  
Ant 2 : [4, 3, 2], 33  
Exploitation  
Ant 11 : [2, 3], 18  
Exploration  
avg = 0.00089458041958  
p = 0.000909090909091  
p = 0.00123333333333  
Ant 12 : [2, 3], 18  
Exploration  
avg = 0.0011856060606  
p = 0.00222222222222  
Ant 13 : [1, 0], 10  
Exploitation  
Ant 14 : [1, 0], 10  
Exploitation  
Ant 3 : [1, 0, 4], 30  
Exploitation  
Ant 15 : [1, 0], 10  
Exploitation  
Ant 16 : [2, 3], 18  
Exploration  
avg = 0.00112535612535  
p = 0.00148148148147  
Ant 1 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.00111776810036  
p = 0.00123333333333  
p = 0.00148146666667  
Ant 17 : [3, 4], 15  
Exploration  
avg = 0.00118560606061  
p = 0.00222222222222  
Ant 18 : [1, 0], 10  
Exploitation

Ant 19 : [1, 0], 10  
Exploitation  
Ant 4 : [4, 3, 2], 33  
Exploitation  
Ant 5 : [3, 4, 0], 35  
Exploitation  
Ant 0 : [1, 0, 4, 3, 2], 63  
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.000807646318996

p = 0.0011111111  
Ant 6 : [1, 0, 4], 30  
Exploitation  
Ant 7 : [3, 4, 0], 35  
Exploitation  
Ant 8 : [4, 3, 2], 33  
Exploration  
avg = 0.000996946767145  
p = 0.0011111111111111  
p = 0.0012345679  
Ant 9 : [4, 3, 2], 33  
Exploitation  
Ant 10 : [1, 0, 4], 30  
Exploration  
avg = 0.000787878787879  
p = 0.000909090909091  
Ant 2 : [4, 3, 2, 1], 55  
Exploration  
avg = 0.00107925124492  
p = 0.0011111111111111  
p = 0.00148148133333  
Ant 11 : [2, 3, 4], 33  
Exploration  
avg = 0.00107925129381  
p = 0.0011111111111111  
p = 0.00148148148  
Ant 12 : [2, 3, 4], 33  
Exploration  
avg = 0.00080764635603  
p = 0.0011111111111111  
Ant 13 : [1, 0, 4], 30  
Exploitation  
Ant 14 : [1, 0, 4], 30  
Exploitation  
Ant 3 : [1, 0, 4, 3], 45  
Exploitation  
Ant 15 : [1, 0, 4], 30  
Exploitation  
Ant 16 : [2, 3, 4], 33  
Exploitation  
Ant 1 : [1, 0, 4, 3, 2], 63  
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.000793443589744

p = 0.00111111

Ant 17 : [3, 4, 0], 35

Exploration

avg = 0.000807646356033

p = 0.0011111111111111

Ant 18 : [1, 0, 4], 30

Exploration

avg = 0.000807646356033

p = 0.0011111111111111

Ant 19 : [1, 0, 4], 30

Exploration

avg = 0.000837878787879

p = 0.0010090909090909

Ant 4 : [4, 3, 2, 1], 55

Exploration

avg = 0.0013333333333333

p = 0.002

Ant 5 : [3, 4, 0, 1], 45

Exploitation

Ant 6 : [1, 0, 4, 3], 45

Exploitation

Ant 7 : [3, 4, 0, 1], 45

Exploitation

Ant 8 : [4, 3, 2, 1], 55

Exploitation

Ant 9 : [4, 3, 2, 1], 55

Exploration

avg = 0.00112535612536

p = 0.00148148148148

Ant 10 : [1, 0, 4, 3], 45

Exploitation

Ant 2 : [4, 3, 2, 1, 0], 65

Update called by 2Exploitation

Ant thread 2 terminating.Ant 11 : [2, 3, 4, 0], 53

Exploitation

Ant 12 : [2, 3, 4, 0], 53

Exploration

avg = 0.00112535612536

p = 0.00148148148148

Ant 13 : [1, 0, 4, 3], 45

Exploitation

Ant 14 : [1, 0, 4, 3], 45

Exploitation

Ant 3 : [1, 0, 4, 3, 2], 63

Update called by 3Exploitation

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

Exploration

avg = 0.0008055555555555

p = 0.0011111111111111  
Ant 16 : [2, 3, 4, 0], 53  
Exploitation  
Ant 17 : [3, 4, 0, 1], 45  
Exploitation  
Ant 18 : [1, 0, 4, 3], 45  
Exploitation  
Ant 19 : [1, 0, 4, 3], 45  
Exploitation  
Ant 4 : [4, 3, 2, 1, 0], 65  
Update called by 4Exploration  
  
Ant thread 4 terminating.avg = 0.000909090909091  
  
Ant 5 : [3, 4, 0, 1, 2], 67  
Update called by 5Exploration  
  
Ant thread 5 terminating.avg = 0.00123456790123  
  
Ant 6 : [1, 0, 4, 3, 2], 63  
Update called by 6Exploration  
  
Ant thread 6 terminating.avg = 0.00100909090909  
  
Ant 7 : [3, 4, 0, 1, 2], 67  
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 : [4, 3, 2, 1, 0], 65  
  
Update called by 9Exploitation  
  
Ant thread 9 terminating.Ant 10 : [1, 0, 4, 3, 2], 63  
  
Update called by 10Exploitation  
  
Ant thread 10 terminating.Ant 11 : [2, 3, 4, 0, 1], 63  
  
ExploitationUpdate called by 11  
  
Ant 12 : [2, 3, 4, 0, 1], 63Ant thread 11 terminating.  
  
Update called by 12Exploitation  
  
Ant thread 12 terminating.Ant 13 : [1, 0, 4, 3, 2], 63  
  
Update called by 13Exploration  
  
Ant thread 13 terminating.avg = 0.00123456790123  
  
Ant 14 : [1, 0, 4, 3, 2], 63



ExplorationUpdate called by 14

avg = 0.00123456790123Ant thread 14 terminating.

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

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

Update called by 16Exploration

Ant thread 16 terminating.avg = 0.00101009090909

Ant 17 : [3, 4, 0, 1, 2], 67  
Update called by 17Exploitation

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

Update called by 18Exploration

Ant thread 18 terminating.avg = 0.00123456790123

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

starting ant = 0  
Exploitationstarting ant = 1

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

Explorationstarting ant = 3

avg = 0.00114477270455starting ant = 4

p = 0.00222starting ant = 5

Ant 1 : [1, 0], 10starting ant = 6

Explorationstarting ant = 7

avg = 0.00072688172043starting ant = 8

p = 0.001starting ant = 9

Ant 0 : [1, 0, 4], 30starting ant = 10

Exploitationstarting ant = 11

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

Explorationstarting ant = 13

avg = 0.00114532270455starting ant = 14

p = 0.0022222starting ant = 15

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

Explorationstarting ant = 17

avg = 0.000905576923077starting ant = 18

p = 0.001starting ant = 19

p = 0.00148

Ant 4 : [4, 3], 15

Exploration

avg = 0.00100627240143

p = 0.00111111111111

p = 0.00133333333333

Ant 5 : [3, 4], 15

Exploration

avg = 0.000763548387097

p = 0.00111

Ant 1 : [1, 0, 4], 30

Exploration

avg = 0.00114532820455

p = 0.002222222

Ant 6 : [1, 0], 10

Exploitation

Ant 7 : [3, 4], 15

Exploration

avg = 0.000905943589744

p = 0.001

p = 0.00148146666667

Ant 8 : [4, 3], 15

Exploitation

Ant 9 : [4, 3], 15

Exploration

avg = 0.00108689458615

p = 0.00148148148

Ant 0 : [1, 0, 4, 3], 45

Exploitation

Ant 10 : [1, 0], 10

Exploration

avg = 0.000828127400122

p = 0.000909090908182

p = 0.001111111

Ant 11 : [2, 3], 18

Exploitation

Ant 2 : [4, 3, 2], 33

Exploration

avg = 0.000858682983178

p = 0.000909090908182

p = 0.00123333333222

Ant 12 : [2, 3], 18

Exploitation  
Ant 13 : [1, 0], 10  
Exploitation  
Ant 14 : [1, 0], 10  
Exploration  
avg = 0.0011453282601  
p = 0.002222222222222  
Ant 15 : [1, 0], 10  
Exploration  
avg = 0.000763915053763  
p = 0.00111111  
Ant 3 : [1, 0, 4], 30  
Exploration  
avg = 0.000858988539008  
p = 0.000909090908182  
p = 0.00123455555554  
Ant 16 : [2, 3], 18  
Exploitation  
Ant 17 : [3, 4], 15  
Exploration  
avg = 0.0011453282601  
p = 0.002222222222222  
Ant 18 : [1, 0], 10  
Exploitation  
Ant 19 : [1, 0], 10  
Exploration  
avg = 0.000937992831541  
p = 0.001  
p = 0.001233333333333  
Ant 4 : [4, 3, 2], 33  
Exploration  
avg = 0.000714102564103  
p = 0.001  
Ant 5 : [3, 4, 0], 35  
Exploitation  
Ant 1 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.00076391872043  
p = 0.0011111111  
Ant 6 : [1, 0, 4], 30  
Exploitation  
Ant 7 : [3, 4, 0], 35  
Exploitation  
Ant 8 : [4, 3, 2], 33  
Exploration  
avg = 0.000938404313023  
p = 0.001  
p = 0.00123456777778  
Ant 9 : [4, 3, 2], 33  
Exploration  
avg = 0.0012345679  
Ant 0 : [1, 0, 4, 3, 2], 63  
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.000763918757097

p = 0.001111111111  
Ant 10 : [1, 0, 4], 30  
Exploration  
avg = 0.00102070883154  
p = 0.00148148133333  
Ant 11 : [2, 3, 4], 33  
Exploration  
avg = 0.000754545454091  
p = 0.000909090908182  
Ant 2 : [4, 3, 2, 1], 55  
Exploration  
avg = 0.00102070888043  
p = 0.00148148148  
Ant 12 : [2, 3, 4], 33  
Exploitation  
Ant 13 : [1, 0, 4], 30  
Exploitation  
Ant 14 : [1, 0, 4], 30  
Exploitation  
Ant 15 : [1, 0, 4], 30  
Exploration  
avg = 0.00108689458689  
p = 0.00148148148148  
Ant 3 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.00102070888092  
p = 0.00148148148147  
Ant 16 : [2, 3, 4], 33  
Exploration  
avg = 0.000751135897436  
p = 0.00111111  
Ant 17 : [3, 4, 0], 35  
Exploration  
avg = 0.000763918757467  
p = 0.00111111111111  
Ant 18 : [1, 0, 4], 30  
Exploration  
avg = 0.000763918757467  
p = 0.00111111111111  
Ant 19 : [1, 0, 4], 30  
Exploitation  
Ant 4 : [4, 3, 2, 1], 55  
Exploration  
avg = 0.0013  
p = 0.002  
Ant 5 : [3, 4, 0, 1], 45  
Exploitation  
Ant 1 : [1, 0, 4, 3, 2], 63  
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.00108689458689

p = 0.00148148148148  
Ant 6 : [1, 0, 4, 3], 45  
Exploitation  
Ant 7 : [3, 4, 0, 1], 45  
Exploration  
avg = 0.000805045454545  
p = 0.00101009090909  
Ant 8 : [4, 3, 2, 1], 55  
Exploitation  
Ant 9 : [4, 3, 2, 1], 55  
Exploitation  
Ant 10 : [1, 0, 4, 3], 45  
Exploitation  
Ant 11 : [2, 3, 4, 0], 53  
Exploration  
avg = 0.00222222222222  
Ant 2 : [4, 3, 2, 1, 0], 65  
Update called by 2Exploration

Ant thread 2 terminating.avg = 0.000780555555

p = 0.001111111111  
Ant 12 : [2, 3, 4, 0], 53  
Exploration  
avg = 0.00108689458689  
p = 0.00148148148148  
Ant 13 : [1, 0, 4, 3], 45  
Exploitation  
Ant 14 : [1, 0, 4, 3], 45  
Exploitation  
Ant 15 : [1, 0, 4, 3], 45  
Exploitation  
Ant 3 : [1, 0, 4, 3, 2], 63  
Update called by 3Exploitation

Ant thread 3 terminating.Ant 16 : [2, 3, 4, 0], 53

Exploitation  
Ant 17 : [3, 4, 0, 1], 45  
Exploration  
avg = 0.00108689458689  
p = 0.00148148148148  
Ant 18 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.00108689458689  
p = 0.00148148148148  
Ant 19 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.00222222222222  
Ant 4 : [4, 3, 2, 1, 0], 65  
Update called by 4Exploitation

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

Update called by 5Exploitation

Ant thread 5 terminating.Ant 6 : [1, 0, 4, 3, 2], 63

Update called by 6Exploitation

Ant thread 6 terminating.Ant 7 : [3, 4, 0, 1, 2], 67

Update called by 7Exploitation

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

ExploitationUpdate called by 8

Ant 9 : [4, 3, 2, 1, 0], 65Ant thread 8 terminating.

ExplorationUpdate called by 9

avg = 0.00123456790123Ant thread 9 terminating.

Ant 10 : [1, 0, 4, 3, 2], 63

Update called by 10Exploration

Ant thread 10 terminating.avg = 0.0022222222

Ant 11 : [2, 3, 4, 0, 1], 63

Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [2, 3, 4, 0, 1], 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 = 0.00123456790123

Ant 14 : [1, 0, 4, 3, 2], 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 : [2, 3, 4, 0, 1], 63

Update called by 16Exploration

Ant thread 16 terminating.avg = 0.00101009090908

Ant 17 : [3, 4, 0, 1, 2], 67

Update called by 17Exploitation

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

Update called by 18Exploration

Ant thread 18 terminating.avg = 0.00123456790123

Ant 19 : [1, 0, 4, 3, 2], 63

Update called by 19

Best: [1, 0, 4, 3, 2], 85, 3, 85

Ant thread 19 terminating.iter\_counter = 4

starting ant = 0

Explorationstarting ant = 1

avg = 0.00105352270455starting ant = 2

p = 0.002starting ant = 3

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

Explorationstarting ant = 5

avg = 0.00110852270455starting ant = 6

p = 0.00222starting ant = 7

Ant 1 : [1, 0], 10starting ant = 8

Explorationstarting ant = 9

avg = 0.000840352564103starting ant = 10

p = 0.001starting ant = 11

p = 0.0013333333333333starting ant = 12

Ant 2 : [4, 3], 15starting ant = 13

Exploitationstarting ant = 14

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

Explorationstarting ant = 16

avg = 0.00068752688172starting ant = 17

p = 0.001starting ant = 18

Ant 0 : [1, 0, 4], 30starting ant = 19

Exploration

avg = 0.000877019230769

p = 0.001

p = 0.00148  
Ant 4 : [4, 3], 15  
Exploitation  
Ant 5 : [3, 4], 15  
Exploitation  
Ant 6 : [1, 0], 10  
Exploration  
avg = 0.00100342293907  
p = 0.0011111111111111  
p = 0.00148  
Ant 7 : [3, 4], 15  
Exploration  
avg = 0.000724193548387  
p = 0.00111  
Ant 1 : [1, 0, 4], 30  
Exploration  
avg = 0.000877385897436  
p = 0.001  
p = 0.001481466666667  
Ant 8 : [4, 3], 15  
Exploration  
avg = 0.000877389564103  
p = 0.001  
p = 0.001481481333333  
Ant 9 : [4, 3], 15  
Exploration  
avg = 0.00110907825955  
p = 0.002222222222  
Ant 10 : [1, 0], 10  
Exploration  
avg = 0.000795819707815  
p = 0.000909090908182  
p = 0.0011111111  
Ant 11 : [2, 3], 18  
Exploration  
avg = 0.00082637529087  
p = 0.000909090908182  
p = 0.00123333333222  
Ant 12 : [2, 3], 18  
Exploration  
avg = 0.000844563918757  
p = 0.0009  
p = 0.0011111111111111  
Ant 2 : [4, 3, 2], 33  
Exploitation  
Ant 13 : [1, 0], 10  
Exploitation  
Ant 14 : [1, 0], 10  
Exploitation  
Ant 3 : [1, 0, 4], 30  
Exploration  
avg = 0.0011090782601  
p = 0.0022222222222222  
Ant 15 : [1, 0], 10



Exploitation  
Ant 16 : [2, 3], 18  
Exploration  
avg = 0.00103434516129  
p = 0.00123333333333  
p = 0.00148146666667  
Ant 17 : [3, 4], 15  
Exploitation  
Ant 18 : [1, 0], 10  
Exploration  
avg = 0.00105227920154  
p = 0.00148148148  
Ant 0 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.0011090782601  
p = 0.00222222222222  
Ant 19 : [1, 0], 10  
Exploitation  
Ant 4 : [4, 3, 2], 33  
Exploitation  
Ant 5 : [3, 4, 0], 35  
Exploration  
avg = 0.00072456388172  
p = 0.0011111111  
Ant 6 : [1, 0, 4], 30  
Exploration  
avg = 0.000712692307692  
p = 0.00111  
Ant 7 : [3, 4, 0], 35  
Exploitation  
Ant 1 : [1, 0, 4, 3], 45  
Exploitation  
Ant 8 : [4, 3, 2], 33  
Exploitation  
Ant 9 : [4, 3, 2], 33  
Exploration  
avg = 0.000724563918387  
p = 0.001111111111  
Ant 10 : [1, 0, 4], 30  
Exploration  
avg = 0.000968020659498  
p = 0.00148148133333  
Ant 11 : [2, 3, 4], 33  
Exploitation  
Ant 12 : [2, 3, 4], 33  
Exploitation  
Ant 2 : [4, 3, 2, 1], 55  
Exploration  
avg = 0.000724563918754  
p = 0.00111111111111  
Ant 13 : [1, 0, 4], 30  
Exploitation  
Ant 14 : [1, 0, 4], 30  
Exploitation

Ant 3 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.000724563918757  
p = 0.001111111111111  
Ant 15 : [1, 0, 4], 30  
Exploration  
avg = 0.000968020708876  
p = 0.00148148148147  
Ant 16 : [2, 3, 4], 33  
Exploitation  
Ant 17 : [3, 4, 0], 35  
Exploration  
avg = 0.000724563918757  
p = 0.001111111111111  
Ant 18 : [1, 0, 4], 30  
Exploitation  
Ant 0 : [1, 0, 4, 3, 2], 63  
Update called by 0Exploitation

Ant thread 0 terminating.Ant 19 : [1, 0, 4], 30

Exploration  
avg = 0.000774545454541  
p = 0.00100909090908  
Ant 4 : [4, 3, 2, 1], 55  
Exploration  
avg = 0.00127  
p = 0.002  
Ant 5 : [3, 4, 0, 1], 45  
Exploitation  
Ant 6 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.00138  
p = 0.00222  
Ant 7 : [3, 4, 0, 1], 45  
Exploration  
avg = 0.00123456790122  
Ant 1 : [1, 0, 4, 3, 2], 63  
Update called by 1Exploitation

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

Exploitation  
Ant 9 : [4, 3, 2, 1], 55  
Exploitation  
Ant 10 : [1, 0, 4, 3], 45  
Exploitation  
Ant 11 : [2, 3, 4, 0], 53  
Exploitation  
Ant 12 : [2, 3, 4, 0], 53  
Exploitation  
Ant 2 : [4, 3, 2, 1, 0], 65  
Update called by 2Exploitation

Ant thread 2 terminating.Ant 13 : [1, 0, 4, 3], 45

Exploration

avg = 0.00105227920228

p = 0.00148148148148

Ant 14 : [1, 0, 4, 3], 45

Exploration

avg = 0.00123456790123

Ant 3 : [1, 0, 4, 3, 2], 63

ExploitationUpdate called by 3

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

Exploration

avg = 0.00075805555555

p = 0.00111111111111

Ant 16 : [2, 3, 4, 0], 53

Exploration

avg = 0.0013811

p = 0.0022222

Ant 17 : [3, 4, 0, 1], 45

Exploration

avg = 0.00105227920228

p = 0.00148148148148

Ant 18 : [1, 0, 4, 3], 45

Exploration

avg = 0.00105227920228

p = 0.00148148148148

Ant 19 : [1, 0, 4, 3], 45

Exploration

avg = 0.00222222222222

Ant 4 : [4, 3, 2, 1, 0], 65

Update called by 4Exploitation

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

ExploitationUpdate called by 5

Ant 6 : [1, 0, 4, 3, 2], 63Ant thread 5 terminating.

Update called by 6Exploration

Ant thread 6 terminating.avg = 0.00100909090818

Ant 7 : [3, 4, 0, 1, 2], 67

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 = 0.00222222222222

Ant 9 : [4, 3, 2, 1, 0], 65  
Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [1, 0, 4, 3, 2], 63  
ExploitationUpdate called by 10

Ant 11 : [2, 3, 4, 0, 1], 63Ant thread 10 terminating.  
Update called by 11Exploitation

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

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

Ant thread 13 terminating.avg = 0.00123456790123

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

Ant thread 14 terminating.avg = 0.00123456790123

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

Ant thread 15 terminating.avg = 0.00222222222222

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

Ant thread 16 terminating.avg = 0.00101009090908

Ant 17 : [3, 4, 0, 1, 2], 67  
Update called by 17Exploitation

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

Ant thread 18 terminating.Ant 19 : [1, 0, 4, 3, 2], 63  
Update called by 19  
Best: [1, 0, 4, 3, 2], 85, 4, 85  
Ant thread 19 terminating.iter\_counter = 5

starting ant = 0  
Explorationstarting ant = 1

avg = 0.00102089770455starting ant = 2

p = 0.002starting ant = 3  
Ant 0 : [1, 0], 10starting ant = 4  
Explorationstarting ant = 5  
avg = 0.00107589770455starting ant = 6  
p = 0.00222starting ant = 7  
Ant 1 : [1, 0], 10starting ant = 8  
Explorationstarting ant = 9  
avg = 0.000814650641026starting ant = 10  
p = 0.001starting ant = 11  
p = 0.0013333333333333starting ant = 12  
Ant 2 : [4, 3], 15starting ant = 13  
Explorationstarting ant = 14  
avg = 0.00107644770455starting ant = 15  
p = 0.0022222starting ant = 16  
Ant 3 : [1, 0], 10starting ant = 17  
Explorationstarting ant = 18  
avg = 0.000652107526882starting ant = 19  
  
p = 0.001  
Ant 0 : [1, 0, 4], 30  
Exploration  
avg = 0.000851317307692  
p = 0.001  
p = 0.00148  
Ant 4 : [4, 3], 15  
Exploration  
avg = 0.000931191756272  
p = 0.001111111111111  
p = 0.001333333333333  
Ant 5 : [3, 4], 15  
Exploration  
avg = 0.00107645320455  
p = 0.00222222  
Ant 6 : [1, 0], 10  
Exploration  
avg = 0.000967858422939  
p = 0.001111111111111  
p = 0.00148

Ant 7 : [3, 4], 15  
Exploitation  
Ant 1 : [1, 0, 4], 30  
Exploitation  
Ant 8 : [4, 3], 15  
Exploitation  
Ant 9 : [4, 3], 15  
Exploitation  
Ant 10 : [1, 0], 10  
Exploration  
avg = 0.000766742784738  
p = 0.000909090908182  
p = 0.0011111111  
Ant 11 : [2, 3], 18  
Exploration  
avg = 0.000797298367793  
p = 0.000909090908182  
p = 0.00123333333222  
Ant 12 : [2, 3], 18  
Exploitation  
Ant 2 : [4, 3, 2], 33  
Exploitation  
Ant 13 : [1, 0], 10  
Exploitation  
Ant 14 : [1, 0], 10  
Exploration  
avg = 0.0010764532601  
p = 0.00222222222222  
Ant 15 : [1, 0], 10  
Exploration  
avg = 0.000797603923624  
p = 0.000909090908182  
p = 0.00123455555554  
Ant 16 : [2, 3], 18  
Exploitation  
Ant 3 : [1, 0, 4], 30  
Exploration  
avg = 0.000998780645161  
p = 0.00123333333333  
p = 0.00148146666667  
Ant 17 : [3, 4], 15  
Exploitation  
Ant 18 : [1, 0], 10  
Exploration  
avg = 0.0010764532601  
p = 0.00222222222222  
Ant 19 : [1, 0], 10  
Exploitation  
Ant 0 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.000837885304659  
p = 0.00123333333333  
Ant 4 : [4, 3, 2], 33  
Exploration

avg = 0.000641756410256  
p = 0.001  
Ant 5 : [3, 4, 0], 35  
Exploitation  
Ant 6 : [1, 0, 4], 30  
Exploration  
avg = 0.000678423076923  
p = 0.00111  
Ant 7 : [3, 4, 0], 35  
Exploitation  
Ant 1 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.000838292712067  
p = 0.00123455555556  
Ant 8 : [4, 3, 2], 33  
Exploration  
avg = 0.000838296786141  
p = 0.00123456777778  
Ant 9 : [4, 3, 2], 33  
Exploitation  
Ant 10 : [1, 0, 4], 30  
Exploration  
avg = 0.000920601304659  
p = 0.00148148133333  
Ant 11 : [2, 3, 4], 33  
Exploration  
avg = 0.000920601353548  
p = 0.00148148148  
Ant 12 : [2, 3, 4], 33  
Exploitation  
Ant 2 : [4, 3, 2, 1], 55  
Exploration  
avg = 0.000689144563915  
p = 0.00111111111111  
Ant 13 : [1, 0, 4], 30  
Exploration  
avg = 0.000689144563919  
p = 0.00111111111111  
Ant 14 : [1, 0, 4], 30  
Exploitation  
Ant 15 : [1, 0, 4], 30  
Exploration  
avg = 0.000920601354037  
p = 0.00148148148147  
Ant 16 : [2, 3, 4], 33  
Exploitation  
Ant 3 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.00067878974359  
p = 0.0011111  
Ant 17 : [3, 4, 0], 35  
Exploration  
avg = 0.000689144563919  
p = 0.00111111111111

Ant 18 : [1, 0, 4], 30  
Exploration  
avg = 0.000689144563919  
p = 0.001111111111111  
Ant 19 : [1, 0, 4], 30  
Exploration  
avg = 0.0012345679  
Ant 0 : [1, 0, 4, 3, 2], 63  
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.000747545454541

p = 0.00100909090908  
Ant 4 : [4, 3, 2, 1], 55  
Exploitation  
Ant 5 : [3, 4, 0, 1], 45  
Exploitation  
Ant 6 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.001353  
p = 0.00222  
Ant 7 : [3, 4, 0, 1], 45  
Exploration  
avg = 0.00123456790122  
Ant 1 : [1, 0, 4, 3, 2], 63  
Update called by 1Exploitation

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

Exploitation  
Ant 9 : [4, 3, 2, 1], 55  
Exploitation  
Ant 10 : [1, 0, 4, 3], 45  
Exploitation  
Ant 11 : [2, 3, 4, 0], 53  
Exploitation  
Ant 12 : [2, 3, 4, 0], 53  
Exploitation  
Ant 2 : [4, 3, 2, 1, 0], 65  
Update called by 2Exploitation

Ant thread 2 terminating.Ant 13 : [1, 0, 4, 3], 45

Exploration  
avg = 0.00102112535613  
p = 0.00148148148148  
Ant 14 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.00102112535613  
p = 0.00148148148148  
Ant 15 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.00073780555555  
p = 0.00111111111111



Ant 16 : [2, 3, 4, 0], 53  
Exploitation  
Ant 3 : [1, 0, 4, 3, 2], 63  
Update called by 3Exploitation

Ant thread 3 terminating.Ant 17 : [3, 4, 0, 1], 45

Exploration  
avg = 0.00102112535613  
p = 0.00148148148148  
Ant 18 : [1, 0, 4, 3], 45  
Exploitation  
Ant 19 : [1, 0, 4, 3], 45  
Exploitation  
Ant 4 : [4, 3, 2, 1, 0], 65  
Update called by 4Exploration

Ant thread 4 terminating.avg = 0.000909090818182

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

Ant thread 5 terminating.avg = 0.00123456790123

Ant 6 : [1, 0, 4, 3, 2], 63  
Update called by 6Exploration

Ant thread 6 terminating.avg = 0.00100909090818

Ant 7 : [3, 4, 0, 1, 2], 67  
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 = 0.00222222222222

Ant 9 : [4, 3, 2, 1, 0], 65  
Update called by 9Exploration

Ant thread 9 terminating.avg = 0.00123456790123

Ant 10 : [1, 0, 4, 3, 2], 63  
Update called by 10Exploration

Ant thread 10 terminating.avg = 0.0022222222

Ant 11 : [2, 3, 4, 0, 1], 63  
Update called by 11Exploration

Ant thread 11 terminating.avg = 0.002222222222

Ant 12 : [2, 3, 4, 0, 1], 63

Update called by 12Exploration

Ant thread 12 terminating.avg = 0.00123456790123

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

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

ExplorationUpdate called by 14

avg = 0.00123456790123Ant thread 14 terminating.

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

Ant thread 15 terminating.avg = 0.00222222222222

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

Ant thread 16 terminating.avg = 0.00101009090908

Ant 17 : [3, 4, 0, 1, 2], 67  
Update called by 17Exploitation

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

Update called by 18Exploitation

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

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

starting ant = 0  
Exploitationstarting ant = 1

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

Explorationstarting ant = 3

avg = 0.00104653520455starting ant = 4

p = 0.00222starting ant = 5

Ant 1 : [1, 0], 10starting ant = 6

Explorationstarting ant = 7

avg = 0.000620230107527starting ant = 8

p = 0.001starting ant = 9

Ant 0 : [1, 0, 4], 30starting ant = 10

Exploitationstarting ant = 11

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

Exploitationstarting ant = 13

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

Explorationstarting ant = 15

avg = 0.000828185576923starting ant = 16

p = 0.001starting ant = 17

p = 0.00148starting ant = 18

Ant 4 : [4, 3], 15starting ant = 19

Exploitation

Ant 5 : [3, 4], 15

Exploration

avg = 0.000656896774194

p = 0.00111

Ant 1 : [1, 0, 4], 30

Exploitation

Ant 6 : [1, 0], 10

Exploitation

Ant 7 : [3, 4], 15

Exploitation

Ant 8 : [4, 3], 15

Exploration

avg = 0.000828555910256

p = 0.001

p = 0.00148148133333

Ant 9 : [4, 3], 15

Exploration

avg = 0.000993086893846

p = 0.00148148148

Ant 0 : [1, 0, 4, 3], 45

Exploitation

Ant 10 : [1, 0], 10

Exploration

avg = 0.000740573553969

p = 0.000909090908182

p = 0.001111111

Ant 11 : [2, 3], 18

Exploration

avg = 0.000754467144564

p = 0.00111111111111

Ant 2 : [4, 3, 2], 33

Exploitation

Ant 12 : [2, 3], 18  
Exploitation  
Ant 13 : [1, 0], 10  
Exploration  
avg = 0.00065726344086  
p = 0.00111111  
Ant 3 : [1, 0, 4], 30  
Exploration  
avg = 0.0010470907601  
p = 0.00222222222222  
Ant 14 : [1, 0], 10  
Exploration  
avg = 0.0010470907601  
p = 0.00222222222222  
Ant 15 : [1, 0], 10  
Exploitation  
Ant 16 : [2, 3], 18  
Exploration  
avg = 0.000966772580645  
p = 0.00123333333333  
p = 0.00148146666667  
Ant 17 : [3, 4], 15  
Exploration  
avg = 0.0010470907601  
p = 0.00222222222222  
Ant 18 : [1, 0], 10  
Exploration  
avg = 0.000795207885305  
p = 0.00123333333333  
Ant 4 : [4, 3, 2], 33  
Exploration  
avg = 0.0010470907601  
p = 0.00222222222222  
Ant 19 : [1, 0], 10  
Exploration  
avg = 0.000610914102564  
p = 0.001  
Ant 5 : [3, 4, 0], 35  
Exploration  
avg = 0.000993086894579  
p = 0.00148148148147  
Ant 1 : [1, 0, 4, 3], 45  
Exploitation  
Ant 6 : [1, 0, 4], 30  
Exploitation  
Ant 7 : [3, 4, 0], 35  
Exploitation  
Ant 8 : [4, 3, 2], 33  
Exploration  
avg = 0.000795619366786  
p = 0.00123456777778  
Ant 9 : [4, 3, 2], 33  
Exploration  
avg = 0.0012345679

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

Ant thread 0 terminating.Ant 10 : [1, 0, 4], 30

Exploitation  
Ant 11 : [2, 3, 4], 33  
Exploitation  
Ant 2 : [4, 3, 2, 1], 55  
Exploitation  
Ant 12 : [2, 3, 4], 33  
Exploration  
avg = 0.00065726714456  
p = 0.00111111111111  
Ant 13 : [1, 0, 4], 30  
Exploitation  
Ant 3 : [1, 0, 4, 3], 45  
Exploitation  
Ant 14 : [1, 0, 4], 30  
Exploration  
avg = 0.000657267144564  
p = 0.00111111111111  
Ant 15 : [1, 0, 4], 30  
Exploitation  
Ant 16 : [2, 3, 4], 33  
Exploration  
avg = 0.000647947435897  
p = 0.0011111  
Ant 17 : [3, 4, 0], 35  
Exploration  
avg = 0.000657267144564  
p = 0.00111111111111  
Ant 18 : [1, 0, 4], 30  
Exploration  
avg = 0.000723245454541  
p = 0.00100909090908  
Ant 4 : [4, 3, 2, 1], 55  
Exploration  
avg = 0.000657267144564  
p = 0.00111111111111  
Ant 19 : [1, 0, 4], 30  
Exploration  
avg = 0.0012187  
p = 0.002  
Ant 5 : [3, 4, 0, 1], 45  
Exploration  
avg = 0.00123456790122  
Ant 1 : [1, 0, 4, 3, 2], 63  
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.000993086894587

p = 0.00148148148148  
Ant 6 : [1, 0, 4, 3], 45

Exploration  
avg = 0.0013287  
p = 0.00222  
Ant 7 : [3, 4, 0, 1], 45  
Exploitation  
Ant 8 : [4, 3, 2, 1], 55  
Exploration  
avg = 0.000723750454545  
p = 0.00101010090909  
Ant 9 : [4, 3, 2, 1], 55  
Exploitation  
Ant 10 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.0007195805  
p = 0.001111111  
Ant 11 : [2, 3, 4, 0], 53  
Exploitation  
Ant 2 : [4, 3, 2, 1, 0], 65  
Update called by 2Exploitation

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

Exploration  
avg = 0.000993086894587  
p = 0.00148148148148  
Ant 13 : [1, 0, 4, 3], 45  
Exploitation  
Ant 3 : [1, 0, 4, 3, 2], 63  
Update called by 3Exploitation

Ant thread 3 terminating.Ant 14 : [1, 0, 4, 3], 45

Exploration  
avg = 0.000993086894587  
p = 0.00148148148148  
Ant 15 : [1, 0, 4, 3], 45  
Exploitation  
Ant 16 : [2, 3, 4, 0], 53  
Exploration  
avg = 0.0013298  
p = 0.0022222  
Ant 17 : [3, 4, 0, 1], 45  
Exploration  
avg = 0.000993086894587  
p = 0.00148148148148  
Ant 18 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.00222222222222  
Ant 4 : [4, 3, 2, 1, 0], 65  
ExploitationUpdate called by 4

Ant 19 : [1, 0, 4, 3], 45Ant thread 4 terminating.

Exploitation

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

Ant thread 5 terminating.avg = 0.00123456790123

Ant 6 : [1, 0, 4, 3, 2], 63  
Update called by 6Exploration

Ant thread 6 terminating.avg = 0.00100909090818

Ant 7 : [3, 4, 0, 1, 2], 67  
Update called by 7Exploitation

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

ExplorationUpdate called by 8

avg = 0.00222222222222Ant thread 8 terminating.

Ant 9 : [4, 3, 2, 1, 0], 65  
Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [1, 0, 4, 3, 2], 63

ExplorationUpdate called by 10

avg = 0.0022222222Ant thread 10 terminating.

Ant 11 : [2, 3, 4, 0, 1], 63  
Update called by 11Exploitation

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

Update called by 12Exploitation

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

Update called by 13Exploration

Ant thread 13 terminating.avg = 0.00123456790123

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

Ant thread 14 terminating.avg = 0.00123456790123

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

Ant thread 15 terminating.avg = 0.00222222222222

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

Ant thread 16 terminating.Ant 17 : [3, 4, 0, 1, 2], 67

Update called by 17Exploration

Ant thread 17 terminating.avg = 0.00123456790123

Ant 18 : [1, 0, 4, 3, 2], 63

Update called by 18Exploitation

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

Update called by 19

Best: [1, 0, 4, 3, 2], 85, 6, 85

Ant thread 19 terminating.iter\_counter = 7

starting ant = 0

Exploitationstarting ant = 1

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

Explorationstarting ant = 3

avg = 0.00102010895455starting ant = 4

p = 0.00222starting ant = 5

Ant 1 : [1, 0], 10starting ant = 6

Explorationstarting ant = 7

avg = 0.000591540430108starting ant = 8

p = 0.001starting ant = 9

Ant 0 : [1, 0, 4], 30starting ant = 10

Exploitationstarting ant = 11

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

Exploitationstarting ant = 13

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

Explorationstarting ant = 15

avg = 0.000807367019231starting ant = 16

p = 0.001starting ant = 17

p = 0.00148starting ant = 18

Ant 4 : [4, 3], 15starting ant = 19



Exploration  
avg = 0.000870376433692  
p = 0.0011111111111111  
p = 0.0013333333333333  
Ant 5 : [3, 4], 15  
Exploration  
avg = 0.000628207096774  
p = 0.00111  
Ant 1 : [1, 0, 4], 30  
Exploitation  
Ant 6 : [1, 0], 10  
Exploitation  
Ant 7 : [3, 4], 15  
Exploration  
avg = 0.000807733685897  
p = 0.001  
p = 0.001481466666667  
Ant 8 : [4, 3], 15  
Exploitation  
Ant 9 : [4, 3], 15  
Exploitation  
Ant 0 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.00102066450955  
p = 0.002222222222  
Ant 10 : [1, 0], 10  
Exploration  
avg = 0.000717021246276  
p = 0.000909090908182  
p = 0.0011111111  
Ant 11 : [2, 3], 18  
Exploration  
avg = 0.000716057467145  
p = 0.0011111111111111  
Ant 2 : [4, 3, 2], 33  
Exploitation  
Ant 12 : [2, 3], 18  
Exploration  
avg = 0.0010206645101  
p = 0.00222222222222  
Ant 13 : [1, 0], 10  
Exploration  
avg = 0.000628573763441  
p = 0.0011111  
Ant 3 : [1, 0, 4], 30  
Exploration  
avg = 0.0010206645101  
p = 0.00222222222222  
Ant 14 : [1, 0], 10  
Exploration  
avg = 0.0010206645101  
p = 0.00222222222222  
Ant 15 : [1, 0], 10  
Exploration

avg = 0.000747882385162  
p = 0.000909090908182  
p = 0.00123455555554  
Ant 16 : [2, 3], 18  
Exploration  
avg = 0.000937965322581  
p = 0.00123333333333  
p = 0.00148146666667  
Ant 17 : [3, 4], 15  
Exploration  
avg = 0.0010206645101  
p = 0.00222222222222  
Ant 18 : [1, 0], 10  
Exploitation  
Ant 4 : [4, 3, 2], 33  
Exploration  
avg = 0.0010206645101  
p = 0.00222222222222  
Ant 19 : [1, 0], 10  
Exploitation  
Ant 5 : [3, 4, 0], 35  
Exploitation  
Ant 1 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.000628577430108  
p = 0.0011111111  
Ant 6 : [1, 0, 4], 30  
Exploration  
avg = 0.000619822692308  
p = 0.00111  
Ant 7 : [3, 4, 0], 35  
Exploitation  
Ant 8 : [4, 3, 2], 33  
Exploration  
avg = 0.000757209689367  
p = 0.00123456777778  
Ant 9 : [4, 3, 2], 33  
Exploration  
avg = 0.0012345679  
Ant 0 : [1, 0, 4, 3, 2], 63  
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.000628577466774

p = 0.001111111111  
Ant 10 : [1, 0, 4], 30  
Exploration  
avg = 0.000839514207885  
p = 0.00148148133333  
Ant 11 : [2, 3, 4], 33  
Exploration  
avg = 0.000651375454091  
p = 0.000909090908182  
Ant 2 : [4, 3, 2, 1], 55

Exploitation  
Ant 12 : [2, 3, 4], 33  
Exploitation  
Ant 13 : [1, 0, 4], 30  
Exploration  
avg = 0.000967852279202  
p = 0.00148148148148  
Ant 3 : [1, 0, 4, 3], 45  
Exploitation  
Ant 14 : [1, 0, 4], 30  
Exploration  
avg = 0.000628577467145  
p = 0.00111111111111  
Ant 15 : [1, 0, 4], 30  
Exploitation  
Ant 16 : [2, 3, 4], 33  
Exploration  
avg = 0.000620189358974  
p = 0.0011111  
Ant 17 : [3, 4, 0], 35  
Exploration  
avg = 0.000628577467145  
p = 0.00111111111111  
Ant 18 : [1, 0, 4], 30  
Exploitation  
Ant 4 : [4, 3, 2, 1], 55  
Exploitation  
Ant 19 : [1, 0, 4], 30  
Exploitation  
Ant 5 : [3, 4, 0, 1], 45  
Exploitation  
Ant 1 : [1, 0, 4, 3, 2], 63  
Update called by 1Exploitation

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

Exploration  
avg = 0.00130683  
p = 0.00222  
Ant 7 : [3, 4, 0, 1], 45  
Exploitation  
Ant 8 : [4, 3, 2, 1], 55  
Exploitation  
Ant 9 : [4, 3, 2, 1], 55  
Exploration  
avg = 0.000967852279202  
p = 0.00148148148148  
Ant 10 : [1, 0, 4, 3], 45  
Exploitation  
Ant 11 : [2, 3, 4, 0], 53  
Exploration  
avg = 0.00222222222222  
Ant 2 : [4, 3, 2, 1, 0], 65  
Update called by 2Exploitation

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

Exploitation

Ant 13 : [1, 0, 4, 3], 45

Exploitation

Ant 3 : [1, 0, 4, 3, 2], 63

Update called by 3Exploitation

Ant thread 3 terminating.Ant 14 : [1, 0, 4, 3], 45

Exploitation

Ant 15 : [1, 0, 4, 3], 45

Exploitation

Ant 16 : [2, 3, 4, 0], 53

Exploration

avg = 0.00130793

p = 0.0022222

Ant 17 : [3, 4, 0, 1], 45

Exploration

avg = 0.000967852279202

p = 0.00148148148148

Ant 18 : [1, 0, 4, 3], 45

Exploration

avg = 0.00222222222222

Ant 4 : [4, 3, 2, 1, 0], 65

Update called by 4Exploitation

Ant thread 4 terminating.Ant 19 : [1, 0, 4, 3], 45

Exploration

avg = 0.000909090818182

Ant 5 : [3, 4, 0, 1, 2], 67

Update called by 5Exploration

Ant thread 5 terminating.avg = 0.00123456790123

Ant 6 : [1, 0, 4, 3, 2], 63

Update called by 6Exploitation

Ant thread 6 terminating.Ant 7 : [3, 4, 0, 1, 2], 67

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 : [4, 3, 2, 1, 0], 65

Update called by 9Exploration

Ant thread 9 terminating.avg = 0.00123456790123

Ant 10 : [1, 0, 4, 3, 2], 63  
Update called by 10Exploration

Ant thread 10 terminating.avg = 0.002222222

Ant 11 : [2, 3, 4, 0, 1], 63  
Update called by 11Exploration

Ant thread 11 terminating.avg = 0.00222222222

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

Ant thread 12 terminating.avg = 0.00123456790123

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

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

Ant thread 14 terminating.avg = 0.00123456790123

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

Ant thread 15 terminating.avg = 0.0022222222222

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

Ant thread 16 terminating.avg = 0.00101009090908

Ant 17 : [3, 4, 0, 1, 2], 67  
Update called by 17Exploitation

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

Ant thread 18 terminating.Ant 19 : [1, 0, 4, 3, 2], 63  
Update called by 19  
Best: [1, 0, 4, 3, 2], 85, 7, 85  
Ant thread 19 terminating.iter\_counter = 8

starting ant = 0  
Exploitationstarting ant = 1

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

Explorationstarting ant = 3

avg = 0.000996325329545starting ant = 4

p = 0.00222starting ant = 5

Ant 1 : [1, 0], 10starting ant = 6

Explorationstarting ant = 7

avg = 0.00056571972043starting ant = 8

p = 0.001starting ant = 9

Ant 0 : [1, 0, 4], 30starting ant = 10

Exploitationstarting ant = 11

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

Exploitationstarting ant = 13

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

Exploitationstarting ant = 15

Ant 4 : [4, 3], 15starting ant = 16

Explorationstarting ant = 17

avg = 0.000844449901434starting ant = 18

p = 0.001111111111111starting ant = 19

p = 0.001333333333333

Ant 5 : [3, 4], 15

Exploitation

Ant 1 : [1, 0, 4], 30

Exploitation

Ant 6 : [1, 0], 10

Exploration

avg = 0.0008811165681

p = 0.001111111111111

p = 0.00148

Ant 7 : [3, 4], 15

Exploration

avg = 0.000788996983974

p = 0.001

p = 0.00148146666667

Ant 8 : [4, 3], 15

Exploration

avg = 0.000789000650641

p = 0.001

p = 0.001481481333333

Ant 9 : [4, 3], 15

Exploitation

Ant 0 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.000996880884545  
p = 0.002222222222  
Ant 10 : [1, 0], 10  
Exploitation  
Ant 11 : [2, 3], 18  
Exploitation  
Ant 2 : [4, 3, 2], 33  
Exploration  
avg = 0.000726379752409  
p = 0.000909090908182  
p = 0.00123333333222  
Ant 12 : [2, 3], 18  
Exploitation  
Ant 13 : [1, 0], 10  
Exploration  
avg = 0.000602753053763  
p = 0.00111111  
Ant 3 : [1, 0, 4], 30  
Exploitation  
Ant 14 : [1, 0], 10  
Exploration  
avg = 0.000996880885101  
p = 0.00222222222222  
Ant 15 : [1, 0], 10  
Exploration  
avg = 0.000722229498208  
p = 0.00123333333333  
Ant 4 : [4, 3, 2], 33  
Exploitation  
Ant 16 : [2, 3], 18  
Exploration  
avg = 0.000912344345878  
p = 0.00123455555556  
p = 0.00148146666667  
Ant 17 : [3, 4], 15  
Exploitation  
Ant 18 : [1, 0], 10  
Exploration  
avg = 0.000996880885101  
p = 0.00222222222222  
Ant 19 : [1, 0], 10  
Exploration  
avg = 0.00055817375641  
p = 0.001  
Ant 5 : [3, 4, 0], 35  
Exploitation  
Ant 1 : [1, 0, 4, 3], 45  
Exploitation  
Ant 6 : [1, 0, 4], 30  
Exploration  
avg = 0.000594840423077  
p = 0.00111

Ant 7 : [3, 4, 0], 35  
Exploitation  
Ant 8 : [4, 3, 2], 33  
Exploitation  
Ant 9 : [4, 3, 2], 33  
Exploration  
avg = 0.0012345679  
Ant 0 : [1, 0, 4, 3, 2], 63  
Update called by 0Exploitation

Ant thread 0 terminating.Ant 10 : [1, 0, 4], 30

Exploration  
avg = 0.000804945498208  
p = 0.00148148133333  
Ant 11 : [2, 3, 4], 33  
Exploration  
avg = 0.000631692454091  
p = 0.000909090908182  
Ant 2 : [4, 3, 2, 1], 55  
Exploitation  
Ant 12 : [2, 3, 4], 33  
Exploration  
avg = 0.000602756757463  
p = 0.00111111111111  
Ant 13 : [1, 0, 4], 30  
Exploration  
avg = 0.000945141125356  
p = 0.00148148148148  
Ant 3 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.000602756757467  
p = 0.00111111111111  
Ant 14 : [1, 0, 4], 30  
Exploration  
avg = 0.000602756757467  
p = 0.00111111111111  
Ant 15 : [1, 0, 4], 30  
Exploration  
avg = 0.000681692454541  
p = 0.00100909090908  
Ant 4 : [4, 3, 2, 1], 55  
Exploration  
avg = 0.000804945547586  
p = 0.00148148148147  
Ant 16 : [2, 3, 4], 33  
Exploration  
avg = 0.000595207089744  
p = 0.0011111  
Ant 17 : [3, 4, 0], 35  
Exploitation  
Ant 18 : [1, 0, 4], 30  
Exploitation  
Ant 19 : [1, 0, 4], 30



Exploitation  
Ant 5 : [3, 4, 0, 1], 45  
Exploitation  
Ant 1 : [1, 0, 4, 3, 2], 63  
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.000945141125356

p = 0.00148148148148  
Ant 6 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.001287147  
p = 0.00222  
Ant 7 : [3, 4, 0, 1], 45  
Exploitation  
Ant 8 : [4, 3, 2, 1], 55  
Exploration  
avg = 0.000682197454545  
p = 0.00101010090909  
Ant 9 : [4, 3, 2, 1], 55  
Exploration  
avg = 0.000945141125356  
p = 0.00148148148148  
Ant 10 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.00068841575  
p = 0.0011111111  
Ant 11 : [2, 3, 4, 0], 53  
Exploration  
avg = 0.00222222222222  
Ant 2 : [4, 3, 2, 1, 0], 65  
Update called by 2Exploration

Ant thread 2 terminating.avg = 0.000688415805

p = 0.001111111111  
Ant 12 : [2, 3, 4, 0], 53  
Exploration  
avg = 0.000945141125356  
p = 0.00148148148148  
Ant 13 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.00123456790123  
Ant 3 : [1, 0, 4, 3, 2], 63  
Update called by 3Exploitation

Ant thread 3 terminating.Ant 14 : [1, 0, 4, 3], 45

Exploitation  
Ant 15 : [1, 0, 4, 3], 45  
Exploitation  
Ant 4 : [4, 3, 2, 1, 0], 65  
Update called by 4Exploration

Ant thread 4 terminating.avg = 0.00068841580555

p = 0.00111111111111

Ant 16 : [2, 3, 4, 0], 53

Exploration

avg = 0.001288247

p = 0.0022222

Ant 17 : [3, 4, 0, 1], 45

Exploitation

Ant 18 : [1, 0, 4, 3], 45

Exploitation

Ant 19 : [1, 0, 4, 3], 45

Exploitation

Ant 5 : [3, 4, 0, 1, 2], 67

Update called by 5Exploitation

Ant thread 5 terminating.Ant 6 : [1, 0, 4, 3, 2], 63

Update called by 6Exploitation

Ant thread 6 terminating.Ant 7 : [3, 4, 0, 1, 2], 67

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 : [4, 3, 2, 1, 0], 65

Update called by 9Exploration

Ant thread 9 terminating.avg = 0.00123456790123

Ant 10 : [1, 0, 4, 3, 2], 63

Update called by 10Exploration

Ant thread 10 terminating.avg = 0.002222222

Ant 11 : [2, 3, 4, 0, 1], 63

Update called by 11Exploration

Ant thread 11 terminating.avg = 0.00222222222

Ant 12 : [2, 3, 4, 0, 1], 63

Update called by 12Exploration

Ant thread 12 terminating.avg = 0.00123456790123

Ant 13 : [1, 0, 4, 3, 2], 63

Update called by 13Exploitation

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

ExplorationUpdate called by 14

avg = 0.00123456790123Ant thread 14 terminating.

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

Ant thread 15 terminating.avg = 0.00222222222222

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

Ant thread 16 terminating.Ant 17 : [3, 4, 0, 1, 2], 67

Update called by 17Exploration

Ant thread 17 terminating.avg = 0.00123456790123

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

Ant thread 18 terminating.avg = 0.00123456790123

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

starting ant = 0  
Explorationstarting ant = 1

avg = 0.000919920067045starting ant = 2

p = 0.002starting ant = 3

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

Explorationstarting ant = 5

avg = 0.000974920067045starting ant = 6

p = 0.00222starting ant = 7

Ant 1 : [1, 0], 10starting ant = 8

Explorationstarting ant = 9

avg = 0.00073510061891starting ant = 10

p = 0.001starting ant = 11

p = 0.0013333333333333starting ant = 12

Ant 2 : [4, 3], 15starting ant = 13

Explorationstarting ant = 14

avg = 0.000975470067045starting ant = 15

p = 0.0022222starting ant = 16

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

Exploitationstarting ant = 18

Ant 0 : [1, 0, 4], 30starting ant = 19

Exploration

avg = 0.000771767285577

p = 0.001

p = 0.00148

Ant 4 : [4, 3], 15

Exploration

avg = 0.000821116022401

p = 0.001111111111111

p = 0.001333333333333

Ant 5 : [3, 4], 15

Exploration

avg = 0.000975475567045

p = 0.002222222

Ant 6 : [1, 0], 10

Exploration

avg = 0.000857782689068

p = 0.001111111111111

p = 0.00148

Ant 7 : [3, 4], 15

Exploration

avg = 0.000579147748387

p = 0.00111

Ant 1 : [1, 0, 4], 30

Exploration

avg = 0.000772133952244

p = 0.001

p = 0.00148146666667

Ant 8 : [4, 3], 15

Exploration

avg = 0.00077213761891

p = 0.001

p = 0.00148148133333

Ant 9 : [4, 3], 15

Exploitation

Ant 10 : [1, 0], 10

Exploitation

Ant 11 : [2, 3], 18

Exploitation

Ant 12 : [2, 3], 18

Exploration

avg = 0.000650376918757

p = 0.0011111111111111  
Ant 2 : [4, 3, 2], 33  
Exploration  
avg = 0.000975475622595  
p = 0.0022222222222222  
Ant 13 : [1, 0], 10  
Exploitation  
Ant 14 : [1, 0], 10  
Exploitation  
Ant 15 : [1, 0], 10  
Exploitation  
Ant 16 : [2, 3], 18  
Exploration  
avg = 0.000579514415054  
p = 0.00111111  
Ant 3 : [1, 0, 4], 30  
Exploration  
avg = 0.00088870491129  
p = 0.0012333333333333  
p = 0.001481466666667  
Ant 17 : [3, 4], 15  
Exploitation  
Ant 18 : [1, 0], 10  
Exploration  
avg = 0.000924701086154  
p = 0.00148148148  
Ant 0 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.000975475622601  
p = 0.0022222222222222  
Ant 19 : [1, 0], 10  
Exploration  
avg = 0.000691117659498  
p = 0.0012333333333333  
Ant 4 : [4, 3, 2], 33  
Exploration  
avg = 0.000535689714103  
p = 0.001  
Ant 5 : [3, 4, 0], 35  
Exploitation  
Ant 6 : [1, 0, 4], 30  
Exploitation  
Ant 7 : [3, 4, 0], 35  
Exploitation  
Ant 1 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.000691525066906  
p = 0.0012345555555556  
Ant 8 : [4, 3, 2], 33  
Exploitation  
Ant 9 : [4, 3, 2], 33  
Exploration  
avg = 0.000579518118387  
p = 0.0011111111111111

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Ant 10 : [1, 0, 4], 30
Exploration
avg = 0.000773833659498
p = 0.00148148133333
Ant 11 : [2, 3, 4], 33
Exploration
avg = 0.000773833708387
p = 0.00148148148
Ant 12 : [2, 3, 4], 33
Exploration
avg = 0.000613977754091
p = 0.000909090908182
Ant 2 : [4, 3, 2, 1], 55
Exploitation
Ant 13 : [1, 0, 4], 30
Exploitation
Ant 14 : [1, 0, 4], 30
Exploration
avg = 0.000579518118757
p = 0.00111111111111
Ant 15 : [1, 0, 4], 30
Exploration
avg = 0.000773833708876
p = 0.00148148148147
Ant 16 : [2, 3, 4], 33
Exploration
avg = 0.000924701086895
p = 0.00148148148148
Ant 3 : [1, 0, 4, 3], 45
Exploitation
Ant 17 : [3, 4, 0], 35
Exploitation
Ant 18 : [1, 0, 4], 30
Exploitation
Ant 0 : [1, 0, 4, 3, 2], 63
Update called by 0Exploitation

Ant thread 0 terminating.Ant 19 : [1, 0, 4], 30

Exploration
avg = 0.000663977754541
p = 0.00100909090908
Ant 4 : [4, 3, 2, 1], 55
Exploration
avg = 0.0011594323
p = 0.002
Ant 5 : [3, 4, 0, 1], 45
Exploration
avg = 0.000924701086895
p = 0.00148148148148
Ant 6 : [1, 0, 4, 3], 45
Exploitation
Ant 7 : [3, 4, 0, 1], 45
Exploration
```

avg = 0.00123456790122  
Ant 1 : [1, 0, 4, 3, 2], 63  
Update called by 1Exploitation

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

Exploitation  
Ant 9 : [4, 3, 2, 1], 55  
Exploration  
avg = 0.000924701086895  
p = 0.00148148148148  
Ant 10 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.000675129725  
p = 0.0011111111  
Ant 11 : [2, 3, 4, 0], 53  
Exploitation  
Ant 12 : [2, 3, 4, 0], 53  
Exploration  
avg = 0.00222222222222  
Ant 2 : [4, 3, 2, 1, 0], 65  
Update called by 2Exploration

Ant thread 2 terminating.avg = 0.000924701086895

p = 0.00148148148148  
Ant 13 : [1, 0, 4, 3], 45  
Exploitation  
Ant 14 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.000924701086895  
p = 0.00148148148148  
Ant 15 : [1, 0, 4, 3], 45  
Exploitation  
Ant 16 : [2, 3, 4, 0], 53  
Exploration  
avg = 0.00123456790123  
Ant 3 : [1, 0, 4, 3, 2], 63  
Update called by 3Exploration

Ant thread 3 terminating.avg = 0.0012705323

p = 0.00222222  
Ant 17 : [3, 4, 0, 1], 45  
Exploration  
avg = 0.000924701086895  
p = 0.00148148148148  
Ant 18 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.000924701086895  
p = 0.00148148148148  
Ant 19 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.00222222222222

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

Ant thread 4 terminating.Ant 5 : [3, 4, 0, 1, 2], 67  
ExplorationUpdate called by 5  
avg = 0.00123456790123Ant thread 5 terminating.

Ant 6 : [1, 0, 4, 3, 2], 63  
Update called by 6Exploration

Ant thread 6 terminating.avg = 0.00100909090818

Ant 7 : [3, 4, 0, 1, 2], 67  
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 : [4, 3, 2, 1, 0], 65  
Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [1, 0, 4, 3, 2], 63  
Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [2, 3, 4, 0, 1], 63  
ExplorationUpdate called by 11  
avg = 0.002222222222Ant thread 11 terminating.

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

Ant thread 12 terminating.avg = 0.00123456790123

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

Ant thread 13 terminating.Ant 14 : [1, 0, 4, 3, 2], 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 : [2, 3, 4, 0, 1], 63  
Update called by 16Exploration



Ant thread 16 terminating.avg = 0.00101009090908

Ant 17 : [3, 4, 0, 1, 2], 67  
Update called by 17Exploitation

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

Ant thread 18 terminating.avg = 0.00123456790123

Ant 19 : [1, 0, 4, 3, 2], 63  
Update called by 19  
Best: [1, 0, 4, 3, 2], 85, 9, 85  
Ant thread 19 terminating.iter\_counter = 10

starting ant = 0  
Exploitationstarting ant = 1

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

Explorationstarting ant = 3

avg = 0.000955655330795starting ant = 4

p = 0.00222starting ant = 5

Ant 1 : [1, 0], 10starting ant = 6

Explorationstarting ant = 7

avg = 0.000521566306882starting ant = 8

p = 0.001starting ant = 9

Ant 0 : [1, 0, 4], 30starting ant = 10

Exploitationstarting ant = 11

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

Exploitationstarting ant = 13

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

Exploitationstarting ant = 15

Ant 4 : [4, 3], 15starting ant = 16

Explorationstarting ant = 17

avg = 0.000800115531272starting ant = 18

p = 0.0011111111111111starting ant = 19

p = 0.0013333333333333

Ant 5 : [3, 4], 15

Exploration

avg = 0.000558232973548

p = 0.00111

Ant 1 : [1, 0, 4], 30

Exploitation

Ant 6 : [1, 0], 10

Exploitation

Ant 7 : [3, 4], 15

Exploration

avg = 0.000756957223686

p = 0.001

p = 0.00148146666667

Ant 8 : [4, 3], 15

Exploitation

Ant 9 : [4, 3], 15

Exploration

avg = 0.000906305051538

p = 0.00148148148

Ant 0 : [1, 0, 4, 3], 45

Exploitation

Ant 10 : [1, 0], 10

Exploitation

Ant 11 : [2, 3], 18

Exploitation

Ant 2 : [4, 3, 2], 33

Exploitation

Ant 12 : [2, 3], 18

Exploitation

Ant 13 : [1, 0], 10

Exploration

avg = 0.000558599640215

p = 0.0011111

Ant 3 : [1, 0, 4], 30

Exploitation

Ant 14 : [1, 0], 10

Exploitation

Ant 15 : [1, 0], 10

Exploitation

Ant 4 : [4, 3, 2], 33

Exploitation

Ant 16 : [2, 3], 18

Exploitation

Ant 17 : [3, 4], 15

Exploration

avg = 0.000956210886351

p = 0.00222222222222

Ant 18 : [1, 0], 10

Exploration

avg = 0.000956210886351

p = 0.00222222222222

Ant 19 : [1, 0], 10  
Exploitation  
Ant 5 : [3, 4, 0], 35  
Exploitation  
Ant 1 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.000558603306882  
p = 0.0011111111  
Ant 6 : [1, 0, 4], 30  
Exploitation  
Ant 7 : [3, 4, 0], 35  
Exploration  
avg = 0.000663524412067  
p = 0.00123455555556  
Ant 8 : [4, 3, 2], 33  
Exploration  
avg = 0.000663528486141  
p = 0.00123456777778  
Ant 9 : [4, 3, 2], 33  
Exploration  
avg = 0.0012345679  
Ant 0 : [1, 0, 4, 3, 2], 63  
Update called by 0Exploitation  
  
Ant thread 0 terminating.Ant 10 : [1, 0, 4], 30

Exploitation  
Ant 11 : [2, 3, 4], 33  
Exploration  
avg = 0.000598034524091  
p = 0.000909090908182  
Ant 2 : [4, 3, 2, 1], 55  
Exploration  
avg = 0.000745833053548  
p = 0.00148148148  
Ant 12 : [2, 3, 4], 33  
Exploitation  
Ant 13 : [1, 0, 4], 30  
Exploration  
avg = 0.000906305052279  
p = 0.00148148148148  
Ant 3 : [1, 0, 4, 3], 45  
Exploitation  
Ant 14 : [1, 0, 4], 30  
Exploration  
avg = 0.000558603343919  
p = 0.00111111111111  
Ant 15 : [1, 0, 4], 30  
Exploitation  
Ant 4 : [4, 3, 2, 1], 55  
Exploitation  
Ant 16 : [2, 3, 4], 33  
Exploitation  
Ant 17 : [3, 4, 0], 35

Exploration  
avg = 0.000558603343919  
p = 0.001111111111111  
Ant 18 : [1, 0, 4], 30  
Exploration  
avg = 0.000558603343919  
p = 0.001111111111111  
Ant 19 : [1, 0, 4], 30  
Exploitation  
Ant 5 : [3, 4, 0, 1], 45  
Exploration  
avg = 0.00123456790122  
Ant 1 : [1, 0, 4, 3, 2], 63  
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.000906305052279

p = 0.00148148148148  
Ant 6 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.00125348907  
p = 0.00222  
Ant 7 : [3, 4, 0, 1], 45  
Exploration  
avg = 0.000648534524545  
p = 0.00101009090909  
Ant 8 : [4, 3, 2, 1], 55  
Exploration  
avg = 0.000648539524545  
p = 0.00101010090909  
Ant 9 : [4, 3, 2, 1], 55  
Exploration  
avg = 0.000906305052279  
p = 0.00148148148148  
Ant 10 : [1, 0, 4, 3], 45  
Exploitation  
Ant 11 : [2, 3, 4, 0], 53  
Exploration  
avg = 0.00222222222222  
Ant 2 : [4, 3, 2, 1, 0], 65  
Update called by 2Exploration

Ant thread 2 terminating.avg = 0.0006631723575

p = 0.001111111111  
Ant 12 : [2, 3, 4, 0], 53  
Exploration  
avg = 0.000906305052279  
p = 0.00148148148148  
Ant 13 : [1, 0, 4, 3], 45  
Exploitation  
Ant 3 : [1, 0, 4, 3, 2], 63  
Update called by 3Exploitation

Ant thread 3 terminating.Ant 14 : [1, 0, 4, 3], 45

Exploitation

Ant 15 : [1, 0, 4, 3], 45

Exploration

avg = 0.002222222222222

Ant 4 : [4, 3, 2, 1, 0], 65

Update called by 4Exploration

Ant thread 4 terminating.avg = 0.00066317235805

p = 0.001111111111111

Ant 16 : [2, 3, 4, 0], 53

Exploration

avg = 0.00125458907

p = 0.0022222

Ant 17 : [3, 4, 0, 1], 45

Exploitation

Ant 18 : [1, 0, 4, 3], 45

Exploitation

Ant 19 : [1, 0, 4, 3], 45

Exploitation

Ant 5 : [3, 4, 0, 1, 2], 67

Update called by 5Exploration

Ant thread 5 terminating.avg = 0.00123456790123

Ant 6 : [1, 0, 4, 3, 2], 63

Update called by 6Exploitation

Ant thread 6 terminating.Ant 7 : [3, 4, 0, 1, 2], 67

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 = 0.002222222222222

Ant 9 : [4, 3, 2, 1, 0], 65

Update called by 9Exploration

Ant thread 9 terminating.avg = 0.00123456790123

Ant 10 : [1, 0, 4, 3, 2], 63

Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [2, 3, 4, 0, 1], 63

Update called by 11Exploration

Ant thread 11 terminating.avg = 0.00222222222

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

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

Ant thread 13 terminating.avg = 0.00123456790123

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

Ant thread 14 terminating.avg = 0.00123456790123

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

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

Ant thread 16 terminating.avg = 0.00101009090908

Ant 17 : [3, 4, 0, 1, 2], 67  
Update called by 17Exploitation

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

Ant thread 18 terminating.avg = 0.00123456790123

Ant 19 : [1, 0, 4, 3, 2], 63  
Update called by 19  
Best: [1, 0, 4, 3, 2], 85, 10, 85  
Ant thread 19 terminating.iter\_counter = 11

starting ant = 0  
Explorationstarting ant = 1

avg = 0.00088331706817starting ant = 2

p = 0.002starting ant = 3

p = 0.000909090818182starting ant = 4

Ant 0 : [1, 2], 22starting ant = 5

Explorationstarting ant = 6

avg = 0.00090831709067starting ant = 7

p = 0.002starting ant = 8

p = 0.00100909090818starting ant = 9  
Ant 1 : [1, 2], 22starting ant = 10  
Exploitationstarting ant = 11  
Ant 2 : [4, 3], 15starting ant = 12  
Exploitationstarting ant = 13  
Ant 3 : [1, 0], 10starting ant = 14  
Exploitationstarting ant = 15  
Ant 4 : [4, 3], 15starting ant = 16  
Exploitationstarting ant = 17  
Ant 0 : [1, 2, 3], 40starting ant = 18  
Exploitationstarting ant = 19  
  
Ant 5 : [3, 4], 15  
Exploitation  
Ant 6 : [1, 0], 10  
Exploitation  
Ant 7 : [3, 4], 15  
Exploitation  
Ant 8 : [4, 3], 15  
Exploration  
avg = 0.000743301834651  
p = 0.001  
p = 0.00148148133333  
Ant 9 : [4, 3], 15  
Exploration  
avg = 0.000596543139664  
p = 0.00123333333222  
Ant 1 : [1, 2, 3], 40  
Exploration  
avg = 0.000964117090895  
p = 0.0022222  
p = 0.00101009090908  
Ant 10 : [1, 2], 22  
Exploration  
avg = 0.000674985637624  
p = 0.000909090908182  
p = 0.0012345555554  
Ant 11 : [2, 3], 18  
Exploitation  
Ant 2 : [4, 3, 2], 33  
Exploration  
avg = 0.000674988693182  
p = 0.000909090908182  
p = 0.00123456777778

Ant 12 : [2, 3], 18  
Exploration  
avg = 0.000964119590898  
p = 0.0022222  
p = 0.00101010090909  
Ant 13 : [1, 2], 22  
Exploration  
avg = 0.000502743009527  
p = 0.001  
Ant 3 : [1, 0, 4], 30  
Exploitation  
Ant 14 : [1, 0], 10  
Exploitation  
Ant 15 : [1, 0], 10  
Exploration  
avg = 0.000637916415305  
p = 0.001233333333333  
Ant 4 : [4, 3, 2], 33  
Exploitation  
Ant 16 : [2, 3], 18  
Exploitation  
Ant 17 : [3, 4], 15  
Exploitation  
Ant 0 : [1, 2, 3, 4], 55  
Exploitation  
Ant 18 : [1, 0], 10  
Exploitation  
Ant 19 : [1, 0], 10  
Exploration  
avg = 0.000497242001756  
p = 0.001  
Ant 5 : [3, 4, 0], 35  
Exploration  
avg = 0.000539409676194  
p = 0.00111  
Ant 6 : [1, 0, 4], 30  
Exploitation  
Ant 7 : [3, 4, 0], 35  
Exploitation  
Ant 8 : [4, 3, 2], 33  
Exploration  
avg = 0.000638327896786  
p = 0.00123456777778  
Ant 9 : [4, 3, 2], 33  
Exploration  
avg = 0.00086571509129  
p = 0.00148148148  
Ant 1 : [1, 2, 3, 4], 55  
Exploration  
avg = 0.000596954662664  
p = 0.00123456790122  
Ant 10 : [1, 2, 3], 40  
Exploration  
avg = 0.000720632464682



p = 0.00148148148147  
Ant 11 : [2, 3, 4], 33  
Exploitation  
Ant 2 : [4, 3, 2, 1], 55  
Exploration  
avg = 0.000720632464687  
p = 0.00148148148148  
Ant 12 : [2, 3, 4], 33  
Exploration  
avg = 0.000596954662668  
p = 0.00123456790123  
Ant 13 : [1, 2, 3], 40  
Exploitation  
Ant 3 : [1, 0, 4, 3], 45  
Exploitation  
Ant 14 : [1, 0, 4], 30  
Exploitation  
Ant 15 : [1, 0, 4], 30  
Exploitation  
Ant 4 : [4, 3, 2, 1], 55  
Exploration  
avg = 0.000720632464687  
p = 0.00148148148148  
Ant 16 : [2, 3, 4], 33  
Exploration  
avg = 0.00053427533509  
p = 0.00111111  
Ant 17 : [3, 4, 0], 35  
Exploration  
avg = 0.001111111  
Ant 0 : [1, 2, 3, 4, 0], 75  
Update called by 0Exploitation

Ant thread 0 terminating.Ant 18 : [1, 0, 4], 30

Exploitation  
Ant 19 : [1, 0, 4], 30  
Exploration  
avg = 0.001129140163  
p = 0.002  
Ant 5 : [3, 4, 0, 1], 45  
Exploration  
avg = 0.000889748621118  
p = 0.00148148148147  
Ant 6 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.001239140163  
p = 0.00222  
Ant 7 : [3, 4, 0, 1], 45  
Exploitation  
Ant 8 : [4, 3, 2, 1], 55  
Exploitation  
Ant 9 : [4, 3, 2, 1], 55  
Exploration

```
avg = 0.001111111111
Ant 1 : [1, 2, 3, 4, 0], 75
Update called by 1Exploitation

Ant thread 1 terminating.Ant 10 : [1, 2, 3, 4], 55

Exploitation
Ant 11 : [2, 3, 4, 0], 53
Exploration
avg = 0.00222222222222
Ant 2 : [4, 3, 2, 1, 0], 65
Update called by 2Exploitation

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

Exploration
avg = 0.000865715092031
p = 0.00148148148148
Ant 13 : [1, 2, 3, 4], 55
Exploration
avg = 0.0012345679
Ant 3 : [1, 0, 4, 3, 2], 63
Update called by 3Exploitation

Ant thread 3 terminating.Ant 14 : [1, 0, 4, 3], 45

Exploitation
Ant 15 : [1, 0, 4, 3], 45
Exploitation
Ant 4 : [4, 3, 2, 1, 0], 65
Update called by 4Exploration

Ant thread 4 terminating.avg = 0.000652410677806

p = 0.00111111111111
Ant 16 : [2, 3, 4, 0], 53
Exploration
avg = 0.001240240163
p = 0.0022222
Ant 17 : [3, 4, 0, 1], 45
Exploration
avg = 0.000889748621125
p = 0.00148148148148
Ant 18 : [1, 0, 4, 3], 45
Exploration
avg = 0.000889748621125
p = 0.00148148148148
Ant 19 : [1, 0, 4, 3], 45
Exploration
avg = 0.00101010100909
Ant 5 : [3, 4, 0, 1, 2], 67
Update called by 5Exploration

Ant thread 5 terminating.avg = 0.00123456790122
```

Ant 6 : [1, 0, 4, 3, 2], 63  
Update called by 6Exploration

Ant thread 6 terminating.avg = 0.00101010101009

Ant 7 : [3, 4, 0, 1, 2], 67  
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 = 0.00222222222222

Ant 9 : [4, 3, 2, 1, 0], 65  
Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [1, 2, 3, 4, 0], 75

Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [2, 3, 4, 0, 1], 63

Update called by 11Exploitation

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

Update called by 12Exploration

Ant thread 12 terminating.avg = 0.00111111111111

Ant 13 : [1, 2, 3, 4, 0], 75  
Update called by 13Exploitation

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

Update called by 14Exploitation

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

Update called by 15Exploration

Ant thread 15 terminating.avg = 0.00222222222222

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

Ant thread 16 terminating.avg = 0.0010101010101

Ant 17 : [3, 4, 0, 1, 2], 67  
Update called by 17Exploitation

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

Update called by 18Exploitation

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

Update called by 19

Best: [1, 0, 4, 3, 2], 85, 11, 85

Ant thread 19 terminating.iter\_counter = 12

starting ant = 0

Explorationstarting ant = 1

avg = 0.000867712654535starting ant = 2

p = 0.002starting ant = 3

p = 0.0009090909091starting ant = 4

Ant 0 : [1, 2], 22starting ant = 5

Explorationstarting ant = 6

avg = 0.000892712654535starting ant = 7

p = 0.002starting ant = 8

p = 0.00100909090909starting ant = 9

Ant 1 : [1, 2], 22starting ant = 10

Exploitationstarting ant = 11

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

Exploitationstarting ant = 13

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

Exploitationstarting ant = 15

Ant 4 : [4, 3], 15starting ant = 16

Exploitationstarting ant = 17

Ant 0 : [1, 2, 3], 40starting ant = 18

Exploitationstarting ant = 19

Ant 5 : [3, 4], 15

Exploitation

Ant 6 : [1, 0], 10

Exploitation

Ant 7 : [3, 4], 15

Exploration

avg = 0.000731005017852  
p = 0.001  
p = 0.00148146666667  
Ant 8 : [4, 3], 15  
Exploration  
avg = 0.000731008684519  
p = 0.001  
p = 0.00148148133333  
Ant 9 : [4, 3], 15  
Exploitation  
Ant 1 : [1, 2, 3], 40  
Exploitation  
Ant 10 : [1, 0], 10  
Exploitation  
Ant 11 : [2, 3], 18  
Exploitation  
Ant 2 : [4, 3, 2], 33  
Exploration  
avg = 0.000661081291013  
p = 0.000909090908182  
p = 0.00123456777778  
Ant 12 : [2, 3], 18  
Exploration  
avg = 0.000948518154535  
p = 0.002222222  
p = 0.00101009090909  
Ant 13 : [1, 2], 22  
Exploration  
avg = 0.000485802041907  
p = 0.001  
Ant 3 : [1, 0, 4], 30  
Exploitation  
Ant 14 : [1, 0], 10  
Exploitation  
Ant 15 : [1, 0], 10  
Exploitation  
Ant 4 : [4, 3, 2], 33  
Exploration  
avg = 0.000661081321569  
p = 0.000909090908182  
p = 0.0012345679  
Ant 16 : [2, 3], 18  
Exploitation  
Ant 17 : [3, 4], 15  
Exploration  
avg = 0.000853217582828  
p = 0.00148148133333  
Ant 0 : [1, 2, 3, 4], 55  
Exploitation  
Ant 18 : [1, 0], 10  
Exploitation  
Ant 19 : [1, 0], 10  
Exploration  
avg = 0.000480851134914

p = 0.001  
Ant 5 : [3, 4, 0], 35  
Exploration  
avg = 0.000522468708574  
p = 0.00111  
Ant 6 : [1, 0, 4], 30  
Exploration  
avg = 0.000517517801581  
p = 0.00111  
Ant 7 : [3, 4, 0], 35  
Exploration  
avg = 0.000615643292293  
p = 0.00123455555556  
Ant 8 : [4, 3, 2], 33  
Exploration  
avg = 0.000615647366367  
p = 0.00123456777778  
Ant 9 : [4, 3, 2], 33  
Exploitation  
Ant 1 : [1, 2, 3, 4], 55  
Exploration  
avg = 0.000522835375241  
p = 0.00111111  
Ant 10 : [1, 0, 4], 30  
Exploitation  
Ant 11 : [2, 3, 4], 33  
Exploration  
avg = 0.000570771600791  
p = 0.000909090908182  
Ant 2 : [4, 3, 2, 1], 55  
Exploration  
avg = 0.000697951934268  
p = 0.00148148148148  
Ant 12 : [2, 3, 4], 33  
Exploration  
avg = 0.000578411459772  
p = 0.00123456790122  
Ant 13 : [1, 2, 3], 40  
Exploration  
avg = 0.000874847832346  
p = 0.00148148148  
Ant 3 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.000522839041908  
p = 0.0011111111  
Ant 14 : [1, 0, 4], 30  
Exploration  
avg = 0.000522839078574  
p = 0.001111111111  
Ant 15 : [1, 0, 4], 30  
Exploitation  
Ant 4 : [4, 3, 2, 1], 55  
Exploration  
avg = 0.000697951934268

p = 0.00148148148148  
Ant 16 : [2, 3, 4], 33  
Exploration  
avg = 0.000517884468247  
p = 0.00111111  
Ant 17 : [3, 4, 0], 35  
Exploitation  
Ant 0 : [1, 2, 3, 4, 0], 75  
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.000522839078941

p = 0.00111111111111  
Ant 18 : [1, 0, 4], 30  
Exploration  
avg = 0.000522839078945  
p = 0.00111111111111  
Ant 19 : [1, 0, 4], 30  
Exploration  
avg = 0.0011162261467  
p = 0.002  
Ant 5 : [3, 4, 0, 1], 45  
Exploration  
avg = 0.000874847833079  
p = 0.00148148148147  
Ant 6 : [1, 0, 4, 3], 45  
Exploration  
avg = 0.0012262261467  
p = 0.00222  
Ant 7 : [3, 4, 0, 1], 45  
Exploitation  
Ant 8 : [4, 3, 2, 1], 55  
Exploration  
avg = 0.000621276601245  
p = 0.00101010090909  
Ant 9 : [4, 3, 2, 1], 55  
Exploration  
avg = 0.001111111111  
Ant 1 : [1, 2, 3, 4, 0], 75  
Update called by 1Exploitation

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

Exploration  
avg = 0.000642725165575  
p = 0.00111111111111  
Ant 11 : [2, 3, 4, 0], 53  
Exploitation  
Ant 2 : [4, 3, 2, 1, 0], 65  
Update called by 2Exploitation

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

Exploration

avg = 0.000853217656902  
p = 0.00148148148148  
Ant 13 : [1, 2, 3, 4], 55

Exploration

avg = 0.0012345679  
Ant 3 : [1, 0, 4, 3, 2], 63  
Update called by 3Exploitation

Ant thread 3 terminating.Ant 14 : [1, 0, 4, 3], 45

Exploration

avg = 0.000874847833087  
p = 0.00148148148148  
Ant 15 : [1, 0, 4, 3], 45

Exploration

avg = 0.00222222222222  
Ant 4 : [4, 3, 2, 1, 0], 65  
Update called by 4Exploration

Ant thread 4 terminating.avg = 0.000642725165581

p = 0.00111111111111  
Ant 16 : [2, 3, 4, 0], 53

Exploitation

Ant 17 : [3, 4, 0, 1], 45

Exploitation

Ant 18 : [1, 0, 4, 3], 45

Exploitation

Ant 19 : [1, 0, 4, 3], 45

Exploitation

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

Ant thread 5 terminating.Ant 6 : [1, 0, 4, 3, 2], 63

Update called by 6Exploitation

Ant thread 6 terminating.Ant 7 : [3, 4, 0, 1, 2], 67

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 = 0.00222222222222

Ant 9 : [4, 3, 2, 1, 0], 65  
Update called by 9Exploration

Ant thread 9 terminating.avg = 0.00123456790123

Ant 10 : [1, 0, 4, 3, 2], 63  
Update called by 10Exploitation



Ant thread 10 terminating.Ant 11 : [2, 3, 4, 0, 1], 63

Update called by 11Exploration

Ant thread 11 terminating.avg = 0.002222222222

Ant 12 : [2, 3, 4, 0, 1], 63

Update called by 12Exploration

Ant thread 12 terminating.avg = 0.001111111111111

Ant 13 : [1, 2, 3, 4, 0], 75

Update called by 13Exploration

Ant thread 13 terminating.avg = 0.00123456790123

Ant 14 : [1, 0, 4, 3, 2], 63

Update called by 14Exploration

Ant thread 14 terminating.avg = 0.00123456790123

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

Update called by 15Exploration

Ant thread 15 terminating.avg = 0.00222222222222

Ant 16 : [2, 3, 4, 0, 1], 63

Update called by 16Exploration

Ant thread 16 terminating.avg = 0.00101010101009

Ant 17 : [3, 4, 0, 1, 2], 67

Update called by 17Exploration

Ant thread 17 terminating.avg = 0.00123456790123

Ant 18 : [1, 0, 4, 3, 2], 63

Update called by 18Exploration

Ant thread 18 terminating.avg = 0.00123456790123

Ant 19 : [1, 0, 4, 3, 2], 63

Update called by 19

Best: [1, 0, 4, 3, 2], 85, 12, 85

Ant thread 19 terminating.

-----  
Results  
-----

Best path = [1, 0, 4, 3, 2]

('B ',)

('A ',)

```
('E ',)  
('D ',)  
('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], [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 : [3, 1], 18starting ant = 2

Exploitationstarting ant = 3

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

Exploitationstarting ant = 5

Ant 0 : [3, 1, 0], 28starting ant = 6

Explorationstarting ant = 7

avg = 0.00209385521886starting ant = 8

p = 0.003125starting ant = 9

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

Explorationstarting ant = 11

avg = 0.00209385521886starting ant = 12

p = 0.003125starting ant = 13

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

Exploitationstarting ant = 15

Ant 1 : [0, 1, 3], 28starting ant = 16

Exploitationstarting ant = 17

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

Exploitationstarting ant = 19

Ant 5 : [3, 1], 18

Exploitation

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

Update called by 0Exploration

Ant thread 0 terminating.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 = 0.00172491039427

p = 0.003125

Ant 8 : [0, 1], 10

Exploration

avg = 0.00149342891278

p = 0.00173611111111

p = 0.00173611111111

Ant 9 : [3, 2], 18

Exploitation

Ant 2 : [1, 0, 2], 40

Exploitation

Ant 10 : [0, 1], 10

Exploitation

Ant 11 : [1, 0], 10

Exploration

avg = 0.00209385521886

p = 0.003125

Ant 12 : [1, 0], 10

Exploitation

Ant 13 : [2, 3], 18

Exploration

avg = 0.0010248655914

p = 0.00104166666667

Ant 3 : [1, 0, 2], 40

Exploration

avg = 0.00209385521886

p = 0.003125

Ant 14 : [1, 0], 10

Exploration

avg = 0.00172491039427

p = 0.003125

Ant 15 : [0, 1], 10

Exploitation

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

Update called by 1Exploration

Ant thread 1 terminating.avg = 0.00209385521886

p = 0.003125  
Ant 16 : [1, 0], 10  
Exploitation  
Ant 17 : [3, 1], 18  
Exploration  
avg = 0.00157828282828  
p = 0.00173611111111  
Ant 4 : [0, 1, 3], 28  
Exploitation  
Ant 18 : [3, 1], 18  
Exploration  
avg = 0.00139941077441  
p = 0.00142045454545  
p = 0.00173611111111  
Ant 19 : [2, 3], 18  
Exploitation  
Ant 5 : [3, 1, 0], 28  
Exploration  
avg = 0.0010248655914  
p = 0.00104166666667  
Ant 6 : [1, 0, 2], 40  
Exploitation  
Ant 7 : [0, 1, 3], 28  
Exploration  
avg = 0.00157828282828  
p = 0.00173611111111  
Ant 8 : [0, 1, 3], 28  
Exploration  
avg = 0.00123106060606  
p = 0.00142045454545  
Ant 9 : [3, 2, 1], 40  
Exploration  
avg = 0.00173611111111  
Ant 2 : [1, 0, 2, 3], 58  
Update called by 2Exploration

Ant thread 2 terminating.avg = 0.00157828282828

p = 0.00173611111111  
Ant 10 : [0, 1, 3], 28  
Exploration  
avg = 0.0010248655914  
p = 0.00104166666667  
Ant 11 : [1, 0, 2], 40  
Exploitation  
Ant 12 : [1, 0, 2], 40  
Exploration  
avg = 0.00137208781362  
p = 0.00173611111111  
Ant 13 : [2, 3, 1], 36

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

Ant thread 3 terminating.avg = 0.0010248655914

p = 0.00104166666667  
Ant 14 : [1, 0, 2], 40  
Exploration  
avg = 0.00157828282828  
p = 0.00173611111111  
Ant 15 : [0, 1, 3], 28  
Exploration  
avg = 0.0010248655914  
p = 0.00104166666667  
Ant 16 : [1, 0, 2], 40  
Exploration  
avg = 0.00227272727273  
p = 0.003125  
Ant 17 : [3, 1, 0], 28  
Exploration  
avg = 0.00173611111111  
Ant 4 : [0, 1, 3, 2], 46  
Update called by 4Exploitation

Ant thread 4 terminating.Ant 18 : [3, 1, 0], 28

Exploration  
avg = 0.00137208781362  
p = 0.00173611111111  
Ant 19 : [2, 3, 1], 36  
Exploitation  
Ant 5 : [3, 1, 0, 2], 58  
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 = 0.00173611111111

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

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

Update called by 8Exploitation

Ant thread 8 terminating.Ant 9 : [3, 2, 1, 0], 50

Update called by 9Exploration

Ant thread 9 terminating.avg = 0.00173611111111

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

Ant thread 10 terminating.avg = 0.001736111111111

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

Ant thread 11 terminating.Ant 12 : [1, 0, 2, 3], 58  
Update called by 12Exploitation

Ant thread 12 terminating.Ant 13 : [2, 3, 1, 0], 46  
Update called by 13Exploration

Ant thread 13 terminating.avg = 0.001736111111111

Ant 14 : [1, 0, 2, 3], 58  
Update called by 14Exploration

Ant thread 14 terminating.avg = 0.001736111111111

Ant 15 : [0, 1, 3, 2], 46  
Update called by 15Exploration

Ant thread 15 terminating.avg = 0.001736111111111

Ant 16 : [1, 0, 2, 3], 58  
Update called by 16Exploration

Ant thread 16 terminating.avg = 0.001041666666667

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

Ant thread 17 terminating.avg = 0.001041666666667

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

avg = 0.003125Ant thread 18 terminating.

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

starting ant = 0  
Explorationstarting ant = 1

avg = 0.00134408602151starting ant = 2

p = 0.0015625starting ant = 3  
p = 0.0015625starting ant = 4  
Ant 0 : [3, 2], 18starting ant = 5  
Explorationstarting ant = 6  
avg = 0.00155241935484starting ant = 7  
p = 0.0028125starting ant = 8  
Ant 1 : [0, 1], 10starting ant = 9  
Explorationstarting ant = 10  
avg = 0.00188446969697starting ant = 11  
p = 0.0028125starting ant = 12  
Ant 2 : [1, 0], 10starting ant = 13  
Explorationstarting ant = 14  
avg = 0.00198759469697starting ant = 15  
p = 0.003121875starting ant = 16  
Ant 3 : [1, 0], 10starting ant = 17  
Exploitationstarting ant = 18  
Ant 4 : [0, 1], 10starting ant = 19  
  
Exploitation  
Ant 0 : [3, 2, 1], 40  
Exploitation  
Ant 5 : [3, 2], 18  
Exploration  
avg = 0.00198862594697  
p = 0.00312496875  
Ant 6 : [1, 0], 10  
Exploration  
avg = 0.00165657560484  
p = 0.00312496875  
Ant 7 : [0, 1], 10  
Exploitation  
Ant 8 : [0, 1], 10  
Exploration  
avg = 0.00142045454545  
p = 0.0015625  
Ant 1 : [0, 1, 3], 28  
Exploration  
avg = 0.00140195060484

p = 0.0015625  
p = 0.00173609375  
Ant 9 : [3, 2], 18  
Exploration  
avg = 0.00165658602046  
p = 0.00312499999688  
Ant 10 : [0, 1], 10  
Exploitation  
Ant 11 : [1, 0], 10  
Exploration  
avg = 0.00204592802926  
p = 0.00312499999688  
Ant 12 : [1, 0], 10  
Exploration  
avg = 0.000922379032258  
p = 0.0009375  
Ant 2 : [1, 0, 2], 40  
Exploration  
avg = 0.00130634469697  
p = 0.00141903409091  
p = 0.0015625  
Ant 13 : [2, 3], 18  
Exploitation  
Ant 14 : [1, 0], 10  
Exploration  
avg = 0.00169096102149  
p = 0.00312499999997  
Ant 15 : [0, 1], 10  
Exploration  
avg = 0.0020459280303  
p = 0.003125  
Ant 16 : [1, 0], 10  
Exploration  
avg = 0.000973941532258  
p = 0.001040625  
Ant 3 : [1, 0, 2], 40  
Exploration  
avg = 0.00140195633401  
p = 0.0015625  
p = 0.0017361109375  
Ant 17 : [3, 2], 18  
Exploration  
avg = 0.0014019563913  
p = 0.0015625  
p = 0.00173611110937  
Ant 18 : [3, 2], 18  
Exploration  
avg = 0.00150639204545  
p = 0.001734375  
Ant 4 : [0, 1, 3], 28  
Exploration  
avg = 0.00136363636364  
p = 0.00141903409091  
p = 0.001734375



Ant 19 : [2, 3], 18  
Exploitation  
Ant 0 : [3, 2, 1, 0], 50  
Update called by 0Exploitation

Ant thread 0 terminating.Ant 5 : [3, 2, 1], 40

Exploitation  
Ant 6 : [1, 0, 2], 40  
Exploitation  
Ant 7 : [0, 1, 3], 28  
Exploitation  
Ant 8 : [0, 1, 3], 28  
Exploitation  
Ant 1 : [0, 1, 3, 2], 46  
Update called by 1Exploitation

Ant thread 1 terminating.Ant 9 : [3, 2, 1], 40

Exploration  
avg = 0.00150726010014  
p = 0.00173611110937  
Ant 10 : [0, 1, 3], 28  
Exploration  
avg = 0.000974462313508  
p = 0.0010416665625  
Ant 11 : [1, 0, 2], 40  
Exploitation  
Ant 12 : [1, 0, 2], 40  
Exploration  
avg = 0.00173609375  
Ant 2 : [1, 0, 2, 3], 58  
Update called by 2Exploration

Ant thread 2 terminating.avg = 0.00123487903226

p = 0.0015625  
Ant 13 : [2, 3, 1], 36  
Exploitation  
Ant 14 : [1, 0, 2], 40  
Exploitation  
Ant 15 : [0, 1, 3], 28  
Exploration  
avg = 0.000974462365591  
p = 0.00104166666667  
Ant 16 : [1, 0, 2], 40  
Exploitation  
Ant 3 : [1, 0, 2, 3], 58  
Update called by 3Exploration

Ant thread 3 terminating.avg = 0.0011789772017

p = 0.00142045440341  
Ant 17 : [3, 2, 1], 40

Exploration  
avg = 0.00117897727202  
p = 0.00142045454403  
Ant 18 : [3, 2, 1], 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 = 0.003125  
Ant 5 : [3, 2, 1, 0], 50  
Update called by 5Exploration  
  
Ant thread 5 terminating.avg = 0.00173611110937  
  
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 : [0, 1, 3, 2], 46  
  
Update called by 8Exploration  
  
Ant thread 8 terminating.avg = 0.003125  
  
Ant 9 : [3, 2, 1, 0], 50  
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  
  
Update called by 11Exploitation  
  
Ant thread 11 terminating.Ant 12 : [1, 0, 2, 3], 58  
  
Update called by 12Exploration  
  
Ant thread 12 terminating.avg = 0.003125  
  
Ant 13 : [2, 3, 1, 0], 46  
Update called by 13Exploration  
  
Ant thread 13 terminating.avg = 0.00173611111111  
  
Ant 14 : [1, 0, 2, 3], 58  
Update called by 14Exploration

Ant thread 14 terminating.avg = 0.0017361111111111

Ant 15 : [0, 1, 3, 2], 46  
Update called by 15Exploration

Ant thread 15 terminating.avg = 0.0017361111111111

Ant 16 : [1, 0, 2, 3], 58  
Update called by 16Exploration

Ant thread 16 terminating.avg = 0.003125

Ant 17 : [3, 2, 1, 0], 50  
Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [3, 2, 1, 0], 50  
Update called by 18Exploration

Ant thread 18 terminating.avg = 0.003125

Ant 19 : [2, 3, 1, 0], 46  
Update called by 19  
Best: [3, 1, 0, 2], 76, 2, 77  
Ant thread 19 terminating.iter\_counter = 3

starting ant = 0  
Exploitationstarting ant = 1

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

Explorationstarting ant = 3

avg = 0.00152217741935starting ant = 4

p = 0.0028125starting ant = 5

Ant 1 : [0, 1], 10starting ant = 6

Exploitationstarting ant = 7

Ant 0 : [3, 2, 1], 40starting ant = 8

Explorationstarting ant = 9

avg = 0.00184185606061starting ant = 10

p = 0.0028125starting ant = 11

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

Explorationstarting ant = 13

avg = 0.00194498106061starting ant = 14

p = 0.003121875starting ant = 15

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

Explorationstarting ant = 17

avg = 0.00162530241935starting ant = 18

p = 0.003121875starting ant = 19

Ant 4 : [0, 1], 10  
Exploitation

Ant 5 : [3, 2], 18  
Exploitation

Ant 1 : [0, 1, 3], 28  
Exploration

avg = 0.00200330397727  
p = 0.00312496875

Ant 6 : [1, 0], 10  
Exploration

avg = 0.00162633366935  
p = 0.00312496875

Ant 7 : [0, 1], 10  
Exploration

avg = 0.0031249996875  
Ant 0 : [3, 2, 1, 0], 50  
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.00162634398185

p = 0.0031249996875

Ant 8 : [0, 1], 10  
Exploitation

Ant 9 : [3, 2], 18  
Exploitation

Ant 10 : [0, 1], 10  
Exploitation

Ant 11 : [1, 0], 10  
Exploration

avg = 0.000877016129032  
p = 0.0009375

Ant 2 : [1, 0, 2], 40  
Exploitation

Ant 12 : [1, 0], 10  
Exploration

avg = 0.00127509469697  
p = 0.00141903409091

p = 0.0015625

Ant 13 : [2, 3], 18  
Exploration

avg = 0.00200331439394  
p = 0.003125

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Ant 14 : [1, 0], 10
Exploration
avg = 0.00166071908601
p = 0.003124999999997
Ant 15 : [0, 1], 10
Exploration
avg = 0.000928578629032
p = 0.001040625
Ant 3 : [1, 0, 2], 40
Exploitation
Ant 16 : [1, 0], 10
Exploitation
Ant 17 : [3, 2], 18
Exploration
avg = 0.00137170924748
p = 0.001562484375
p = 0.00173611110937
Ant 18 : [3, 2], 18
Exploration
avg = 0.00133238636364
p = 0.00141903409091
p = 0.001734375
Ant 19 : [2, 3], 18
Exploration
avg = 0.00144247159091
p = 0.001734375
Ant 4 : [0, 1, 3], 28
Exploitation
Ant 5 : [3, 2, 1], 40
Exploration
avg = 0.00173611111109
Ant 1 : [0, 1, 3, 2], 46
Update called by 1Exploitation

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

Exploration
avg = 0.00144333096591
p = 0.00173609375
Ant 7 : [0, 1, 3], 28
Exploitation
Ant 8 : [0, 1, 3], 28
Exploration
avg = 0.00113209517045
p = 0.00142044034091
Ant 9 : [3, 2, 1], 40
Exploration
avg = 0.0014433396456
p = 0.00173611110937
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 = 0.000929099461845

p = 0.00104166666563  
Ant 12 : [1, 0, 2], 40  
Exploitation  
Ant 13 : [2, 3, 1], 36  
Exploitation  
Ant 14 : [1, 0, 2], 40  
Exploration  
avg = 0.00144333964646  
p = 0.00173611111109  
Ant 15 : [0, 1, 3], 28  
Exploration  
avg = 0.0017361109375  
Ant 3 : [1, 0, 2, 3], 58  
Update called by 3Exploitation

Ant thread 3 terminating.Ant 16 : [1, 0, 2], 40

Exploitation  
Ant 17 : [3, 2, 1], 40  
Exploration  
avg = 0.00113210227202  
p = 0.00142045454403  
Ant 18 : [3, 2, 1], 40  
Exploration  
avg = 0.00127545355091  
p = 0.00173437484375  
Ant 19 : [2, 3, 1], 36  
Exploration  
avg = 0.00173611111111  
Ant 4 : [0, 1, 3, 2], 46  
Update called by 4Exploitation

Ant thread 4 terminating.Ant 5 : [3, 2, 1, 0], 50

Update called by 5Exploitation

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

Update called by 6Exploration

Ant thread 6 terminating.avg = 0.00173611111111

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

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

Update called by 8Exploitation

Ant thread 8 terminating.Ant 9 : [3, 2, 1, 0], 50

Update called by 9Exploration

Ant thread 9 terminating.avg = 0.00173611111111

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 = 0.00173611111111

Ant 12 : [1, 0, 2, 3], 58

Update called by 12Exploration

Ant thread 12 terminating.avg = 0.003125

Ant 13 : [2, 3, 1, 0], 46

Update called by 13Exploration

Ant thread 13 terminating.avg = 0.00173611111111

Ant 14 : [1, 0, 2, 3], 58

Update called by 14Exploration

Ant thread 14 terminating.avg = 0.00173611111111

Ant 15 : [0, 1, 3, 2], 46

Update called by 15Exploration

Ant thread 15 terminating.avg = 0.00173611111111

Ant 16 : [1, 0, 2, 3], 58

Update called by 16Exploration

Ant thread 16 terminating.avg = 0.003125

Ant 17 : [3, 2, 1, 0], 50

Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [3, 2, 1, 0], 50

Update called by 18Exploration

Ant thread 18 terminating.avg = 0.003125

Ant 19 : [2, 3, 1, 0], 46

Update called by 19

Best: [3, 1, 0, 2], 76, 3, 77

Ant thread 19 terminating.iter\_counter = 4

starting ant = 0

Explorationstarting ant = 1  
avg = 0.00128662113528starting ant = 2  
p = 0.00156248437359starting ant = 3  
p = 0.0015625starting ant = 4  
Ant 0 : [3, 2], 18starting ant = 5  
Exploitationstarting ant = 6  
Ant 1 : [0, 1], 10starting ant = 7  
Exploitationstarting ant = 8  
Ant 2 : [1, 0], 10starting ant = 9  
Exploitationstarting ant = 10  
Ant 3 : [1, 0], 10starting ant = 11  
Explorationstarting ant = 12  
avg = 0.00159808467742starting ant = 13  
p = 0.003121875starting ant = 14  
Ant 4 : [0, 1], 10starting ant = 15  
Explorationstarting ant = 16  
avg = 0.00101889204545starting ant = 17  
p = 0.0012784090909starting ant = 18  
Ant 0 : [3, 2, 1], 40starting ant = 19  
  
Exploitation  
Ant 5 : [3, 2], 18  
Exploration  
avg = 0.00190766003788  
p = 0.00312496875  
Ant 6 : [1, 0], 10  
Exploration  
avg = 0.00129900568182  
p = 0.0015625  
Ant 1 : [0, 1, 3], 28  
Exploration  
avg = 0.00159911592742  
p = 0.00312496875  
Ant 7 : [0, 1], 10  
Exploration  
avg = 0.00159912623992



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p = 0.0031249996875
Ant 8 : [0, 1], 10
Exploration
avg = 0.000836189516129
p = 0.0009375
Ant 2 : [1, 0, 2], 40
Exploration
avg = 0.00134448571862
p = 0.00156248437359
p = 0.00173609375
Ant 9 : [3, 2], 18
Exploration
avg = 0.00163350134304
p = 0.00312499999688
Ant 10 : [0, 1], 10
Exploitation
Ant 3 : [1, 0, 2], 40
Exploitation
Ant 11 : [1, 0], 10
Exploitation
Ant 12 : [1, 0], 10
Exploitation
Ant 13 : [2, 3], 18
Exploitation
Ant 14 : [1, 0], 10
Exploration
avg = 0.00138494318182
p = 0.001734375
Ant 4 : [0, 1, 3], 28
Exploitation
Ant 15 : [0, 1], 10
Exploration
avg = 0.00196553503788
p = 0.003125
Ant 16 : [1, 0], 10
Exploitation
Ant 17 : [3, 2], 18
Exploration
avg = 0.00134449150508
p = 0.00156248437359
p = 0.00173611110937
Ant 18 : [3, 2], 18
Exploration
avg = 0.003125
Ant 0 : [3, 2, 1, 0], 50
Update called by 0Exploitation

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

Exploitation
Ant 5 : [3, 2, 1], 40
Exploration
avg = 0.000888267641129
p = 0.00104165625
```

Ant 6 : [1, 0, 2], 40

Exploitation

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

Update called by 1Exploitation

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

Exploration

avg = 0.00138581115057

p = 0.0017361109375

Ant 8 : [0, 1, 3], 28

Exploration

avg = 0.00173609375

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

Update called by 2Exploitation

Ant thread 2 terminating.Ant 9 : [3, 2, 1], 40

Exploitation

Ant 10 : [0, 1, 3], 28

Exploration

avg = 0.0017361109375

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

Update called by 3Exploration

Ant thread 3 terminating.avg = 0.000888272797379

p = 0.0010416665625

Ant 11 : [1, 0, 2], 40

Exploration

avg = 0.000888272848942

p = 0.00104166666563

Ant 12 : [1, 0, 2], 40

Exploration

avg = 0.00114868170293

p = 0.00156248437359

Ant 13 : [2, 3, 1], 36

Exploitation

Ant 14 : [1, 0, 2], 40

Exploration

avg = 0.00173611111111

Ant 4 : [0, 1, 3, 2], 46

Update called by 4Exploration

Ant thread 4 terminating.avg = 0.00138581123737

p = 0.00173611111109

Ant 15 : [0, 1, 3], 28

Exploration

avg = 0.000888272849462

p = 0.00104166666667

Ant 16 : [1, 0, 2], 40

Exploitation

Ant 17 : [3, 2, 1], 40

Exploration  
avg = 0.00108991477202  
p = 0.00142045454403  
Ant 18 : [3, 2, 1], 40  
Exploitation  
Ant 19 : [2, 3, 1], 36  
Exploitation  
Ant 5 : [3, 2, 1, 0], 50  
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 : [0, 1, 3, 2], 46  
  
Update called by 8Exploration  
  
Ant thread 8 terminating.avg = 0.003125  
  
Ant 9 : [3, 2, 1, 0], 50  
Update called by 9Exploitation  
  
Ant thread 9 terminating.Ant 10 : [0, 1, 3, 2], 46  
  
Update called by 10Exploration  
  
Ant thread 10 terminating.avg = 0.00173611111109  
  
Ant 11 : [1, 0, 2, 3], 58  
Update called by 11Exploration  
  
Ant thread 11 terminating.avg = 0.00173611111111  
  
Ant 12 : [1, 0, 2, 3], 58  
Update called by 12Exploitation  
  
Ant thread 12 terminating.Ant 13 : [2, 3, 1, 0], 46  
  
Update called by 13Exploitation  
  
Ant thread 13 terminating.Ant 14 : [1, 0, 2, 3], 58  
  
Update called by 14Exploration  
  
Ant thread 14 terminating.avg = 0.00173611111111  
  
Ant 15 : [0, 1, 3, 2], 46  
Update called by 15Exploration

Ant thread 15 terminating.avg = 0.0017361111111111

Ant 16 : [1, 0, 2, 3], 58  
Update called by 16Exploitation

Ant thread 16 terminating.Ant 17 : [3, 2, 1, 0], 50  
Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [3, 2, 1, 0], 50  
ExploitationUpdate called by 18

Ant 19 : [2, 3, 1, 0], 46Ant thread 18 terminating.  
Update called by 19  
Best: [3, 1, 0, 2], 76, 4, 77  
Ant thread 19 terminating.iter\_counter = 5

starting ant = 0  
Exploitationstarting ant = 1

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

Ant 1 : [0, 1], 10starting ant = 4  
Exploitationstarting ant = 5

Ant 0 : [3, 2, 1], 40starting 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 = 0.00124723011364starting ant = 14  
p = 0.0015625starting ant = 15

Ant 1 : [0, 1, 3], 28starting ant = 16  
Explorationstarting ant = 17

avg = 0.00157358870968starting ant = 18

p = 0.003121875starting ant = 19

Ant 4 : [0, 1], 10

Exploitation

Ant 5 : [3, 2], 18

Exploitation

Ant 0 : [3, 2, 1, 0], 50

Update called by 0Exploitation

Ant thread 0 terminating.Ant 6 : [1, 0], 10

Exploration

avg = 0.00157461995968

p = 0.00312496875

Ant 7 : [0, 1], 10

Exploration

avg = 0.00157463027218

p = 0.0031249996875

Ant 8 : [0, 1], 10

Exploration

avg = 0.00131998975088

p = 0.00156248437359

p = 0.00173609375

Ant 9 : [3, 2], 18

Exploration

avg = 0.000799445564516

p = 0.0009375

Ant 2 : [1, 0, 2], 40

Exploitation

Ant 10 : [0, 1], 10

Exploration

avg = 0.00193044507472

p = 0.00312499999688

Ant 11 : [1, 0], 10

Exploitation

Ant 3 : [1, 0, 2], 40

Exploration

avg = 0.00193044507575

p = 0.00312499999997

Ant 12 : [1, 0], 10

Exploitation

Ant 13 : [2, 3], 18

Exploration

avg = 0.00193044507576

p = 0.003125

Ant 14 : [1, 0], 10

Exploitation

Ant 15 : [0, 1], 10

Exploration

avg = 0.0017361109375

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

Update called by 1Exploitation

Ant thread 1 terminating.Ant 16 : [1, 0], 10

Exploration

avg = 0.00131999553733

p = 0.00156248437359

p = 0.00173611110937

Ant 17 : [3, 2], 18

Exploitation

Ant 18 : [3, 2], 18

Exploitation

Ant 19 : [2, 3], 18

Exploration

avg = 0.00133316761364

p = 0.001734375

Ant 4 : [0, 1, 3], 28

Exploitation

Ant 5 : [3, 2, 1], 40

Exploitation

Ant 6 : [1, 0, 2], 40

Exploitation

Ant 7 : [0, 1, 3], 28

Exploitation

Ant 8 : [0, 1, 3], 28

Exploitation

Ant 9 : [3, 2, 1], 40

Exploration

avg = 0.00173609375

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

Update called by 2Exploration

Ant thread 2 terminating.avg = 0.00133403566832

p = 0.00173611110937

Ant 10 : [0, 1, 3], 28

Exploration

avg = 0.000851528845766

p = 0.00104166665625

Ant 11 : [1, 0, 2], 40

Exploitation

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

Update called by 3Exploration

Ant thread 3 terminating.avg = 0.000851528897329

p = 0.00104166666563

Ant 12 : [1, 0, 2], 40

Exploration

avg = 0.00111193775131

p = 0.00156248437359

Ant 13 : [2, 3, 1], 36

Exploitation

Ant 14 : [1, 0, 2], 40

Exploration

avg = 0.00133403566918  
p = 0.00173611111109  
Ant 15 : [0, 1, 3], 28  
Exploration  
avg = 0.000851528897849  
p = 0.00104166666667  
Ant 16 : [1, 0, 2], 40  
Exploitation  
Ant 17 : [3, 2, 1], 40  
Exploration  
avg = 0.00105194602202  
p = 0.00142045454403  
Ant 18 : [3, 2, 1], 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 : [3, 2, 1, 0], 50  
  
Update called by 5Exploration  
  
Ant thread 5 terminating.avg = 0.00173611110937  
  
Ant 6 : [1, 0, 2, 3], 58  
ExplorationUpdate called by 6  
  
avg = 0.00173611111111Ant thread 6 terminating.  
  
Ant 7 : [0, 1, 3, 2], 46  
Update called by 7Exploration  
  
Ant thread 7 terminating.avg = 0.00173611111111  
  
Ant 8 : [0, 1, 3, 2], 46  
Update called by 8Exploitation  
  
Ant thread 8 terminating.Ant 9 : [3, 2, 1, 0], 50  
  
Update called by 9Exploitation  
  
Ant thread 9 terminating.Ant 10 : [0, 1, 3, 2], 46  
  
Update called by 10Exploration  
  
Ant thread 10 terminating.avg = 0.00173611111109  
  
Ant 11 : [1, 0, 2, 3], 58  
Update called by 11Exploration  
  
Ant thread 11 terminating.avg = 0.00173611111111  
  
Ant 12 : [1, 0, 2, 3], 58

Update called by 12Exploration

Ant thread 12 terminating.avg = 0.003125

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

Ant thread 13 terminating.Ant 14 : [1, 0, 2, 3], 58

Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [0, 1, 3, 2], 46

Update called by 15Exploration

Ant thread 15 terminating.avg = 0.00173611111111

Ant 16 : [1, 0, 2, 3], 58  
Update called by 16Exploration

Ant thread 16 terminating.avg = 0.003125

Ant 17 : [3, 2, 1, 0], 50  
Update called by 17Exploration

Ant thread 17 terminating.avg = 0.003125

Ant 18 : [3, 2, 1, 0], 50  
Update called by 18Exploration

Ant thread 18 terminating.avg = 0.003125

Ant 19 : [2, 3, 1, 0], 46  
Update called by 19  
Best: [3, 1, 0, 2], 76, 5, 77  
Ant thread 19 terminating.iter\_counter = 6

starting ant = 0  
Explorationstarting ant = 1

avg = 0.00124007879657starting ant = 2

p = 0.00156248437359starting ant = 3

p = 0.0015625starting ant = 4

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

Explorationstarting ant = 6

avg = 0.00144841733871starting ant = 7

p = 0.0028125starting ant = 8



Ant 1 : [0, 1], 10starting ant = 9  
Exploitationstarting ant = 10  
Ant 2 : [1, 0], 10starting ant = 11  
Exploitationstarting ant = 12  
Ant 3 : [1, 0], 10starting ant = 13  
Exploitationstarting ant = 14  
Ant 4 : [0, 1], 10starting ant = 15  
Exploitationstarting ant = 16  
Ant 0 : [3, 2, 1], 40starting ant = 17  
Explorationstarting ant = 18  
avg = 0.00129737046324starting ant = 19  
  
p = 0.00156248437359  
p = 0.001734375  
Ant 5 : [3, 2], 18  
Exploitation  
Ant 6 : [1, 0], 10  
Exploration  
avg = 0.00155257358871  
p = 0.00312496875  
Ant 7 : [0, 1], 10  
Exploitation  
Ant 8 : [0, 1], 10  
Exploration  
avg = 0.00120063210227  
p = 0.0015625  
Ant 1 : [0, 1, 3], 28  
Exploration  
avg = 0.00129794337991  
p = 0.00156248437359  
p = 0.00173609375  
Ant 9 : [3, 2], 18  
Exploitation  
Ant 10 : [0, 1], 10  
Exploration  
avg = 0.000766376008065  
p = 0.0009375  
Ant 2 : [1, 0, 2], 40  
Exploration  
avg = 0.00189937963068  
p = 0.0031249996875  
Ant 11 : [1, 0], 10  
Exploration  
avg = 0.00189937973381

p = 0.00312499999688  
Ant 12 : [1, 0], 10  
Exploitation  
Ant 3 : [1, 0, 2], 40  
Exploration  
avg = 0.00119887594697  
p = 0.00141903409091  
p = 0.0015625  
Ant 13 : [2, 3], 18  
Exploration  
avg = 0.00189937973484  
p = 0.00312499999997  
Ant 14 : [1, 0], 10  
Exploration  
avg = 0.00128656960227  
p = 0.001734375  
Ant 4 : [0, 1, 3], 28  
Exploration  
avg = 0.00158730275537  
p = 0.00312499999997  
Ant 15 : [0, 1], 10  
Exploitation  
Ant 16 : [1, 0], 10  
Exploitation  
Ant 0 : [3, 2, 1, 0], 50  
ExplorationUpdate called by 0

avg = 0.00129794910907Ant thread 0 terminating.

p = 0.00156248437359  
p = 0.0017361109375  
Ant 17 : [3, 2], 18  
Exploitation  
Ant 18 : [3, 2], 18  
Exploitation  
Ant 19 : [2, 3], 18  
Exploitation  
Ant 5 : [3, 2, 1], 40  
Exploitation  
Ant 6 : [1, 0, 2], 40  
Exploitation  
Ant 7 : [0, 1, 3], 28  
Exploitation  
Ant 8 : [0, 1, 3], 28  
Exploration  
avg = 0.00173611111109  
Ant 1 : [0, 1, 3, 2], 46  
Update called by 1Exploitation

Ant thread 1 terminating.Ant 9 : [3, 2, 1], 40

Exploitation  
Ant 10 : [0, 1, 3], 28  
Exploitation

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

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

Exploitation  
Ant 12 : [1, 0, 2], 40  
Exploitation  
Ant 3 : [1, 0, 2, 3], 58  
Update called by 3Exploration

Ant thread 3 terminating.avg = 0.00107886819486

p = 0.00156248437359  
Ant 13 : [2, 3, 1], 36  
Exploration  
avg = 0.000818459341393  
p = 0.001041666666666  
Ant 14 : [1, 0, 2], 40  
Exploration  
avg = 0.001736111111111  
Ant 4 : [0, 1, 3, 2], 46  
Update called by 4Exploration

Ant thread 4 terminating.avg = 0.00128743765782

p = 0.001736111111109  
Ant 15 : [0, 1, 3], 28  
Exploration  
avg = 0.000818459341398  
p = 0.001041666666667  
Ant 16 : [1, 0, 2], 40  
Exploitation  
Ant 17 : [3, 2, 1], 40  
Exploration  
avg = 0.00101777414702  
p = 0.00142045454403  
Ant 18 : [3, 2, 1], 40  
Exploration  
avg = 0.00116481342993  
p = 0.00173437484374  
Ant 19 : [2, 3, 1], 36  
Exploitation  
Ant 5 : [3, 2, 1, 0], 50  
Update called by 5Exploitation

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

Update called by 6Exploration

Ant thread 6 terminating.avg = 0.001736111111111

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

Ant thread 7 terminating.Ant 8 : [0, 1, 3, 2], 46  
Update called by 8Exploitation  
Ant thread 8 terminating.Ant 9 : [3, 2, 1, 0], 50  
Update called by 9Exploitation  
Ant thread 9 terminating.Ant 10 : [0, 1, 3, 2], 46  
Update called by 10Exploration  
Ant thread 10 terminating.avg = 0.00173611111109  
Ant 11 : [1, 0, 2, 3], 58  
Update called by 11Exploration  
Ant thread 11 terminating.avg = 0.00173611111111  
Ant 12 : [1, 0, 2, 3], 58  
Update called by 12Exploration  
Ant thread 12 terminating.avg = 0.003125  
Ant 13 : [2, 3, 1, 0], 46  
Update called by 13Exploration  
Ant thread 13 terminating.avg = 0.00173611111111  
Ant 14 : [1, 0, 2, 3], 58  
Update called by 14Exploitation  
Ant thread 14 terminating.Ant 15 : [0, 1, 3, 2], 46  
Update called by 15Exploration  
Ant thread 15 terminating.avg = 0.00173611111111  
Ant 16 : [1, 0, 2, 3], 58  
Update called by 16Exploitation  
Ant thread 16 terminating.Ant 17 : [3, 2, 1, 0], 50  
ExplorationUpdate called by 17  
avg = 0.003125Ant thread 17 terminating.  
Ant 18 : [3, 2, 1, 0], 50  
Update called by 18Exploitation  
Ant thread 18 terminating.Ant 19 : [2, 3, 1, 0], 46  
Update called by 19

Best: [3, 1, 0, 2], 76, 6, 77  
Ant thread 19 terminating.iter\_counter = 7

starting ant = 0

Explorationstarting ant = 1

avg = 0.0012202370627starting ant = 2

p = 0.00156248437359starting ant = 3

p = 0.0015625starting ant = 4

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

Exploitationstarting ant = 6

Ant 1 : [0, 1], 10starting ant = 7

Explorationstarting ant = 8

avg = 0.0017099625947starting ant = 9

p = 0.0028125starting ant = 10

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

Exploitationstarting ant = 12

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

Exploitationstarting ant = 14

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

Explorationstarting ant = 16

avg = 0.000915996732948starting ant = 17

p = 0.0012784090909starting ant = 18

Ant 0 : [3, 2, 1], 40starting ant = 19

Exploitation

Ant 5 : [3, 2], 18

Exploration

avg = 0.0018141188447

p = 0.00312496875

Ant 6 : [1, 0], 10

Exploitation

Ant 1 : [0, 1, 3], 28

Exploration

avg = 0.00153273185484

p = 0.00312496875

Ant 7 : [0, 1], 10

Exploitation  
Ant 8 : [0, 1], 10  
Exploration  
avg = 0.00127810164604  
p = 0.00156248437359  
p = 0.00173609375  
Ant 9 : [3, 2], 18  
Exploitation  
Ant 10 : [0, 1], 10  
Exploitation  
Ant 2 : [1, 0, 2], 40  
Exploration  
avg = 0.00187142082386  
p = 0.0031249996875  
Ant 11 : [1, 0], 10  
Exploitation  
Ant 12 : [1, 0], 10  
Exploitation  
Ant 3 : [1, 0, 2], 40  
Exploitation  
Ant 13 : [2, 3], 18  
Exploitation  
Ant 14 : [1, 0], 10  
Exploration  
avg = 0.00124463139205  
p = 0.001734375  
Ant 4 : [0, 1, 3], 28  
Exploitation  
Ant 15 : [0, 1], 10  
Exploitation  
Ant 16 : [1, 0], 10  
Exploration  
avg = 0.0012781073752  
p = 0.00156248437359  
p = 0.0017361109375  
Ant 17 : [3, 2], 18  
Exploitation  
Ant 18 : [3, 2], 18  
Exploitation  
Ant 0 : [3, 2, 1, 0], 50  
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.00123566448864

p = 0.00141903409091  
p = 0.001734375  
Ant 19 : [2, 3], 18  
Exploration  
avg = 0.000986309232954  
p = 0.00141903409091  
Ant 5 : [3, 2, 1], 40  
Exploration  
avg = 0.000788691532258  
p = 0.00104165625

Ant 6 : [1, 0, 2], 40  
Exploitation  
Ant 1 : [0, 1, 3, 2], 46  
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.00124549076705

p = 0.00173609375  
Ant 7 : [0, 1, 3], 28  
Exploitation  
Ant 8 : [0, 1, 3], 28  
Exploitation  
Ant 9 : [3, 2, 1], 40  
Exploitation  
Ant 10 : [0, 1, 3], 28  
Exploitation  
Ant 2 : [1, 0, 2, 3], 58  
Update called by 2Exploitation

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

Exploitation  
Ant 12 : [1, 0, 2], 40  
Exploration  
avg = 0.0017361109375  
Ant 3 : [1, 0, 2, 3], 58  
Update called by 3Exploration

Ant thread 3 terminating.avg = 0.00104910559405

p = 0.00156248437359  
Ant 13 : [2, 3, 1], 36  
Exploration  
avg = 0.000788696740586  
p = 0.001041666666666  
Ant 14 : [1, 0, 2], 40  
Exploration  
avg = 0.001736111111111  
Ant 4 : [0, 1, 3, 2], 46  
ExplorationUpdate called by 4

avg = 0.00124549944759Ant thread 4 terminating.

p = 0.001736111111109  
Ant 15 : [0, 1, 3], 28  
Exploitation  
Ant 16 : [1, 0, 2], 40  
Exploration  
avg = 0.000987019389205  
p = 0.00142045440341  
Ant 17 : [3, 2, 1], 40  
Exploitation  
Ant 18 : [3, 2, 1], 40  
Exploitation

Ant 19 : [2, 3, 1], 36  
Exploration  
avg = 0.003125  
Ant 5 : [3, 2, 1, 0], 50  
Update called by 5Exploitation

Ant thread 5 terminating.Ant 6 : [1, 0, 2, 3], 58  
Update called by 6Exploration

Ant thread 6 terminating.avg = 0.001736111111111

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

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

Ant 9 : [3, 2, 1, 0], 50Ant thread 8 terminating.  
Update called by 9Exploration

Ant thread 9 terminating.avg = 0.001736111111111

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

Ant thread 10 terminating.avg = 0.001736111111109

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

Ant thread 11 terminating.avg = 0.001736111111111

Ant 12 : [1, 0, 2, 3], 58  
Update called by 12Exploration

Ant thread 12 terminating.avg = 0.003125

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

Ant thread 13 terminating.avg = 0.001736111111111

Ant 14 : [1, 0, 2, 3], 58  
Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [0, 1, 3, 2], 46  
Update called by 15Exploration

Ant thread 15 terminating.avg = 0.001736111111111



Ant 16 : [1, 0, 2, 3], 58  
Update called by 16Exploitation

Ant thread 16 terminating.Ant 17 : [3, 2, 1, 0], 50  
Update called by 17Exploration

Ant thread 17 terminating.avg = 0.003125

Ant 18 : [3, 2, 1, 0], 50  
Update called by 18Exploitation

Ant thread 18 terminating.Ant 19 : [2, 3, 1, 0], 46  
Update called by 19  
Best: [3, 1, 0, 2], 76, 7, 77  
Ant thread 19 terminating.iter\_counter = 8

starting ant = 0  
Explorationstarting ant = 1

avg = 0.00120237950222starting ant = 2

p = 0.00156248437359starting ant = 3

p = 0.0015625starting ant = 4

Ant 0 : [3, 2], 18starting ant = 5  
Exploitationstarting ant = 6

Ant 1 : [0, 1], 10starting ant = 7  
Exploitationstarting ant = 8

Ant 2 : [1, 0], 10starting ant = 9  
Explorationstarting ant = 10

avg = 0.00178792466856starting ant = 11

p = 0.003121875starting ant = 12

Ant 3 : [1, 0], 10starting ant = 13  
Explorationstarting ant = 14

avg = 0.00151384304435starting ant = 15

p = 0.003121875starting ant = 16

Ant 4 : [0, 1], 10starting ant = 17  
Exploitationstarting ant = 18

Ant 0 : [3, 2, 1], 40starting ant = 19

Exploitation

Ant 5 : [3, 2], 18

Exploration

avg = 0.00178895591856

p = 0.00312496875

Ant 6 : [1, 0], 10

Exploration

avg = 0.00112094950284

p = 0.0015625

Ant 1 : [0, 1, 3], 28

Exploitation

Ant 7 : [0, 1], 10

Exploration

avg = 0.00151488460685

p = 0.0031249996875

Ant 8 : [0, 1], 10

Exploitation

Ant 2 : [1, 0, 2], 40

Exploration

avg = 0.00126024408555

p = 0.00156248437359

p = 0.00173609375

Ant 9 : [3, 2], 18

Exploration

avg = 0.00154925970998

p = 0.00312499999688

Ant 10 : [0, 1], 10

Exploitation

Ant 11 : [1, 0], 10

Exploration

avg = 0.00184625800085

p = 0.00312499999688

Ant 12 : [1, 0], 10

Exploitation

Ant 3 : [1, 0, 2], 40

Exploitation

Ant 13 : [2, 3], 18

Exploitation

Ant 14 : [1, 0], 10

Exploitation

Ant 15 : [0, 1], 10

Exploitation

Ant 16 : [1, 0], 10

Exploitation

Ant 4 : [0, 1, 3], 28

Exploitation

Ant 17 : [3, 2], 18

Exploitation

Ant 18 : [3, 2], 18

Exploration

avg = 0.003125

Ant 0 : [3, 2, 1, 0], 50  
Update called by 0Exploitation

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

Exploitation  
Ant 5 : [3, 2, 1], 40  
Exploitation  
Ant 6 : [1, 0, 2], 40  
Exploitation  
Ant 1 : [0, 1, 3, 2], 46  
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.00120774637784

p = 0.00173609375  
Ant 7 : [0, 1, 3], 28  
Exploration  
avg = 0.00120775497159  
p = 0.0017361109375  
Ant 8 : [0, 1, 3], 28  
Exploitation  
Ant 2 : [1, 0, 2, 3], 58  
Update called by 2Exploration

Ant thread 2 terminating.avg = 0.000959333139205

p = 0.00142044034091  
Ant 9 : [3, 2, 1], 40  
Exploration  
avg = 0.00120775505753  
p = 0.00173611110937  
Ant 10 : [0, 1, 3], 28  
Exploitation  
Ant 11 : [1, 0, 2], 40  
Exploration  
avg = 0.000761910399345  
p = 0.00104166666563  
Ant 12 : [1, 0, 2], 40  
Exploitation  
Ant 3 : [1, 0, 2, 3], 58  
Update called by 3Exploitation

Ant thread 3 terminating.Ant 13 : [2, 3, 1], 36

Exploitation  
Ant 14 : [1, 0, 2], 40  
Exploration  
avg = 0.00120775505839  
p = 0.00173611111109  
Ant 15 : [0, 1, 3], 28  
Exploration  
avg = 0.000761910399866  
p = 0.00104166666667

Ant 16 : [1, 0, 2], 40

Exploration

avg = 0.001736111111111

Ant 4 : [0, 1, 3, 2], 46

Update called by 4Exploitation

Ant thread 4 terminating.Ant 17 : [3, 2, 1], 40

Exploitation

Ant 18 : [3, 2, 1], 40

Exploration

avg = 0.0011082644884

p = 0.00173437484374

Ant 19 : [2, 3, 1], 36

Exploitation

Ant 5 : [3, 2, 1, 0], 50

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 : [0, 1, 3, 2], 46

Update called by 8Exploration

Ant thread 8 terminating.avg = 0.003125

Ant 9 : [3, 2, 1, 0], 50

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

Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [1, 0, 2, 3], 58

Update called by 12Exploration

Ant thread 12 terminating.avg = 0.003125

Ant 13 : [2, 3, 1, 0], 46

Update called by 13Exploration

Ant thread 13 terminating.avg = 0.001736111111111

Ant 14 : [1, 0, 2, 3], 58  
Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [0, 1, 3, 2], 46  
Update called by 15Exploitation

Ant thread 15 terminating.Ant 16 : [1, 0, 2, 3], 58  
Update called by 16Exploration

Ant thread 16 terminating.avg = 0.003125

Ant 17 : [3, 2, 1, 0], 50  
Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [3, 2, 1, 0], 50  
Update called by 18Exploration

Ant thread 18 terminating.avg = 0.003125

Ant 19 : [2, 3, 1, 0], 46  
Update called by 19  
Best: [3, 1, 0, 2], 76, 8, 77  
Ant thread 19 terminating.iter\_counter = 9

starting ant = 0  
Exploitationstarting ant = 1

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

Exploitationstarting ant = 3

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

Explorationstarting ant = 5

avg = 0.000863406217323starting ant = 6

p = 0.0012784090909starting ant = 7

Ant 0 : [3, 2, 1], 40starting 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

Exploitationstarting ant = 15

Ant 1 : [0, 1, 3], 28starting ant = 16

Explorationstarting ant = 17

avg = 0.00149777123992starting ant = 18

p = 0.003121875starting ant = 19

Ant 4 : [0, 1], 10

Exploration

avg = 0.00124359936445

p = 0.00156248437359

p = 0.001734375

Ant 5 : [3, 2], 18

Exploitation

Ant 6 : [1, 0], 10

Exploitation

Ant 7 : [0, 1], 10

Exploration

avg = 0.0031249996875

Ant 0 : [3, 2, 1, 0], 50

Update called by 0Exploration

Ant thread 0 terminating.avg = 0.00149881280242

p = 0.0031249996875

Ant 8 : [0, 1], 10

Exploitation

Ant 9 : [3, 2], 18

Exploitation

Ant 10 : [0, 1], 10

Exploration

avg = 0.00182361136733

p = 0.00312499999688

Ant 11 : [1, 0], 10

Exploitation

Ant 2 : [1, 0, 2], 40

Exploration

avg = 0.00182361136836

p = 0.00312499999997

Ant 12 : [1, 0], 10

Exploitation

Ant 13 : [2, 3], 18

Exploitation

Ant 3 : [1, 0, 2], 40

Exploitation

Ant 14 : [1, 0], 10

Exploration

avg = 0.00153353165658

p = 0.00312499999997

Ant 15 : [0, 1], 10  
Exploration  
avg = 0.0017361109375  
Ant 1 : [0, 1, 3, 2], 46  
Update called by 1Exploitation

Ant thread 1 terminating.Ant 16 : [1, 0], 10

Exploration  
avg = 0.00124417806758  
p = 0.00156248437359  
p = 0.00173611110937  
Ant 17 : [3, 2], 18  
Exploitation  
Ant 18 : [3, 2], 18  
Exploitation  
Ant 19 : [2, 3], 18  
Exploration  
avg = 0.00117291705256  
p = 0.001734375  
Ant 4 : [0, 1, 3], 28  
Exploitation  
Ant 5 : [3, 2, 1], 40  
Exploitation  
Ant 6 : [1, 0, 2], 40  
Exploration  
avg = 0.00117377642756  
p = 0.00173609375  
Ant 7 : [0, 1, 3], 28  
Exploitation  
Ant 8 : [0, 1, 3], 28  
Exploitation  
Ant 9 : [3, 2, 1], 40  
Exploration  
avg = 0.00117378510724  
p = 0.00173611110937  
Ant 10 : [0, 1, 3], 28  
Exploitation  
Ant 11 : [1, 0, 2], 40  
Exploitation  
Ant 2 : [1, 0, 2, 3], 58  
Update called by 2Exploitation

Ant thread 2 terminating.Ant 12 : [1, 0, 2], 40

Exploration  
avg = 0.000998211546676  
p = 0.00156248437359  
Ant 13 : [2, 3, 1], 36  
Exploitation  
Ant 3 : [1, 0, 2, 3], 58  
Update called by 3Exploration

Ant thread 3 terminating.avg = 0.000737802693207

p = 0.0010416666666666  
Ant 14 : [1, 0, 2], 40  
Exploration  
avg = 0.0011737851081  
p = 0.001736111111109  
Ant 15 : [0, 1, 3], 28  
Exploitation  
Ant 16 : [1, 0, 2], 40  
Exploitation  
Ant 17 : [3, 2, 1], 40  
Exploitation  
Ant 18 : [3, 2, 1], 40  
Exploration  
avg = 0.00108415678175  
p = 0.00173437484374  
Ant 19 : [2, 3, 1], 36  
Exploitation  
Ant 4 : [0, 1, 3, 2], 46  
Update called by 4Exploration  
  
Ant thread 4 terminating.avg = 0.003125  
  
Ant 5 : [3, 2, 1, 0], 50  
Update called by 5Exploitation  
  
Ant thread 5 terminating.Ant 6 : [1, 0, 2, 3], 58  
  
Update called by 6Exploration  
  
Ant thread 6 terminating.avg = 0.00173611111111  
  
Ant 7 : [0, 1, 3, 2], 46  
Update called by 7Exploration  
  
Ant thread 7 terminating.avg = 0.00173611111111  
  
Ant 8 : [0, 1, 3, 2], 46  
Update called by 8Exploitation  
  
Ant thread 8 terminating.Ant 9 : [3, 2, 1, 0], 50  
  
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  
  
Update called by 11Exploration  
  
Ant thread 11 terminating.avg = 0.00173611111111



Ant 12 : [1, 0, 2, 3], 58  
Update called by 12Exploration

Ant thread 12 terminating.avg = 0.003125

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

Ant thread 13 terminating.avg = 0.00173611111111

Ant 14 : [1, 0, 2, 3], 58  
Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [0, 1, 3, 2], 46  
ExploitationUpdate called by 15

Ant 16 : [1, 0, 2, 3], 58Ant thread 15 terminating.  
Update called by 16Exploitation

Ant thread 16 terminating.Ant 17 : [3, 2, 1, 0], 50  
Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [3, 2, 1, 0], 50  
Update called by 18Exploration

Ant thread 18 terminating.avg = 0.003125

Ant 19 : [2, 3, 1, 0], 46  
Update called by 19  
Best: [3, 1, 0, 2], 76, 9, 77  
Ant thread 19 terminating.iter\_counter = 10

starting ant = 0  
Exploitationstarting ant = 1

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

Explorationstarting ant = 3

avg = 0.00138018161593starting ant = 4

p = 0.0028125starting ant = 5

Ant 1 : [0, 1], 10starting ant = 6

Exploitationstarting ant = 7

Ant 0 : [3, 2, 1], 40starting ant = 8

Explorationstarting ant = 9

avg = 0.00164177106487starting ant = 10

p = 0.0028125starting ant = 11

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

Explorationstarting ant = 13

avg = 0.00174489606487starting 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 : [3, 2], 18

Exploration

avg = 0.0010564065973

p = 0.0015625

Ant 1 : [0, 1, 3], 28

Exploitation

Ant 6 : [1, 0], 10

Exploration

avg = 0.00148433786593

p = 0.00312496875

Ant 7 : [0, 1], 10

Exploitation

Ant 0 : [3, 2, 1, 0], 50

Update called by 0Exploitation

Ant thread 0 terminating.Ant 8 : [0, 1], 10

Exploration

avg = 0.00122970765713

p = 0.00156248437359

p = 0.00173609375

Ant 9 : [3, 2], 18

Exploitation

Ant 10 : [0, 1], 10

Exploitation

Ant 11 : [1, 0], 10

Exploration

avg = 0.000664022423891

p = 0.0009375

Ant 2 : [1, 0, 2], 40

Exploration

avg = 0.00180322939819

p = 0.00312499999997

Ant 12 : [1, 0], 10  
Exploration  
avg = 0.00112836570009  
p = 0.00141903409091  
p = 0.0015625  
Ant 13 : [2, 3], 18  
Exploitation  
Ant 14 : [1, 0], 10  
Exploitation  
Ant 15 : [0, 1], 10  
Exploration  
avg = 0.000715584923891  
p = 0.001040625  
Ant 3 : [1, 0, 2], 40  
Exploration  
avg = 0.0018032293982  
p = 0.003125  
Ant 16 : [1, 0], 10  
Exploration  
avg = 0.00122971338629  
p = 0.00156248437359  
p = 0.0017361109375  
Ant 17 : [3, 2], 18  
Exploration  
avg = 0.0011423440973  
p = 0.001734375  
Ant 4 : [0, 1, 3], 28  
Exploitation  
Ant 18 : [3, 2], 18  
Exploitation  
Ant 19 : [2, 3], 18  
Exploitation  
Ant 5 : [3, 2, 1], 40  
Exploitation  
Ant 1 : [0, 1, 3, 2], 46  
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.000716100548891

p = 0.00104165625  
Ant 6 : [1, 0, 2], 40  
Exploitation  
Ant 7 : [0, 1, 3], 28  
Exploitation  
Ant 8 : [0, 1, 3], 28  
Exploration  
avg = 0.000912001675142  
p = 0.00142044034091  
Ant 9 : [3, 2, 1], 40  
Exploration  
avg = 0.00114321215199  
p = 0.00173611110937  
Ant 10 : [0, 1, 3], 28  
Exploitation

Ant 11 : [1, 0, 2], 40  
Exploration  
avg = 0.00173609375  
Ant 2 : [1, 0, 2, 3], 58  
Update called by 2Exploitation

Ant thread 2 terminating.Ant 12 : [1, 0, 2], 40

Exploitation  
Ant 13 : [2, 3, 1], 36  
Exploration  
avg = 0.000716105757219  
p = 0.001041666666666  
Ant 14 : [1, 0, 2], 40  
Exploration  
avg = 0.00114321215285  
p = 0.001736111111109  
Ant 15 : [0, 1, 3], 28  
Exploitation  
Ant 3 : [1, 0, 2, 3], 58  
Update called by 3Exploration

Ant thread 3 terminating.avg = 0.000716105757224

p = 0.001041666666667  
Ant 16 : [1, 0, 2], 40  
Exploitation  
Ant 17 : [3, 2, 1], 40  
Exploitation  
Ant 4 : [0, 1, 3, 2], 46  
Update called by 4Exploitation

Ant thread 4 terminating.Ant 18 : [3, 2, 1], 40

Exploration  
avg = 0.00106245984576  
p = 0.00173437484374  
Ant 19 : [2, 3, 1], 36  
Exploration  
avg = 0.003125  
Ant 5 : [3, 2, 1, 0], 50  
Update called by 5Exploration

Ant thread 5 terminating.avg = 0.00173611110937

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 : [0, 1, 3, 2], 46

Update called by 8Exploitation  
Ant thread 8 terminating.Ant 9 : [3, 2, 1, 0], 50  
Update called by 9Exploitation  
Ant thread 9 terminating.Ant 10 : [0, 1, 3, 2], 46  
Update called by 10Exploration  
Ant thread 10 terminating.avg = 0.001736111111109  
Ant 11 : [1, 0, 2, 3], 58  
Update called by 11Exploration  
Ant thread 11 terminating.avg = 0.001736111111111  
Ant 12 : [1, 0, 2, 3], 58  
Update called by 12Exploitation  
Ant thread 12 terminating.Ant 13 : [2, 3, 1, 0], 46  
ExploitationUpdate called by 13  
Ant 14 : [1, 0, 2, 3], 58Ant thread 13 terminating.  
Update called by 14Exploitation  
Ant thread 14 terminating.Ant 15 : [0, 1, 3, 2], 46  
Update called by 15Exploration  
Ant thread 15 terminating.avg = 0.001736111111111  
Ant 16 : [1, 0, 2, 3], 58  
Update called by 16Exploitation  
Ant thread 16 terminating.Ant 17 : [3, 2, 1, 0], 50  
Update called by 17Exploitation  
Ant thread 17 terminating.Ant 18 : [3, 2, 1, 0], 50  
ExplorationUpdate called by 18  
avg = 0.003125Ant thread 18 terminating.  
Ant 19 : [2, 3, 1, 0], 46  
Update called by 19  
Best: [3, 1, 0, 2], 76, 10, 77  
Ant thread 19 terminating.iter\_counter = 11  
  
starting ant = 0  
Explorationstarting ant = 1

avg = 0.0011588249122starting ant = 2  
p = 0.00156248437359starting ant = 3  
p = 0.0015625starting ant = 4  
Ant 0 : [3, 2], 18starting ant = 5  
Exploitationstarting ant = 6  
Ant 1 : [0, 1], 10starting ant = 7  
Exploitationstarting ant = 8  
Ant 2 : [1, 0], 10starting ant = 9  
Exploitationstarting ant = 10  
Ant 3 : [1, 0], 10starting ant = 11  
Exploitationstarting ant = 12  
Ant 4 : [0, 1], 10starting ant = 13  
Exploitationstarting ant = 14  
Ant 0 : [3, 2, 1], 40starting ant = 15  
Exploitationstarting ant = 16  
Ant 5 : [3, 2], 18starting ant = 17  
Explorationstarting ant = 18  
avg = 0.00172758354171starting ant = 19  
p = 0.00312496875  
Ant 6 : [1, 0], 10  
Exploitation  
Ant 1 : [0, 1, 3], 28  
Exploitation  
Ant 7 : [0, 1], 10  
Exploration  
avg = 0.00147133001683  
p = 0.0031249996875  
Ant 8 : [0, 1], 10  
Exploration  
avg = 0.000644495181502  
p = 0.0009375  
Ant 2 : [1, 0, 2], 40  
Exploration  
avg = 0.00121668949553  
p = 0.00156248437359

p = 0.00173609375  
Ant 9 : [3, 2], 18  
Exploration  
avg = 0.00150570511996  
p = 0.00312499999688  
Ant 10 : [0, 1], 10  
Exploration  
avg = 0.000696057681502  
p = 0.001040625  
Ant 3 : [1, 0, 2], 40  
Exploitation  
Ant 11 : [1, 0], 10  
Exploitation  
Ant 12 : [1, 0], 10  
Exploitation  
Ant 4 : [0, 1, 3], 28  
Exploitation  
Ant 13 : [2, 3], 18  
Exploration  
avg = 0.0017854585417  
p = 0.00312499999997  
Ant 14 : [1, 0], 10  
Exploration  
avg = 0.003125  
Ant 0 : [3, 2, 1, 0], 50  
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.00150604887099

p = 0.00312499999997  
Ant 15 : [0, 1], 10  
Exploitation  
Ant 16 : [1, 0], 10  
Exploration  
avg = 0.000891120399673  
p = 0.00141903409091  
Ant 5 : [3, 2, 1], 40  
Exploration  
avg = 0.0012166952247  
p = 0.00156248437359  
p = 0.0017361109375  
Ant 17 : [3, 2], 18  
Exploration  
avg = 0.00121669528199  
p = 0.00156248437359  
p = 0.00173611110937  
Ant 18 : [3, 2], 18  
Exploration  
avg = 0.00117267401645  
p = 0.00142044034091  
p = 0.001734375  
Ant 19 : [2, 3], 18  
Exploration  
avg = 0.000696573306502

```

p = 0.00104165625
Ant 6 : [1, 0, 2], 40
Exploration
avg = 0.00173611111109
Ant 1 : [0, 1, 3, 2], 46
Update called by 1Exploitation

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

Exploitation
Ant 8 : [0, 1, 3], 28
Exploitation
Ant 2 : [1, 0, 2, 3], 58
Update called by 2Exploitation

Ant thread 2 terminating.Ant 9 : [3, 2, 1], 40

Exploration
avg = 0.00111569649226
p = 0.00173611110937
Ant 10 : [0, 1, 3], 28
Exploration
avg = 0.0017361109375
Ant 3 : [1, 0, 2, 3], 58
Update called by 3Exploration

Ant thread 3 terminating.avg = 0.000696578462752

p = 0.0010416665625
Ant 11 : [1, 0, 2], 40
Exploitation
Ant 12 : [1, 0, 2], 40
Exploitation
Ant 4 : [0, 1, 3, 2], 46
Update called by 4Exploitation

Ant thread 4 terminating.Ant 13 : [2, 3, 1], 36

Exploration
avg = 0.00069657851483
p = 0.00104166666666
Ant 14 : [1, 0, 2], 40
Exploration
avg = 0.00111569649312
p = 0.00173611111109
Ant 15 : [0, 1, 3], 28
Exploitation
Ant 16 : [1, 0, 2], 40
Exploration
avg = 0.003125
Ant 5 : [3, 2, 1, 0], 50
Update called by 5Exploitation

Ant thread 5 terminating.Ant 17 : [3, 2, 1], 40

```



Exploitation  
Ant 18 : [3, 2, 1], 40  
Exploitation  
Ant 19 : [2, 3, 1], 36  
Exploration  
avg = 0.00173611110937  
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 = 0.00173611111111  
  
Ant 8 : [0, 1, 3, 2], 46  
Update called by 8Exploration  
  
Ant thread 8 terminating.avg = 0.003125  
  
Ant 9 : [3, 2, 1, 0], 50  
Update called by 9Exploitation  
  
Ant thread 9 terminating.Ant 10 : [0, 1, 3, 2], 46  
  
Update called by 10Exploration  
  
Ant thread 10 terminating.avg = 0.00173611111109  
  
Ant 11 : [1, 0, 2, 3], 58  
Update called by 11Exploration  
  
Ant thread 11 terminating.avg = 0.00173611111111  
  
Ant 12 : [1, 0, 2, 3], 58  
Update called by 12Exploration  
  
Ant thread 12 terminating.avg = 0.003125  
  
Ant 13 : [2, 3, 1, 0], 46  
Update called by 13Exploitation  
  
Ant thread 13 terminating.Ant 14 : [1, 0, 2, 3], 58  
  
ExploitationUpdate called by 14  
  
Ant 15 : [0, 1, 3, 2], 46Ant thread 14 terminating.  
  
Update called by 15Exploitation  
  
Ant thread 15 terminating.Ant 16 : [1, 0, 2, 3], 58

Update called by 16Exploitation  
Ant thread 16 terminating.Ant 17 : [3, 2, 1, 0], 50  
Update called by 17Exploitation  
Ant thread 17 terminating.Ant 18 : [3, 2, 1, 0], 50  
Update called by 18Exploitation  
Ant thread 18 terminating.Ant 19 : [2, 3, 1, 0], 46  
Update called by 19  
Best: [3, 1, 0, 2], 76, 11, 77  
Ant thread 19 terminating.iter\_counter = 12  
  
starting ant = 0  
Explorationstarting ant = 1  
  
avg = 0.00114710856677starting ant = 2  
  
p = 0.00156248437359starting ant = 3  
  
p = 0.0015625starting ant = 4  
  
Ant 0 : [3, 2], 18starting ant = 5  
  
Explorationstarting ant = 6  
  
avg = 0.0013554471089starting ant = 7  
  
p = 0.0028125starting ant = 8  
  
Ant 1 : [0, 1], 10starting ant = 9  
  
Exploitationstarting ant = 10  
  
Ant 2 : [1, 0], 10starting ant = 11  
  
Explorationstarting ant = 12  
  
avg = 0.00171004289588starting ant = 13  
  
p = 0.003121875starting ant = 14  
  
Ant 3 : [1, 0], 10starting ant = 15  
  
Exploitationstarting ant = 16  
  
Ant 4 : [0, 1], 10starting ant = 17  
  
Explorationstarting ant = 18  
  
avg = 0.000802647564245starting ant = 19

p = 0.0012784090909  
Ant 0 : [3, 2, 1], 40  
Exploration  
avg = 0.00120440023343  
p = 0.00156248437359  
p = 0.001734375  
Ant 5 : [3, 2], 18  
Exploitation  
Ant 6 : [1, 0], 10  
Exploration  
avg = 0.0014596033589  
p = 0.00312496875  
Ant 7 : [0, 1], 10  
Exploration  
avg = 0.0014596136714  
p = 0.0031249996875  
Ant 8 : [0, 1], 10  
Exploration  
avg = 0.00100412684381  
p = 0.0015625  
Ant 1 : [0, 1, 3], 28  
Exploitation  
Ant 9 : [3, 2], 18  
Exploration  
avg = 0.00145961377453  
p = 0.00312499999688  
Ant 10 : [0, 1], 10  
Exploitation  
Ant 2 : [1, 0, 2], 40  
Exploration  
avg = 0.00176837612504  
p = 0.0031249996875  
Ant 11 : [1, 0], 10  
Exploration  
avg = 0.00176837622817  
p = 0.00312499999688  
Ant 12 : [1, 0], 10  
Exploitation  
Ant 13 : [2, 3], 18  
Exploration  
avg = 0.0017683762292  
p = 0.00312499999997  
Ant 14 : [1, 0], 10  
Exploitation  
Ant 3 : [1, 0, 2], 40  
Exploitation  
Ant 15 : [0, 1], 10  
Exploration  
avg = 0.00176837622921  
p = 0.003125  
Ant 16 : [1, 0], 10  
Exploration  
avg = 0.00109006434381

p = 0.001734375  
Ant 4 : [0, 1, 3], 28  
Exploitation  
Ant 17 : [3, 2], 18  
Exploitation  
Ant 18 : [3, 2], 18  
Exploitation  
Ant 19 : [2, 3], 18  
Exploitation  
Ant 0 : [3, 2, 1, 0], 50  
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.000872960064251

p = 0.00141903409091  
Ant 5 : [3, 2, 1], 40  
Exploitation  
Ant 6 : [1, 0, 2], 40  
Exploitation  
Ant 7 : [0, 1, 3], 28  
Exploration  
avg = 0.00109093231256  
p = 0.0017361109375  
Ant 8 : [0, 1, 3], 28  
Exploitation  
Ant 1 : [0, 1, 3, 2], 46  
Update called by 1Exploitation

Ant thread 1 terminating.Ant 9 : [3, 2, 1], 40

Exploration  
avg = 0.0010909323985  
p = 0.00173611110937  
Ant 10 : [0, 1, 3], 28  
Exploration  
avg = 0.00173609375  
Ant 2 : [1, 0, 2, 3], 58  
Update called by 2Exploitation

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

Exploitation  
Ant 12 : [1, 0, 2], 40  
Exploitation  
Ant 13 : [2, 3, 1], 36  
Exploitation  
Ant 14 : [1, 0, 2], 40  
Exploitation  
Ant 3 : [1, 0, 2, 3], 58  
Update called by 3Exploitation

Ant thread 3 terminating.Ant 15 : [0, 1, 3], 28

Exploitation

Ant 16 : [1, 0, 2], 40

Exploitation

Ant 4 : [0, 1, 3, 2], 46

Update called by 4Exploration

Ant thread 4 terminating.avg = 0.000873670220501

p = 0.00142045440341

Ant 17 : [3, 2, 1], 40

Exploitation

Ant 18 : [3, 2, 1], 40

Exploitation

Ant 19 : [2, 3, 1], 36

Exploration

avg = 0.003125

Ant 5 : [3, 2, 1, 0], 50

Update called by 5Exploration

Ant thread 5 terminating.avg = 0.001736111110937

Ant 6 : [1, 0, 2, 3], 58

Update called by 6Exploration

Ant thread 6 terminating.avg = 0.001736111111111

Ant 7 : [0, 1, 3, 2], 46

Update called by 7Exploitation

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

Update called by 8Exploitation

Ant thread 8 terminating.Ant 9 : [3, 2, 1, 0], 50

Update called by 9Exploration

Ant thread 9 terminating.avg = 0.001736111111111

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

Update called by 10Exploration

Ant thread 10 terminating.avg = 0.001736111111109

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

Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [1, 0, 2, 3], 58

Update called by 12Exploration

Ant thread 12 terminating.avg = 0.003125

Ant 13 : [2, 3, 1, 0], 46

Update called by 13Exploration

Ant thread 13 terminating.avg = 0.0017361111111111

Ant 14 : [1, 0, 2, 3], 58

Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [0, 1, 3, 2], 46

Update called by 15Exploitation

Ant thread 15 terminating.Ant 16 : [1, 0, 2, 3], 58

Update called by 16Exploration

Ant thread 16 terminating.avg = 0.003125

Ant 17 : [3, 2, 1, 0], 50

Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [3, 2, 1, 0], 50

Update called by 18Exploitation

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

Update called by 19

Best: [3, 1, 0, 2], 76, 12, 77

Ant thread 19 terminating.

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### Results

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Best path = [3, 1, 0, 2]

('D ',)

('B ',)

('A ',)

('C ',)

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\pickled.py

Traceback (most recent call last):

File "C:\Users\teleuser\Documents\Kantor\Kuliah\Master\Semester 3\Perencanaan Jaringan\Tugas\program\Python\tsp-atncolony\Python-Ant-Colony-TSP-Solver-master\pickled.py", line 11, in <module>

[43, 39, 18, 20, 15, 33, 31, 0]])

TypeError: list indices must be integers, not tuple

>>>

```

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, 43], [10, 0, 22, 18, 40, 26, 37, 39], [30, 22, 0,
18, 26, 23, 50, 18], [31, 18, 18, 0, 15, 22, 42, 20], [20, 40, 26, 15, 0, 12,
10, 15], [28, 26, 23, 22, 12, 0, 16, 33], [44, 37, 50, 42, 10, 16, 0, 31], [43,
39, 18, 20, 15, 33, 31, 0]]
8
Average = 23
Tau0 = 0.0108695652174
iter_counter = 1
starting ant = 0
Explorationstarting ant = 1

avg = 0.000526777941205starting ant = 2

p = 0.000905797101449starting ant = 3

p = 0.000679347826087starting ant = 4

Ant 0 : [5, 6], 16starting ant = 5

Explorationstarting ant = 6

avg = 0.000492452938105starting ant = 7

p = 0.00108695652174starting ant = 8

p = 0.000494071146245starting ant = 9

p = 0.0006038647343starting ant = 10

Ant 1 : [1, 3], 18starting ant = 11

Exploitationstarting ant = 12

Ant 2 : [0, 1], 10starting ant = 13

Exploitationstarting ant = 14

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

Exploitationstarting ant = 16

Ant 4 : [6, 4], 10starting ant = 17

Explorationstarting ant = 18

```

avg = 0.000409097623333starting ant = 19

p = 0.00108695652174

Ant 0 : [5, 6, 4], 26

Exploitation

Ant 5 : [3, 4], 15

Exploitation

Ant 6 : [5, 4], 12

Exploration

avg = 0.00066790093964

p = 0.000724637681159

p = 0.000905797101449

p = 0.00108695652174

p = 0.000724637681159

Ant 7 : [4, 7], 15

Exploration

avg = 0.000526777941205

p = 0.000905797101449

p = 0.000679347826087

Ant 8 : [5, 6], 16

Exploration

avg = 0.000440497137633

p = 0.0006038647343

p = 0.00054347826087

p = 0.000724637681159

Ant 9 : [7, 4], 15

Exploitation

Ant 10 : [1, 0], 10

Exploitation

Ant 1 : [1, 3, 4], 33

Exploitation

Ant 11 : [5, 4], 12

Exploration

avg = 0.000440497137633

p = 0.0006038647343

p = 0.00054347826087

p = 0.000724637681159

Ant 12 : [7, 4], 15

Exploitation

Ant 2 : [0, 1, 3], 28

Exploration

avg = 0.000440497137633

p = 0.0006038647343

p = 0.00054347826087

p = 0.000724637681159

Ant 13 : [7, 4], 15

Exploration

avg = 0.000447704795155

p = 0.00108695652174

p = 0.000679347826087

Ant 14 : [6, 5], 16

Exploration

avg = 0.000658444816054

p = 0.000724637681159



p = 0.000905797101449  
p = 0.00108695652174  
Ant 3 : [7, 4, 6], 25  
Exploitation  
Ant 15 : [2, 3], 18  
Exploitation  
Ant 16 : [6, 4], 10  
Exploration  
avg = 0.000598058342624  
p = 0.000724637681159  
p = 0.000905797101449  
p = 0.000724637681159  
Ant 4 : [6, 4, 7], 25  
Exploration  
avg = 0.000461628525224  
p = 0.00108695652174  
p = 0.00054347826087  
Ant 17 : [0, 4], 20  
Exploration  
avg = 0.000440497137633  
p = 0.0006038647343  
p = 0.00054347826087  
p = 0.000724637681159  
Ant 18 : [7, 4], 15  
Exploration  
avg = 0.000447704795155  
p = 0.00108695652174  
p = 0.000679347826087  
Ant 19 : [6, 5], 16  
Exploitation  
Ant 0 : [5, 6, 4, 3], 41  
Exploitation  
Ant 5 : [3, 4, 6], 25  
Exploitation  
Ant 6 : [5, 4, 6], 22  
Exploration  
avg = 0.000393140380379  
p = 0.0006038647343  
p = 0.00054347826087  
Ant 7 : [4, 7, 3], 35  
Exploitation  
Ant 8 : [5, 6, 4], 26  
Exploration  
avg = 0.000658444816054  
p = 0.000724637681159  
p = 0.000905797101449  
p = 0.00108695652174  
Ant 9 : [7, 4, 6], 25  
Exploitation  
Ant 10 : [1, 0, 4], 30  
Exploitation  
Ant 1 : [1, 3, 4, 6], 43  
Exploitation  
Ant 11 : [5, 4, 6], 22

Exploration  
avg = 0.000658444816054  
p = 0.000724637681159  
p = 0.000905797101449  
p = 0.00108695652174  
Ant 12 : [7, 4, 6], 25  
Exploitation  
Ant 2 : [0, 1, 3, 4], 43  
Exploitation  
Ant 13 : [7, 4, 6], 25  
Exploitation  
Ant 14 : [6, 5, 4], 28  
Exploration  
avg = 0.00033926918166  
p = 0.000679347826087  
Ant 3 : [7, 4, 6, 5], 41  
Exploitation  
Ant 15 : [2, 3, 4], 33  
Exploration  
avg = 0.000598058342624  
p = 0.000724637681159  
p = 0.000905797101449  
p = 0.000724637681159  
Ant 16 : [6, 4, 7], 25  
Exploration  
avg = 0.000401642229246  
p = 0.0006038647343  
p = 0.00054347826087  
Ant 4 : [6, 4, 7, 3], 45  
Exploitation  
Ant 17 : [0, 4, 6], 30  
Exploration  
avg = 0.000658444816054  
p = 0.000724637681159  
p = 0.000905797101449  
p = 0.00108695652174  
Ant 18 : [7, 4, 6], 25  
Exploration  
avg = 0.000501349627059  
p = 0.000905797101449  
Ant 19 : [6, 5, 4], 28  
Exploitation  
Ant 0 : [5, 6, 4, 3, 1], 59  
Exploitation  
Ant 5 : [3, 4, 6, 5], 41  
Exploitation  
Ant 6 : [5, 4, 6, 7], 53  
Exploitation  
Ant 7 : [4, 7, 3, 1], 53  
Exploration  
avg = 0.000536510590858  
p = 0.00054347826087  
p = 0.000724637681159  
p = 0.000724637681159

Ant 8 : [5, 6, 4, 7], 41  
Exploitation  
Ant 9 : [7, 4, 6, 5], 41  
Exploitation  
Ant 10 : [1, 0, 4, 6], 40  
Exploitation  
Ant 1 : [1, 3, 4, 6, 5], 59  
Exploitation  
Ant 11 : [5, 4, 6, 7], 53  
Exploitation  
Ant 12 : [7, 4, 6, 5], 41  
Exploration  
avg = 0.000783862876254  
p = 0.000905797101449  
p = 0.00108695652174  
Ant 2 : [0, 1, 3, 4, 6], 53  
Exploration  
avg = 0.00033926918166  
p = 0.000679347826087  
Ant 13 : [7, 4, 6, 5], 41  
Exploitation  
Ant 14 : [6, 5, 4, 3], 43  
Exploitation  
Ant 3 : [7, 4, 6, 5, 3], 63  
Exploitation  
Ant 15 : [2, 3, 4, 6], 43  
Exploitation  
Ant 16 : [6, 4, 7, 2], 43  
Exploration  
avg = 0.000513107937722  
p = 0.0006038647343  
p = 0.0006038647343  
Ant 4 : [6, 4, 7, 3, 2], 63  
Exploration  
avg = 0.000359988294245  
p = 0.000679347826087  
Ant 17 : [0, 4, 6, 5], 46  
Exploitation  
Ant 18 : [7, 4, 6, 5], 41  
Exploitation  
Ant 19 : [6, 5, 4, 3], 43  
Exploitation  
Ant 0 : [5, 6, 4, 3, 1, 0], 69  
Exploration  
avg = 0.000402057378664  
p = 0.000418060200669  
p = 0.00047258979206  
Ant 5 : [3, 4, 6, 5, 2], 64  
Exploration  
avg = 0.000419707595516  
p = 0.0006038647343  
p = 0.00054347826087  
Ant 6 : [5, 4, 6, 7, 3], 73  
Exploration

avg = 0.000573214975389  
p = 0.00108695652174  
Ant 7 : [4, 7, 3, 1, 0], 63  
Exploitation  
Ant 8 : [5, 6, 4, 7, 2], 59  
Exploitation  
Ant 9 : [7, 4, 6, 5, 3], 63  
Exploitation  
Ant 10 : [1, 0, 4, 6, 5], 56  
Exploration  
avg = 0.000396723104663  
p = 0.00047258979206  
Ant 1 : [1, 3, 4, 6, 5, 2], 82  
Exploration  
avg = 0.000419707595516  
p = 0.0006038647343  
p = 0.00054347826087  
Ant 11 : [5, 4, 6, 7, 3], 73  
Exploration  
avg = 0.000443229974185  
p = 0.00047258979206  
p = 0.000494071146245  
Ant 12 : [7, 4, 6, 5, 3], 63  
Exploitation  
Ant 2 : [0, 1, 3, 4, 6, 5], 69  
Exploration  
avg = 0.000443229974185  
p = 0.00047258979206  
p = 0.000494071146245  
Ant 13 : [7, 4, 6, 5, 3], 63  
Exploitation  
Ant 14 : [6, 5, 4, 3, 1], 61  
Exploitation  
Ant 3 : [7, 4, 6, 5, 3, 1], 81  
Exploration  
avg = 0.000392696642039  
p = 0.000679347826087  
Ant 15 : [2, 3, 4, 6, 5], 59  
Exploitation  
Ant 16 : [6, 4, 7, 2, 3], 61  
Exploration  
avg = 0.000442993259628  
p = 0.000494071146245  
p = 0.00047258979206  
Ant 4 : [6, 4, 7, 3, 2, 5], 86  
Exploration  
avg = 0.000428525475784  
p = 0.00047258979206  
p = 0.000494071146245  
Ant 17 : [0, 4, 6, 5, 3], 68  
Exploitation  
Ant 18 : [7, 4, 6, 5, 3], 63  
Exploitation  
Ant 19 : [6, 5, 4, 3, 1], 61

Exploration  
avg = 0.000307549713515  
p = 0.00036231884058  
Ant 0 : [5, 6, 4, 3, 1, 0, 2], 99  
Exploration  
avg = 0.000486751573708  
p = 0.000494071146245  
p = 0.0006038647343  
Ant 5 : [3, 4, 6, 5, 2, 7], 82  
Exploitation  
Ant 6 : [5, 4, 6, 7, 3, 1], 91  
Exploration  
avg = 0.000332517723822  
p = 0.00036231884058  
p = 0.000388198757764  
Ant 7 : [4, 7, 3, 1, 0, 5], 91  
Exploration  
avg = 0.000486751573708  
p = 0.000494071146245  
p = 0.0006038647343  
Ant 8 : [5, 6, 4, 7, 2, 3], 77  
Exploration  
avg = 0.000519453534881  
p = 0.0006038647343  
p = 0.0006038647343  
Ant 9 : [7, 4, 6, 5, 3, 2], 81  
Exploitation  
Ant 10 : [1, 0, 4, 6, 5, 3], 78  
Exploitation  
Ant 1 : [1, 3, 4, 6, 5, 2, 7], 100  
Exploration  
avg = 0.000519453534881  
p = 0.0006038647343  
p = 0.0006038647343  
Ant 11 : [5, 4, 6, 7, 3, 2], 91  
Exploration  
avg = 0.000519453534881  
p = 0.0006038647343  
p = 0.0006038647343  
Ant 12 : [7, 4, 6, 5, 3, 2], 81  
Exploitation  
Ant 2 : [0, 1, 3, 4, 6, 5, 2], 92  
Exploration  
avg = 0.000519453534881  
p = 0.0006038647343  
p = 0.0006038647343  
Ant 13 : [7, 4, 6, 5, 3, 2], 81  
Exploration  
avg = 0.000619911489477  
p = 0.00108695652174  
Ant 14 : [6, 5, 4, 3, 1, 0], 71  
Exploration  
avg = 0.000790513833992  
p = 0.00108695652174

Ant 3 : [7, 4, 6, 5, 3, 1, 0], 91  
Exploration  
avg = 0.000378546574199  
p = 0.000388198757764  
p = 0.000418060200669  
Ant 15 : [2, 3, 4, 6, 5, 1], 85  
Exploitation  
Ant 16 : [6, 4, 7, 2, 3, 1], 79  
Exploitation  
Ant 4 : [6, 4, 7, 3, 2, 5, 1], 112  
Exploitation  
Ant 17 : [0, 4, 6, 5, 3, 1], 86  
Exploration  
avg = 0.000519453534881  
p = 0.0006038647343  
p = 0.0006038647343  
Ant 18 : [7, 4, 6, 5, 3, 2], 81  
Exploitation  
Ant 19 : [6, 5, 4, 3, 1, 0], 71  
Exploitation  
Ant 0 : [5, 6, 4, 3, 1, 0, 2, 7], 117  
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.000265743693448

p = 0.000278706800446  
Ant 5 : [3, 4, 6, 5, 2, 7, 1], 121  
Exploration  
avg = 0.000790513833992  
p = 0.00108695652174  
Ant 6 : [5, 4, 6, 7, 3, 1, 0], 101  
Exploration  
avg = 0.000575968809074  
p = 0.000679347826087  
Ant 7 : [4, 7, 3, 1, 0, 5, 6], 107  
Exploitation  
Ant 8 : [5, 6, 4, 7, 2, 3, 1], 95  
Exploitation  
Ant 9 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploration  
avg = 0.000573671497585  
p = 0.0006038647343  
Ant 10 : [1, 0, 4, 6, 5, 3, 2], 96  
Exploitation  
Ant 1 : [1, 3, 4, 6, 5, 2, 7, 0], 143  
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.000428194993412

p = 0.000494071146245  
Ant 11 : [5, 4, 6, 7, 3, 2, 1], 113  
Exploration  
avg = 0.000428194993412  
p = 0.000494071146245

Ant 12 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploration  
avg = 0.0006038647343  
Ant 2 : [0, 1, 3, 4, 6, 5, 2, 7], 110  
Update called by 2Exploitation

Ant thread 2 terminating.Ant 13 : [7, 4, 6, 5, 3, 2, 1], 103

Exploitation  
Ant 14 : [6, 5, 4, 3, 1, 0, 2], 101  
Exploration  
avg = 0.00036231884058  
Ant 3 : [7, 4, 6, 5, 3, 1, 0, 2], 121  
Update called by 3Exploration

Ant thread 3 terminating.avg = 0.000682831661093

p = 0.00108695652174  
Ant 15 : [2, 3, 4, 6, 5, 1, 0], 95  
Exploration  
avg = 0.000752508361204  
p = 0.00108695652174  
Ant 16 : [6, 4, 7, 2, 3, 1, 0], 89  
Exploitation  
Ant 4 : [6, 4, 7, 3, 2, 5, 1, 0], 122  
Update called by 4Exploration

Ant thread 4 terminating.avg = 0.000386388973345

p = 0.000494071146245  
Ant 17 : [0, 4, 6, 5, 3, 1, 2], 108  
Exploration  
avg = 0.000428194993412  
p = 0.000494071146245  
Ant 18 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploration  
avg = 0.000307549713515  
p = 0.00036231884058  
Ant 19 : [6, 5, 4, 3, 1, 0, 2], 101  
Exploitation  
Ant 5 : [3, 4, 6, 5, 2, 7, 1, 0], 131  
ExplorationUpdate called by 5

avg = 0.00036231884058Ant thread 5 terminating.

Ant 6 : [5, 4, 6, 7, 3, 1, 0, 2], 131  
Update called by 6Exploitation

Ant thread 6 terminating.Ant 7 : [4, 7, 3, 1, 0, 5, 6, 2], 157

Update called by 7Exploitation

Ant thread 7 terminating.Ant 8 : [5, 6, 4, 7, 2, 3, 1, 0], 105

Update called by 8Exploration

Ant thread 8 terminating.avg = 0.00108695652174

Ant 9 : [7, 4, 6, 5, 3, 2, 1, 0], 113

Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [1, 0, 4, 6, 5, 3, 2, 7], 114

Update called by 10Exploration

Ant thread 10 terminating.avg = 0.00108695652174

Ant 11 : [5, 4, 6, 7, 3, 2, 1, 0], 123

Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [7, 4, 6, 5, 3, 2, 1, 0], 113

Update called by 12Exploration

Ant thread 12 terminating.avg = 0.00108695652174

Ant 13 : [7, 4, 6, 5, 3, 2, 1, 0], 113

Update called by 13Exploration

Ant thread 13 terminating.avg = 0.0006038647343

Ant 14 : [6, 5, 4, 3, 1, 0, 2, 7], 119

Update called by 14Exploration

Ant thread 14 terminating.avg = 0.000252780586451

Ant 15 : [2, 3, 4, 6, 5, 1, 0, 7], 138

Update called by 15Exploration

Ant thread 15 terminating.avg = 0.000388198757764

Ant 16 : [6, 4, 7, 2, 3, 1, 0, 5], 117

Update called by 16Exploration

Ant thread 16 terminating.avg = 0.0006038647343

Ant 17 : [0, 4, 6, 5, 3, 1, 2, 7], 126

ExplorationUpdate called by 17

avg = 0.00108695652174Ant thread 17 terminating.

Ant 18 : [7, 4, 6, 5, 3, 2, 1, 0], 113

Update called by 18Exploration

Ant thread 18 terminating.avg = 0.0006038647343

Ant 19 : [6, 5, 4, 3, 1, 0, 2, 7], 119

Update called by 19



Best: [5, 6, 4, 7, 2, 3, 1, 0], 133, 1, 153  
Ant thread 19 terminating.iter\_counter = 2

starting ant = 0

Explorationstarting ant = 1

avg = 0.000474100147085starting ant = 2

p = 0.000815217391304starting ant = 3

p = 0.000611413043478starting ant = 4

Ant 0 : [5, 6], 16starting ant = 5

Exploitationstarting ant = 6

Ant 1 : [1, 0], 10starting ant = 7

Exploitationstarting ant = 8

Ant 2 : [0, 1], 10starting ant = 9

Explorationstarting ant = 10

avg = 0.00039644742387starting ant = 11

p = 0.00054347826087starting ant = 12

p = 0.000489130434783starting ant = 13

p = 0.000652173913043starting ant = 14

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

Explorationstarting ant = 16

avg = 0.00040293431564starting ant = 17

p = 0.000978260869565starting ant = 18

p = 0.000611413043478starting ant = 19

Ant 4 : [6, 5], 16

Exploration

avg = 0.000368187861

p = 0.000978260869565

Ant 0 : [5, 6, 4], 26

Exploitation

Ant 5 : [3, 4], 15

Exploitation

Ant 6 : [5, 4], 12

Exploration

avg = 0.000321666473225

p = 0.000326086956522

p = 0.000489130434783  
p = 0.000349378881988  
Ant 1 : [1, 0, 5], 38  
Exploitation  
Ant 7 : [4, 6], 10  
Exploitation  
Ant 8 : [5, 4], 12  
Exploration  
avg = 0.000354032106749  
p = 0.000444664031621  
p = 0.00054347826087  
p = 0.000376254180602  
Ant 2 : [0, 1, 5], 36  
Exploitation  
Ant 9 : [7, 4], 15  
Exploration  
avg = 0.000464492880797  
p = 0.00108586956522  
p = 0.00054347826087  
Ant 10 : [1, 3], 18  
Exploitation  
Ant 11 : [5, 4], 12  
Exploitation  
Ant 12 : [7, 4], 15  
Exploitation  
Ant 13 : [7, 4], 15  
Exploration  
avg = 0.000427914905702  
p = 0.00108586956522  
p = 0.000678668478261  
Ant 14 : [6, 5], 16  
Exploration  
avg = 0.000610535117057  
p = 0.000652173913043  
p = 0.000815217391304  
p = 0.00108586956522  
Ant 3 : [7, 4, 6], 25  
Exploitation  
Ant 15 : [2, 3], 18  
Exploitation  
Ant 16 : [6, 4], 10  
Exploitation  
Ant 17 : [0, 1], 10  
Exploration  
avg = 0.00040679939064  
p = 0.00054347826087  
p = 0.000489130434783  
p = 0.000724637680435  
Ant 18 : [7, 4], 15  
Exploitation  
Ant 19 : [6, 4], 10  
Exploration  
avg = 0.000466311267614  
p = 0.00090579701087

Ant 4 : [6, 5, 4], 28  
Exploitation  
Ant 0 : [5, 6, 4, 3], 41  
Exploitation  
Ant 5 : [3, 4, 6], 25  
Exploration  
avg = 0.000595498867057  
p = 0.000723913043478  
p = 0.00108695641304  
p = 0.000652173913043  
Ant 6 : [5, 4, 7], 27  
Exploitation  
Ant 1 : [1, 0, 5, 4], 50  
Exploration  
avg = 0.000318367888174  
p = 0.000679341032609  
Ant 7 : [4, 6, 5], 26  
Exploration  
avg = 0.000607455388796  
p = 0.000723913043478  
p = 0.00108695641304  
p = 0.000723913043478  
Ant 8 : [5, 4, 7], 27  
Exploration  
avg = 0.000550180622385  
p = 0.00090579710144  
p = 0.000678668478261  
Ant 2 : [0, 1, 5, 6], 52  
Exploration  
avg = 0.0006226727801  
p = 0.000723913043478  
p = 0.000815217391304  
p = 0.00108695641304  
Ant 9 : [7, 4, 6], 25  
Exploitation  
Ant 10 : [1, 3, 4], 33  
Exploitation  
Ant 11 : [5, 4, 6], 22  
Exploitation  
Ant 12 : [7, 4, 6], 25  
Exploration  
avg = 0.000622672798216  
p = 0.000723913043478  
p = 0.000815217391304  
p = 0.00108695652174  
Ant 13 : [7, 4, 6], 25  
Exploration  
avg = 0.000466311282709  
p = 0.00090579710144  
Ant 14 : [6, 5, 4], 28  
Exploration  
avg = 0.000318929206429  
p = 0.000679347758152  
Ant 3 : [7, 4, 6, 5], 41

Exploitation  
Ant 15 : [2, 3, 4], 33  
Exploitation  
Ant 16 : [6, 4, 5], 22  
Exploration  
avg = 0.000370893868176  
p = 0.000444664031621  
p = 0.000603260869565  
p = 0.000417642140468  
Ant 17 : [0, 1, 5], 36  
Exploitation  
Ant 18 : [7, 4, 6], 25  
Exploration  
avg = 0.000577230769231  
p = 0.000723913043478  
p = 0.000904891304348  
p = 0.000724630434783  
Ant 19 : [6, 4, 7], 25  
Exploitation  
Ant 4 : [6, 5, 4, 7], 43  
Exploitation  
Ant 0 : [5, 6, 4, 3, 1], 59  
Exploitation  
Ant 5 : [3, 4, 6, 5], 41  
Exploitation  
Ant 6 : [5, 4, 7, 2], 45  
Exploration  
avg = 0.000727940356564  
p = 0.00108695652174  
Ant 1 : [1, 0, 5, 4, 6], 60  
Exploration  
avg = 0.000378414118962  
p = 0.000425330812854  
p = 0.000444664031621  
Ant 7 : [4, 6, 5, 3], 48  
Exploitation  
Ant 8 : [5, 4, 7, 2], 45  
Exploration  
avg = 0.000457773966014  
p = 0.00108695641304  
Ant 2 : [0, 1, 5, 6, 4], 62  
Exploration  
avg = 0.000318929220015  
p = 0.00067934782608  
Ant 9 : [7, 4, 6, 5], 41  
Exploration  
avg = 0.000716374024381  
p = 0.000904891304348  
p = 0.00108695652174  
p = 0.000724637680435  
Ant 10 : [1, 3, 4, 7], 48  
Exploration  
avg = 0.000246173259287  
p = 0.000264394829612

p = 0.00031556802244  
Ant 11 : [5, 4, 6, 7], 53  
Exploitation  
Ant 12 : [7, 4, 6, 5], 41  
Exploration  
avg = 0.000318929220016  
p = 0.000679347826087  
Ant 13 : [7, 4, 6, 5], 41  
Exploration  
avg = 0.000511700111481  
p = 0.000723913043478  
p = 0.000724637681152  
Ant 14 : [6, 5, 4, 7], 43  
Exploitation  
Ant 3 : [7, 4, 6, 5, 3], 63  
Exploration  
avg = 0.000690036231884  
p = 0.000904891304348  
p = 0.00108695652174  
p = 0.000724637681159  
Ant 15 : [2, 3, 4, 7], 48  
Exploration  
avg = 0.000388294553745  
p = 0.000425330812854  
p = 0.000494066205534  
Ant 16 : [6, 4, 5, 3], 44  
Exploitation  
Ant 17 : [0, 1, 5, 4], 48  
Exploration  
avg = 0.000318929220016  
p = 0.000679347826087  
Ant 18 : [7, 4, 6, 5], 41  
Exploitation  
Ant 19 : [6, 4, 7, 2], 43  
Exploration  
avg = 0.000392833439226  
p = 0.000603864673913  
p = 0.000489130434783  
Ant 4 : [6, 5, 4, 7, 3], 63  
Exploitation  
Ant 0 : [5, 6, 4, 3, 1, 0], 69  
Exploitation  
Ant 5 : [3, 4, 6, 5, 2], 64  
Exploitation  
Ant 6 : [5, 4, 7, 2, 3], 63  
Exploration  
avg = 0.00025961731116  
p = 0.000350280504909  
Ant 1 : [1, 0, 5, 4, 6, 7], 91  
Exploration  
avg = 0.000487859396914  
p = 0.000603260869565  
p = 0.00054347826087  
p = 0.000489130434783

Ant 7 : [4, 6, 5, 3, 7], 68  
Exploration  
avg = 0.000392565464427  
p = 0.000444664031621  
p = 0.000603858695652  
Ant 8 : [5, 4, 7, 2, 3], 63  
Exploitation  
Ant 2 : [0, 1, 5, 6, 4, 7], 77  
Exploitation  
Ant 9 : [7, 4, 6, 5, 3], 63  
Exploitation  
Ant 10 : [1, 3, 4, 7, 2], 66  
Exploration  
avg = 0.000406284541128  
p = 0.000603864733696  
p = 0.000542934782609  
Ant 11 : [5, 4, 6, 7, 3], 73  
Exploration  
avg = 0.000422955352652  
p = 0.000472117202268  
p = 0.000494071145751  
Ant 12 : [7, 4, 6, 5, 3], 63  
Exploitation  
Ant 13 : [7, 4, 6, 5, 3], 63  
Exploration  
avg = 0.000406419051997  
p = 0.000603864733696  
p = 0.000543472826087  
Ant 14 : [6, 5, 4, 7, 3], 63  
Exploration  
avg = 0.000487435717625  
p = 0.000603260869565  
p = 0.00054347826087  
Ant 3 : [7, 4, 6, 5, 3, 2], 81  
Exploration  
avg = 0.000272587339599  
p = 0.000296442687747  
p = 0.00031556802244  
Ant 15 : [2, 3, 4, 7, 6], 79  
Exploration  
avg = 0.000516256136045  
p = 0.000603260869565  
p = 0.000603260869565  
p = 0.000542934782609  
Ant 16 : [6, 4, 5, 3, 7], 64  
Exploitation  
Ant 17 : [0, 1, 5, 4, 6], 58  
Exploration  
avg = 0.000422955352776  
p = 0.000472117202268  
p = 0.000494071146245  
Ant 18 : [7, 4, 6, 5, 3], 63  
Exploration  
avg = 0.000449986618727

p = 0.000603864673913  
Ant 19 : [6, 4, 7, 2, 3], 61  
Exploration  
avg = 0.000507363253857  
p = 0.000603260869565  
p = 0.000603260869565  
Ant 4 : [6, 5, 4, 7, 3, 2], 81  
Exploitation  
Ant 0 : [5, 6, 4, 3, 1, 0, 2], 99  
Exploitation  
Ant 5 : [3, 4, 6, 5, 2, 7], 82  
Exploration  
avg = 0.000383916048888  
p = 0.000603260869565  
Ant 6 : [5, 4, 7, 2, 3, 1], 81  
Exploitation  
Ant 1 : [1, 0, 5, 4, 6, 7, 2], 109  
Exploration  
avg = 0.000360734460834  
p = 0.000603864734293  
Ant 7 : [4, 6, 5, 3, 7, 2], 86  
Exploration  
avg = 0.00038411532425  
p = 0.000603858695652  
Ant 8 : [5, 4, 7, 2, 3, 1], 81  
Exploration  
avg = 0.000573671470411  
p = 0.000603864734299  
Ant 2 : [0, 1, 5, 6, 4, 7, 2], 95  
Exploration  
avg = 0.000507763797335  
p = 0.000603864673913  
p = 0.000603858695652  
Ant 9 : [7, 4, 6, 5, 3, 2], 81  
Exploration  
avg = 0.000315689981096  
p = 0.000326086956522  
p = 0.000425330812854  
Ant 10 : [1, 3, 4, 7, 2, 5], 89  
Exploitation  
Ant 11 : [5, 4, 6, 7, 3, 1], 91  
Exploration  
avg = 0.000507765810016  
p = 0.000603864733696  
p = 0.000603864673913  
Ant 12 : [7, 4, 6, 5, 3, 2], 81  
Exploitation  
Ant 13 : [7, 4, 6, 5, 3, 1], 81  
Exploration  
avg = 0.000507765830143  
p = 0.000603864734293  
p = 0.000603864733696  
Ant 14 : [6, 5, 4, 7, 3, 2], 81  
Exploration

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avg = 0.000385375494071
p = 0.000444664031621
Ant 3 : [7, 4, 6, 5, 3, 2, 1], 103
Exploitation
Ant 15 : [2, 3, 4, 7, 6, 5], 95
Exploration
avg = 0.000360734460836
p = 0.0006038647343
Ant 16 : [6, 4, 5, 3, 7, 2], 82
Exploitation
Ant 17 : [0, 1, 5, 4, 6, 7], 89
Exploitation
Ant 18 : [7, 4, 6, 5, 3, 1], 81
Exploitation
Ant 19 : [6, 4, 7, 2, 3, 1], 79
Exploration
avg = 0.00040983201581
p = 0.000493577075099
Ant 4 : [6, 5, 4, 7, 3, 2, 1], 103
Exploration
avg = 0.000603260869565
Ant 0 : [5, 6, 4, 3, 1, 0, 2, 7], 117
Update called by 0Exploitation

Ant thread 0 terminating.Ant 5 : [3, 4, 6, 5, 2, 7, 1], 121

Exploration
avg = 0.000675670240893
p = 0.00108694565217
Ant 6 : [5, 4, 7, 2, 3, 1, 0], 91
Exploration
avg = 0.000603864733696
Ant 1 : [1, 0, 5, 4, 6, 7, 2, 3], 127
Update called by 1Exploitation

Ant thread 1 terminating.Ant 7 : [4, 6, 5, 3, 7, 2, 1], 108

Exploitation
Ant 8 : [5, 4, 7, 2, 3, 1, 0], 91
Exploitation
Ant 2 : [0, 1, 5, 6, 4, 7, 2, 3], 113
Update called by 2Exploitation

Ant thread 2 terminating.Ant 9 : [7, 4, 6, 5, 3, 2, 1], 103

Exploitation
Ant 10 : [1, 3, 4, 7, 2, 5, 6], 105
Exploration
avg = 0.000765810276136
p = 0.00108695652065
Ant 11 : [5, 4, 6, 7, 3, 1, 0], 101
Exploitation
Ant 12 : [7, 4, 6, 5, 3, 2, 1], 103
Exploitation

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Ant 13 : [7, 4, 6, 5, 3, 1, 0], 91

Exploitation

Ant 14 : [6, 5, 4, 7, 3, 2, 1], 103

Exploration

avg = 0.00108695652174

Ant 3 : [7, 4, 6, 5, 3, 2, 1, 0], 113

Update called by 3Exploitation

Ant thread 3 terminating.Ant 15 : [2, 3, 4, 7, 6, 5, 1], 121

Exploration

avg = 0.000410079051383

p = 0.000494071146245

Ant 16 : [6, 4, 5, 3, 7, 2, 1], 104

Exploitation

Ant 17 : [0, 1, 5, 4, 6, 7, 2], 107

Exploitation

Ant 18 : [7, 4, 6, 5, 3, 1, 0], 91

Exploitation

Ant 19 : [6, 4, 7, 2, 3, 1, 0], 89

Exploration

avg = 0.00108695652174

Ant 4 : [6, 5, 4, 7, 3, 2, 1, 0], 113

Update called by 4Exploration

Ant thread 4 terminating.avg = 0.00108695652174

Ant 5 : [3, 4, 6, 5, 2, 7, 1, 0], 131

Update called by 5Exploitation

Ant thread 5 terminating.Ant 6 : [5, 4, 7, 2, 3, 1, 0, 6], 135

Update called by 6Exploitation

Ant thread 6 terminating.Ant 7 : [4, 6, 5, 3, 7, 2, 1, 0], 118

Update called by 7Exploration

Ant thread 7 terminating.avg = 0.000246788537549

Ant 8 : [5, 4, 7, 2, 3, 1, 0, 6], 135

Update called by 8Exploration

Ant thread 8 terminating.avg = 0.00108695652174

Ant 9 : [7, 4, 6, 5, 3, 2, 1, 0], 113

Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [1, 3, 4, 7, 2, 5, 6, 0], 149

Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [5, 4, 6, 7, 3, 1, 0, 2], 131

Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [7, 4, 6, 5, 3, 2, 1, 0], 113

Update called by 12Exploitation

Ant thread 12 terminating.Ant 13 : [7, 4, 6, 5, 3, 1, 0, 2], 121

Update called by 13Exploitation

Ant thread 13 terminating.Ant 14 : [6, 5, 4, 7, 3, 2, 1, 0], 113

Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [2, 3, 4, 7, 6, 5, 1, 0], 131

ExplorationUpdate called by 15

avg = 0.00108695652174Ant thread 15 terminating.

Ant 16 : [6, 4, 5, 3, 7, 2, 1, 0], 114

Update called by 16Exploitation

Ant thread 16 terminating.Ant 17 : [0, 1, 5, 4, 6, 7, 2, 3], 125

Update called by 17Exploration

Ant thread 17 terminating.avg = 0.000362318804348

Ant 18 : [7, 4, 6, 5, 3, 1, 0, 2], 121

Update called by 18Exploration

Ant thread 18 terminating.avg = 0.000387810559006

Ant 19 : [6, 4, 7, 2, 3, 1, 0, 5], 117

Update called by 19

Best: [5, 6, 4, 7, 2, 3, 1, 0], 133, 2, 151

Ant thread 19 terminating.iter\_counter = 3

starting ant = 0

Explorationstarting ant = 1

avg = 0.000464759603784starting ant = 2

p = 0.000815217391304starting ant = 3

p = 0.000611412982337starting ant = 4

Ant 0 : [5, 6], 16starting ant = 5

Explorationstarting ant = 6

avg = 0.000425922892765starting ant = 7

p = 0.000978260869565starting ant = 8

p = 0.000542934782609starting ant = 9

Ant 1 : [1, 3], 18starting ant = 10

Explorationstarting ant = 11

avg = 0.000400717730052starting ant = 12

p = 0.000978251086957starting ant = 13

p = 0.000440217391304starting ant = 14

Ant 2 : [0, 4], 20starting ant = 15

Exploitationstarting ant = 16

Ant 3 : [7, 4], 15starting ant = 17

Exploitationstarting ant = 18

Ant 4 : [6, 4], 10starting ant = 19

Exploitation

Ant 0 : [5, 6, 4], 26

Exploitation

Ant 5 : [3, 4], 15

Exploitation

Ant 6 : [5, 4], 12

Exploitation

Ant 7 : [4, 6], 10

Exploitation

Ant 8 : [5, 4], 12

Exploitation

Ant 9 : [7, 4], 15

Exploitation

Ant 1 : [1, 3, 4], 33

Exploitation

Ant 10 : [1, 0], 10

Exploitation

Ant 11 : [5, 4], 12

Exploitation

Ant 12 : [7, 4], 15

Exploitation

Ant 13 : [7, 4], 15

Exploration

avg = 0.000408529428956

p = 0.00108694565217

p = 0.000611413043478

Ant 14 : [6, 5], 16

Exploration

avg = 0.000627117474916

p = 0.00065152173913

p = 0.000814402173913  
p = 0.00108586956522  
p = 0.000652173913043  
Ant 2 : [0, 4, 7], 35  
Exploration  
avg = 0.000394959225793  
p = 0.000444664031621  
p = 0.00054347826087  
p = 0.000424905482042  
p = 0.00054347826087  
Ant 15 : [2, 7], 18  
Exploration  
avg = 0.000418137348211  
p = 0.00108694565217  
p = 0.000678668478261  
Ant 16 : [6, 5], 16  
Exploration  
avg = 0.00059179138796  
p = 0.00065152173913  
p = 0.000814402173913  
p = 0.00108586956522  
Ant 3 : [7, 4, 6], 25  
Exploration  
avg = 0.00041532176732  
p = 0.000978251086957  
p = 0.000542445652174  
Ant 17 : [0, 4], 20  
Exploration  
avg = 0.000399233537124  
p = 0.00054347826087  
p = 0.00048913038587  
p = 0.000724637680435  
Ant 18 : [7, 4], 15  
Exploitation  
Ant 4 : [6, 4, 5], 22  
Exploitation  
Ant 19 : [6, 4], 10  
Exploration  
avg = 0.000474877926421  
p = 0.00065152173913  
p = 0.000723913043478  
Ant 0 : [5, 6, 4, 7], 41  
Exploration  
avg = 0.000619235681438  
p = 0.000904883152174  
p = 0.00108694565217  
p = 0.000724630434783  
Ant 5 : [3, 4, 7], 30  
Exploitation  
Ant 6 : [5, 4, 6], 22  
Exploitation  
Ant 7 : [4, 6, 5], 26  
Exploration  
avg = 0.000577011768395

p = 0.00065152173913  
p = 0.00108695641304  
p = 0.000724637608696  
Ant 8 : [5, 4, 7], 27  
Exploration  
avg = 0.000607052692308  
p = 0.00065152173913  
p = 0.000904883152174  
p = 0.00108695641304  
Ant 9 : [7, 4, 6], 25  
Exploration  
avg = 0.000699064701421  
p = 0.000904883152174  
p = 0.00108695652065  
p = 0.000724637680435  
Ant 1 : [1, 3, 4, 7], 48  
Exploitation  
Ant 10 : [1, 0, 4], 30  
Exploitation  
Ant 11 : [5, 4, 6], 22  
Exploration  
avg = 0.000607052710422  
p = 0.00065152173913  
p = 0.000904883152174  
p = 0.00108695652173  
Ant 12 : [7, 4, 6], 25  
Exploration  
avg = 0.000607052710424  
p = 0.00065152173913  
p = 0.000904883152174  
p = 0.00108695652174  
Ant 13 : [7, 4, 6], 25  
Exploitation  
Ant 14 : [6, 5, 4], 28  
Exploitation  
Ant 2 : [0, 4, 7, 2], 53  
Exploitation  
Ant 15 : [2, 7, 4], 33  
Exploration  
avg = 0.000455413992231  
p = 0.000905797100543  
Ant 16 : [6, 5, 4], 28  
Exploitation  
Ant 3 : [7, 4, 6, 5], 41  
Exploitation  
Ant 17 : [0, 4, 6], 30  
Exploration  
avg = 0.000607052710424  
p = 0.00065152173913  
p = 0.000904883152174  
p = 0.00108695652174  
Ant 18 : [7, 4, 6], 25  
Exploration  
avg = 0.000365337370569

p = 0.000375877926421  
p = 0.000424905482042  
p = 0.000444664031621  
Ant 4 : [6, 4, 5, 3], 44  
Exploitation  
Ant 19 : [6, 4, 5], 22  
Exploration  
avg = 0.000386932203685  
p = 0.000603260869565  
p = 0.00048913038587  
Ant 0 : [5, 6, 4, 7, 3], 61  
Exploitation  
Ant 5 : [3, 4, 7, 2], 48  
Exploitation  
Ant 6 : [5, 4, 6, 7], 53  
Exploitation  
Ant 7 : [4, 6, 5, 3], 48  
Exploration  
avg = 0.000383476698299  
p = 0.000603858695652  
p = 0.00054293478212  
Ant 8 : [5, 4, 7, 3], 47  
Exploration  
avg = 0.000305025428313  
p = 0.000679347825408  
Ant 9 : [7, 4, 6, 5], 41  
Exploitation  
Ant 1 : [1, 3, 4, 7, 2], 66  
Exploitation  
Ant 10 : [1, 0, 4, 6], 40  
Exploitation  
Ant 11 : [5, 4, 6, 7], 53  
Exploration  
avg = 0.000305025428448  
p = 0.00067934782608  
Ant 12 : [7, 4, 6, 5], 41  
Exploration  
avg = 0.000305025428449  
p = 0.000679347826087  
Ant 13 : [7, 4, 6, 5], 41  
Exploitation  
Ant 14 : [6, 5, 4, 7], 43  
Exploitation  
Ant 2 : [0, 4, 7, 2, 3], 71  
Exploration  
avg = 0.000660918461957  
p = 0.000905787961957  
p = 0.00108695652174  
Ant 15 : [2, 7, 4, 6], 43  
Exploration  
avg = 0.000475022853958  
p = 0.00065152173913  
p = 0.000724637681159  
Ant 16 : [6, 5, 4, 7], 43

Exploration  
avg = 0.000402322651946  
p = 0.000424905482042  
p = 0.000494066205534  
Ant 3 : [7, 4, 6, 5, 3], 63  
Exploration  
avg = 0.000330729017637  
p = 0.000679347826087  
p = 0.00035062762973  
Ant 17 : [0, 4, 6, 7], 61  
Exploration  
avg = 0.000305025428449  
p = 0.000679347826087  
Ant 18 : [7, 4, 6, 5], 41  
Exploration  
avg = 0.000465023321352  
p = 0.00054347826087  
p = 0.000543478260864  
p = 0.000489125543478  
Ant 4 : [6, 4, 5, 3, 7], 64  
Exploration  
avg = 0.000375218783612  
p = 0.000375877926421  
p = 0.000424905482042  
p = 0.000494071096838  
Ant 19 : [6, 4, 5, 3], 44  
Exploration  
avg = 0.00045698924731  
p = 0.00054347826087  
p = 0.000543478260864  
Ant 0 : [5, 6, 4, 7, 3, 2], 79  
Exploitation  
Ant 5 : [3, 4, 7, 2, 1], 70  
Exploration  
avg = 0.000400668764825  
p = 0.000603864673913  
p = 0.000543472826082  
Ant 6 : [5, 4, 6, 7, 3], 73  
Exploitation  
Ant 7 : [4, 6, 5, 3, 2], 66  
Exploitation  
Ant 8 : [5, 4, 7, 3, 2], 65  
Exploration  
avg = 0.000402323887001  
p = 0.000424905482042  
p = 0.000494071145751  
Ant 9 : [7, 4, 6, 5, 3], 63  
Exploration  
avg = 0.000298156899811  
p = 0.000424905482042  
Ant 1 : [1, 3, 4, 7, 2, 5], 89  
Exploitation  
Ant 10 : [1, 0, 4, 6, 5], 56  
Exploitation

Ant 11 : [5, 4, 6, 7, 2], 71  
Exploitation  
Ant 12 : [7, 4, 6, 5, 3], 63  
Exploration  
avg = 0.000402323887124  
p = 0.000424905482042  
p = 0.000494071146245  
Ant 13 : [7, 4, 6, 5, 3], 63  
Exploitation  
Ant 14 : [6, 5, 4, 7, 2], 61  
Exploitation  
Ant 2 : [0, 4, 7, 2, 3, 1], 89  
Exploration  
avg = 0.000337260046431  
p = 0.000679347826087  
Ant 15 : [2, 7, 4, 6, 5], 59  
Exploration  
avg = 0.00040067012503  
p = 0.000603864734293  
p = 0.000543478206522  
Ant 16 : [6, 5, 4, 7, 3], 63  
Exploration  
avg = 0.000497045587892  
p = 0.000603260869565  
p = 0.000603864673913  
Ant 3 : [7, 4, 6, 5, 3, 2], 81  
Exploitation  
Ant 17 : [0, 4, 6, 7, 2], 79  
Exploitation  
Ant 18 : [7, 4, 6, 5, 3], 63  
Exploitation  
Ant 4 : [6, 4, 5, 3, 7, 2], 82  
Exploitation  
Ant 19 : [6, 4, 5, 3, 2], 62  
Exploration  
avg = 0.000393527667984  
p = 0.000493577075099  
Ant 0 : [5, 6, 4, 7, 3, 2, 1], 101  
Exploration  
avg = 0.000566691776643  
p = 0.00108586956522  
Ant 5 : [3, 4, 7, 2, 1, 0], 80  
Exploration  
avg = 0.000497045608018  
p = 0.000603260869565  
p = 0.000603864734293  
Ant 6 : [5, 4, 6, 7, 3, 2], 91  
Exploration  
avg = 0.00046360176054  
p = 0.000494066205534  
p = 0.000603260815217  
Ant 7 : [4, 6, 5, 3, 2, 7], 84  
Exploration  
avg = 0.000321210474308



p = 0.000494066205534  
Ant 8 : [5, 4, 7, 3, 2, 1], 87  
Exploitation  
Ant 9 : [7, 4, 6, 5, 3, 2], 81  
Exploitation  
Ant 1 : [1, 3, 4, 7, 2, 5, 6], 105  
Exploration  
avg = 0.000395258349086  
p = 0.000424905482042  
p = 0.000494071146245  
Ant 10 : [1, 0, 4, 6, 5, 3], 78  
Exploration  
avg = 0.000463603409091  
p = 0.000494071096838  
p = 0.000603260869565  
Ant 11 : [5, 4, 6, 7, 2, 3], 89  
Exploitation  
Ant 12 : [7, 4, 6, 5, 3, 2], 81  
Exploration  
avg = 0.00049704560802  
p = 0.000603260869565  
p = 0.0006038647343  
Ant 13 : [7, 4, 6, 5, 3, 2], 81  
Exploitation  
Ant 14 : [6, 5, 4, 7, 2, 3], 79  
Exploitation  
Ant 2 : [0, 4, 7, 2, 3, 1, 5], 115  
Exploration  
avg = 0.000394796688818  
p = 0.000494071146245  
Ant 15 : [2, 7, 4, 6, 5, 3], 81  
Exploration  
avg = 0.00049704560802  
p = 0.000603260869565  
p = 0.0006038647343  
Ant 16 : [6, 5, 4, 7, 3, 2], 81  
Exploration  
avg = 0.000393774678854  
p = 0.000494071096838  
Ant 3 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploration  
avg = 0.000523349589541  
p = 0.000603864673913  
Ant 17 : [0, 4, 6, 7, 2, 3], 97  
Exploration  
avg = 0.00049704560802  
p = 0.000603260869565  
p = 0.0006038647343  
Ant 18 : [7, 4, 6, 5, 3, 2], 81  
Exploitation  
Ant 4 : [6, 4, 5, 3, 7, 2, 1], 104  
Exploration  
avg = 0.000463802700739  
p = 0.00049407114624

p = 0.000603858695109  
Ant 19 : [6, 4, 5, 3, 2, 7], 80  
Exploitation  
Ant 0 : [5, 6, 4, 7, 3, 2, 1, 0], 111  
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.000285852590344

p = 0.000349375388199  
Ant 5 : [3, 4, 7, 2, 1, 0, 5], 108  
Exploration  
avg = 0.000393774703555  
p = 0.00049407114624  
Ant 6 : [5, 4, 6, 7, 3, 2, 1], 113  
Exploitation  
Ant 7 : [4, 6, 5, 3, 2, 7, 1], 123  
Exploration  
avg = 0.000662455879847  
p = 0.00108695641304  
Ant 8 : [5, 4, 7, 3, 2, 1, 0], 97  
Exploitation  
Ant 9 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploitation  
Ant 1 : [1, 3, 4, 7, 2, 5, 6, 0], 149  
Update called by 1Exploitation

Ant thread 1 terminating.Ant 10 : [1, 0, 4, 6, 5, 3, 2], 96

Exploration  
avg = 0.000443636044881  
p = 0.000603260869565  
Ant 11 : [5, 4, 6, 7, 2, 3, 1], 107  
Exploitation  
Ant 12 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploration  
avg = 0.000393774703557  
p = 0.000494071146245  
Ant 13 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploitation  
Ant 14 : [6, 5, 4, 7, 2, 3, 1], 97  
Exploration  
avg = 0.000679341032603  
Ant 2 : [0, 4, 7, 2, 3, 1, 5, 6], 131  
Update called by 2Exploitation

Ant thread 2 terminating.Ant 15 : [2, 7, 4, 6, 5, 3, 1], 99

Exploitation  
Ant 16 : [6, 5, 4, 7, 3, 2, 1], 103  
Exploration  
avg = 0.00108695652065  
Ant 3 : [7, 4, 6, 5, 3, 2, 1, 0], 113  
Update called by 3Exploitation

Ant thread 3 terminating.Ant 17 : [0, 4, 6, 7, 2, 3, 1], 115

Exploitation

Ant 18 : [7, 4, 6, 5, 3, 2, 1], 103

Exploration

avg = 0.00108695652173

Ant 4 : [6, 4, 5, 3, 7, 2, 1, 0], 114

Update called by 4Exploration

Ant thread 4 terminating.avg = 0.000241588930155

p = 0.000278425585284

Ant 19 : [6, 4, 5, 3, 2, 7, 1], 119

Exploitation

Ant 5 : [3, 4, 7, 2, 1, 0, 5, 6], 124

Update called by 5Exploration

Ant thread 5 terminating.avg = 0.00108695652174

Ant 6 : [5, 4, 6, 7, 3, 2, 1, 0], 123

Update called by 6Exploitation

Ant thread 6 terminating.Ant 7 : [4, 6, 5, 3, 2, 7, 1, 0], 133

Update called by 7Exploration

Ant thread 7 terminating.avg = 0.00022232979249

Ant 8 : [5, 4, 7, 3, 2, 1, 0, 6], 141

Update called by 8Exploitation

Ant thread 8 terminating.Ant 9 : [7, 4, 6, 5, 3, 2, 1, 0], 113

Update called by 9Exploration

Ant thread 9 terminating.avg = 0.000603864673908

Ant 10 : [1, 0, 4, 6, 5, 3, 2, 7], 114

Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [5, 4, 6, 7, 2, 3, 1, 0], 117

ExplorationUpdate called by 11

avg = 0.00108695652174Ant thread 11 terminating.

Ant 12 : [7, 4, 6, 5, 3, 2, 1, 0], 113

Update called by 12Exploitation

Ant thread 12 terminating.Ant 13 : [7, 4, 6, 5, 3, 2, 1, 0], 113

Update called by 13Exploration

Ant thread 13 terminating.avg = 0.00108695652174

Ant 14 : [6, 5, 4, 7, 2, 3, 1, 0], 107  
Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [2, 7, 4, 6, 5, 3, 1, 0], 109  
Update called by 15Exploitation

Ant thread 15 terminating.Ant 16 : [6, 5, 4, 7, 3, 2, 1, 0], 113  
Update called by 16Exploration

Ant thread 16 terminating.avg = 0.000417642102843

Ant 17 : [0, 4, 6, 7, 2, 3, 1, 5], 141  
Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [7, 4, 6, 5, 3, 2, 1, 0], 113  
Update called by 18Exploitation

Ant thread 18 terminating.Ant 19 : [6, 4, 5, 3, 2, 7, 1, 0], 129  
Update called by 19  
Best: [5, 6, 4, 7, 2, 3, 1, 0], 133, 3, 156  
Ant thread 19 terminating.iter\_counter = 4

starting ant = 0  
Exploitationstarting ant = 1

Ant 0 : [5, 4], 12starting ant = 2

Exploitationstarting ant = 3

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

Exploitationstarting ant = 5

Ant 0 : [5, 4, 6], 22starting ant = 6

Explorationstarting ant = 7

avg = 0.000382008694547starting ant = 8

p = 0.000880425978261starting ant = 9

p = 0.000489130341848starting ant = 10

Ant 2 : [0, 4], 20starting ant = 11

Explorationstarting ant = 12

avg = 0.000377677004464starting ant = 13

p = 0.00054347826087starting ant = 14

p = 0.000489130434293starting ant = 15

p = 0.000652173913043starting ant = 16

Ant 3 : [7, 4], 15starting ant = 17

Explorationstarting ant = 18

avg = 0.0003079065539starting ant = 19

p = 0.000542934781679

p = 0.000349029471661

Ant 1 : [1, 0, 5], 38

Exploration

avg = 0.000384093165434

p = 0.000978260771739

p = 0.000611413043478

Ant 4 : [6, 5], 16

Exploitation

Ant 5 : [3, 4], 15

Exploitation

Ant 0 : [5, 4, 6, 7], 53

Exploration

avg = 0.000457826988277

p = 0.000904891304348

p = 0.000611413042867

Ant 6 : [5, 6], 16

Exploitation

Ant 7 : [4, 6], 10

Exploration

avg = 0.000467434907618

p = 0.000904891304348

p = 0.000678668478255

Ant 8 : [5, 6], 16

Exploration

avg = 0.000387925451669

p = 0.00054347826087

p = 0.000489130434293

p = 0.000723913043478

Ant 9 : [7, 4], 15

Exploitation

Ant 10 : [1, 0], 10

Exploitation

Ant 2 : [0, 4, 6], 30

Exploitation

Ant 11 : [5, 4], 12

Exploration

avg = 0.000388027936141

p = 0.00054347826087

p = 0.000489130434293

p = 0.000724630434783

Ant 12 : [7, 4], 15

Exploitation  
Ant 13 : [7, 4], 15  
Exploration  
avg = 0.000398660015218  
p = 0.000978260771739  
p = 0.000678668478261  
Ant 14 : [6, 5], 16  
Exploration  
avg = 0.000383413826897  
p = 0.000444664031621  
p = 0.000543478260326  
p = 0.000424901654064  
p = 0.000543478260326  
Ant 15 : [2, 7], 18  
Exploration  
avg = 0.000398756094411  
p = 0.000978260771739  
p = 0.000679341032609  
Ant 16 : [6, 5], 16  
Exploitation  
Ant 3 : [7, 4, 6], 25  
Exploration  
avg = 0.000395234699272  
p = 0.000880425978261  
p = 0.000542934781679  
Ant 17 : [0, 4], 20  
Exploitation  
Ant 18 : [7, 4], 15  
Exploration  
avg = 0.000398757055203  
p = 0.000978260771739  
p = 0.000679347758152  
Ant 19 : [6, 5], 16  
Exploitation  
Ant 1 : [1, 0, 5, 4], 50  
Exploitation  
Ant 4 : [6, 5, 4], 28  
Exploitation  
Ant 5 : [3, 4, 6], 25  
Exploration  
avg = 0.000366929833038  
p = 0.00054347826087  
p = 0.000489130434293  
Ant 0 : [5, 4, 6, 7, 3], 73  
Exploitation  
Ant 6 : [5, 6, 4], 26  
Exploitation  
Ant 7 : [4, 6, 5], 26  
Exploitation  
Ant 8 : [5, 6, 4], 26  
Exploration  
avg = 0.000564599102876  
p = 0.000586369565217  
p = 0.000815209165761

p = 0.00108695652173  
Ant 9 : [7, 4, 6], 25  
Exploration  
avg = 0.000314459160173  
p = 0.000543472826078  
p = 0.000387807064903  
Ant 10 : [1, 0, 5], 38  
Exploitation  
Ant 2 : [0, 4, 6, 5], 46  
Exploration  
avg = 0.000537426560758  
p = 0.000586369565217  
p = 0.00108695652174  
p = 0.000652173913043  
Ant 11 : [5, 4, 7], 27  
Exploration  
avg = 0.000564599102878  
p = 0.000586369565217  
p = 0.000815209165761  
p = 0.00108695652174  
Ant 12 : [7, 4, 6], 25  
Exploitation  
Ant 13 : [7, 4, 6], 25  
Exploitation  
Ant 14 : [6, 5, 4], 28  
Exploration  
avg = 0.000371088147799  
p = 0.000542934782604  
p = 0.000724637681152  
Ant 15 : [2, 7, 4], 33  
Exploitation  
Ant 16 : [6, 5, 4], 28  
Exploration  
avg = 0.000292551635604  
p = 0.000679347826087  
Ant 3 : [7, 4, 6, 5], 41  
Exploration  
avg = 0.000619218668095  
p = 0.000815209165761  
p = 0.00108695652174  
p = 0.000723913043478  
Ant 17 : [0, 4, 7], 35  
Exploitation  
Ant 18 : [7, 4, 6], 25  
Exploitation  
Ant 19 : [6, 5, 4], 28  
Exploration  
avg = 0.000675680602007  
p = 0.00108695652174  
p = 0.000724630434783  
Ant 1 : [1, 0, 5, 4, 7], 65  
Exploration  
avg = 0.000442013307692  
p = 0.000586369565217

p = 0.000724637608696  
Ant 4 : [6, 5, 4, 7], 43  
Exploitation  
Ant 5 : [3, 4, 6, 5], 41  
Exploration  
avg = 0.000447522206637  
p = 0.000543478260864  
p = 0.00054347826087  
Ant 0 : [5, 4, 6, 7, 3, 2], 91  
Exploitation  
Ant 6 : [5, 6, 4, 7], 41  
Exploration  
avg = 0.000337696914144  
p = 0.000338290133779  
p = 0.000382414933837  
p = 0.000444664031621  
Ant 7 : [4, 6, 5, 3], 48  
Exploitation  
Ant 8 : [5, 6, 4, 7], 41  
Exploitation  
Ant 9 : [7, 4, 6, 5], 41  
Exploration  
avg = 0.000540249744014  
p = 0.000905797101449  
p = 0.000679341032609  
Ant 10 : [1, 0, 5, 6], 54  
Exploration  
avg = 0.000363600179948  
p = 0.000382414933837  
p = 0.000493577075099  
Ant 2 : [0, 4, 6, 5, 3], 68  
Exploitation  
Ant 11 : [5, 4, 7, 2], 45  
Exploitation  
Ant 12 : [7, 4, 6, 5], 41  
Exploration  
avg = 0.000292551635604  
p = 0.000679347826087  
Ant 13 : [7, 4, 6, 5], 41  
Exploration  
avg = 0.000442013322185  
p = 0.000586369565217  
p = 0.000724637681159  
Ant 14 : [6, 5, 4, 7], 43  
Exploration  
avg = 0.000616565746196  
p = 0.000815209165761  
p = 0.00108695652174  
Ant 15 : [2, 7, 4, 6], 43  
Exploration  
avg = 0.000442013322185  
p = 0.000586369565217  
p = 0.000724637681159  
Ant 16 : [6, 5, 4, 7], 43



Exploitation  
Ant 3 : [7, 4, 6, 5, 3], 63  
Exploration  
avg = 0.000384175005537  
p = 0.000603260869565  
p = 0.000542934782604  
Ant 17 : [0, 4, 7, 3], 55  
Exploitation  
Ant 18 : [7, 4, 6, 5], 41  
Exploitation  
Ant 19 : [6, 5, 4, 7], 43  
Exploration  
avg = 0.000476820301543  
p = 0.000603260869565  
p = 0.000543472826087  
Ant 1 : [1, 0, 5, 4, 7, 3], 85  
Exploration  
avg = 0.000395462428269  
p = 0.000603260869565  
p = 0.000543478206522  
Ant 4 : [6, 5, 4, 7, 3], 63  
Exploitation  
Ant 5 : [3, 4, 6, 5, 2], 64  
Exploitation  
Ant 0 : [5, 4, 6, 7, 3, 2, 1], 113  
Exploitation  
Ant 6 : [5, 6, 4, 7, 2], 59  
Exploration  
avg = 0.000472747622233  
p = 0.000543478260864  
p = 0.000603260869565  
p = 0.000488641260326  
Ant 7 : [4, 6, 5, 3, 7], 68  
Exploitation  
Ant 8 : [5, 6, 4, 7, 2], 59  
Exploitation  
Ant 9 : [7, 4, 6, 5, 3], 63  
Exploitation  
Ant 10 : [1, 0, 5, 6, 4], 64  
Exploration  
avg = 0.000563223007098  
p = 0.000603260869565  
Ant 2 : [0, 4, 6, 5, 3, 2], 86  
Exploration  
avg = 0.000364916007769  
p = 0.000493577075099  
p = 0.000543478260326  
Ant 11 : [5, 4, 7, 2, 3], 63  
Exploration  
avg = 0.000396761554355  
p = 0.000471688043478  
p = 0.000494071145751  
Ant 12 : [7, 4, 6, 5, 3], 63  
Exploration

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avg = 0.000396761554477
p = 0.000471688043478
p = 0.00049407114624
Ant 13 : [7, 4, 6, 5, 3], 63
Exploitation
Ant 14 : [6, 5, 4, 7, 2], 61
Exploitation
Ant 15 : [2, 7, 4, 6, 5], 59
Exploration
avg = 0.000395613407752
p = 0.000603864733696
p = 0.000543478260326
Ant 16 : [6, 5, 4, 7, 3], 63
Exploration
avg = 0.000467649018231
p = 0.000543478260864
p = 0.000603858695652
Ant 3 : [7, 4, 6, 5, 3, 2], 81
Exploration
avg = 0.000424046349166
p = 0.000543478260864
p = 0.000603864673913
Ant 17 : [0, 4, 7, 3, 2], 73
Exploration
avg = 0.000396761554478
p = 0.000471688043478
p = 0.000494071146245
Ant 18 : [7, 4, 6, 5, 3], 63
Exploration
avg = 0.000395613407887
p = 0.000603864733696
p = 0.000543478260864
Ant 19 : [6, 5, 4, 7, 3], 63
Exploration
avg = 0.000396264664984
p = 0.000603864733696
Ant 1 : [1, 0, 5, 4, 7, 3, 2], 103
Exploitation
Ant 4 : [6, 5, 4, 7, 3, 2], 81
Exploitation
Ant 5 : [3, 4, 6, 5, 2, 7], 82
Exploitation
Ant 0 : [5, 4, 6, 7, 3, 2, 1, 0], 123
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.00045365612648

p = 0.000493577075099
p = 0.00060326086956
Ant 6 : [5, 6, 4, 7, 2, 3], 77
Exploitation
Ant 7 : [4, 6, 5, 3, 7, 2], 86
Exploitation
Ant 8 : [5, 6, 4, 7, 2, 3], 77

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Exploitation  
Ant 9 : [7, 4, 6, 5, 3, 2], 81  
Exploitation  
Ant 10 : [1, 0, 5, 6, 4, 7], 79  
Exploration  
avg = 0.000548717885375  
p = 0.000603858695652  
Ant 2 : [0, 4, 6, 5, 3, 2, 7], 104  
Exploration  
avg = 0.000329250985105  
p = 0.000543478260864  
Ant 11 : [5, 4, 7, 2, 3, 1], 81  
Exploration  
avg = 0.000487578567347  
p = 0.000603260869565  
p = 0.0006038647343  
Ant 12 : [7, 4, 6, 5, 3, 2], 81  
Exploitation  
Ant 13 : [7, 4, 6, 5, 3, 2], 81  
Exploration  
avg = 0.000453857394598  
p = 0.000493577075099  
p = 0.000603864673913  
Ant 14 : [6, 5, 4, 7, 2, 3], 79  
Exploitation  
Ant 15 : [2, 7, 4, 6, 5, 3], 81  
Exploitation  
Ant 16 : [6, 5, 4, 7, 3, 2], 81  
Exploitation  
Ant 3 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploration  
avg = 0.000359148706822  
p = 0.000494066205534  
p = 0.000424901654064  
Ant 17 : [0, 4, 7, 3, 2, 5], 96  
Exploration  
avg = 0.000487578567347  
p = 0.000603260869565  
p = 0.0006038647343  
Ant 18 : [7, 4, 6, 5, 3, 2], 81  
Exploitation  
Ant 19 : [6, 5, 4, 7, 3, 2], 81  
Exploration  
avg = 0.00015847826087  
Ant 1 : [1, 0, 5, 4, 7, 3, 2, 6], 153  
Update called by 1Exploitation  
  
Ant thread 1 terminating.Ant 4 : [6, 5, 4, 7, 3, 2, 1], 103  
  
Exploitation  
Ant 5 : [3, 4, 6, 5, 2, 7, 1], 121  
Exploitation  
Ant 6 : [5, 6, 4, 7, 2, 3, 1], 95  
Exploitation

Ant 7 : [4, 6, 5, 3, 7, 2, 1], 108  
Exploitation  
Ant 8 : [5, 6, 4, 7, 2, 3, 1], 95  
Exploration  
avg = 0.000379100790267  
p = 0.000494071145751  
Ant 9 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploitation  
Ant 10 : [1, 0, 5, 6, 4, 7, 2], 97  
Exploration  
avg = 0.000278428068336  
Ant 2 : [0, 4, 6, 5, 3, 2, 7, 1], 143  
Update called by 2Exploration

Ant thread 2 terminating.avg = 0.000650558112515

p = 0.00108695641304  
Ant 11 : [5, 4, 7, 2, 3, 1, 0], 91  
Exploitation  
Ant 12 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploration  
avg = 0.000379100790514  
p = 0.000494071146245  
Ant 13 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploitation  
Ant 14 : [6, 5, 4, 7, 2, 3, 1], 97  
Exploration  
avg = 0.000429737415936  
p = 0.000603864733696  
Ant 15 : [2, 7, 4, 6, 5, 3, 1], 99  
Exploitation  
Ant 16 : [6, 5, 4, 7, 3, 2, 1], 103  
Exploration  
avg = 0.00108695652065  
Ant 3 : [7, 4, 6, 5, 3, 2, 1, 0], 113  
Update called by 3Exploitation

Ant thread 3 terminating.Ant 17 : [0, 4, 7, 3, 2, 5, 6], 112

Exploration  
avg = 0.000379100790514  
p = 0.000494071146245  
Ant 18 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploitation  
Ant 19 : [6, 5, 4, 7, 3, 2, 1], 103  
Exploration  
avg = 0.00108695652173  
Ant 4 : [6, 5, 4, 7, 3, 2, 1, 0], 113  
ExplorationUpdate called by 4

avg = 0.00108695652174Ant thread 4 terminating.

Ant 5 : [3, 4, 6, 5, 2, 7, 1, 0], 131  
Update called by 5Exploitation

Ant thread 5 terminating.Ant 6 : [5, 6, 4, 7, 2, 3, 1, 0], 105

Update called by 6Exploration

Ant thread 6 terminating.avg = 0.00108695652174

Ant 7 : [4, 6, 5, 3, 7, 2, 1, 0], 118

Update called by 7Exploration

Ant thread 7 terminating.avg = 0.00108695652174

Ant 8 : [5, 6, 4, 7, 2, 3, 1, 0], 105

Update called by 8Exploration

Ant thread 8 terminating.avg = 0.00108695652174

Ant 9 : [7, 4, 6, 5, 3, 2, 1, 0], 113

Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [1, 0, 5, 6, 4, 7, 2, 3], 115

Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [5, 4, 7, 2, 3, 1, 0, 6], 135

Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [7, 4, 6, 5, 3, 2, 1, 0], 113

ExplorationUpdate called by 12

avg = 0.00108695652174Ant thread 12 terminating.

Ant 13 : [7, 4, 6, 5, 3, 2, 1, 0], 113

Update called by 13Exploration

Ant thread 13 terminating.avg = 0.00108695652174

Ant 14 : [6, 5, 4, 7, 2, 3, 1, 0], 107

Update called by 14Exploration

Ant thread 14 terminating.avg = 0.00108695652174

Ant 15 : [2, 7, 4, 6, 5, 3, 1, 0], 109

Update called by 15Exploration

Ant thread 15 terminating.avg = 0.00108695652174

Ant 16 : [6, 5, 4, 7, 3, 2, 1, 0], 113

Update called by 16Exploration

Ant thread 16 terminating.avg = 0.000214159811986

Ant 17 : [0, 4, 7, 3, 2, 5, 6, 1], 149  
Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [7, 4, 6, 5, 3, 2, 1, 0], 113

Update called by 18Exploitation

Ant thread 18 terminating.Ant 19 : [6, 5, 4, 7, 3, 2, 1, 0], 113

Update called by 19

Best: [5, 6, 4, 7, 2, 3, 1, 0], 133, 4, 152

Ant thread 19 terminating.iter\_counter = 5

starting ant = 0

Explorationstarting ant = 1

avg = 0.000438725535666starting ant = 2

p = 0.000444664031621starting ant = 3

p = 0.000815217391304starting ant = 4

p = 0.000611413042867starting ant = 5

Ant 0 : [5, 6], 16starting ant = 6

Exploitationstarting ant = 7

Ant 1 : [1, 0], 10starting ant = 8

Explorationstarting ant = 9

avg = 0.000359002975562starting ant = 10

p = 0.000792383380435starting ant = 11

p = 0.00048912554347starting ant = 12

Ant 2 : [0, 4], 20starting ant = 13

Exploitationstarting ant = 14

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

Explorationstarting ant = 16

avg = 0.000382990010704starting ant = 17

p = 0.000978260771739starting ant = 18

p = 0.000611413043478starting ant = 19

Ant 4 : [6, 5], 16

Exploration

avg = 0.000421588915429  
p = 0.000543478260864  
p = 0.00054347826087  
p = 0.000651521680435  
p = 0.000488636901778  
Ant 5 : [3, 7], 20  
Exploitation  
Ant 0 : [5, 6, 4], 26  
Exploration  
avg = 0.000448333455007  
p = 0.000815217391304  
p = 0.000678668478255  
Ant 6 : [5, 6], 16  
Exploration  
avg = 0.000528715581226  
p = 0.000733688249185  
p = 0.000978260869565  
p = 0.000652173913043  
Ant 7 : [4, 7], 15  
Exploration  
avg = 0.000295741106454  
p = 0.000542934733696  
p = 0.000349375356752  
Ant 1 : [1, 0, 5], 38  
Exploitation  
Ant 8 : [5, 4], 12  
Exploitation  
Ant 9 : [7, 4], 15  
Exploitation  
Ant 10 : [1, 0], 10  
Exploitation  
Ant 11 : [5, 4], 12  
Exploration  
avg = 0.000377911898923  
p = 0.00054347826087  
p = 0.000489130434783  
p = 0.000724630434783  
Ant 12 : [7, 4], 15  
Exploitation  
Ant 2 : [0, 4, 6], 30  
Exploration  
avg = 0.000377912923768  
p = 0.00054347826087  
p = 0.000489130434783  
p = 0.000724637608696  
Ant 13 : [7, 4], 15  
Exploitation  
Ant 14 : [6, 4], 10  
Exploitation  
Ant 3 : [7, 4, 6], 25  
Exploitation  
Ant 15 : [2, 3], 18  
Exploitation  
Ant 16 : [6, 4], 10

Exploitation  
Ant 17 : [0, 1], 10  
Exploration  
avg = 0.000377912934017  
p = 0.00054347826087  
p = 0.000489130434783  
p = 0.000724637680435  
Ant 18 : [7, 4], 15  
Exploitation  
Ant 19 : [6, 4], 10  
Exploration  
avg = 0.000425039393161  
p = 0.000444664031621  
p = 0.000905788043478  
Ant 4 : [6, 5, 4], 28  
Exploitation  
Ant 5 : [3, 7, 4], 35  
Exploitation  
Ant 0 : [5, 6, 4, 7], 41  
Exploitation  
Ant 6 : [5, 6, 4], 26  
Exploration  
avg = 0.00032012547628  
p = 0.00054347826087  
p = 0.000489130434783  
Ant 7 : [4, 7, 3], 35  
Exploration  
avg = 0.000534085606719  
p = 0.00090579701087  
p = 0.000679341032609  
Ant 1 : [1, 0, 5, 6], 54  
Exploitation  
Ant 8 : [5, 4, 6], 22  
Exploitation  
Ant 9 : [7, 4, 6], 25  
Exploitation  
Ant 10 : [1, 0, 4], 30  
Exploration  
avg = 0.000524745498704  
p = 0.000527732608696  
p = 0.00108695652065  
p = 0.000724630434783  
Ant 11 : [5, 4, 7], 27  
Exploration  
avg = 0.000526255134438  
p = 0.000527732608696  
p = 0.000733688249185  
p = 0.00108695652065  
Ant 12 : [7, 4, 6], 25  
Exploration  
avg = 0.000314005564689  
p = 0.000678668478261  
p = 0.000315252454134  
Ant 2 : [0, 4, 6, 7], 61



Exploration  
avg = 0.000526255134617  
p = 0.000527732608696  
p = 0.000733688249185  
p = 0.00108695652173  
Ant 13 : [7, 4, 6], 25  
Exploration  
avg = 0.000465868649112  
p = 0.000527732608696  
p = 0.000733688249185  
p = 0.000724637608696  
Ant 14 : [6, 4, 7], 25  
Exploration  
avg = 0.000290934456768  
p = 0.000678668478261  
Ant 3 : [7, 4, 6, 5], 41  
Exploration  
avg = 0.000410322848772  
p = 0.000543478260864  
p = 0.000651521680435  
p = 0.000542929847279  
Ant 15 : [2, 3, 7], 38  
Exploration  
avg = 0.000465868661068  
p = 0.000527732608696  
p = 0.000733688249185  
p = 0.000724637680435  
Ant 16 : [6, 4, 7], 25  
Exploration  
avg = 0.000284218960535  
p = 0.000324160079051  
p = 0.000488636902174  
p = 0.000338625375949  
Ant 17 : [0, 1, 5], 36  
Exploitation  
Ant 18 : [7, 4, 6], 25  
Exploration  
avg = 0.000465868661188  
p = 0.000527732608696  
p = 0.000733688249185  
p = 0.000724637681152  
Ant 19 : [6, 4, 7], 25  
Exploration  
avg = 0.00041230474359  
p = 0.000527732608696  
p = 0.000724637681159  
Ant 4 : [6, 5, 4, 7], 43  
Exploitation  
Ant 5 : [3, 7, 4, 6], 45  
Exploration  
avg = 0.000375773999515  
p = 0.00054347826087  
p = 0.000542934782609  
Ant 0 : [5, 6, 4, 7, 3], 61

Exploration  
avg = 0.00041230474359  
p = 0.000527732608696  
p = 0.000724637681159  
Ant 6 : [5, 6, 4, 7], 41  
Exploration  
avg = 0.000362192765158  
p = 0.000543478260864  
p = 0.00054347826087  
Ant 7 : [4, 7, 3, 2], 53  
Exploitation  
Ant 1 : [1, 0, 5, 6, 4], 64  
Exploration  
avg = 0.000225256230961  
p = 0.000263678319624  
p = 0.000350277349226  
Ant 8 : [5, 4, 6, 7], 53  
Exploitation  
Ant 9 : [7, 4, 6, 5], 41  
Exploitation  
Ant 10 : [1, 0, 4, 6], 40  
Exploration  
avg = 0.000351797705924  
p = 0.00054347826087  
p = 0.00054347826087  
Ant 11 : [5, 4, 7, 3], 47  
Exploration  
avg = 0.000291070312746  
p = 0.000679347758152  
Ant 12 : [7, 4, 6, 5], 41  
Exploration  
avg = 0.000388474199643  
p = 0.00054347826087  
p = 0.000543478206522  
Ant 2 : [0, 4, 6, 7, 3], 81  
Exploration  
avg = 0.000291070326197  
p = 0.000679347825408  
Ant 13 : [7, 4, 6, 5], 41  
Exploration  
avg = 0.000343949239029  
p = 0.00054347826087  
p = 0.000543478260326  
Ant 14 : [6, 4, 7, 3], 45  
Exploration  
avg = 0.00035708539903  
p = 0.00042451923913  
p = 0.000444664031621  
Ant 3 : [7, 4, 6, 5, 3], 63  
Exploration  
avg = 0.000322556368638  
p = 0.000724637681159  
Ant 15 : [2, 3, 7, 4], 53  
Exploitation

Ant 16 : [6, 4, 7, 2], 43  
Exploration  
avg = 0.000543869560524  
p = 0.00090579701087  
p = 0.000679347758152  
Ant 17 : [0, 1, 5, 6], 52  
Exploitation  
Ant 18 : [7, 4, 6, 5], 41  
Exploitation  
Ant 19 : [6, 4, 7, 2], 43  
Exploration  
avg = 0.000391004977775  
p = 0.000603858695652  
p = 0.000543478260864  
Ant 4 : [6, 5, 4, 7, 3], 63  
Exploration  
avg = 0.000321388373755  
p = 0.000679347826087  
Ant 5 : [3, 7, 4, 6, 5], 61  
Exploration  
avg = 0.000458929406263  
p = 0.000543478260864  
p = 0.000603260869565  
Ant 0 : [5, 6, 4, 7, 3, 2], 79  
Exploitation  
Ant 6 : [5, 6, 4, 7, 2], 59  
Exploration  
avg = 0.000325601249765  
p = 0.000444664031621  
p = 0.000424901619612  
Ant 7 : [4, 7, 3, 2, 5], 76  
Exploitation  
Ant 1 : [1, 0, 5, 6, 4, 7], 79  
Exploitation  
Ant 8 : [5, 4, 6, 7, 2], 71  
Exploration  
avg = 0.0003693136599  
p = 0.00042451923913  
p = 0.000493577075099  
Ant 9 : [7, 4, 6, 5, 3], 63  
Exploration  
avg = 0.000335600998923  
p = 0.000679347826087  
p = 0.000350627598177  
Ant 10 : [1, 0, 4, 6, 7], 71  
Exploitation  
Ant 11 : [5, 4, 7, 3, 2], 65  
Exploitation  
Ant 12 : [7, 4, 6, 5, 3], 63  
Exploration  
avg = 0.00049050100461  
p = 0.000543478260864  
p = 0.000603864673913  
Ant 2 : [0, 4, 6, 7, 3, 2], 99

Exploration  
avg = 0.000369437165335  
p = 0.00042451923913  
p = 0.000494071096838  
Ant 13 : [7, 4, 6, 5, 3], 63  
Exploitation  
Ant 14 : [6, 4, 7, 3, 2], 63  
Exploitation  
Ant 3 : [7, 4, 6, 5, 3, 2], 81  
Exploration  
avg = 0.00058887722534  
p = 0.000733688249185  
p = 0.00108695652174  
Ant 15 : [2, 3, 7, 4, 6], 63  
Exploitation  
Ant 16 : [6, 4, 7, 2, 3], 61  
Exploitation  
Ant 17 : [0, 1, 5, 6, 4], 62  
Exploitation  
Ant 18 : [7, 4, 6, 5, 3], 63  
Exploration  
avg = 0.000439588257228  
p = 0.000444664031621  
p = 0.000603858695652  
p = 0.000472112910336  
Ant 19 : [6, 4, 7, 2, 5], 66  
Exploitation  
Ant 4 : [6, 5, 4, 7, 3, 2], 81  
Exploitation  
Ant 5 : [3, 7, 4, 6, 5, 2], 84  
Exploitation  
Ant 0 : [5, 6, 4, 7, 3, 2, 1], 101  
Exploitation  
Ant 6 : [5, 6, 4, 7, 2, 3], 77  
Exploration  
avg = 0.000412835383593  
p = 0.000679347825408  
Ant 7 : [4, 7, 3, 2, 5, 6], 92  
Exploration  
avg = 0.000573671497283  
p = 0.000603864733696  
Ant 1 : [1, 0, 5, 6, 4, 7, 2], 97  
Exploration  
avg = 0.000445053046772  
p = 0.000493577075099  
p = 0.000603864673913  
Ant 8 : [5, 4, 6, 7, 2, 3], 89  
Exploration  
avg = 0.000459130694508  
p = 0.000543478260864  
p = 0.0006038647343  
Ant 9 : [7, 4, 6, 5, 3, 2], 81  
Exploitation  
Ant 10 : [1, 0, 4, 6, 7, 2], 89

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Exploration
avg = 0.000308805474308
p = 0.000493577075099
Ant 11 : [5, 4, 7, 3, 2, 1], 87
Exploitation
Ant 12 : [7, 4, 6, 5, 3, 2], 81
Exploration
avg = 0.000483325614388
p = 0.000494066205534
Ant 2 : [0, 4, 6, 7, 3, 2, 1], 121
Exploitation
Ant 13 : [7, 4, 6, 5, 3, 2], 81
Exploration
avg = 0.000401457837129
p = 0.000494071096838
p = 0.000472585023243
Ant 14 : [6, 4, 7, 3, 2, 5], 86
Exploitation
Ant 3 : [7, 4, 6, 5, 3, 2, 1], 103
Exploration
avg = 0.000380974353412
p = 0.000679347826087
Ant 15 : [2, 3, 7, 4, 6, 5], 79
Exploitation
Ant 16 : [6, 4, 7, 2, 3, 1], 79
Exploration
avg = 0.000508886529171
p = 0.000527732608696
p = 0.000724637681159
Ant 17 : [0, 1, 5, 6, 4, 7], 77
Exploration
avg = 0.000479058230741
p = 0.000603260869565
p = 0.0006038647343
Ant 18 : [7, 4, 6, 5, 3, 2], 81
Exploitation
Ant 19 : [6, 4, 7, 2, 5, 3], 88
Exploitation
Ant 4 : [6, 5, 4, 7, 3, 2, 1], 103
Exploitation
Ant 5 : [3, 7, 4, 6, 5, 2, 1], 106
Exploitation
Ant 0 : [5, 6, 4, 7, 3, 2, 1, 0], 111
Update called by 0Exploitation

Ant thread 0 terminating.Ant 6 : [5, 6, 4, 7, 2, 3, 1], 95

Exploitation
Ant 7 : [4, 7, 3, 2, 5, 6, 1], 129
Exploitation
Ant 1 : [1, 0, 5, 6, 4, 7, 2, 3], 115
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.000416953892006

```

p = 0.000603858695652  
Ant 8 : [5, 4, 6, 7, 2, 3, 1], 107  
Exploration  
avg = 0.000365894268775  
p = 0.000494071146245  
Ant 9 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploitation  
Ant 10 : [1, 0, 4, 6, 7, 2, 3], 107  
Exploitation  
Ant 11 : [5, 4, 7, 3, 2, 1, 0], 97  
Exploration  
avg = 0.000365894268775  
p = 0.000494071146245  
Ant 12 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploration  
avg = 0.000417265852422  
Ant 2 : [0, 4, 6, 7, 3, 2, 1, 5], 147  
Update called by 2Exploration

Ant thread 2 terminating.avg = 0.000365894268775

p = 0.000494071146245  
Ant 13 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploration  
avg = 0.000279579162685  
p = 0.000304461120401  
Ant 14 : [6, 4, 7, 3, 2, 5, 1], 112  
Exploitation  
Ant 3 : [7, 4, 6, 5, 3, 2, 1, 0], 113  
Update called by 3Exploration

Ant thread 3 terminating.avg = 0.000335810707418

p = 0.000416924209866  
Ant 15 : [2, 3, 7, 4, 6, 5, 1], 105  
Exploitation  
Ant 16 : [6, 4, 7, 2, 3, 1, 0], 89  
Exploration  
avg = 0.000573671497584  
p = 0.000603864734299  
Ant 17 : [0, 1, 5, 6, 4, 7, 2], 95  
Exploration  
avg = 0.000365894268775  
p = 0.000494071146245  
Ant 18 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploration  
avg = 0.000416956881136  
p = 0.000603864673913  
Ant 19 : [6, 4, 7, 2, 5, 3, 1], 106  
Exploitation  
Ant 4 : [6, 5, 4, 7, 3, 2, 1, 0], 113  
Update called by 4Exploration

Ant thread 4 terminating.avg = 0.00108695652174

Ant 5 : [3, 7, 4, 6, 5, 2, 1, 0], 116  
Update called by 5Exploration

Ant thread 5 terminating.avg = 0.00108695652174

Ant 6 : [5, 6, 4, 7, 2, 3, 1, 0], 105  
Update called by 6Exploration

Ant thread 6 terminating.avg = 0.00108695652174

Ant 7 : [4, 7, 3, 2, 5, 6, 1, 0], 139  
Update called by 7Exploitation

Ant thread 7 terminating.Ant 8 : [5, 4, 6, 7, 2, 3, 1, 0], 117  
Update called by 8Exploitation

Ant thread 8 terminating.Ant 9 : [7, 4, 6, 5, 3, 2, 1, 0], 113  
Update called by 9Exploration

Ant thread 9 terminating.avg = 0.000324160079051

Ant 10 : [1, 0, 4, 6, 7, 2, 3, 5], 129  
Update called by 10Exploration

Ant thread 10 terminating.avg = 0.000222107682626

Ant 11 : [5, 4, 7, 3, 2, 1, 0, 6], 141  
Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [7, 4, 6, 5, 3, 2, 1, 0], 113  
Update called by 12Exploration

Ant thread 12 terminating.avg = 0.00108695652174

Ant 13 : [7, 4, 6, 5, 3, 2, 1, 0], 113  
Update called by 13Exploitation

Ant thread 13 terminating.Ant 14 : [6, 4, 7, 3, 2, 5, 1, 0], 122  
Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [2, 3, 7, 4, 6, 5, 1, 0], 115  
Update called by 15Exploitation

Ant thread 15 terminating.Ant 16 : [6, 4, 7, 2, 3, 1, 0, 5], 117  
Update called by 16Exploration

Ant thread 16 terminating.avg = 0.000603864734299

Ant 17 : [0, 1, 5, 6, 4, 7, 2, 3], 113  
Update called by 17Exploration

Ant thread 17 terminating.avg = 0.00108695652174

Ant 18 : [7, 4, 6, 5, 3, 2, 1, 0], 113  
Update called by 18Exploration

Ant thread 18 terminating.avg = 0.00108695652174

Ant 19 : [6, 4, 7, 2, 5, 3, 1, 0], 116  
Update called by 19  
Best: [5, 6, 4, 7, 2, 3, 1, 0], 133, 5, 151  
Ant thread 19 terminating.iter\_counter = 6

starting ant = 0  
Explorationstarting ant = 1

avg = 0.000442308578763starting ant = 2

p = 0.000444664031621starting ant = 3

p = 0.000815217309783starting ant = 4

p = 0.000611413043472starting ant = 5

Ant 0 : [5, 6], 16starting ant = 6

Exploitationstarting ant = 7

Ant 1 : [1, 0], 10starting ant = 8

Exploitationstarting ant = 9

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

Explorationstarting ant = 11

avg = 0.000354873193503starting ant = 12

p = 0.00054347826087starting ant = 13

p = 0.000489130434783starting ant = 14

p = 0.000652173913043starting ant = 15

Ant 3 : [7, 4], 15starting ant = 16

Explorationstarting ant = 17

avg = 0.000375779832456starting ant = 18



p = 0.000978260869565starting ant = 19

p = 0.000611413043478

Ant 4 : [6, 5], 16

Exploitation

Ant 5 : [3, 4], 15

Exploitation

Ant 0 : [5, 6, 4], 26

Exploration

avg = 0.000451916498019

p = 0.000815217309783

p = 0.000678668478261

Ant 6 : [5, 6], 16

Exploration

avg = 0.000499135948569

p = 0.000660319424266

p = 0.000978260869565

p = 0.000652173913043

Ant 7 : [4, 7], 15

Exploitation

Ant 1 : [1, 0, 4], 30

Exploration

avg = 0.000452012577211

p = 0.000815217309783

p = 0.000679341032609

Ant 8 : [5, 6], 16

Exploration

avg = 0.000365121640708

p = 0.00054347826087

p = 0.000489130434783

p = 0.000723913043478

Ant 9 : [7, 4], 15

Exploitation

Ant 2 : [0, 1, 3], 28

Exploration

avg = 0.000407798107477

p = 0.00108586956522

p = 0.000602223819076

Ant 10 : [1, 3], 18

Exploration

avg = 0.000452013538003

p = 0.000815217309783

p = 0.000679347758152

Ant 11 : [5, 6], 16

Exploration

avg = 0.00036522412518

p = 0.00054347826087

p = 0.000489130434783

p = 0.000724630434783

Ant 12 : [7, 4], 15

Exploitation

Ant 13 : [7, 4], 15

Exploitation

Ant 14 : [6, 4], 10

Exploitation  
Ant 15 : [2, 3], 18  
Exploration  
avg = 0.000473629621157  
p = 0.000474959347826  
p = 0.000660319424266  
p = 0.000978260869565  
Ant 3 : [7, 4, 6], 25  
Exploration  
avg = 0.000400914149227  
p = 0.00108694565217  
p = 0.000678668478261  
Ant 16 : [6, 5], 16  
Exploration  
avg = 0.000399183831298  
p = 0.00108584305363  
p = 0.000542934733691  
Ant 17 : [0, 4], 20  
Exploration  
avg = 0.000365225160273  
p = 0.00054347826087  
p = 0.000489130434783  
p = 0.000724637680435  
Ant 18 : [7, 4], 15  
Exploitation  
Ant 19 : [6, 4], 10  
Exploitation  
Ant 4 : [6, 5, 4], 28  
Exploitation  
Ant 5 : [3, 4, 6], 25  
Exploration  
avg = 0.000385422095318  
p = 0.000474959347826  
p = 0.000723913043478  
Ant 0 : [5, 6, 4, 7], 41  
Exploitation  
Ant 6 : [5, 6, 4], 26  
Exploration  
avg = 0.00030532307358  
p = 0.00054347826087  
p = 0.000489130434783  
Ant 7 : [4, 7, 3], 35  
Exploration  
avg = 0.000638743045388  
p = 0.000660319424266  
p = 0.00108694565217  
p = 0.000724630434783  
Ant 1 : [1, 0, 4, 7], 45  
Exploration  
avg = 0.000354623572467  
p = 0.00108695652065  
Ant 8 : [5, 6, 4], 26  
Exploitation  
Ant 9 : [7, 4, 6], 25

Exploitation  
Ant 2 : [0, 1, 3, 4], 43  
Exploration  
avg = 0.000426704158132  
p = 0.00054347826087  
p = 0.000724623854343  
p = 0.000443134832016  
p = 0.00048912549906  
Ant 10 : [1, 3, 7], 38  
Exploitation  
Ant 11 : [5, 6, 4], 26  
Exploitation  
Ant 12 : [7, 4, 6], 25  
Exploration  
avg = 0.000491745563005  
p = 0.000660319424266  
p = 0.00108695652065  
Ant 13 : [7, 4, 6], 25  
Exploitation  
Ant 14 : [6, 4, 7], 25  
Exploration  
avg = 0.00043567236374  
p = 0.000543478260326  
p = 0.000724623854343  
p = 0.000443134832016  
p = 0.000542934733251  
Ant 15 : [2, 3, 7], 38  
Exploitation  
Ant 3 : [7, 4, 6, 5], 41  
Exploitation  
Ant 16 : [6, 5, 4], 28  
Exploitation  
Ant 17 : [0, 4, 6], 30  
Exploitation  
Ant 18 : [7, 4, 6], 25  
Exploitation  
Ant 19 : [6, 4, 7], 25  
Exploitation  
Ant 4 : [6, 5, 4, 7], 43  
Exploration  
avg = 0.000313462869864  
p = 0.000679347758152  
p = 0.0003155679906  
Ant 5 : [3, 4, 6, 7], 56  
Exploration  
avg = 0.000365356925651  
p = 0.00054347826087  
p = 0.000542934782609  
Ant 0 : [5, 6, 4, 7, 3], 61  
Exploitation  
Ant 6 : [5, 6, 4, 7], 41  
Exploration  
avg = 0.000377990771143  
p = 0.000543478260326

p = 0.00054347826087  
p = 0.000443134832016  
Ant 7 : [4, 7, 3, 5], 57  
Exploration  
avg = 0.000377816543415  
p = 0.00054347826087  
p = 0.00054347826087  
Ant 1 : [1, 0, 4, 7, 3], 65  
Exploration  
avg = 0.000385567022854  
p = 0.000474959347826  
p = 0.000724637681159  
Ant 8 : [5, 6, 4, 7], 41  
Exploitation  
Ant 9 : [7, 4, 6, 5], 41  
Exploitation  
Ant 2 : [0, 1, 3, 4, 6], 53  
Exploitation  
Ant 10 : [1, 3, 7, 4], 53  
Exploitation  
Ant 11 : [5, 6, 4, 7], 41  
Exploitation  
Ant 12 : [7, 4, 6, 5], 41  
Exploration  
avg = 0.000280912949926  
p = 0.00067934782608  
Ant 13 : [7, 4, 6, 5], 41  
Exploitation  
Ant 14 : [6, 4, 7, 2], 43  
Exploration  
avg = 0.000304793485397  
p = 0.000724637681159  
Ant 15 : [2, 3, 7, 4], 53  
Exploitation  
Ant 3 : [7, 4, 6, 5, 3], 63  
Exploration  
avg = 0.000385567022854  
p = 0.000474959347826  
p = 0.000724637681159  
Ant 16 : [6, 5, 4, 7], 43  
Exploration  
avg = 0.000314987606231  
p = 0.000679347826087  
p = 0.00035028050459  
Ant 17 : [0, 4, 6, 7], 61  
Exploitation  
Ant 18 : [7, 4, 6, 5], 41  
Exploitation  
Ant 19 : [6, 4, 7, 2], 43  
Exploration  
avg = 0.000380587890325  
p = 0.000603858695652  
p = 0.000543478206522  
Ant 4 : [6, 5, 4, 7, 3], 63

Exploitation  
Ant 5 : [3, 4, 6, 7, 2], 74  
Exploration  
avg = 0.000431333566906  
p = 0.000543478260326  
p = 0.00054347826087  
Ant 0 : [5, 6, 4, 7, 3, 2], 79  
Exploration  
avg = 0.000380589398341  
p = 0.000603864673913  
p = 0.000543478260326  
Ant 6 : [5, 6, 4, 7, 3], 61  
Exploitation  
Ant 7 : [4, 7, 3, 5, 6], 73  
Exploration  
avg = 0.000416546991883  
p = 0.000603260869565  
p = 0.000493561783103  
Ant 1 : [1, 0, 4, 7, 3, 5], 87  
Exploration  
avg = 0.000380589398475  
p = 0.000603864673913  
p = 0.000543478260864  
Ant 8 : [5, 6, 4, 7, 3], 61  
Exploitation  
Ant 9 : [7, 4, 6, 5, 3], 63  
Exploitation  
Ant 2 : [0, 1, 3, 4, 6, 5], 69  
Exploitation  
Ant 10 : [1, 3, 7, 4, 6], 63  
Exploration  
avg = 0.000380589398477  
p = 0.000603864673913  
p = 0.00054347826087  
Ant 11 : [5, 6, 4, 7, 3], 61  
Exploitation  
Ant 12 : [7, 4, 6, 5, 3], 63  
Exploitation  
Ant 13 : [7, 4, 6, 5, 3], 63  
Exploitation  
Ant 14 : [6, 4, 7, 2, 3], 61  
Exploration  
avg = 0.000557163415849  
p = 0.000660319424266  
p = 0.00108695652174  
Ant 15 : [2, 3, 7, 4, 6], 63  
Exploitation  
Ant 3 : [7, 4, 6, 5, 3, 2], 81  
Exploitation  
Ant 16 : [6, 5, 4, 7, 2], 61  
Exploitation  
Ant 17 : [0, 4, 6, 7, 2], 79  
Exploitation  
Ant 18 : [7, 4, 6, 5, 3], 63

Exploitation  
Ant 19 : [6, 4, 7, 2, 3], 61  
Exploration  
avg = 0.0004514603785  
p = 0.000543478260326  
p = 0.000603858695652  
Ant 4 : [6, 5, 4, 7, 3, 2], 81  
Exploration  
avg = 0.000361313484577  
p = 0.000444664031621  
p = 0.000425330769935  
Ant 5 : [3, 4, 6, 7, 2, 5], 97  
Exploration  
avg = 0.000329304841897  
p = 0.000444664031621  
Ant 0 : [5, 6, 4, 7, 3, 2, 1], 101  
Exploitation  
Ant 6 : [5, 6, 4, 7, 3, 2], 79  
Exploration  
avg = 0.000190799533523  
p = 0.000264123986193  
Ant 7 : [4, 7, 3, 5, 6, 1], 110  
Exploitation  
Ant 1 : [1, 0, 4, 7, 3, 5, 6], 103  
Exploration  
avg = 0.000451462391182  
p = 0.000543478260326  
p = 0.000603864733696  
Ant 8 : [5, 6, 4, 7, 3, 2], 79  
Exploitation  
Ant 9 : [7, 4, 6, 5, 3, 2], 81  
Exploitation  
Ant 2 : [0, 1, 3, 4, 6, 5, 2], 92  
Exploitation  
Ant 10 : [1, 3, 7, 4, 6, 5], 79  
Exploration  
avg = 0.000451462391383  
p = 0.000543478260326  
p = 0.000603864734299  
Ant 11 : [5, 6, 4, 7, 3, 2], 79  
Exploitation  
Ant 12 : [7, 4, 6, 5, 3, 2], 81  
Exploitation  
Ant 13 : [7, 4, 6, 5, 3, 2], 81  
Exploitation  
Ant 14 : [6, 4, 7, 2, 3, 1], 79  
Exploitation  
Ant 15 : [2, 3, 7, 4, 6, 5], 79  
Exploitation  
Ant 3 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploration  
avg = 0.000437292177207  
p = 0.000494066205534  
p = 0.000603864673913

Ant 16 : [6, 5, 4, 7, 2, 3], 79  
Exploration  
avg = 0.000523349380356  
p = 0.000603864733696  
Ant 17 : [0, 4, 6, 7, 2, 3], 97  
Exploration  
avg = 0.000471389927794  
p = 0.00060326086956  
p = 0.0006038647343  
Ant 18 : [7, 4, 6, 5, 3, 2], 81  
Exploration  
avg = 0.000434790367232  
p = 0.00060326086956  
p = 0.000494066052614  
Ant 19 : [6, 4, 7, 2, 3, 5], 83  
Exploration  
avg = 0.000354005928854  
p = 0.000494066205534  
Ant 4 : [6, 5, 4, 7, 3, 2, 1], 103  
Exploration  
avg = 0.000302735720578  
p = 0.000376243956685  
Ant 5 : [3, 4, 6, 7, 2, 5, 1], 123  
Exploration  
avg = 0.00108586956522  
Ant 0 : [5, 6, 4, 7, 3, 2, 1, 0], 111  
Update called by 0Exploitation

Ant thread 0 terminating.Ant 6 : [5, 6, 4, 7, 3, 2, 1], 101

Exploration  
avg = 0.00068934486166  
p = 0.00108694565217  
Ant 7 : [4, 7, 3, 5, 6, 1, 0], 120  
Exploitation  
Ant 1 : [1, 0, 4, 7, 3, 5, 6, 2], 153  
Update called by 1Exploitation

Ant thread 1 terminating.Ant 8 : [5, 6, 4, 7, 3, 2, 1], 101

Exploitation  
Ant 9 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploration  
avg = 0.00048913038587  
Ant 2 : [0, 1, 3, 4, 6, 5, 2, 7], 110  
ExplorationUpdate called by 2

avg = 0.000350670180195Ant thread 2 terminating.

p = 0.000472112875919  
Ant 10 : [1, 3, 7, 4, 6, 5, 2], 102  
Exploration  
avg = 0.000354008399209  
p = 0.000494071146245

Ant 11 : [5, 6, 4, 7, 3, 2, 1], 101  
Exploitation  
Ant 12 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploitation  
Ant 13 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploitation  
Ant 14 : [6, 4, 7, 2, 3, 1, 0], 89  
Exploration  
avg = 0.000323434761351  
p = 0.000417642038229  
Ant 15 : [2, 3, 7, 4, 6, 5, 1], 105  
Exploitation  
Ant 3 : [7, 4, 6, 5, 3, 2, 1, 0], 113  
Update called by 3Exploitation

Ant thread 3 terminating.Ant 16 : [6, 5, 4, 7, 2, 3, 1], 97

Exploration  
avg = 0.00054896489548  
p = 0.000603858695652  
Ant 17 : [0, 4, 6, 7, 2, 3, 1], 115  
Exploration  
avg = 0.000354008399209  
p = 0.000494071146245  
Ant 18 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploration  
avg = 0.000323641751758  
p = 0.000418056019044  
Ant 19 : [6, 4, 7, 2, 3, 5, 1], 109  
Exploration  
avg = 0.00108695652173  
Ant 4 : [6, 5, 4, 7, 3, 2, 1, 0], 113  
Update called by 4Exploration

Ant thread 4 terminating.avg = 0.00108695652174

Ant 5 : [3, 4, 6, 7, 2, 5, 1, 0], 133  
Update called by 5Exploitation

Ant thread 5 terminating.Ant 6 : [5, 6, 4, 7, 3, 2, 1, 0], 111

ExploitationUpdate called by 6

Ant 7 : [4, 7, 3, 5, 6, 1, 0, 2], 150Ant thread 6 terminating.

Update called by 7Exploration

Ant thread 7 terminating.avg = 0.00108695652174

Ant 8 : [5, 6, 4, 7, 3, 2, 1, 0], 111  
Update called by 8Exploitation

Ant thread 8 terminating.Ant 9 : [7, 4, 6, 5, 3, 2, 1, 0], 113



Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [1, 3, 7, 4, 6, 5, 2, 0], 132

Update called by 10Exploration

Ant thread 10 terminating.avg = 0.00108695652174

Ant 11 : [5, 6, 4, 7, 3, 2, 1, 0], 111

Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [7, 4, 6, 5, 3, 2, 1, 0], 113

Update called by 12Exploration

Ant thread 12 terminating.avg = 0.00108695652174

Ant 13 : [7, 4, 6, 5, 3, 2, 1, 0], 113

Update called by 13Exploitation

Ant thread 13 terminating.Ant 14 : [6, 4, 7, 2, 3, 1, 0, 5], 117

Update called by 14Exploration

Ant thread 14 terminating.avg = 0.00108695652174

Ant 15 : [2, 3, 7, 4, 6, 5, 1, 0], 115

Update called by 15Exploitation

Ant thread 15 terminating.Ant 16 : [6, 5, 4, 7, 2, 3, 1, 0], 107

Update called by 16Exploration

Ant thread 16 terminating.avg = 0.000376247031468

Ant 17 : [0, 4, 6, 7, 2, 3, 1, 5], 141

Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [7, 4, 6, 5, 3, 2, 1, 0], 113

Update called by 18Exploration

Ant thread 18 terminating.avg = 0.00108695652174

Ant 19 : [6, 4, 7, 2, 3, 5, 1, 0], 119

Update called by 19

Best: [5, 6, 4, 7, 2, 3, 1, 0], 133, 6, 153

Ant thread 19 terminating.iter\_counter = 7

starting ant = 0

Explorationstarting ant = 1

avg = 0.000436316879501starting ant = 2

p = 0.000444664031616starting ant = 3  
p = 0.000815209239123starting ant = 4  
p = 0.000611413043478starting ant = 5  
Ant 0 : [5, 6], 16starting ant = 6  
Explorationstarting ant = 7  
avg = 0.000372689132457starting ant = 8  
p = 0.000978260869565starting ant = 9  
p = 0.000543463492633starting ant = 10  
p = 0.000375877862079starting ant = 11  
Ant 1 : [1, 5], 26starting ant = 12  
Exploitationstarting ant = 13  
Ant 2 : [0, 1], 10starting ant = 14  
Exploitationstarting ant = 15  
Ant 3 : [7, 4], 15starting ant = 16  
Explorationstarting ant = 17  
avg = 0.000380524389591starting ant = 18  
p = 0.000978260869565starting ant = 19  
  
p = 0.000611413043478  
Ant 4 : [6, 5], 16  
Exploitation  
Ant 5 : [3, 4], 15  
Exploration  
avg = 0.000342042947276  
p = 0.000978260869565  
Ant 0 : [5, 6, 4], 26  
Exploration  
avg = 0.000445924798756  
p = 0.000815209239123  
p = 0.000678668478261  
Ant 6 : [5, 6], 16  
Exploration  
avg = 0.000472514279178  
p = 0.00059428748184  
p = 0.000978260869565  
p = 0.000652173913043  
Ant 7 : [4, 7], 15  
Exploitation

Ant 8 : [5, 4], 12  
Exploitation  
Ant 9 : [7, 4], 15  
Exploration  
avg = 0.000378654920343  
p = 0.000978260869565  
p = 0.000543463492633  
p = 0.000417638377283  
Ant 10 : [1, 5], 26  
Exploration  
avg = 0.000458832589906  
p = 0.000904891222826  
p = 0.000679341032609  
Ant 11 : [5, 6], 16  
Exploration  
avg = 0.000472596785319  
p = 0.000904891222826  
p = 0.000679347758152  
Ant 1 : [1, 5, 6], 42  
Exploitation  
Ant 12 : [7, 4], 15  
Exploitation  
Ant 13 : [7, 4], 15  
Exploration  
avg = 0.000278790196332  
p = 0.000543463492633  
p = 0.000418055982435  
Ant 2 : [0, 1, 5], 36  
Exploration  
avg = 0.000405504979653  
p = 0.00108586956522  
p = 0.000678668478261  
Ant 14 : [6, 5], 16  
Exploration  
avg = 0.000380066877084  
p = 0.000444664031621  
p = 0.000543478260864  
p = 0.000424905481655  
p = 0.000542445651734  
Ant 15 : [2, 7], 18  
Exploitation  
Ant 3 : [7, 4, 6], 25  
Exploration  
avg = 0.000405601058846  
p = 0.00108586956522  
p = 0.000679341032609  
Ant 16 : [6, 5], 16  
Exploration  
avg = 0.000395650675673  
p = 0.001085859544  
p = 0.000489125543038  
Ant 17 : [0, 4], 20  
Exploitation  
Ant 18 : [7, 4], 15

Exploration  
avg = 0.000405602019638  
p = 0.00108586956522  
p = 0.000679347758152  
Ant 19 : [6, 5], 16  
Exploitation  
Ant 4 : [6, 5, 4], 28  
Exploitation  
Ant 5 : [3, 4, 6], 25  
Exploitation  
Ant 0 : [5, 6, 4, 7], 41  
Exploitation  
Ant 6 : [5, 6, 4], 26  
Exploitation  
Ant 7 : [4, 7, 2], 33  
Exploration  
avg = 0.000482408962793  
p = 0.00108694565217  
p = 0.000724630434783  
Ant 8 : [5, 4, 7], 27  
Exploitation  
Ant 9 : [7, 4, 6], 25  
Exploitation  
Ant 10 : [1, 5, 4], 38  
Exploration  
avg = 0.000360157077711  
p = 0.00108694565217  
Ant 11 : [5, 6, 4], 26  
Exploitation  
Ant 1 : [1, 5, 6, 4], 52  
Exploitation  
Ant 12 : [7, 4, 6], 25  
Exploitation  
Ant 13 : [7, 4, 6], 25  
Exploration  
avg = 0.000526036366236  
p = 0.000905797010861  
p = 0.000679347825408  
Ant 2 : [0, 1, 5, 6], 52  
Exploitation  
Ant 14 : [6, 5, 4], 28  
Exploitation  
Ant 15 : [2, 7, 4], 33  
Exploration  
avg = 0.000287555954549  
p = 0.000679347825408  
Ant 3 : [7, 4, 6, 5], 41  
Exploitation  
Ant 16 : [6, 5, 4], 28  
Exploration  
avg = 0.000533322111938  
p = 0.00059428748184  
p = 0.00108695652173  
p = 0.000724637608696

Ant 17 : [0, 4, 7], 35  
Exploitation  
Ant 18 : [7, 4, 6], 25  
Exploration  
avg = 0.000422232162558  
p = 0.000425326520609  
p = 0.000444664031616  
p = 0.00090579710144  
Ant 19 : [6, 5, 4], 28  
Exploitation  
Ant 4 : [6, 5, 4, 7], 43  
Exploitation  
Ant 5 : [3, 4, 6, 5], 41  
Exploration  
avg = 0.00035747612439  
p = 0.000603260869565  
p = 0.000489130434783  
Ant 0 : [5, 6, 4, 7, 3], 61  
Exploration  
avg = 0.00036150307419  
p = 0.000427463413043  
p = 0.000724637681152  
Ant 6 : [5, 6, 4, 7], 41  
Exploitation  
Ant 7 : [4, 7, 2, 3], 51  
Exploration  
avg = 0.000338109196146  
p = 0.000603260869565  
p = 0.000542934782609  
Ant 8 : [5, 4, 7, 3], 47  
Exploitation  
Ant 9 : [7, 4, 6, 5], 41  
Exploitation  
Ant 10 : [1, 5, 4, 6], 48  
Exploitation  
Ant 11 : [5, 6, 4, 7], 41  
Exploitation  
Ant 1 : [1, 5, 6, 4, 7], 67  
Exploration  
avg = 0.000287555954685  
p = 0.000679347826087  
Ant 12 : [7, 4, 6, 5], 41  
Exploration  
avg = 0.000287555954685  
p = 0.000679347826087  
Ant 13 : [7, 4, 6, 5], 41  
Exploration  
avg = 0.000433727209197  
p = 0.00108695652065  
Ant 2 : [0, 1, 5, 6, 4], 62  
Exploitation  
Ant 14 : [6, 5, 4, 7], 43  
Exploitation  
Ant 15 : [2, 7, 4, 6], 43

Exploitation  
Ant 3 : [7, 4, 6, 5, 3], 63  
Exploration  
avg = 0.000361503074192  
p = 0.000427463413043  
p = 0.000724637681159  
Ant 16 : [6, 5, 4, 7], 43  
Exploration  
avg = 0.00034635849985  
p = 0.000603260869565  
p = 0.000543472826087  
Ant 17 : [0, 4, 7, 3], 55  
Exploitation  
Ant 18 : [7, 4, 6, 5], 41  
Exploration  
avg = 0.000361503074192  
p = 0.000427463413043  
p = 0.000724637681159  
Ant 19 : [6, 5, 4, 7], 43  
Exploration  
avg = 0.000371063067325  
p = 0.000603260869565  
p = 0.000543478206522  
Ant 4 : [6, 5, 4, 7, 3], 63  
Exploration  
avg = 0.000295732960572  
p = 0.000376254142967  
p = 0.000425326520609  
Ant 5 : [3, 4, 6, 5, 2], 64  
Exploitation  
Ant 0 : [5, 6, 4, 7, 3, 2], 79  
Exploration  
avg = 0.000371063080776  
p = 0.000603260869565  
p = 0.000543478260326  
Ant 6 : [5, 6, 4, 7, 3], 61  
Exploration  
avg = 0.000328004611138  
p = 0.000543478206522  
p = 0.000444663985778  
Ant 7 : [4, 7, 2, 3, 5], 73  
Exploitation  
Ant 8 : [5, 4, 7, 3, 2], 65  
Exploitation  
Ant 9 : [7, 4, 6, 5, 3], 63  
Exploration  
avg = 0.000202467204225  
p = 0.000315564866757  
Ant 10 : [1, 5, 4, 6, 7], 79  
Exploration  
avg = 0.00037106308091  
p = 0.000603260869565  
p = 0.000543478260864  
Ant 11 : [5, 6, 4, 7, 3], 61

Exploration  
avg = 0.00042702569936  
p = 0.000603260869565  
p = 0.00054347826087  
Ant 1 : [1, 5, 6, 4, 7, 3], 87  
Exploration  
avg = 0.000387185560968  
p = 0.000472117159346  
p = 0.000494066205534  
Ant 12 : [7, 4, 6, 5, 3], 63  
Exploration  
avg = 0.000387186783794  
p = 0.000472117159346  
p = 0.000494071096838  
Ant 13 : [7, 4, 6, 5, 3], 63  
Exploitation  
Ant 2 : [0, 1, 5, 6, 4, 7], 77  
Exploration  
avg = 0.000371063080912  
p = 0.000603260869565  
p = 0.00054347826087  
Ant 14 : [6, 5, 4, 7, 3], 63  
Exploration  
avg = 0.000310732203682  
p = 0.000679347826087  
Ant 15 : [2, 7, 4, 6, 5], 59  
Exploration  
avg = 0.000444558887915  
p = 0.000543478206522  
p = 0.000603858695652  
Ant 3 : [7, 4, 6, 5, 3, 2], 81  
Exploitation  
Ant 16 : [6, 5, 4, 7, 2], 61  
Exploitation  
Ant 17 : [0, 4, 7, 3, 2], 73  
Exploitation  
Ant 18 : [7, 4, 6, 5, 3], 63  
Exploitation  
Ant 19 : [6, 5, 4, 7, 2], 61  
Exploration  
avg = 0.000444560900596  
p = 0.000543478206522  
p = 0.000603864733696  
Ant 4 : [6, 5, 4, 7, 3, 2], 81  
Exploitation  
Ant 5 : [3, 4, 6, 5, 2, 7], 82  
Exploitation  
Ant 0 : [5, 6, 4, 7, 3, 2, 1], 101  
Exploration  
avg = 0.000444560900795  
p = 0.000543478206522  
p = 0.000603864734293  
Ant 6 : [5, 6, 4, 7, 3, 2], 79  
Exploitation

Ant 7 : [4, 7, 2, 3, 5, 6], 89  
Exploitation  
Ant 8 : [5, 4, 7, 3, 2, 1], 87  
Exploitation  
Ant 9 : [7, 4, 6, 5, 3, 2], 81  
Exploitation  
Ant 10 : [1, 5, 4, 6, 7, 2], 97  
Exploration  
avg = 0.000444560900797  
p = 0.000543478206522  
p = 0.0006038647343  
Ant 11 : [5, 6, 4, 7, 3, 2], 79  
Exploitation  
Ant 1 : [1, 5, 6, 4, 7, 3, 2], 105  
Exploitation  
Ant 12 : [7, 4, 6, 5, 3, 2], 81  
Exploitation  
Ant 13 : [7, 4, 6, 5, 3, 2], 81  
Exploitation  
Ant 2 : [0, 1, 5, 6, 4, 7, 2], 95  
Exploration  
avg = 0.000444560900797  
p = 0.000543478206522  
p = 0.0006038647343  
Ant 14 : [6, 5, 4, 7, 3, 2], 81  
Exploration  
avg = 0.000358876675077  
p = 0.000376254142967  
p = 0.00049407114624  
Ant 15 : [2, 7, 4, 6, 5, 3], 81  
Exploration  
avg = 0.00040940890168  
p = 0.000494066205534  
Ant 3 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploration  
avg = 0.000474027854743  
p = 0.000494071096838  
p = 0.000603260869565  
Ant 16 : [6, 5, 4, 7, 2, 3], 79  
Exploration  
avg = 0.000359008454425  
p = 0.000494071096838  
p = 0.000424905481655  
Ant 17 : [0, 4, 7, 3, 2, 5], 96  
Exploration  
avg = 0.000444560900797  
p = 0.000543478206522  
p = 0.0006038647343  
Ant 18 : [7, 4, 6, 5, 3, 2], 81  
Exploration  
avg = 0.000474227130105  
p = 0.000494071096838  
p = 0.000603858695652  
Ant 19 : [6, 5, 4, 7, 2, 3], 79



Exploration  
avg = 0.000409411347332  
p = 0.000494071096838  
Ant 4 : [6, 5, 4, 7, 3, 2, 1], 103  
Exploration  
avg = 0.000168756596606  
p = 0.000203175225568  
Ant 5 : [3, 4, 6, 5, 2, 7, 1], 121  
Exploration  
avg = 0.000978260869565  
Ant 0 : [5, 6, 4, 7, 3, 2, 1, 0], 111  
Update called by 0Exploitation

Ant thread 0 terminating.Ant 6 : [5, 6, 4, 7, 3, 2, 1], 101

Exploration  
avg = 0.000213022248979  
p = 0.000264127997192  
Ant 7 : [4, 7, 2, 3, 5, 6, 1], 126  
Exploration  
avg = 0.000620996034078  
p = 0.00108586956522  
Ant 8 : [5, 4, 7, 3, 2, 1, 0], 97  
Exploration  
avg = 0.000409411372033  
p = 0.00049407114624  
Ant 9 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploration  
avg = 0.00046430813587  
p = 0.000603864673913  
Ant 10 : [1, 5, 4, 6, 7, 2, 3], 115  
Exploration  
avg = 0.000409411372036  
p = 0.000494071146245  
Ant 11 : [5, 6, 4, 7, 3, 2, 1], 101  
Exploration  
avg = 0.000324751597826  
Ant 1 : [1, 5, 6, 4, 7, 3, 2, 0], 135  
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.000428007157199

p = 0.000494071146245  
Ant 12 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploitation  
Ant 13 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploration  
avg = 0.000603864733696  
Ant 2 : [0, 1, 5, 6, 4, 7, 2, 3], 113  
Update called by 2Exploration

Ant thread 2 terminating.avg = 0.000428007157199

p = 0.000494071146245

Ant 14 : [6, 5, 4, 7, 3, 2, 1], 103

Exploitation

Ant 15 : [2, 7, 4, 6, 5, 3, 1], 99

Exploration

avg = 0.00108694565217

Ant 3 : [7, 4, 6, 5, 3, 2, 1, 0], 113

Update called by 3Exploitation

Ant thread 3 terminating.Ant 16 : [6, 5, 4, 7, 2, 3, 1], 97

Exploitation

Ant 17 : [0, 4, 7, 3, 2, 5, 6], 112

Exploration

avg = 0.000428007157199

p = 0.000494071146245

Ant 18 : [7, 4, 6, 5, 3, 2, 1], 103

Exploitation

Ant 19 : [6, 5, 4, 7, 2, 3, 1], 97

Exploration

avg = 0.00108695641304

Ant 4 : [6, 5, 4, 7, 3, 2, 1, 0], 113

Update called by 4Exploration

Ant thread 4 terminating.avg = 0.00108695652065

Ant 5 : [3, 4, 6, 5, 2, 7, 1, 0], 131

Update called by 5Exploration

Ant thread 5 terminating.avg = 0.00108695652173

Ant 6 : [5, 6, 4, 7, 3, 2, 1, 0], 111

Update called by 6Exploitation

Ant thread 6 terminating.Ant 7 : [4, 7, 2, 3, 5, 6, 1, 0], 136

Update called by 7Exploration

Ant thread 7 terminating.avg = 0.000199896898316

Ant 8 : [5, 4, 7, 3, 2, 1, 0, 6], 141

Update called by 8Exploitation

Ant thread 8 terminating.Ant 9 : [7, 4, 6, 5, 3, 2, 1, 0], 113

Update called by 9Exploration

Ant thread 9 terminating.avg = 0.000186339761571

Ant 10 : [1, 5, 4, 6, 7, 2, 3, 0], 146

Update called by 10Exploration

Ant thread 10 terminating.avg = 0.00108695652174

Ant 11 : [5, 6, 4, 7, 3, 2, 1, 0], 111

Update called by 11Exploration

Ant thread 11 terminating.avg = 0.00108695652174

Ant 12 : [7, 4, 6, 5, 3, 2, 1, 0], 113  
ExploitationUpdate called by 12

Ant 13 : [7, 4, 6, 5, 3, 2, 1, 0], 113Ant thread 12 terminating.

Update called by 13Exploration

Ant thread 13 terminating.avg = 0.00108695652174

Ant 14 : [6, 5, 4, 7, 3, 2, 1, 0], 113  
Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [2, 7, 4, 6, 5, 3, 1, 0], 109

Update called by 15Exploration

Ant thread 15 terminating.avg = 0.00108695652174

Ant 16 : [6, 5, 4, 7, 2, 3, 1, 0], 107  
Update called by 16Exploration

Ant thread 16 terminating.avg = 0.000293475592545

Ant 17 : [0, 4, 7, 3, 2, 5, 6, 1], 149  
Update called by 17Exploration

Ant thread 17 terminating.avg = 0.00108695652174

Ant 18 : [7, 4, 6, 5, 3, 2, 1, 0], 113  
Update called by 18Exploitation

Ant thread 18 terminating.Ant 19 : [6, 5, 4, 7, 2, 3, 1, 0], 107

Update called by 19  
Best: [5, 6, 4, 7, 2, 3, 1, 0], 133, 7, 151  
Ant thread 19 terminating.iter\_counter = 8

starting ant = 0  
Explorationstarting ant = 1

avg = 0.000425434957047starting ant = 2

p = 0.000444664031621starting ant = 3

p = 0.000815217391304starting ant = 4

p = 0.000611413043478starting ant = 5

Ant 0 : [5, 6], 16starting ant = 6

Explorationstarting ant = 7

avg = 0.0003548188126starting ant = 8

p = 0.000978260869565starting ant = 9

p = 0.000489117143369starting ant = 10

p = 0.000376254142638starting ant = 11

Ant 1 : [1, 5], 26starting ant = 12

Exploitationstarting ant = 13

Ant 2 : [0, 1], 10starting ant = 14

Explorationstarting ant = 15

avg = 0.000342791190861starting ant = 16

p = 0.000543478260864starting ant = 17

p = 0.000489130434783starting ant = 18

p = 0.000652173913043starting ant = 19

Ant 3 : [7, 4], 15

Exploration

avg = 0.000373456007976

p = 0.000978260869555

p = 0.000611413043478

Ant 4 : [6, 5], 16

Exploration

avg = 0.000437254670302

p = 0.000543478206522

p = 0.00054347826087

p = 0.000651521627133

p = 0.000444219367176

p = 0.000440212988731

Ant 5 : [3, 7], 20

Exploitation

Ant 0 : [5, 6, 4], 26

Exploitation

Ant 6 : [5, 4], 12

Exploitation

Ant 7 : [4, 6], 10

Exploration

avg = 0.000447853435308

p = 0.000904891304348

p = 0.000678668478261

Ant 8 : [5, 6], 16

Exploitation

Ant 9 : [7, 4], 15

Exploitation

Ant 10 : [1, 0], 10  
Exploration  
avg = 0.0004479495145  
p = 0.000904891304348  
p = 0.000679341032609  
Ant 11 : [5, 6], 16  
Exploration  
avg = 0.000466170766396  
p = 0.000904891304348  
p = 0.000679347758152  
Ant 1 : [1, 5, 6], 42  
Exploration  
avg = 0.000353142122538  
p = 0.000543478260864  
p = 0.000489130434783  
p = 0.000724630434783  
Ant 12 : [7, 4], 15  
Exploitation  
Ant 13 : [7, 4], 15  
Exploitation  
Ant 2 : [0, 1, 3], 28  
Exploration  
avg = 0.000398436598039  
p = 0.00108586956522  
p = 0.000678668478261  
Ant 14 : [6, 5], 16  
Exploration  
avg = 0.00037492376219  
p = 0.000444664031621  
p = 0.000543478260864  
p = 0.000424901654061  
p = 0.000543472733152  
Ant 15 : [2, 7], 18  
Exploitation  
Ant 16 : [6, 4], 10  
Exploration  
avg = 0.000384516312913  
p = 0.00108585969242  
p = 0.000488641260322  
Ant 17 : [0, 4], 20  
Exploitation  
Ant 18 : [7, 4], 15  
Exploration  
avg = 0.00039868640394  
p = 0.00108694565217  
p = 0.000679341032609  
Ant 19 : [6, 5], 16  
Exploitation  
Ant 3 : [7, 4, 6], 25  
Exploitation  
Ant 4 : [6, 5, 4], 28  
Exploitation  
Ant 5 : [3, 7, 4], 35  
Exploitation

Ant 0 : [5, 6, 4, 7], 41  
Exploitation  
Ant 6 : [5, 4, 6], 22  
Exploration  
avg = 0.000283977650158  
p = 0.000679347758152  
p = 0.000315252426017  
Ant 7 : [4, 6, 7], 41  
Exploration  
avg = 0.00035774811965  
p = 0.00108694565217  
Ant 8 : [5, 6, 4], 26  
Exploration  
avg = 0.00043273417792  
p = 0.000534858733656  
p = 0.00108695641304  
Ant 9 : [7, 4, 6], 25  
Exploration  
avg = 0.000276673854753  
p = 0.000292468989129  
p = 0.000542929890864  
p = 0.000314126524493  
Ant 10 : [1, 0, 5], 38  
Exploitation  
Ant 11 : [5, 6, 4], 26  
Exploitation  
Ant 1 : [1, 5, 6, 4], 52  
Exploration  
avg = 0.000432734195855  
p = 0.000534858733656  
p = 0.00108695652065  
Ant 12 : [7, 4, 6], 25  
Exploration  
avg = 0.000432734196034  
p = 0.000534858733656  
p = 0.00108695652173  
Ant 13 : [7, 4, 6], 25  
Exploitation  
Ant 2 : [0, 1, 3, 4], 43  
Exploitation  
Ant 14 : [6, 5, 4], 28  
Exploration  
avg = 0.000321420640546  
p = 0.000489130434783  
p = 0.000724637681159  
Ant 15 : [2, 7, 4], 33  
Exploitation  
Ant 16 : [6, 4, 7], 25  
Exploitation  
Ant 17 : [0, 4, 6], 30  
Exploration  
avg = 0.000432734196036  
p = 0.000534858733656  
p = 0.00108695652174

Ant 18 : [7, 4, 6], 25  
Exploitation  
Ant 19 : [6, 5, 4], 28  
Exploration  
avg = 0.000277722694986  
p = 0.000679347758152  
Ant 3 : [7, 4, 6, 5], 41  
Exploitation  
Ant 4 : [6, 5, 4, 7], 43  
Exploitation  
Ant 5 : [3, 7, 4, 6], 45  
Exploitation  
Ant 0 : [5, 6, 4, 7, 2], 59  
Exploitation  
Ant 6 : [5, 4, 6, 7], 53  
Exploration  
avg = 0.000324198721975  
p = 0.000603260869565  
p = 0.000489130434783  
Ant 7 : [4, 6, 7, 3], 61  
Exploration  
avg = 0.000339845505903  
p = 0.000384717071739  
p = 0.000724637608696  
Ant 8 : [5, 6, 4, 7], 41  
Exploitation  
Ant 9 : [7, 4, 6, 5], 41  
Exploration  
avg = 0.00052245123988  
p = 0.000905797100543  
p = 0.000679347825408  
Ant 10 : [1, 0, 5, 6], 54  
Exploitation  
Ant 11 : [5, 6, 4, 7], 41  
Exploitation  
Ant 1 : [1, 5, 6, 4, 7], 67  
Exploration  
avg = 0.000277722708572  
p = 0.00067934782608  
Ant 12 : [7, 4, 6, 5], 41  
Exploitation  
Ant 13 : [7, 4, 6, 5], 41  
Exploitation  
Ant 2 : [0, 1, 3, 4, 6], 53  
Exploration  
avg = 0.000339845520396  
p = 0.000384717071739  
p = 0.000724637681159  
Ant 14 : [6, 5, 4, 7], 43  
Exploitation  
Ant 15 : [2, 7, 4, 6], 43  
Exploitation  
Ant 16 : [6, 4, 7, 2], 43  
Exploitation

Ant 17 : [0, 4, 6, 5], 46  
Exploration  
avg = 0.000277722708573  
p = 0.000679347826087  
Ant 18 : [7, 4, 6, 5], 41  
Exploration  
avg = 0.000339845520396  
p = 0.000384717071739  
p = 0.000724637681159  
Ant 19 : [6, 5, 4, 7], 43  
Exploration  
avg = 0.000348468116531  
p = 0.000424905443411  
p = 0.000444664031621  
Ant 3 : [7, 4, 6, 5, 3], 63  
Exploration  
avg = 0.000379463496342  
p = 0.000603858695652  
p = 0.000542934782609  
Ant 4 : [6, 5, 4, 7, 3], 63  
Exploitation  
Ant 5 : [3, 7, 4, 6, 5], 61  
Exploration  
avg = 0.000437963714607  
p = 0.000444664031621  
p = 0.000543478260864  
Ant 0 : [5, 6, 4, 7, 2, 3], 77  
Exploration  
avg = 0.000379598007212  
p = 0.000603858695652  
p = 0.00054347826087  
Ant 6 : [5, 4, 6, 7, 3], 73  
Exploration  
avg = 0.000461316308659  
p = 0.000543478206522  
p = 0.00054347826087  
Ant 7 : [4, 6, 7, 3, 2], 79  
Exploitation  
Ant 8 : [5, 6, 4, 7, 2], 59  
Exploitation  
Ant 9 : [7, 4, 6, 5, 3], 63  
Exploration  
avg = 0.000434183206086  
p = 0.00108695652173  
Ant 10 : [1, 0, 5, 6, 4], 64  
Exploitation  
Ant 11 : [5, 6, 4, 7, 2], 59  
Exploration  
avg = 0.000422749037032  
p = 0.000603864733696  
p = 0.000543478206522  
Ant 1 : [1, 5, 6, 4, 7, 3], 87  
Exploitation  
Ant 12 : [7, 4, 6, 5, 3], 63



Exploitation  
Ant 13 : [7, 4, 6, 5, 3], 63  
Exploration  
avg = 0.000401780429029  
p = 0.000679347826087  
Ant 2 : [0, 1, 3, 4, 6, 5], 69  
Exploration  
avg = 0.000379600875282  
p = 0.000603864733696  
p = 0.000543478260326  
Ant 14 : [6, 5, 4, 7, 3], 63  
Exploration  
avg = 0.00030331192001  
p = 0.000679347826087  
Ant 15 : [2, 7, 4, 6, 5], 59  
Exploration  
avg = 0.000449643851646  
p = 0.000603260869565  
Ant 16 : [6, 4, 7, 2, 3], 61  
Exploitation  
Ant 17 : [0, 4, 6, 5, 3], 68  
Exploitation  
Ant 18 : [7, 4, 6, 5, 3], 63  
Exploration  
avg = 0.000379600875417  
p = 0.000603864733696  
p = 0.000543478260864  
Ant 19 : [6, 5, 4, 7, 3], 63  
Exploration  
avg = 0.000486942825386  
p = 0.000543478206522  
p = 0.000603260869565  
Ant 3 : [7, 4, 6, 5, 3, 2], 81  
Exploration  
avg = 0.000487142100748  
p = 0.000543478206522  
p = 0.000603858695652  
Ant 4 : [6, 5, 4, 7, 3, 2], 81  
Exploitation  
Ant 5 : [3, 7, 4, 6, 5, 2], 84  
Exploitation  
Ant 0 : [5, 6, 4, 7, 2, 3, 1], 95  
Exploitation  
Ant 6 : [5, 4, 6, 7, 3, 2], 91  
Exploitation  
Ant 7 : [4, 6, 7, 3, 2, 1], 101  
Exploration  
avg = 0.000474394874029  
p = 0.000493577075099  
p = 0.000603858695652  
Ant 8 : [5, 6, 4, 7, 2, 3], 77  
Exploration  
avg = 0.000507071667596  
p = 0.000603260869022

p = 0.000603864733696  
Ant 9 : [7, 4, 6, 5, 3, 2], 81  
Exploration  
avg = 0.000436437216964  
p = 0.000724637681159  
Ant 10 : [1, 0, 5, 6, 4, 7], 79  
Exploration  
avg = 0.000474396866783  
p = 0.000493577075099  
p = 0.000603864673913  
Ant 11 : [5, 6, 4, 7, 2, 3], 77  
Exploration  
avg = 0.000458977067182  
p = 0.000603864734293  
Ant 1 : [1, 5, 6, 4, 7, 3, 2], 105  
Exploration  
avg = 0.000507071667797  
p = 0.000603260869022  
p = 0.000603864734299  
Ant 12 : [7, 4, 6, 5, 3, 2], 81  
Exploration  
avg = 0.000507071667797  
p = 0.000603260869022  
p = 0.0006038647343  
Ant 13 : [7, 4, 6, 5, 3, 2], 81  
Exploitation  
Ant 2 : [0, 1, 3, 4, 6, 5, 2], 92  
Exploration  
avg = 0.000507071667797  
p = 0.000603260869022  
p = 0.0006038647343  
Ant 14 : [6, 5, 4, 7, 3, 2], 81  
Exploration  
avg = 0.000339458045779  
p = 0.000494071146245  
Ant 15 : [2, 7, 4, 6, 5, 3], 81  
Exploration  
avg = 0.000453856545423  
p = 0.000603260869022  
Ant 16 : [6, 4, 7, 2, 3, 1], 79  
Exploitation  
Ant 17 : [0, 4, 6, 5, 3, 2], 86  
Exploitation  
Ant 18 : [7, 4, 6, 5, 3, 2], 81  
Exploration  
avg = 0.000507270943339  
p = 0.000603858695647  
p = 0.0006038647343  
Ant 19 : [6, 5, 4, 7, 3, 2], 81  
Exploration  
avg = 0.000409662963218  
p = 0.000493577075099  
Ant 3 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploitation

Ant 4 : [6, 5, 4, 7, 3, 2, 1], 103

Exploration

avg = 0.000409909974087

p = 0.000494071096838

Ant 5 : [3, 7, 4, 6, 5, 2, 1], 106

Exploration

avg = 0.00108586956522

Ant 0 : [5, 6, 4, 7, 2, 3, 1, 0], 105

Update called by 0Exploitation

Ant thread 0 terminating.Ant 6 : [5, 4, 6, 7, 3, 2, 1], 113

Exploration

avg = 0.000752293896131

p = 0.00108694565217

Ant 7 : [4, 6, 7, 3, 2, 1, 0], 111

Exploration

avg = 0.000458974047858

p = 0.000603858695647

Ant 8 : [5, 6, 4, 7, 2, 3, 1], 95

Exploitation

Ant 9 : [7, 4, 6, 5, 3, 2, 1], 103

Exploitation

Ant 10 : [1, 0, 5, 6, 4, 7, 2], 97

Exploration

avg = 0.000458977036992

p = 0.000603864673913

Ant 11 : [5, 6, 4, 7, 2, 3, 1], 95

Exploration

avg = 0.000325748851337

Ant 1 : [1, 5, 6, 4, 7, 3, 2, 0], 135

Update called by 1Exploration

Ant thread 1 terminating.avg = 0.000428012143466

p = 0.000494071146245

Ant 12 : [7, 4, 6, 5, 3, 2, 1], 103

Exploitation

Ant 13 : [7, 4, 6, 5, 3, 2, 1], 103

Exploitation

Ant 2 : [0, 1, 3, 4, 6, 5, 2, 7], 110

Update called by 2Exploration

Ant thread 2 terminating.avg = 0.000428012143466

p = 0.000494071146245

Ant 14 : [6, 5, 4, 7, 3, 2, 1], 103

Exploration

avg = 0.000458977066883

p = 0.000603864733696

Ant 15 : [2, 7, 4, 6, 5, 3, 1], 99

Exploitation

Ant 16 : [6, 4, 7, 2, 3, 1, 0], 89

Exploitation

Ant 17 : [0, 4, 6, 5, 3, 2, 7], 104  
Exploitation  
Ant 18 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploitation  
Ant 19 : [6, 5, 4, 7, 3, 2, 1], 103  
Exploration  
avg = 0.00108695652065  
Ant 3 : [7, 4, 6, 5, 3, 2, 1, 0], 113  
Update called by 3Exploration  
  
Ant thread 3 terminating.avg = 0.00108695652173  
  
Ant 4 : [6, 5, 4, 7, 3, 2, 1, 0], 113  
Update called by 4Exploration  
  
Ant thread 4 terminating.avg = 0.00108695652174  
  
Ant 5 : [3, 7, 4, 6, 5, 2, 1, 0], 116  
Update called by 5Exploration  
  
Ant thread 5 terminating.avg = 0.00108695652174  
  
Ant 6 : [5, 4, 6, 7, 3, 2, 1, 0], 123  
Update called by 6Exploration  
  
Ant thread 6 terminating.avg = 0.000387458035431  
  
Ant 7 : [4, 6, 7, 3, 2, 1, 0, 5], 139  
Update called by 7Exploration  
  
Ant thread 7 terminating.avg = 0.00108695652174  
  
Ant 8 : [5, 6, 4, 7, 2, 3, 1, 0], 105  
Update called by 8Exploration  
  
Ant thread 8 terminating.avg = 0.00108695652174  
  
Ant 9 : [7, 4, 6, 5, 3, 2, 1, 0], 113  
Update called by 9Exploitation  
  
Ant thread 9 terminating.Ant 10 : [1, 0, 5, 6, 4, 7, 2, 3], 115  
Update called by 10Exploitation  
  
Ant thread 10 terminating.Ant 11 : [5, 6, 4, 7, 2, 3, 1, 0], 105  
Update called by 11Exploitation  
  
Ant thread 11 terminating.Ant 12 : [7, 4, 6, 5, 3, 2, 1, 0], 113  
ExplorationUpdate called by 12  
  
avg = 0.00108695652174Ant thread 12 terminating.

Ant 13 : [7, 4, 6, 5, 3, 2, 1, 0], 113  
Update called by 13Exploitation

Ant thread 13 terminating.Ant 14 : [6, 5, 4, 7, 3, 2, 1, 0], 113  
Update called by 14Exploration

Ant thread 14 terminating.avg = 0.00108695652174

Ant 15 : [2, 7, 4, 6, 5, 3, 1, 0], 109  
Update called by 15Exploitation

Ant thread 15 terminating.Ant 16 : [6, 4, 7, 2, 3, 1, 0, 5], 117  
ExploitationUpdate called by 16

Ant 17 : [0, 4, 6, 5, 3, 2, 7, 1], 143Ant thread 16 terminating.  
Update called by 17Exploitation

Ant thread 17 terminating.Ant 18 : [7, 4, 6, 5, 3, 2, 1, 0], 113  
Update called by 18Exploration

Ant thread 18 terminating.avg = 0.00108695652174

Ant 19 : [6, 5, 4, 7, 3, 2, 1, 0], 113  
Update called by 19  
Best: [5, 6, 4, 7, 2, 3, 1, 0], 133, 8, 147  
Ant thread 19 terminating.iter\_counter = 9

starting ant = 0  
Exploitationstarting ant = 1

Ant 0 : [5, 4], 12starting ant = 2  
Exploitationstarting ant = 3

Ant 1 : [1, 0], 10starting ant = 4  
Exploitationstarting ant = 5

Ant 0 : [5, 4, 6], 22starting ant = 6  
Explorationstarting ant = 7

avg = 0.000362568211731starting ant = 8  
p = 0.000977273723176starting ant = 9  
p = 0.000488636901778starting ant = 10

Ant 2 : [0, 4], 20starting ant = 11

Exploitationstarting ant = 12

Ant 3 : [7, 4], 15starting ant = 13

Exploitationstarting ant = 14

Ant 1 : [1, 0, 4], 30starting ant = 15

Exploitationstarting ant = 16

Ant 4 : [6, 4], 10starting ant = 17

Exploitationstarting ant = 18

Ant 5 : [3, 4], 15starting ant = 19

Exploration

avg = 0.000190780796692

p = 0.000237952945484

p = 0.000315564838356

Ant 0 : [5, 4, 6, 7], 53

Exploration

avg = 0.000428565030179

p = 0.000444664031621

p = 0.00090489130434

p = 0.000611413043472

Ant 6 : [5, 6], 16

Exploration

avg = 0.000442363895327

p = 0.00048137286029

p = 0.00108586956522

p = 0.000652173913043

Ant 7 : [4, 7], 15

Exploitation

Ant 8 : [5, 4], 12

Exploitation

Ant 9 : [7, 4], 15

Exploitation

Ant 10 : [1, 0], 10

Exploitation

Ant 2 : [0, 4, 6], 30

Exploitation

Ant 11 : [5, 4], 12

Exploration

avg = 0.000346565392664

p = 0.000543478260864

p = 0.000489130434783

p = 0.000724630434783

Ant 12 : [7, 4], 15

Exploration

avg = 0.000407574906867

p = 0.00048137286029

p = 0.00108694565217

Ant 3 : [7, 4, 6], 25

Exploitation  
Ant 13 : [7, 4], 15  
Exploitation  
Ant 14 : [6, 4], 10  
Exploitation  
Ant 1 : [1, 0, 4, 6], 40  
Exploration  
avg = 0.000363967219735  
p = 0.000444664031621  
p = 0.000543478260864  
p = 0.000382411488655  
p = 0.000543478206517  
Ant 15 : [2, 7], 18  
Exploration  
avg = 0.000383854044832  
p = 0.00108694565217  
p = 0.000611413043478  
Ant 16 : [6, 5], 16  
Exploration  
avg = 0.000347069472084  
p = 0.00048137286029  
p = 0.000723913043478  
Ant 4 : [6, 4, 7], 25  
Exploitation  
Ant 17 : [0, 1], 10  
Exploration  
avg = 0.000346566427757  
p = 0.000543478260864  
p = 0.000489130434783  
p = 0.000724637680435  
Ant 18 : [7, 4], 15  
Exploration  
avg = 0.00047064089665  
p = 0.00048137286029  
p = 0.00108695652065  
p = 0.000724630434783  
Ant 5 : [3, 4, 7], 30  
Exploitation  
Ant 19 : [6, 4], 10  
Exploitation  
Ant 0 : [5, 4, 6, 7, 2], 71  
Exploitation  
Ant 6 : [5, 6, 4], 26  
Exploitation  
Ant 7 : [4, 7, 2], 33  
Exploration  
avg = 0.000448120843014  
p = 0.00108695652065  
p = 0.000724637608696  
Ant 8 : [5, 4, 7], 27  
Exploitation  
Ant 9 : [7, 4, 6], 25  
Exploitation  
Ant 10 : [1, 0, 4], 30

Exploitation  
Ant 2 : [0, 4, 6, 5], 46  
Exploration  
avg = 0.00044812085515  
p = 0.00108695652173  
p = 0.000724637680435  
Ant 11 : [5, 4, 7], 27  
Exploration  
avg = 0.000407576718459  
p = 0.00048137286029  
p = 0.00108695652173  
Ant 12 : [7, 4, 6], 25  
Exploration  
avg = 0.000263536035542  
p = 0.000679341032609  
Ant 3 : [7, 4, 6, 5], 41  
Exploitation  
Ant 13 : [7, 4, 6], 25  
Exploitation  
Ant 14 : [6, 4, 7], 25  
Exploitation  
Ant 1 : [1, 0, 4, 6, 5], 56  
Exploration  
avg = 0.000313747789026  
p = 0.000489130434783  
p = 0.000724637681152  
Ant 15 : [2, 7, 4], 33  
Exploitation  
Ant 16 : [6, 5, 4], 28  
Exploration  
avg = 0.000318833933805  
p = 0.000603858695652  
p = 0.000489130434783  
Ant 4 : [6, 4, 7, 3], 45  
Exploration  
avg = 0.000249068839666  
p = 0.000542445532551  
p = 0.00037587792608  
Ant 17 : [0, 1, 5], 36  
Exploration  
avg = 0.000407576718461  
p = 0.00048137286029  
p = 0.00108695652174  
Ant 18 : [7, 4, 6], 25  
Exploitation  
Ant 5 : [3, 4, 7, 2], 48  
Exploration  
avg = 0.000347190245031  
p = 0.00048137286029  
p = 0.000724637681159  
Ant 19 : [6, 4, 7], 25  
Exploration  
avg = 0.000437966706368  
p = 0.000444664031621



p = 0.000543478260864  
Ant 0 : [5, 4, 6, 7, 2, 3], 89  
Exploration  
avg = 0.000320353721979  
p = 0.000346245364565  
p = 0.000724637681159  
Ant 6 : [5, 6, 4, 7], 41  
Exploration  
avg = 0.000376822746427  
p = 0.000444664031621  
p = 0.000603260869565  
p = 0.000382411488655  
Ant 7 : [4, 7, 2, 5], 56  
Exploration  
avg = 0.000334746091233  
p = 0.000603864673913  
p = 0.000542934782609  
Ant 8 : [5, 4, 7, 3], 47  
Exploration  
avg = 0.000263537394102  
p = 0.000679347825408  
Ant 9 : [7, 4, 6, 5], 41  
Exploitation  
Ant 10 : [1, 0, 4, 6], 40  
Exploitation  
Ant 2 : [0, 4, 6, 5, 3], 68  
Exploitation  
Ant 11 : [5, 4, 7, 2], 45  
Exploitation  
Ant 12 : [7, 4, 6, 5], 41  
Exploration  
avg = 0.000347694072086  
p = 0.000425326521263  
p = 0.000493577075099  
Ant 3 : [7, 4, 6, 5, 3], 63  
Exploration  
avg = 0.000263537394238  
p = 0.000679347826087  
Ant 13 : [7, 4, 6, 5], 41  
Exploitation  
Ant 14 : [6, 4, 7, 2], 43  
Exploitation  
Ant 1 : [1, 0, 4, 6, 5, 3], 78  
Exploitation  
Ant 15 : [2, 7, 4, 6], 43  
Exploitation  
Ant 16 : [6, 5, 4, 7], 43  
Exploitation  
Ant 4 : [6, 4, 7, 3, 2], 63  
Exploitation  
Ant 17 : [0, 1, 5, 4], 48  
Exploration  
avg = 0.000263537394238  
p = 0.000679347826087

Ant 18 : [7, 4, 6, 5], 41  
Exploration  
avg = 0.000342532345735  
p = 0.000444664031621  
p = 0.000471688009026  
Ant 5 : [3, 4, 7, 2, 5], 71  
Exploitation  
Ant 19 : [6, 4, 7, 2], 43  
Exploitation  
Ant 0 : [5, 4, 6, 7, 2, 3, 1], 107  
Exploitation  
Ant 6 : [5, 6, 4, 7, 2], 59  
Exploitation  
Ant 7 : [4, 7, 2, 5, 6], 72  
Exploitation  
Ant 8 : [5, 4, 7, 3, 2], 65  
Exploitation  
Ant 9 : [7, 4, 6, 5, 3], 63  
Exploitation  
Ant 10 : [1, 0, 4, 6, 5], 56  
Exploration  
avg = 0.00056510687085  
p = 0.000603260869565  
p = 0.000603858695652  
Ant 2 : [0, 4, 6, 5, 3, 2], 86  
Exploitation  
Ant 11 : [5, 4, 7, 2, 3], 63  
Exploration  
avg = 0.000347817589749  
p = 0.000425326521263  
p = 0.000494071145751  
Ant 12 : [7, 4, 6, 5, 3], 63  
Exploration  
avg = 0.00049660200118  
p = 0.000603260869565  
p = 0.000603864673913  
Ant 3 : [7, 4, 6, 5, 3, 2], 81  
Exploration  
avg = 0.000347817589872  
p = 0.000425326521263  
p = 0.00049407114624  
Ant 13 : [7, 4, 6, 5, 3], 63  
Exploitation  
Ant 14 : [6, 4, 7, 2, 3], 61  
Exploration  
avg = 0.000546032890515  
p = 0.000603864733696  
Ant 1 : [1, 0, 4, 6, 5, 3, 2], 96  
Exploration  
avg = 0.000289964423661  
p = 0.000679347826087  
Ant 15 : [2, 7, 4, 6, 5], 59  
Exploration  
avg = 0.0003766826201

p = 0.0006038647343  
p = 0.000543472826087  
Ant 16 : [6, 5, 4, 7, 3], 63  
Exploitation  
Ant 4 : [6, 4, 7, 3, 2, 5], 86  
Exploitation  
Ant 17 : [0, 1, 5, 4, 6], 58  
Exploration  
avg = 0.000347817589873  
p = 0.000425326521263  
p = 0.000494071146245  
Ant 18 : [7, 4, 6, 5, 3], 63  
Exploration  
avg = 0.000383737908197  
p = 0.000679341032609  
Ant 5 : [3, 4, 7, 2, 5, 6], 87  
Exploitation  
Ant 19 : [6, 4, 7, 2, 3], 61  
Exploitation  
Ant 0 : [5, 4, 6, 7, 2, 3, 1, 0], 117  
Update called by 0Exploration  
  
Ant thread 0 terminating.avg = 0.000458095530645

p = 0.000603864733696  
Ant 6 : [5, 6, 4, 7, 2, 3], 77  
Exploration  
avg = 0.000160169956186  
p = 0.000237952945484  
Ant 7 : [4, 7, 2, 5, 6, 1], 109  
Exploitation  
Ant 8 : [5, 4, 7, 3, 2, 1], 87  
Exploitation  
Ant 9 : [7, 4, 6, 5, 3, 2], 81  
Exploration  
avg = 0.000353728428695  
p = 0.000425326521263  
p = 0.000494071146245  
Ant 10 : [1, 0, 4, 6, 5, 3], 78  
Exploitation  
Ant 2 : [0, 4, 6, 5, 3, 2, 7], 104  
Exploration  
avg = 0.000332448629027  
p = 0.000603260869565  
Ant 11 : [5, 4, 7, 2, 3, 1], 81  
Exploitation  
Ant 12 : [7, 4, 6, 5, 3, 2], 81  
Exploration  
avg = 0.000409667450859  
p = 0.000493577075099  
Ant 3 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploitation  
Ant 13 : [7, 4, 6, 5, 3, 2], 81  
Exploitation

Ant 14 : [6, 4, 7, 2, 3, 1], 79  
Exploration  
avg = 0.000603858695647  
Ant 1 : [1, 0, 4, 6, 5, 3, 2, 7], 114  
Update called by 1Exploration

Ant thread 1 terminating.avg = 0.00032198127941

p = 0.000494071146245  
Ant 15 : [2, 7, 4, 6, 5, 3], 81  
Exploitation  
Ant 16 : [6, 5, 4, 7, 3, 2], 81  
Exploitation  
Ant 4 : [6, 4, 7, 3, 2, 5, 1], 112  
Exploration  
avg = 0.000206504769022  
p = 0.000350280473068  
Ant 17 : [0, 1, 5, 4, 6, 7], 89  
Exploration  
avg = 0.000496803289425  
p = 0.000603864673913  
p = 0.0006038647343  
Ant 18 : [7, 4, 6, 5, 3, 2], 81  
Exploration  
avg = 0.000212183103824  
p = 0.000293213842028  
Ant 5 : [3, 4, 7, 2, 5, 6, 1], 124  
Exploration  
avg = 0.000428780854812  
p = 0.000603864673913  
Ant 19 : [6, 4, 7, 2, 3, 1], 79  
Exploration  
avg = 0.000443272596879  
p = 0.000603864733696  
Ant 6 : [5, 6, 4, 7, 2, 3, 1], 95  
Exploration  
avg = 0.000814700972797  
p = 0.00108695641304  
Ant 7 : [4, 7, 2, 5, 6, 1, 0], 119  
Exploitation  
Ant 8 : [5, 4, 7, 3, 2, 1, 0], 97  
Exploitation  
Ant 9 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploration  
avg = 0.000546032890816  
p = 0.0006038647343  
Ant 10 : [1, 0, 4, 6, 5, 3, 2], 96  
Exploitation  
Ant 2 : [0, 4, 6, 5, 3, 2, 7, 1], 143  
Update called by 2Exploitation

Ant thread 2 terminating.Ant 11 : [5, 4, 7, 2, 3, 1, 0], 91

Exploitation

Ant 12 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploration  
avg = 0.00108695652174  
Ant 3 : [7, 4, 6, 5, 3, 2, 1, 0], 113  
Update called by 3Exploitation

Ant thread 3 terminating.Ant 13 : [7, 4, 6, 5, 3, 2, 1], 103

Exploitation  
Ant 14 : [6, 4, 7, 2, 3, 1, 0], 89  
Exploration  
avg = 0.000443272597178  
p = 0.000603864734293  
Ant 15 : [2, 7, 4, 6, 5, 3, 1], 99  
Exploitation  
Ant 16 : [6, 5, 4, 7, 3, 2, 1], 103  
Exploration  
avg = 0.00108695652174  
Ant 4 : [6, 4, 7, 3, 2, 5, 1, 0], 122  
Update called by 4Exploitation

Ant thread 4 terminating.Ant 17 : [0, 1, 5, 4, 6, 7, 2], 107

Exploitation  
Ant 18 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploration  
avg = 0.00108695652174  
Ant 5 : [3, 4, 7, 2, 5, 6, 1, 0], 134  
Update called by 5Exploration

Ant thread 5 terminating.avg = 0.000752297449831

p = 0.00108695652174  
Ant 19 : [6, 4, 7, 2, 3, 1, 0], 89  
Exploration  
avg = 0.00108695652174  
Ant 6 : [5, 6, 4, 7, 2, 3, 1, 0], 105  
Update called by 6Exploration

Ant thread 6 terminating.avg = 0.000150935206872

Ant 7 : [4, 7, 2, 5, 6, 1, 0, 3], 150  
Update called by 7Exploration

Ant thread 7 terminating.avg = 0.000199716990963

Ant 8 : [5, 4, 7, 3, 2, 1, 0, 6], 141  
Update called by 8Exploitation

Ant thread 8 terminating.Ant 9 : [7, 4, 6, 5, 3, 2, 1, 0], 113

Update called by 9Exploration

Ant thread 9 terminating.avg = 0.000603864673913

Ant 10 : [1, 0, 4, 6, 5, 3, 2, 7], 114  
Update called by 10Exploitation

Ant thread 10 terminating.Ant 11 : [5, 4, 7, 2, 3, 1, 0, 6], 135  
Update called by 11Exploitation

Ant thread 11 terminating.Ant 12 : [7, 4, 6, 5, 3, 2, 1, 0], 113  
Update called by 12Exploitation

Ant thread 12 terminating.Ant 13 : [7, 4, 6, 5, 3, 2, 1, 0], 113  
Update called by 13Exploration

Ant thread 13 terminating.avg = 0.000349378815323

Ant 14 : [6, 4, 7, 2, 3, 1, 0, 5], 117  
Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [2, 7, 4, 6, 5, 3, 1, 0], 109  
Update called by 15Exploitation

Ant thread 15 terminating.Ant 16 : [6, 5, 4, 7, 3, 2, 1, 0], 113  
Update called by 16Exploration

Ant thread 16 terminating.avg = 0.000603864734293

Ant 17 : [0, 1, 5, 4, 6, 7, 2, 3], 125  
Update called by 17Exploration

Ant thread 17 terminating.avg = 0.00108695652174

Ant 18 : [7, 4, 6, 5, 3, 2, 1, 0], 113  
Update called by 18Exploration

Ant thread 18 terminating.avg = 0.00038781055834

Ant 19 : [6, 4, 7, 2, 3, 1, 0, 5], 117  
Update called by 19  
Best: [5, 6, 4, 7, 2, 3, 1, 0], 133, 9, 151  
Ant thread 19 terminating.iter\_counter = 10

starting ant = 0  
Exploitationstarting ant = 1

Ant 0 : [5, 4], 12starting ant = 2

Exploitationstarting ant = 3

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

Exploitationstarting ant = 5

Ant 0 : [5, 4, 6], 22starting ant = 6

Exploitationstarting ant = 7

Ant 2 : [0, 1], 10starting ant = 8

Explorationstarting ant = 9

avg = 0.000330241576896starting ant = 10

p = 0.00054347826087starting ant = 11

p = 0.00048913038587starting ant = 12

p = 0.000652173913043starting ant = 13

Ant 3 : [7, 4], 15starting ant = 14

Explorationstarting ant = 15

avg = 0.000284906091573starting ant = 16

p = 0.000313770759078starting ant = 17

p = 0.000489130385425starting ant = 18

p = 0.000349375388193starting ant = 19

Ant 1 : [1, 0, 5], 38

Exploitation

Ant 4 : [6, 4], 10

Exploitation

Ant 5 : [3, 4], 15

Exploration

avg = 0.000188060450405

p = 0.000264389805894

p = 0.000315564866474

Ant 0 : [5, 4, 6, 7], 53

Exploitation

Ant 6 : [5, 4], 12

Exploration

avg = 0.000422956698341

p = 0.000433235574261

p = 0.00108586956522

p = 0.000652173913043

Ant 7 : [4, 7], 15

Exploration

avg = 0.000230426023476

p = 0.000488200979296

p = 0.000375874540131

Ant 2 : [0, 1, 5], 36

Exploitation  
Ant 8 : [5, 4], 12  
Exploitation  
Ant 9 : [7, 4], 15  
Exploitation  
Ant 10 : [1, 0], 10  
Exploitation  
Ant 11 : [5, 4], 12  
Exploitation  
Ant 12 : [7, 4], 15  
Exploitation  
Ant 13 : [7, 4], 15  
Exploitation  
Ant 3 : [7, 4, 6], 25  
Exploration  
avg = 0.000381757209655  
p = 0.00108586956521  
p = 0.000611413043478  
Ant 14 : [6, 5], 16  
Exploitation  
Ant 15 : [2, 3], 18  
Exploitation  
Ant 16 : [6, 4], 10  
Exploration  
avg = 0.00040481876844  
p = 0.00108585969377  
p = 0.000489130385425  
Ant 17 : [0, 4], 20  
Exploration  
avg = 0.000340593543666  
p = 0.00054347826087  
p = 0.00048913038587  
p = 0.000724637680435  
Ant 18 : [7, 4], 15  
Exploration  
avg = 0.000391518855619  
p = 0.00108694565217  
p = 0.000678668478261  
Ant 19 : [6, 5], 16  
Exploration  
avg = 0.000494455368071  
p = 0.000905797100543  
p = 0.000611412982337  
Ant 1 : [1, 0, 5, 6], 54  
Exploration  
avg = 0.000324427742267  
p = 0.000433235574261  
p = 0.000723913043478  
Ant 4 : [6, 4, 7], 25  
Exploitation  
Ant 5 : [3, 4, 6], 25  
Exploration  
avg = 0.000345280999211  
p = 0.00054347826087



p = 0.00048913038587  
Ant 0 : [5, 4, 6, 7, 3], 73  
Exploitation  
Ant 6 : [5, 4, 6], 22  
Exploitation  
Ant 7 : [4, 7, 2], 33  
Exploration  
avg = 0.000507906467134  
p = 0.000905797100543  
p = 0.000678668477649  
Ant 2 : [0, 1, 5, 6], 52  
Exploitation  
Ant 8 : [5, 4, 6], 22  
Exploitation  
Ant 9 : [7, 4, 6], 25  
Exploitation  
Ant 10 : [1, 0, 4], 30  
Exploration  
avg = 0.000433500798731  
p = 0.00108695652174  
p = 0.000724630434783  
Ant 11 : [5, 4, 7], 27  
Exploration  
avg = 0.000384934988644  
p = 0.000433235574261  
p = 0.00108695652174  
Ant 12 : [7, 4, 6], 25  
Exploration  
avg = 0.000384934988644  
p = 0.000433235574261  
p = 0.00108695652174  
Ant 13 : [7, 4, 6], 25  
Exploitation  
Ant 3 : [7, 4, 6, 5], 41  
Exploration  
avg = 0.000397749090347  
p = 0.000444664031621  
p = 0.000905797100543  
Ant 14 : [6, 5, 4], 28  
Exploration  
avg = 0.000403543311527  
p = 0.00054347826087  
p = 0.000723906462515  
p = 0.0004393809426  
Ant 15 : [2, 3, 7], 38  
Exploitation  
Ant 16 : [6, 4, 7], 25  
Exploitation  
Ant 17 : [0, 4, 6], 30  
Exploration  
avg = 0.000384934988644  
p = 0.000433235574261  
p = 0.00108695652174  
Ant 18 : [7, 4, 6], 25

Exploitation  
Ant 19 : [6, 5, 4], 28  
Exploitation  
Ant 1 : [1, 0, 5, 6, 4], 64  
Exploration  
avg = 0.000324463971702  
p = 0.000603260869565  
p = 0.00054293478212  
Ant 4 : [6, 4, 7, 3], 45  
Exploitation  
Ant 5 : [3, 4, 6, 5], 41  
Exploitation  
Ant 0 : [5, 4, 6, 7, 3, 2], 91  
Exploitation  
Ant 6 : [5, 4, 6, 7], 53  
Exploitation  
Ant 7 : [4, 7, 2, 3], 51  
Exploitation  
Ant 2 : [0, 1, 5, 6, 4], 62  
Exploration  
avg = 0.000195073002994  
p = 0.000264389805894  
p = 0.000350627629418  
Ant 8 : [5, 4, 6, 7], 53  
Exploitation  
Ant 9 : [7, 4, 6, 5], 41  
Exploitation  
Ant 10 : [1, 0, 4, 6], 40  
Exploration  
avg = 0.000329206663484  
p = 0.000603260869565  
p = 0.000543472826082  
Ant 11 : [5, 4, 7, 3], 47  
Exploration  
avg = 0.000260817042326  
p = 0.000264389805894  
p = 0.00067934782608  
Ant 12 : [7, 4, 6, 5], 41  
Exploitation  
Ant 13 : [7, 4, 6, 5], 41  
Exploration  
avg = 0.000338272146204  
p = 0.000375234531498  
p = 0.000382793869137  
p = 0.000444664031621  
Ant 3 : [7, 4, 6, 5, 3], 63  
Exploitation  
Ant 14 : [6, 5, 4, 7], 43  
Exploitation  
Ant 15 : [2, 3, 7, 4], 53  
Exploitation  
Ant 16 : [6, 4, 7, 2], 43  
Exploitation  
Ant 17 : [0, 4, 6, 5], 46

Exploration  
avg = 0.000260817042327  
p = 0.000264389805894  
p = 0.000679347826087  
Ant 18 : [7, 4, 6, 5], 41  
Exploration  
avg = 0.000302811103403  
p = 0.000311620828109  
p = 0.000724637681152  
Ant 19 : [6, 5, 4, 7], 43  
Exploration  
avg = 0.000399407865548  
p = 0.000724637681159  
Ant 1 : [1, 0, 5, 6, 4, 7], 79  
Exploitation  
Ant 4 : [6, 4, 7, 3, 2], 63  
Exploration  
avg = 0.000259008352479  
p = 0.000375234531498  
p = 0.000382793869137  
Ant 5 : [3, 4, 6, 5, 2], 64  
Exploitation  
Ant 0 : [5, 4, 6, 7, 3, 2, 1], 113  
Exploitation  
Ant 6 : [5, 4, 6, 7, 2], 71  
Exploration  
avg = 0.000314493116012  
p = 0.00054347826087  
p = 0.000359817687413  
Ant 7 : [4, 7, 2, 3, 5], 73  
Exploration  
avg = 0.000399407865548  
p = 0.000724637681159  
Ant 2 : [0, 1, 5, 6, 4, 7], 77  
Exploitation  
Ant 8 : [5, 4, 6, 7, 2], 71  
Exploitation  
Ant 9 : [7, 4, 6, 5, 3], 63  
Exploration  
avg = 0.000318072344416  
p = 0.000679347826087  
p = 0.000350631100979  
Ant 10 : [1, 0, 4, 6, 7], 71  
Exploration  
avg = 0.000375503368072  
p = 0.00054347826087  
p = 0.000603858695652  
Ant 11 : [5, 4, 7, 3, 2], 65  
Exploration  
avg = 0.000372847180606  
p = 0.000375234531498  
p = 0.000471691832831  
p = 0.000494066205534  
Ant 12 : [7, 4, 6, 5, 3], 63

Exploration  
avg = 0.000372848403432  
p = 0.000375234531498  
p = 0.000471691832831  
p = 0.000494071096838  
Ant 13 : [7, 4, 6, 5, 3], 63  
Exploration  
avg = 0.000467251782946  
p = 0.00054347826087  
p = 0.000603864673913  
Ant 3 : [7, 4, 6, 5, 3, 2], 81  
Exploitation  
Ant 14 : [6, 5, 4, 7, 2], 61  
Exploitation  
Ant 15 : [2, 3, 7, 4, 6], 63  
Exploration  
avg = 0.0004539871366  
p = 0.000493577075099  
p = 0.000603858695652  
Ant 16 : [6, 4, 7, 2, 3], 61  
Exploration  
avg = 0.0003671515917  
p = 0.000375234531498  
p = 0.000471691832831  
p = 0.000494071145751  
Ant 17 : [0, 4, 6, 5, 3], 68  
Exploitation  
Ant 18 : [7, 4, 6, 5, 3], 63  
Exploitation  
Ant 19 : [6, 5, 4, 7, 2], 61  
Exploration  
avg = 0.000573671470411  
p = 0.000603864734299  
Ant 1 : [1, 0, 5, 6, 4, 7, 2], 97  
Exploration  
avg = 0.00040402995025  
p = 0.000493577075099  
p = 0.000425330731694  
Ant 4 : [6, 4, 7, 3, 2, 5], 86  
Exploration  
avg = 0.000443412459794  
p = 0.000493577075099  
p = 0.000543478260326  
Ant 5 : [3, 4, 6, 5, 2, 7], 82  
Exploration  
avg = 0.00108694565217  
Ant 0 : [5, 4, 6, 7, 3, 2, 1, 0], 123  
Update called by 0Exploitation

Ant thread 0 terminating.Ant 6 : [5, 4, 6, 7, 2, 3], 89

Exploration  
avg = 0.000401657238888  
p = 0.000679341032603

Ant 7 : [4, 7, 2, 3, 5, 6], 89  
Exploitation  
Ant 2 : [0, 1, 5, 6, 4, 7, 2], 95  
Exploration  
avg = 0.00046354128425  
p = 0.000493577075099  
p = 0.000603864733696  
Ant 8 : [5, 4, 6, 7, 2, 3], 89  
Exploration  
avg = 0.000467251802874  
p = 0.00054347826087  
p = 0.000603864733696  
Ant 9 : [7, 4, 6, 5, 3, 2], 81  
Exploration  
avg = 0.000424983932514  
p = 0.0006038647343  
p = 0.000543478206522  
Ant 10 : [1, 0, 4, 6, 7, 3], 91  
Exploration  
avg = 0.000300658894387  
p = 0.000493577075099  
Ant 11 : [5, 4, 7, 3, 2, 1], 87  
Exploration  
avg = 0.000467251803073  
p = 0.00054347826087  
p = 0.000603864734293  
Ant 12 : [7, 4, 6, 5, 3, 2], 81  
Exploitation  
Ant 13 : [7, 4, 6, 5, 3, 2], 81  
Exploration  
avg = 0.000393624124745  
p = 0.000494066205534  
Ant 3 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploration  
avg = 0.000463705958363  
p = 0.000494071096838  
p = 0.000603864734293  
Ant 14 : [6, 5, 4, 7, 2, 3], 79  
Exploitation  
Ant 15 : [2, 3, 7, 4, 6, 5], 79  
Exploration  
avg = 0.000430206428861  
p = 0.00054347826087  
p = 0.000492728611657  
Ant 16 : [6, 4, 7, 2, 3, 5], 83  
Exploitation  
Ant 17 : [0, 4, 6, 5, 3, 2], 86  
Exploration  
avg = 0.000467251803075  
p = 0.00054347826087  
p = 0.0006038647343  
Ant 18 : [7, 4, 6, 5, 3, 2], 81  
Exploitation  
Ant 19 : [6, 5, 4, 7, 2, 3], 79

Exploration  
avg = 0.0006038647343  
Ant 1 : [1, 0, 5, 6, 4, 7, 2, 3], 115  
Update called by 1Exploitation

Ant thread 1 terminating.Ant 4 : [6, 4, 7, 3, 2, 5, 1], 112

Exploitation  
Ant 5 : [3, 4, 6, 5, 2, 7, 1], 121  
Exploitation  
Ant 6 : [5, 4, 6, 7, 2, 3, 1], 107  
Exploration  
avg = 0.000191213467476  
p = 0.000264389805894  
Ant 7 : [4, 7, 2, 3, 5, 6, 1], 126  
Exploration  
avg = 0.0006038647343  
Ant 2 : [0, 1, 5, 6, 4, 7, 2, 3], 113  
Update called by 2Exploitation

Ant thread 2 terminating.Ant 8 : [5, 4, 6, 7, 2, 3, 1], 107

Exploitation  
Ant 9 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploration  
avg = 0.000548961227599  
p = 0.0006038647343  
Ant 10 : [1, 0, 4, 6, 7, 3, 2], 109  
Exploitation  
Ant 11 : [5, 4, 7, 3, 2, 1, 0], 97  
Exploitation  
Ant 12 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploitation  
Ant 13 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploitation  
Ant 3 : [7, 4, 6, 5, 3, 2, 1, 0], 113  
Update called by 3Exploration

Ant thread 3 terminating.avg = 0.000429135554854

p = 0.000603858695652  
Ant 14 : [6, 5, 4, 7, 2, 3, 1], 97  
Exploration  
avg = 0.00028401404827  
p = 0.000417631943977  
Ant 15 : [2, 3, 7, 4, 6, 5, 1], 105  
Exploitation  
Ant 16 : [6, 4, 7, 2, 3, 5, 1], 109  
Exploitation  
Ant 17 : [0, 4, 6, 5, 3, 2, 7], 104  
Exploitation  
Ant 18 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploration  
avg = 0.000429138543985

p = 0.000603864673913  
Ant 19 : [6, 5, 4, 7, 2, 3, 1], 97  
Exploration  
avg = 0.00108695652173  
Ant 4 : [6, 4, 7, 3, 2, 5, 1, 0], 122  
Update called by 4Exploitation

Ant thread 4 terminating.Ant 5 : [3, 4, 6, 5, 2, 7, 1, 0], 131  
Update called by 5Exploration

Ant thread 5 terminating.avg = 0.00108695652174

Ant 6 : [5, 4, 6, 7, 2, 3, 1, 0], 117  
Update called by 6Exploration

Ant thread 6 terminating.avg = 0.00108695652174

Ant 7 : [4, 7, 2, 3, 5, 6, 1, 0], 136  
Update called by 7Exploration

Ant thread 7 terminating.avg = 0.00108695652174

Ant 8 : [5, 4, 6, 7, 2, 3, 1, 0], 117  
Update called by 8Exploration

Ant thread 8 terminating.avg = 0.00108695652174

Ant 9 : [7, 4, 6, 5, 3, 2, 1, 0], 113  
Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [1, 0, 4, 6, 7, 3, 2, 5], 132  
Update called by 10Exploration

Ant thread 10 terminating.avg = 0.000222327757138

Ant 11 : [5, 4, 7, 3, 2, 1, 0, 6], 141  
ExploitationUpdate called by 11

Ant 12 : [7, 4, 6, 5, 3, 2, 1, 0], 113Ant thread 11 terminating.  
Update called by 12Exploitation

Ant thread 12 terminating.Ant 13 : [7, 4, 6, 5, 3, 2, 1, 0], 113  
Update called by 13Exploitation

Ant thread 13 terminating.Ant 14 : [6, 5, 4, 7, 2, 3, 1, 0], 107  
Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [2, 3, 7, 4, 6, 5, 1, 0], 115

Update called by 15Exploration

Ant thread 15 terminating.avg = 0.00108695652174

Ant 16 : [6, 4, 7, 2, 3, 5, 1, 0], 119

Update called by 16Exploration

Ant thread 16 terminating.avg = 0.000278425562158

Ant 17 : [0, 4, 6, 5, 3, 2, 7, 1], 143

Update called by 17Exploration

Ant thread 17 terminating.avg = 0.00108695652174

Ant 18 : [7, 4, 6, 5, 3, 2, 1, 0], 113

Update called by 18Exploitation

Ant thread 18 terminating.Ant 19 : [6, 5, 4, 7, 2, 3, 1, 0], 107

Update called by 19

Best: [5, 6, 4, 7, 2, 3, 1, 0], 133, 10, 153

Ant thread 19 terminating.iter\_counter = 11

starting ant = 0

Exploitationstarting ant = 1

Ant 0 : [5, 4], 12starting ant = 2

Explorationstarting ant = 3

avg = 0.000322878402839starting ant = 4

p = 0.000978260869565starting ant = 5

p = 0.000439380881366starting ant = 6

p = 0.000375874509657starting ant = 7

Ant 1 : [1, 5], 26starting ant = 8

Exploitationstarting ant = 9

Ant 0 : [5, 4, 6], 22starting ant = 10

Exploitationstarting ant = 11

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

Explorationstarting ant = 13

avg = 0.000324901307654starting ant = 14

p = 0.00054347826087starting ant = 15



p = 0.000489130434293starting ant = 16

p = 0.000652173913043starting ant = 17

Ant 3 : [7, 4], 15starting ant = 18

Exploitationstarting ant = 19

Ant 4 : [6, 4], 10

Exploitation

Ant 5 : [3, 4], 15

Exploration

avg = 0.000430278516895

p = 0.000444664031621

p = 0.000904891304348

p = 0.000611412982337

Ant 6 : [5, 6], 16

Exploration

avg = 0.000405490221053

p = 0.00108586956522

p = 0.000652173913043

Ant 7 : [4, 7], 15

Exploration

avg = 0.000450491828587

p = 0.000904891304348

p = 0.000678668477649

Ant 1 : [1, 5, 6], 42

Exploitation

Ant 8 : [5, 4], 12

Exploitation

Ant 9 : [7, 4], 15

Exploration

avg = 0.000180802246677

p = 0.000264130389569

p = 0.000315568022125

Ant 0 : [5, 4, 6, 7], 53

Exploration

avg = 0.000328844664854

p = 0.000978260869565

p = 0.000439380881366

p = 0.000417638343759

Ant 10 : [1, 5], 26

Exploitation

Ant 11 : [5, 4], 12

Exploration

avg = 0.000220678237126

p = 0.000439380881366

p = 0.0004180559821

Ant 2 : [0, 1, 5], 36

Exploitation

Ant 12 : [7, 4], 15

Exploitation

Ant 13 : [7, 4], 15

Exploration

avg = 0.000376572332122  
p = 0.00108586956521  
p = 0.000611413043478  
Ant 14 : [6, 5], 16  
Exploration  
avg = 0.000352895700573  
p = 0.000444664031621  
p = 0.00054347826087  
p = 0.000425326559539  
p = 0.00054347826087  
Ant 15 : [2, 7], 18  
Exploitation  
Ant 16 : [6, 4], 10  
Exploration  
avg = 0.000389981010169  
p = 0.00108585969377  
p = 0.000489125543474  
Ant 17 : [0, 4], 20  
Exploitation  
Ant 3 : [7, 4, 6], 25  
Exploitation  
Ant 18 : [7, 4], 15  
Exploration  
avg = 0.000386333978086  
p = 0.00108694565217  
p = 0.000678668478261  
Ant 19 : [6, 5], 16  
Exploration  
avg = 0.000304050185432  
p = 0.000389912016835  
p = 0.000723913043478  
Ant 4 : [6, 4, 7], 25  
Exploitation  
Ant 5 : [3, 4, 6], 25  
Exploration  
avg = 0.00033761156139  
p = 0.00108694565217  
p = 0.000350280504906  
Ant 6 : [5, 6, 7], 47  
Exploration  
avg = 0.000270355873423  
p = 0.00054347826087  
p = 0.000489130434293  
Ant 7 : [4, 7, 3], 35  
Exploration  
avg = 0.000352377220719  
p = 0.00108694565217  
Ant 1 : [1, 5, 6, 4], 52  
Exploration  
avg = 0.000420343816684  
p = 0.00108695641304  
p = 0.000724630434783  
Ant 8 : [5, 4, 7], 27  
Exploitation

Ant 9 : [7, 4, 6], 25  
Exploration  
avg = 0.000356346443325  
p = 0.00054347826087  
p = 0.000542934782604  
Ant 0 : [5, 4, 6, 7, 3], 73  
Exploration  
avg = 0.000450754872166  
p = 0.00090579701087  
p = 0.000679341032603  
Ant 10 : [1, 5, 6], 42  
Exploitation  
Ant 11 : [5, 4, 6], 22  
Exploration  
avg = 0.000513835884248  
p = 0.00090579701087  
p = 0.000679347758152  
Ant 2 : [0, 1, 5, 6], 52  
Exploitation  
Ant 12 : [7, 4, 6], 25  
Exploration  
avg = 0.000364557431809  
p = 0.000389912016835  
p = 0.00108695652174  
Ant 13 : [7, 4, 6], 25  
Exploitation  
Ant 14 : [6, 5, 4], 28  
Exploration  
avg = 0.000309606175436  
p = 0.000543472826087  
p = 0.000724637681152  
Ant 15 : [2, 7, 4], 33  
Exploitation  
Ant 16 : [6, 4, 7], 25  
Exploration  
avg = 0.00045374718651  
p = 0.00108695652174  
p = 0.000724637680435  
Ant 17 : [0, 4, 7], 35  
Exploitation  
Ant 3 : [7, 4, 6, 5], 41  
Exploration  
avg = 0.000364557431809  
p = 0.000389912016835  
p = 0.00108695652174  
Ant 18 : [7, 4, 6], 25  
Exploitation  
Ant 19 : [6, 5, 4], 28  
Exploitation  
Ant 4 : [6, 4, 7, 2], 43  
Exploration  
avg = 0.000305636181521  
p = 0.000679347758152  
p = 0.000350627629733

Ant 5 : [3, 4, 6, 7], 56  
Exploration  
avg = 0.000442068821328  
p = 0.000603260869565  
p = 0.000543472826087  
p = 0.000724637681159  
Ant 6 : [5, 6, 7, 4], 62  
Exploration  
avg = 0.000370163466839  
p = 0.000543478260326  
p = 0.00054347826087  
p = 0.000444651948809  
Ant 7 : [4, 7, 3, 5], 57  
Exploration  
avg = 0.000335091039329  
p = 0.000724637681152  
Ant 1 : [1, 5, 6, 4, 7], 67  
Exploration  
avg = 0.000324282453996  
p = 0.000603260869565  
p = 0.000543472826087  
Ant 8 : [5, 4, 7, 3], 47  
Exploration  
avg = 0.000253558193882  
p = 0.000264130389569  
p = 0.000679347758152  
Ant 9 : [7, 4, 6, 5], 41  
Exploitation  
Ant 0 : [5, 4, 6, 7, 3, 2], 91  
Exploitation  
Ant 10 : [1, 5, 6, 4], 52  
Exploitation  
Ant 11 : [5, 4, 6, 7], 53  
Exploration  
avg = 0.000413916765471  
p = 0.00108695652065  
Ant 2 : [0, 1, 5, 6, 4], 62  
Exploration  
avg = 0.000253558207333  
p = 0.000264130389569  
p = 0.000679347825408  
Ant 12 : [7, 4, 6, 5], 41  
Exploitation  
Ant 13 : [7, 4, 6, 5], 41  
Exploitation  
Ant 14 : [6, 5, 4, 7], 43  
Exploitation  
Ant 15 : [2, 7, 4, 6], 43  
Exploration  
avg = 0.000320111955392  
p = 0.000603260869565  
p = 0.000543478206522  
Ant 16 : [6, 4, 7, 3], 45  
Exploration

avg = 0.000329625306939  
p = 0.000603260869565  
p = 0.000543478260326  
Ant 17 : [0, 4, 7, 3], 55  
Exploitation  
Ant 3 : [7, 4, 6, 5, 3], 63  
Exploration  
avg = 0.000253558207469  
p = 0.000264130389569  
p = 0.000679347826087  
Ant 18 : [7, 4, 6, 5], 41  
Exploration  
avg = 0.000287022746687  
p = 0.000724637681159  
Ant 19 : [6, 5, 4, 7], 43  
Exploitation  
Ant 4 : [6, 4, 7, 2, 3], 61  
Exploration  
avg = 0.00026427039261  
p = 0.000603260869565  
Ant 5 : [3, 4, 6, 7, 2], 74  
Exploitation  
Ant 6 : [5, 6, 7, 4, 3], 77  
Exploration  
avg = 0.00040387028858  
p = 0.000424522649548  
p = 0.000679347825408  
Ant 7 : [4, 7, 3, 5, 6], 73  
Exploration  
avg = 0.000411825365696  
p = 0.000603858695652  
p = 0.000543478260864  
Ant 1 : [1, 5, 6, 4, 7, 3], 87  
Exploitation  
Ant 8 : [5, 4, 7, 3, 2], 65  
Exploitation  
Ant 9 : [7, 4, 6, 5, 3], 63  
Exploitation  
Ant 0 : [5, 4, 6, 7, 3, 2, 1], 113  
Exploration  
avg = 0.000445025325956  
p = 0.000720195891801  
p = 0.000724637681159  
Ant 10 : [1, 5, 6, 4, 7], 67  
Exploitation  
Ant 11 : [5, 4, 6, 7, 2], 71  
Exploitation  
Ant 2 : [0, 1, 5, 6, 4, 7], 77  
Exploration  
avg = 0.000357549883612  
p = 0.000376254142059  
p = 0.000424522649548  
p = 0.000494066205534  
Ant 12 : [7, 4, 6, 5, 3], 63

Exploration  
avg = 0.000357551106438  
p = 0.000376254142059  
p = 0.000424522649548  
p = 0.000494071096838  
Ant 13 : [7, 4, 6, 5, 3], 63  
Exploitation  
Ant 14 : [6, 5, 4, 7, 2], 61  
Exploration  
avg = 0.000284987330836  
p = 0.000679347826087  
Ant 15 : [2, 7, 4, 6, 5], 59  
Exploitation  
Ant 16 : [6, 4, 7, 3, 2], 63  
Exploitation  
Ant 17 : [0, 4, 7, 3, 2], 73  
Exploration  
avg = 0.000458771388891  
p = 0.000543478260326  
p = 0.000603864733696  
Ant 3 : [7, 4, 6, 5, 3, 2], 81  
Exploration  
avg = 0.000357551118666  
p = 0.000376254142059  
p = 0.000424522649548  
p = 0.000494071145751  
Ant 18 : [7, 4, 6, 5, 3], 63  
Exploitation  
Ant 19 : [6, 5, 4, 7, 2], 61  
Exploration  
avg = 0.000422008795749  
p = 0.000543478260326  
p = 0.000493576954271  
Ant 4 : [6, 4, 7, 2, 3, 5], 83  
Exploitation  
Ant 5 : [3, 4, 6, 7, 2, 1], 96  
Exploration  
avg = 0.00045877138909  
p = 0.000543478260326  
p = 0.000603864734293  
Ant 6 : [5, 6, 7, 4, 3, 2], 95  
Exploration  
avg = 0.000166068506574  
p = 0.000264130389569  
Ant 7 : [4, 7, 3, 5, 6, 1], 110  
Exploitation  
Ant 1 : [1, 5, 6, 4, 7, 3, 2], 105  
Exploration  
avg = 0.000287208617597  
p = 0.000494066205534  
Ant 8 : [5, 4, 7, 3, 2, 1], 87  
Exploration  
avg = 0.000458771389092  
p = 0.000543478260326

p = 0.0006038647343  
Ant 9 : [7, 4, 6, 5, 3, 2], 81  
Exploitation  
Ant 0 : [5, 4, 6, 7, 3, 2, 1, 0], 123  
Update called by 0Exploration

Ant thread 0 terminating.avg = 0.000411827378578

p = 0.000603864734293  
p = 0.00054347826087  
Ant 10 : [1, 5, 6, 4, 7, 3], 87  
Exploitation  
Ant 11 : [5, 4, 6, 7, 2, 3], 89  
Exploitation  
Ant 2 : [0, 1, 5, 6, 4, 7, 2], 95  
Exploration  
avg = 0.000458771389092  
p = 0.000543478260326  
p = 0.0006038647343  
Ant 12 : [7, 4, 6, 5, 3, 2], 81  
Exploration  
avg = 0.000458771389092  
p = 0.000543478260326  
p = 0.0006038647343  
Ant 13 : [7, 4, 6, 5, 3, 2], 81  
Exploitation  
Ant 14 : [6, 5, 4, 7, 2, 3], 79  
Exploration  
avg = 0.000335227275202  
p = 0.000376254142059  
p = 0.00049407114624  
Ant 15 : [2, 7, 4, 6, 5, 3], 81  
Exploitation  
Ant 16 : [6, 4, 7, 3, 2, 1], 85  
Exploration  
avg = 0.000341031170995  
p = 0.000494071145751  
p = 0.000425326559539  
Ant 17 : [0, 4, 7, 3, 2, 5], 96  
Exploration  
avg = 0.000378967492656  
p = 0.000494071145751  
Ant 3 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploration  
avg = 0.000458771389092  
p = 0.000543478260326  
p = 0.0006038647343  
Ant 18 : [7, 4, 6, 5, 3, 2], 81  
Exploration  
avg = 0.000453933219905  
p = 0.00049407114624  
p = 0.000603864673913  
Ant 19 : [6, 5, 4, 7, 2, 3], 79  
Exploitation

Ant 4 : [6, 4, 7, 2, 3, 5, 1], 109  
Exploration  
avg = 0.00075196486185  
p = 0.00108586956522  
Ant 5 : [3, 4, 6, 7, 2, 1, 0], 106  
Exploration  
avg = 0.000378967492901  
p = 0.00049407114624  
Ant 6 : [5, 6, 7, 4, 3, 2, 1], 117  
Exploration  
avg = 0.000629608804373  
p = 0.00108694565217  
Ant 7 : [4, 7, 3, 5, 6, 1, 0], 120  
Exploration  
avg = 0.000263863839561  
Ant 1 : [1, 5, 6, 4, 7, 3, 2, 0], 135  
Update called by 1Exploitation

Ant thread 1 terminating.Ant 8 : [5, 4, 7, 3, 2, 1, 0], 97

Exploitation  
Ant 9 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploration  
avg = 0.000416417953475  
p = 0.0006038647343  
Ant 10 : [1, 5, 6, 4, 7, 3, 2], 105  
Exploration  
avg = 0.000386224716489  
p = 0.000543478260326  
Ant 11 : [5, 4, 6, 7, 2, 3, 1], 107  
Exploration  
avg = 0.000603864733696  
Ant 2 : [0, 1, 5, 6, 4, 7, 2, 3], 113  
Update called by 2Exploitation

Ant thread 2 terminating.Ant 12 : [7, 4, 6, 5, 3, 2, 1], 103

Exploitation  
Ant 13 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploration  
avg = 0.000416116021105  
p = 0.00060326086956  
Ant 14 : [6, 5, 4, 7, 2, 3, 1], 97  
Exploitation  
Ant 15 : [2, 7, 4, 6, 5, 3, 1], 99  
Exploitation  
Ant 16 : [6, 4, 7, 3, 2, 1, 0], 95  
Exploration  
avg = 0.000548494983081  
p = 0.00067934782608  
Ant 17 : [0, 4, 7, 3, 2, 5, 6], 112  
Exploration  
avg = 0.00108695652173  
Ant 3 : [7, 4, 6, 5, 3, 2, 1, 0], 113



Update called by 3Exploration

Ant thread 3 terminating.avg = 0.000427702718407

p = 0.000494071146245

Ant 18 : [7, 4, 6, 5, 3, 2, 1], 103

Exploitation

Ant 19 : [6, 5, 4, 7, 2, 3, 1], 97

Exploration

avg = 0.00108695652174

Ant 4 : [6, 4, 7, 2, 3, 5, 1, 0], 119

Update called by 4Exploitation

Ant thread 4 terminating.Ant 5 : [3, 4, 6, 7, 2, 1, 0, 5], 134

Update called by 5Exploitation

Ant thread 5 terminating.Ant 6 : [5, 6, 7, 4, 3, 2, 1, 0], 127

Update called by 6Exploration

Ant thread 6 terminating.avg = 0.000213209893075

Ant 7 : [4, 7, 3, 5, 6, 1, 0, 2], 150

Update called by 7Exploitation

Ant thread 7 terminating.Ant 8 : [5, 4, 7, 3, 2, 1, 0, 6], 141

Update called by 8Exploration

Ant thread 8 terminating.avg = 0.00108695652174

Ant 9 : [7, 4, 6, 5, 3, 2, 1, 0], 113

Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [1, 5, 6, 4, 7, 3, 2, 0], 135

Update called by 10Exploration

Ant thread 10 terminating.avg = 0.00108695652174

Ant 11 : [5, 4, 6, 7, 2, 3, 1, 0], 117

Update called by 11Exploration

Ant thread 11 terminating.avg = 0.00108695652174

Ant 12 : [7, 4, 6, 5, 3, 2, 1, 0], 113

ExplorationUpdate called by 12

avg = 0.00108695652174Ant thread 12 terminating.

Ant 13 : [7, 4, 6, 5, 3, 2, 1, 0], 113

Update called by 13Exploration

Ant thread 13 terminating.avg = 0.00108695652174

Ant 14 : [6, 5, 4, 7, 2, 3, 1, 0], 107  
Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [2, 7, 4, 6, 5, 3, 1, 0], 109

Update called by 15Exploitation

Ant thread 15 terminating.Ant 16 : [6, 4, 7, 3, 2, 1, 0, 5], 123

Update called by 16Exploitation

Ant thread 16 terminating.Ant 17 : [0, 4, 7, 3, 2, 5, 6, 1], 149

ExploitationUpdate called by 17

Ant 18 : [7, 4, 6, 5, 3, 2, 1, 0], 113Ant thread 17 terminating.

Update called by 18Exploration

Ant thread 18 terminating.avg = 0.00108695652174

Ant 19 : [6, 5, 4, 7, 2, 3, 1, 0], 107  
Update called by 19  
Best: [5, 6, 4, 7, 2, 3, 1, 0], 133, 11, 152  
Ant thread 19 terminating.iter\_counter = 12

starting ant = 0

Explorationstarting ant = 1

avg = 0.000407775262083starting ant = 2

p = 0.000444664031621starting ant = 3

p = 0.000815217391296starting ant = 4

p = 0.000611413043478starting ant = 5

Ant 0 : [5, 6], 16starting ant = 6

Explorationstarting ant = 7

avg = 0.00030998958697starting ant = 8

p = 0.000978260869565starting ant = 9

p = 0.00039544279323starting ant = 10

p = 0.000376254142635starting ant = 11

Ant 1 : [1, 5], 26starting ant = 12

Explorationstarting ant = 13

avg = 0.00038508893447starting ant = 14

p = 0.000977273724389starting ant = 15

p = 0.000488641260326starting ant = 16

Ant 2 : [0, 4], 20starting ant = 17

Explorationstarting ant = 18

avg = 0.000316479499933starting ant = 19

p = 0.00054347826087

p = 0.000489130434783

p = 0.000652173913043

Ant 3 : [7, 4], 15

Exploration

avg = 0.000351645090935

p = 0.000978260869555

p = 0.000611413043478

Ant 4 : [6, 5], 16

Exploration

avg = 0.000415684871735

p = 0.000543478260326

p = 0.00054347826087

p = 0.000651515816259

p = 0.000444659583893

p = 0.000439374203026

Ant 5 : [3, 7], 20

Exploitation

Ant 0 : [5, 6, 4], 26

Exploitation

Ant 6 : [5, 4], 12

Exploitation

Ant 7 : [4, 6], 10

Exploitation

Ant 8 : [5, 4], 12

Exploration

avg = 0.000326727947138

p = 0.00054347826087

p = 0.000489130434783

p = 0.000723913043478

Ant 9 : [7, 4], 15

Exploitation

Ant 10 : [1, 0], 10

Exploitation

Ant 11 : [5, 4], 12

Exploration

avg = 0.000439397327144

p = 0.000444664031621

p = 0.00090579701087

p = 0.000678668478261

Ant 1 : [1, 5, 6], 42

Exploitation  
Ant 12 : [7, 4], 15  
Exploration  
avg = 0.000326831456455  
p = 0.00054347826087  
p = 0.000489130434783  
p = 0.000724637608696  
Ant 13 : [7, 4], 15  
Exploitation  
Ant 14 : [6, 4], 10  
Exploitation  
Ant 15 : [2, 3], 18  
Exploitation  
Ant 16 : [6, 4], 10  
Exploitation  
Ant 2 : [0, 4, 6], 30  
Exploitation  
Ant 17 : [0, 1], 10  
Exploitation  
Ant 18 : [7, 4], 15  
Exploration  
avg = 0.000376780944973  
p = 0.00108695641304  
p = 0.000678668478261  
Ant 19 : [6, 5], 16  
Exploitation  
Ant 3 : [7, 4, 6], 25  
Exploration  
avg = 0.000388932235113  
p = 0.000444664031621  
p = 0.00090579701087  
Ant 4 : [6, 5, 4], 28  
Exploration  
avg = 0.00029978163881  
p = 0.00054347826087  
p = 0.000724637681152  
Ant 5 : [3, 7, 4], 35  
Exploitation  
Ant 0 : [5, 6, 4, 7], 41  
Exploration  
avg = 0.000474343555904  
p = 0.000648176302621  
p = 0.00108695641304  
p = 0.000723913043478  
Ant 6 : [5, 4, 7], 27  
Exploitation  
Ant 7 : [4, 6, 5], 26  
Exploration  
avg = 0.000474463121121  
p = 0.000648176302621  
p = 0.00108695641304  
p = 0.000724630434783  
Ant 8 : [5, 4, 7], 27  
Exploration

avg = 0.000412178184516  
p = 0.000648176302621  
p = 0.00108695641304  
Ant 9 : [7, 4, 6], 25  
Exploration  
avg = 0.000295439574573  
p = 0.000324744975994  
p = 0.000542929890864  
p = 0.000349375356752  
Ant 10 : [1, 0, 5], 38  
Exploration  
avg = 0.000474464334708  
p = 0.000648176302621  
p = 0.00108695652065  
p = 0.000724637608696  
Ant 11 : [5, 4, 7], 27  
Exploration  
avg = 0.000338881194938  
p = 0.00108695641304  
Ant 1 : [1, 5, 6, 4], 52  
Exploration  
avg = 0.000412178202451  
p = 0.000648176302621  
p = 0.00108695652065  
Ant 12 : [7, 4, 6], 25  
Exploration  
avg = 0.00041217820263  
p = 0.000648176302621  
p = 0.00108695652173  
Ant 13 : [7, 4, 6], 25  
Exploration  
avg = 0.000351791729081  
p = 0.000648176302621  
p = 0.000724637680435  
Ant 14 : [6, 4, 7], 25  
Exploration  
avg = 0.00041156314309  
p = 0.000543478260326  
p = 0.000651515816259  
p = 0.000444659583893  
p = 0.000542437220291  
Ant 15 : [2, 3, 7], 38  
Exploration  
avg = 0.000351791729201  
p = 0.000648176302621  
p = 0.000724637681152  
Ant 16 : [6, 4, 7], 25  
Exploration  
avg = 0.000291115881425  
p = 0.000679347758152  
p = 0.000315568022125  
Ant 2 : [0, 4, 6, 7], 61  
Exploitation  
Ant 17 : [0, 1, 5], 36

Exploitation  
Ant 18 : [7, 4, 6], 25  
Exploration  
avg = 0.000388932250058  
p = 0.000444664031621  
p = 0.000905797100543  
Ant 19 : [6, 5, 4], 28  
Exploitation  
Ant 3 : [7, 4, 6, 5], 41  
Exploration  
avg = 0.000351965912012  
p = 0.000648176302621  
p = 0.000724637681159  
Ant 4 : [6, 5, 4, 7], 43  
Exploitation  
Ant 5 : [3, 7, 4, 6], 45  
Exploration  
avg = 0.000334421038124  
p = 0.00054347826087  
p = 0.000489130434783  
Ant 0 : [5, 6, 4, 7, 3], 61  
Exploitation  
Ant 6 : [5, 4, 7, 2], 45  
Exploitation  
Ant 7 : [4, 6, 5, 3], 48  
Exploitation  
Ant 8 : [5, 4, 7, 2], 45  
Exploration  
avg = 0.000247124305359  
p = 0.000264392161864  
p = 0.000679347825408  
Ant 9 : [7, 4, 6, 5], 41  
Exploitation  
Ant 10 : [1, 0, 5, 4], 50  
Exploitation  
Ant 11 : [5, 4, 7, 2], 45  
Exploration  
avg = 0.00041863873539  
p = 0.000648176302621  
p = 0.000724637681159  
Ant 1 : [1, 5, 6, 4, 7], 67  
Exploration  
avg = 0.000247124305493  
p = 0.000264392161864  
p = 0.00067934782608  
Ant 12 : [7, 4, 6, 5], 41  
Exploitation  
Ant 13 : [7, 4, 6, 5], 41  
Exploration  
avg = 0.000311047617462  
p = 0.000603864673913  
p = 0.000542934782609  
Ant 14 : [6, 4, 7, 3], 45  
Exploration

avg = 0.000251042314399  
p = 0.000724637681159  
Ant 15 : [2, 3, 7, 4], 53  
Exploration  
avg = 0.000311155226158  
p = 0.000603864673913  
p = 0.000543472826087  
Ant 16 : [6, 4, 7, 3], 45  
Exploration  
avg = 0.000369114071177  
p = 0.000603864673913  
p = 0.000543478206522  
Ant 2 : [0, 4, 6, 7, 3], 81  
Exploitation  
Ant 17 : [0, 1, 5, 4], 48  
Exploration  
avg = 0.000247124305494  
p = 0.000264392161864  
p = 0.000679347826087  
Ant 18 : [7, 4, 6, 5], 41  
Exploration  
avg = 0.000351965912012  
p = 0.000648176302621  
p = 0.000724637681159  
Ant 19 : [6, 5, 4, 7], 43  
Exploration  
avg = 0.000343336567335  
p = 0.000375877926075  
p = 0.000382070384593  
p = 0.000493577075099  
Ant 3 : [7, 4, 6, 5, 3], 63  
Exploration  
avg = 0.000363104597771  
p = 0.000603864673913  
p = 0.000543478260326  
Ant 4 : [6, 5, 4, 7, 3], 63  
Exploitation  
Ant 5 : [3, 7, 4, 6, 5], 61  
Exploitation  
Ant 0 : [5, 6, 4, 7, 3, 2], 79  
Exploration  
avg = 0.000366832305921  
p = 0.000444664031621  
p = 0.000603260869565  
Ant 6 : [5, 4, 7, 2, 3], 63  
Exploration  
avg = 0.000474070258935  
p = 0.000543478260326  
p = 0.000603260869565  
p = 0.000543467850464  
Ant 7 : [4, 6, 5, 3, 7], 68  
Exploration  
avg = 0.000366981762443  
p = 0.000444664031621

p = 0.000603858695652  
Ant 8 : [5, 4, 7, 2, 3], 63  
Exploration  
avg = 0.000343458849944  
p = 0.000375877926075  
p = 0.000382070384593  
p = 0.000494066205534  
Ant 9 : [7, 4, 6, 5, 3], 63  
Exploration  
avg = 0.000647740556573  
p = 0.000648176302621  
p = 0.00108695652174  
p = 0.000724637681159  
Ant 10 : [1, 0, 5, 4, 7], 65  
Exploration  
avg = 0.000366983257008  
p = 0.000444664031621  
p = 0.000603864673913  
Ant 11 : [5, 4, 7, 2, 3], 63  
Exploitation  
Ant 1 : [1, 5, 6, 4, 7, 2], 85  
Exploration  
avg = 0.00034346007277  
p = 0.000375877926075  
p = 0.000382070384593  
p = 0.000494071096838  
Ant 12 : [7, 4, 6, 5, 3], 63  
Exploitation  
Ant 13 : [7, 4, 6, 5, 3], 63  
Exploitation  
Ant 14 : [6, 4, 7, 3, 2], 63  
Exploitation  
Ant 15 : [2, 3, 7, 4, 6], 63  
Exploration  
avg = 0.000449517648814  
p = 0.000543478260326  
p = 0.000603858695652  
Ant 16 : [6, 4, 7, 3, 2], 63  
Exploitation  
Ant 2 : [0, 4, 6, 7, 3, 2], 99  
Exploitation  
Ant 17 : [0, 1, 5, 4, 6], 58  
Exploration  
avg = 0.000343460085121  
p = 0.000375877926075  
p = 0.000382070384593  
p = 0.00049407114624  
Ant 18 : [7, 4, 6, 5, 3], 63  
Exploration  
avg = 0.000363104612851  
p = 0.000603864733696  
p = 0.000543478260864  
Ant 19 : [6, 5, 4, 7, 3], 63  
Exploitation



Ant 3 : [7, 4, 6, 5, 3, 2], 81  
Exploitation  
Ant 4 : [6, 5, 4, 7, 3, 2], 81  
Exploration  
avg = 0.000293256398081  
p = 0.000375877926075  
p = 0.000382070384593  
Ant 5 : [3, 7, 4, 6, 5, 2], 84  
Exploitation  
Ant 0 : [5, 6, 4, 7, 3, 2, 1], 101  
Exploration  
avg = 0.000276922079365  
p = 0.000543478260326  
Ant 6 : [5, 4, 7, 2, 3, 1], 81  
Exploration  
avg = 0.000302980063514  
p = 0.000603864733696  
Ant 7 : [4, 6, 5, 3, 7, 2], 86  
Exploitation  
Ant 8 : [5, 4, 7, 2, 3, 1], 81  
Exploitation  
Ant 9 : [7, 4, 6, 5, 3, 2], 81  
Exploitation  
Ant 10 : [1, 0, 5, 4, 7, 2], 83  
Exploration  
avg = 0.000297048891141  
p = 0.000603858695652  
Ant 11 : [5, 4, 7, 2, 3, 1], 81  
Exploitation  
Ant 1 : [1, 5, 6, 4, 7, 2, 3], 103  
Exploitation  
Ant 12 : [7, 4, 6, 5, 3, 2], 81  
Exploration  
avg = 0.0004712678212  
p = 0.000603864673913  
p = 0.0006038647343  
Ant 13 : [7, 4, 6, 5, 3, 2], 81  
Exploitation  
Ant 14 : [6, 4, 7, 3, 2, 1], 85  
Exploitation  
Ant 15 : [2, 3, 7, 4, 6, 5], 79  
Exploitation  
Ant 16 : [6, 4, 7, 3, 2, 1], 85  
Exploration  
avg = 0.0004594882703  
p = 0.000494071096838  
Ant 2 : [0, 4, 6, 7, 3, 2, 1], 121  
Exploration  
avg = 0.000182183989963  
p = 0.000350280504906  
Ant 17 : [0, 1, 5, 4, 6, 7], 89  
Exploitation  
Ant 18 : [7, 4, 6, 5, 3, 2], 81  
Exploitation

Ant 19 : [6, 5, 4, 7, 3, 2], 81  
Exploration  
avg = 0.000410074620661  
p = 0.000494071145751  
Ant 3 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploration  
avg = 0.000410074620906  
p = 0.00049407114624  
Ant 4 : [6, 5, 4, 7, 3, 2, 1], 103  
Exploration  
avg = 0.000410074620908  
p = 0.000494071146245  
Ant 5 : [3, 7, 4, 6, 5, 2, 1], 106  
Exploitation  
Ant 0 : [5, 6, 4, 7, 3, 2, 1, 0], 111  
Update called by 0Exploitation

Ant thread 0 terminating.Ant 6 : [5, 4, 7, 2, 3, 1, 0], 91

Exploitation  
Ant 7 : [4, 6, 5, 3, 7, 2, 1], 108  
Exploration  
avg = 0.000589572594902  
p = 0.00108695641304  
Ant 8 : [5, 4, 7, 2, 3, 1, 0], 91  
Exploitation  
Ant 9 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploitation  
Ant 10 : [1, 0, 5, 4, 7, 2, 3], 101  
Exploitation  
Ant 11 : [5, 4, 7, 2, 3, 1, 0], 91  
Exploration  
avg = 0.000206074055386  
Ant 1 : [1, 5, 6, 4, 7, 2, 3, 0], 134  
Update called by 1Exploitation

Ant thread 1 terminating.Ant 12 : [7, 4, 6, 5, 3, 2, 1], 103

Exploration  
avg = 0.000410074620908  
p = 0.000494071146245  
Ant 13 : [7, 4, 6, 5, 3, 2, 1], 103  
Exploration  
avg = 0.000752506270896  
p = 0.00108695652173  
Ant 14 : [6, 4, 7, 3, 2, 1, 0], 95  
Exploitation  
Ant 15 : [2, 3, 7, 4, 6, 5, 1], 105  
Exploration  
avg = 0.000752506270901  
p = 0.00108695652174  
Ant 16 : [6, 4, 7, 3, 2, 1, 0], 95  
Exploration  
avg = 0.000418056020063

Ant 2 : [0, 4, 6, 7, 3, 2, 1, 5], 147  
Update called by 2Exploitation

Ant thread 2 terminating.Ant 17 : [0, 1, 5, 4, 6, 7, 2], 107

Exploitation

Ant 18 : [7, 4, 6, 5, 3, 2, 1], 103

Exploration

avg = 0.000410074620908

p = 0.000494071146245

Ant 19 : [6, 5, 4, 7, 3, 2, 1], 103

Exploitation

Ant 3 : [7, 4, 6, 5, 3, 2, 1, 0], 113

Update called by 3Exploitation

Ant thread 3 terminating.Ant 4 : [6, 5, 4, 7, 3, 2, 1, 0], 113

Update called by 4Exploitation

Ant thread 4 terminating.Ant 5 : [3, 7, 4, 6, 5, 2, 1, 0], 116

ExplorationUpdate called by 5

avg = 0.000222107682461Ant thread 5 terminating.

Ant 6 : [5, 4, 7, 2, 3, 1, 0, 6], 135

Update called by 6Exploration

Ant thread 6 terminating.avg = 0.00108695652174

Ant 7 : [4, 6, 5, 3, 7, 2, 1, 0], 118

Update called by 7Exploration

Ant thread 7 terminating.avg = 0.000246786294216

Ant 8 : [5, 4, 7, 2, 3, 1, 0, 6], 135

Update called by 8Exploration

Ant thread 8 terminating.avg = 0.00108695652174

Ant 9 : [7, 4, 6, 5, 3, 2, 1, 0], 113

Update called by 9Exploitation

Ant thread 9 terminating.Ant 10 : [1, 0, 5, 4, 7, 2, 3, 6], 143

Update called by 10Exploration

Ant thread 10 terminating.avg = 0.000247033080333

Ant 11 : [5, 4, 7, 2, 3, 1, 0, 6], 135

ExploitationUpdate called by 11

Ant 12 : [7, 4, 6, 5, 3, 2, 1, 0], 113Ant thread 11 terminating.

ExplorationUpdate called by 12

avg = 0.00108695652174Ant thread 12 terminating.

Ant 13 : [7, 4, 6, 5, 3, 2, 1, 0], 113  
Update called by 13Exploitation

Ant thread 13 terminating.Ant 14 : [6, 4, 7, 3, 2, 1, 0, 5], 123  
Update called by 14Exploitation

Ant thread 14 terminating.Ant 15 : [2, 3, 7, 4, 6, 5, 1, 0], 115  
Update called by 15Exploration

Ant thread 15 terminating.avg = 0.000388194875424

Ant 16 : [6, 4, 7, 3, 2, 1, 0, 5], 123  
Update called by 16Exploration

Ant thread 16 terminating.avg = 0.000603864734299

Ant 17 : [0, 1, 5, 4, 6, 7, 2, 3], 125  
Update called by 17Exploration

Ant thread 17 terminating.avg = 0.00108695652174

Ant 18 : [7, 4, 6, 5, 3, 2, 1, 0], 113  
Update called by 18Exploration

Ant thread 18 terminating.avg = 0.00108695652174

Ant 19 : [6, 5, 4, 7, 3, 2, 1, 0], 113  
Update called by 19  
Best: [5, 6, 4, 7, 2, 3, 1, 0], 133, 12, 152  
Ant thread 19 terminating.

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### Results

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Best path = [5, 6, 4, 7, 2, 3, 1, 0]  
( 'F ', )  
( 'G ', )  
( 'E ', )  
( 'H ', )  
( 'C ', )  
( 'D ', )  
( 'B ', )  
( 'A ', )

Best path cost = 133

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