

ANNEXOS

EXPERIMENTO 1

Cambio

op1: True, op2: True, op3: True

=== Average Times ===

Total execution time: 23.86 seconds

Average execution time: 2.39 seconds

Average heuristic cost: 489.10

Average heuristic happiness: 0.00

op1: True, op2: True, op3: False

=== Average Times ===

Total execution time: 23.65 seconds

Average execution time: 2.36 seconds

Average heuristic cost: 489.10

Average heuristic happiness: 0.00

op1: True, op2: False, op3: True

=== Average Times ===

Total execution time: 9.92 seconds

Average execution time: 0.99 seconds

Average heuristic cost: 489.99

Average heuristic happiness: 0.00

op1: True, op2: False, op3: False

=== Average Times ===

Total execution time: 5.92 seconds

Average execution time: 0.59 seconds

Average heuristic cost: 490.02

Average heuristic happiness: 0.00

op1: False, op2: True, op3: True

=== Average Times ===

Total execution time: 36.48 seconds
Average execution time: 3.65 seconds
Average heuristic cost: 1000.81
Average heuristic happiness: 28.60

op1: False, op2: True, op3: False

=== Average Times ===

Total execution time: 30.82 seconds
Average execution time: 3.08 seconds
Average heuristic cost: 1050.58
Average heuristic happiness: 28.70

op1: False, op2: False, op3: True

=== Average Times ===

Total execution time: 0.89 seconds
Average execution time: 0.09 seconds
Average heuristic cost: 2348.56
Average heuristic happiness: 41.10

op1: False, op2: False, op3: False

=== Average Times ===

Total execution time: 0.01 seconds
Average execution time: 0.00 seconds
Average heuristic cost: 10963.89
Average heuristic happiness: 41.10

EXPERIMENTO 2

Con prioridad:

=== Prueba 1 ===

Initial state generation time: 0.00 seconds
Hill climbing time: 2.45 seconds
Time: 2.45 seconds
Initial cost: 10587.92
Final cost: 435.975
Cost improvement: 10151.94
Heuristic happiness: 0.0

=== Prueba 2 ===

Initial state generation time: 0.00 seconds
Hill climbing time: 2.18 seconds
Time: 2.18 seconds
Initial cost: 15487.935
Final cost: 331.83499999999999
Cost improvement: 15156.10
Heuristic happiness: 0.0

=== Prueba 3 ===

Initial state generation time: 0.00 seconds
Hill climbing time: 3.10 seconds
Time: 3.10 seconds
Initial cost: 11790.710000000001
Final cost: 526.245
Cost improvement: 11264.47
Heuristic happiness: 0.0

=== Prueba 4 ===

Initial state generation time: 0.00 seconds
Hill climbing time: 3.21 seconds
Time: 3.21 seconds
Initial cost: 9125.75
Final cost: 410.4
Cost improvement: 8715.35
Heuristic happiness: 0.0

=== Prueba 5 ===

Initial state generation time: 0.00 seconds
Hill climbing time: 2.76 seconds

Time: 2.76 seconds
Initial cost: 6715.455
Final cost: 498.4599999999998
Cost improvement: 6216.99
Heuristic happiness: 0.0

=== Prueba 6 ===

Initial state generation time: 0.00 seconds
Hill climbing time: 2.27 seconds
Time: 2.27 seconds
Initial cost: 9635.01
Final cost: 502.72999999999996
Cost improvement: 9132.28
Heuristic happiness: 0.0

=== Prueba 7 ===

Initial state generation time: 0.00 seconds
Hill climbing time: 2.27 seconds
Time: 2.27 seconds
Initial cost: 13034.17
Final cost: 440.33500000000004
Cost improvement: 12593.83
Heuristic happiness: 0.0

=== Prueba 8 ===

Initial state generation time: 0.00 seconds
Hill climbing time: 2.56 seconds
Time: 2.56 seconds
Initial cost: 10776.185
Final cost: 618.3299999999998
Cost improvement: 10157.85
Heuristic happiness: 0.0

=== Prueba 9 ===

Initial state generation time: 0.00 seconds
Hill climbing time: 2.12 seconds
Time: 2.12 seconds
Initial cost: 12743.970000000001
Final cost: 561.8399999999999
Cost improvement: 12182.13
Heuristic happiness: 0.0

=== Prueba 10 ===

Initial state generation time: 0.00 seconds
Hill climbing time: 3.48 seconds

Time: 3.48 seconds
Initial cost: 9741.805
Final cost: 564.8849999999999
Cost improvement: 9176.92
Heuristic happiness: 0.0

=== Average Times ===
Total execution time: 26.42 seconds
Average execution time: 2.64 seconds
Average heuristic cost: 489.10
Average heuristic happiness: 0.00

Sin prioridad:

=== Prueba 1 ===
Initial state generation time: 0.00 seconds
Hill climbing time: 2.10 seconds
Time: 2.10 seconds
Initial cost: 8583.685
Final cost: 435.9750000000001
Cost improvement: 8147.71
Heuristic happiness: 0.0

=== Prueba 2 ===
Initial state generation time: 0.00 seconds
Hill climbing time: 1.77 seconds
Time: 1.77 seconds
Initial cost: 15438.289999999999
Final cost: 331.54999999999995
Cost improvement: 15106.74
Heuristic happiness: 0.0

=== Prueba 3 ===
Initial state generation time: 0.00 seconds
Hill climbing time: 2.52 seconds
Time: 2.52 seconds
Initial cost: 14733.285
Final cost: 525.7649999999999
Cost improvement: 14207.52
Heuristic happiness: 0.0

=== Prueba 4 ===
Initial state generation time: 0.00 seconds

Hill climbing time: 2.48 seconds
Time: 2.48 seconds
Initial cost: 9554.56
Final cost: 410.4000000000001
Cost improvement: 9144.16
Heuristic happiness: 0.0

=== Prueba 5 ===

Initial state generation time: 0.00 seconds
Hill climbing time: 2.61 seconds
Time: 2.61 seconds
Initial cost: 8683.295
Final cost: 498.5649999999999
Cost improvement: 8184.73
Heuristic happiness: 0.0

=== Prueba 6 ===

Initial state generation time: 0.00 seconds
Hill climbing time: 2.10 seconds
Time: 2.10 seconds
Initial cost: 8625.82
Final cost: 502.6949999999999
Cost improvement: 8123.12
Heuristic happiness: 0.0

=== Prueba 7 ===

Initial state generation time: 0.00 seconds
Hill climbing time: 2.04 seconds
Time: 2.04 seconds
Initial cost: 10535.185
Final cost: 440.405
Cost improvement: 10094.78
Heuristic happiness: 0.0

=== Prueba 8 ===

Initial state generation time: 0.00 seconds
Hill climbing time: 2.05 seconds
Time: 2.05 seconds
Initial cost: 7735.045
Final cost: 619.74
Cost improvement: 7115.31
Heuristic happiness: 0.0

=== Prueba 9 ===

Initial state generation time: 0.00 seconds

Hill climbing time: 1.70 seconds

Time: 1.70 seconds

Initial cost: 11692.6

Final cost: 561.78

Cost improvement: 11130.82

Heuristic happiness: 0.0

=== Prueba 10 ===

Initial state generation time: 0.00 seconds

Hill climbing time: 2.99 seconds

Time: 2.99 seconds

Initial cost: 6720.45

Final cost: 564.9199999999998

Cost improvement: 6155.53

Heuristic happiness: 0.0

=== Average Times ===

Total execution time: 22.37 seconds

Average execution time: 2.24 seconds

Average heuristic cost: 489.18

Average heuristic happiness: 0.00

EXPERIMENTO 3:

ANNEALING INICIAL(K=20, lam=0.005, limit=1000)

=== Prueba 1 ===

Time: 0.95 seconds

Heuristic cost: 576.79 | Heuristic happiness: 11 | Assignments: [13, 13, 8, 6, 9, 2, 5, 7, 2, 10, 9, 9, 14, 2, 1, 14, 1, 9, 8, 1, 7, 8, 2, 11, 4, 6, 9, 12, 8, 3, 7, 2, 9, 2, 14, 9, 8, 12, 10, 6, 1, 6, 0, 1, 5, 13, 2, 2, 2, 7]

=== Prueba 2 ===

Time: 0.92 seconds

Heuristic cost: 550.7649999999996 | Heuristic happiness: 18 | Assignments: [3, 4, 13, 13, 14, 0, 4, 12, 11, 2, 3, 12, 0, 13, 4, 10, 3, 3, 10, 12, 14, 9, 13, 1, 14, 9, 6, 2, 14, 0, 6, 14, 12, 1, 7, 10, 13, 2, 12, 12, 14, 9, 13, 8, 6, 3, 12, 6, 4, 3]

=== Prueba 3 ===

Time: 0.87 seconds

Heuristic cost: 513.0099999999999 | Heuristic happiness: 18 | Assignments: [2, 8, 8, 5, 5, 10, 8, 3, 2, 7, 3, 8, 6, 4, 7, 8, 10, 8, 3, 11, 11, 7, 10, 7, 10, 11, 7, 5, 9, 10, 7, 7, 2, 0, 2, 2, 7, 5, 6, 0, 5, 2, 1, 2, 6, 7, 1, 1, 2, 2]

=== Prueba 4 ===

Time: 0.85 seconds

Heuristic cost: 542.7249999999999 | Heuristic happiness: 17 | Assignments: [9, 10, 2, 10, 8, 11, 12, 4, 5, 0, 1, 2, 2, 10, 15, 15, 0, 10, 14, 7, 10, 13, 7, 7, 7, 4, 2, 4, 4, 0, 15, 1, 0, 12, 1, 5, 5, 2, 2, 6, 8, 7, 6, 10, 0, 8, 7, 9, 5, 10]

=== Prueba 5 ===

Time: 0.91 seconds

Heuristic cost: 363.51499999999993 | Heuristic happiness: 12 | Assignments: [0, 12, 1, 3, 5, 8, 4, 6, 8, 5, 6, 6, 12, 8, 2, 12, 3, 8, 4, 1, 6, 11, 2, 0, 11, 1, 3, 6, 0, 8, 7, 8, 1, 1, 6, 5, 11, 0, 7, 8, 7, 1, 5, 6, 0, 12, 0, 4, 6, 11]

=== Prueba 6 ===

Time: 1.00 seconds

Heuristic cost: 407.37500000000006 | Heuristic happiness: 14 | Assignments: [4, 1, 6, 7, 10, 1, 1, 10, 8, 1, 10, 1, 5, 6, 3, 6, 6, 0, 4, 1, 2, 7, 5, 6, 8, 1, 4, 10, 0, 4, 1, 10, 7, 10, 7, 9, 5, 3, 6, 1, 4, 2, 6, 0, 10, 5, 9, 0, 3, 6]

=== Prueba 7 ===

Time: 1.09 seconds

Heuristic cost: 452.7 | Heuristic happiness: 16 | Assignments: [1, 4, 6, 13, 8, 12, 9, 1, 7, 2, 1, 12, 2, 8, 5, 13, 1, 8, 8, 1, 7, 8, 8, 7, 5, 3, 7, 8, 4, 10, 10, 9, 12, 5, 10, 12, 12, 9, 7, 8, 3, 4, 9, 4, 9, 12, 13, 13, 12, 7]

=== Prueba 8 ===

Time: 0.91 seconds

Heuristic cost: 393.56000000000006 | Heuristic happiness: 12 | Assignments: [11, 1, 3, 7, 12, 8, 14, 1, 1, 12, 1, 5, 2, 8, 8, 5, 0, 7, 12, 14, 6, 8, 9, 5, 8, 1, 9, 11, 1, 8, 7, 13, 0, 1, 3, 13, 10, 1, 5, 12, 8, 7, 11, 14, 7, 14, 14, 12, 0, 8]

=== Prueba 9 ===

Time: 0.91 seconds

Heuristic cost: 488.91500000000001 | Heuristic happiness: 18 | Assignments: [13, 2, 6, 11, 12, 13, 9, 12, 2, 12, 1, 4, 12, 0, 3, 6, 6, 4, 6, 10, 13, 5, 6, 6, 13, 8, 9, 1, 8, 1, 7, 8, 8, 8, 1, 1, 9, 0, 8, 9, 5, 4, 9, 4, 1, 8, 11, 1, 2, 4]

=== Prueba 10 ===

Time: 0.84 seconds

Heuristic cost: 554.325 | Heuristic happiness: 14 | Assignments: [8, 6, 8, 3, 0, 8, 14, 5, 5, 1, 0, 8, 14, 9, 6, 2, 0, 10, 0, 0, 3, 6, 2, 3, 13, 10, 5, 0, 4, 3, 8, 1, 12, 2, 0, 6, 13, 1, 8, 3, 11, 3, 8, 3, 11, 9, 1, 9, 11, 9]

=== Averages over 10 tests ===

Average execution time: 0.93 seconds

Average heuristic cost: 484.37

Average heuristic happiness: 15.00

AUTOMATITZACIO ANNEALING:

1000 iteraciones:

=====Test k=0.001 i lam=0.001=====

=== Averages over 10 tests ===

Total time: 41.079564332962036

Average execution time: 0.82 seconds

Average heuristic cost: 589.39

Average heuristic happiness: -0.82

=====Test k=0.05 i lam=0.001=====

=== Averages over 10 tests ===

Total time: 40.96586608886719

Average execution time: 0.82 seconds

Average heuristic cost: 580.00

Average heuristic happiness: -0.74

=====Test k=1 i lam=0.001=====

=== Averages over 10 tests ===

Total time: 43.43520212173462

Average execution time: 0.87 seconds

Average heuristic cost: 602.12

Average heuristic happiness: -0.12

=====Test k=10 i lam=0.001=====

=== Averages over 10 tests ===

Total time: 47.17925238609314

Average execution time: 0.94 seconds

Average heuristic cost: 529.61

Average heuristic happiness: 11.46

=====Test k=20 i lam=0.001=====

=== Averages over 10 tests ===

Total time: 47.62408638000488

Average execution time: 0.95 seconds

Average heuristic cost: 551.56

Average heuristic happiness: 13.84

=====Test k=0.001 i lam=0.005=====

=== Averages over 10 tests ===

Total time: 41.289939403533936

Average execution time: 0.83 seconds

Average heuristic cost: 569.65
Average heuristic happiness: -0.84

=====Test k=0.05 i lam=0.005=====

=== Averages over 10 tests ===
Total time: 40.95976400375366
Average execution time: 0.82 seconds
Average heuristic cost: 589.82
Average heuristic happiness: -0.90

=====Test k=1 i lam=0.005=====

=== Averages over 10 tests ===
Total time: 41.86126685142517
Average execution time: 0.84 seconds
Average heuristic cost: 550.03
Average heuristic happiness: -0.20

=====Test k=10 i lam=0.005=====

=== Averages over 10 tests ===
Total time: 44.287500858306885
Average execution time: 0.89 seconds
Average heuristic cost: 551.23
Average heuristic happiness: -0.20

=====Test k=20 i lam=0.005=====

=== Averages over 10 tests ===
Total time: 45.53088736534119
Average execution time: 0.91 seconds
Average heuristic cost: 494.37
Average heuristic happiness: 1.38

=====Test k=0.001 i lam=0.01=====

=== Averages over 10 tests ===
Total time: 41.314916133880615
Average execution time: 0.83 seconds
Average heuristic cost: 590.15
Average heuristic happiness: -0.72

=====Test k=0.05 i lam=0.01=====

=== Averages over 10 tests ===

Total time: 41.2529730796814

Average execution time: 0.83 seconds

Average heuristic cost: 609.34

Average heuristic happiness: -0.92

=====Test k=1 i lam=0.01=====

=== Averages over 10 tests ===

Total time: 42.081709146499634

Average execution time: 0.84 seconds

Average heuristic cost: 600.49

Average heuristic happiness: -0.68

=====Test k=10 i lam=0.01=====

=== Averages over 10 tests ===

Total time: 42.12988567352295

Average execution time: 0.84 seconds

Average heuristic cost: 540.08

Average heuristic happiness: -0.02

=====Test k=20 i lam=0.01=====

=== Averages over 10 tests ===

Total time: 43.07980036735535

Average execution time: 0.86 seconds

Average heuristic cost: 629.17

Average heuristic happiness: -1.22

=====Test k=0.001 i lam=0.1=====

=== Averages over 10 tests ===

Total time: 41.24148631095886

Average execution time: 0.82 seconds

Average heuristic cost: 499.89

Average heuristic happiness: 0.22

=====Test k=0.05 i lam=0.1=====

=== Averages over 10 tests ===

Total time: 40.878602743148804

Average execution time: 0.82 seconds

Average heuristic cost: 549.57

Average heuristic happiness: -0.36

=====Test k=1 i lam=0.1=====

=== Averages over 10 tests ===

Total time: 42.54728174209595

Average execution time: 0.85 seconds

Average heuristic cost: 579.69

Average heuristic happiness: -0.88

=====Test k=10 i lam=0.1=====

=== Averages over 10 tests ===

Total time: 41.22298789024353

Average execution time: 0.82 seconds

Average heuristic cost: 620.33

Average heuristic happiness: -0.74

=====Test k=20 i lam=0.1=====

=== Averages over 10 tests ===

Total time: 43.050443172454834

Average execution time: 0.86 seconds

Average heuristic cost: 688.89

Average heuristic happiness: -1.80

=====Test k=0.001 i lam=0.5=====

=== Averages over 10 tests ===

Total time: 41.236902952194214

Average execution time: 0.82 seconds

Average heuristic cost: 649.68

Average heuristic happiness: -1.26

=====Test k=0.05 i lam=0.5=====

=== Averages over 10 tests ===

Total time: 41.56414222717285

Average execution time: 0.83 seconds

Average heuristic cost: 579.41

Average heuristic happiness: -0.54

=====Test k=1 i lam=0.5=====

=== Averages over 10 tests ===

Total time: 41.15225338935852

Average execution time: 0.82 seconds

Average heuristic cost: 589.39

Average heuristic happiness: -0.92

=====Test k=10 i lam=0.5=====

=== Averages over 10 tests ===

Total time: 41.72299265861511

Average execution time: 0.83 seconds

Average heuristic cost: 570.00

Average heuristic happiness: -0.58

=====Test k=20 i lam=0.5=====

=== Averages over 10 tests ===

Total time: 41.18432140350342

Average execution time: 0.82 seconds

Average heuristic cost: 619.86

Average heuristic happiness: -1.06

5000 iterations:

=====Test k=0.001 i lam=0.001=====

=== Averages over 10 tests ===

Total time: 200.0926058292389

Average execution time: 4.00 seconds

Average heuristic cost: 479.09

Average heuristic happiness: 0.00

=====Test k=0.05 i lam=0.001=====

=== Averages over 10 tests ===

Total time: 204.51574754714966

Average execution time: 4.09 seconds

Average heuristic cost: 479.10

Average heuristic happiness: 0.00

=====Test k=1 i lam=0.001=====

=== Averages over 10 tests ===

Total time: 227.03026938438416

Average execution time: 4.54 seconds

Average heuristic cost: 479.04
Average heuristic happiness: 0.00

=====Test k=10 i lam=0.001=====

=== Averages over 10 tests ===
Total time: 263.7062256336212
Average execution time: 5.27 seconds
Average heuristic cost: 479.34
Average heuristic happiness: 0.00

=====Test k=20 i lam=0.001=====

=== Averages over 10 tests ===
Total time: 168.96209120750427
Average execution time: 3.38 seconds
Average heuristic cost: 480.18
Average heuristic happiness: 0.18

=====Test k=0.001 i lam=0.005=====

=== Averages over 10 tests ===
Total time: 131.21468305587769
Average execution time: 2.62 seconds
Average heuristic cost: 479.09
Average heuristic happiness: 0.00

=====Test k=0.05 i lam=0.005=====

=== Averages over 10 tests ===
Total time: 124.2598295211792
Average execution time: 2.49 seconds
Average heuristic cost: 479.13
Average heuristic happiness: 0.00

=====Test k=1 i lam=0.005=====

=== Averages over 10 tests ===
Total time: 124.21722745895386
Average execution time: 2.48 seconds
Average heuristic cost: 479.10
Average heuristic happiness: 0.00

=====Test k=10 i lam=0.005=====

=== Averages over 10 tests ===

Total time: 132.5006856918335

Average execution time: 2.65 seconds

Average heuristic cost: 479.10

Average heuristic happiness: 0.00

=====Test k=20 i lam=0.005=====

=== Averages over 10 tests ===

Total time: 125.63431000709534

Average execution time: 2.51 seconds

Average heuristic cost: 479.10

Average heuristic happiness: 0.00

=====Test k=0.001 i lam=0.01=====

=== Averages over 10 tests ===

Total time: 125.81850385665894

Average execution time: 2.52 seconds

Average heuristic cost: 479.13

Average heuristic happiness: 0.00

=====Test k=0.05 i lam=0.01=====

=== Averages over 10 tests ===

Total time: 121.49353384971619

Average execution time: 2.43 seconds

Average heuristic cost: 479.13

Average heuristic happiness: 0.00

=====Test k=1 i lam=0.01=====

=== Averages over 10 tests ===

Total time: 116.79080772399902

Average execution time: 2.34 seconds

Average heuristic cost: 479.10

Average heuristic happiness: 0.00

=====Test k=10 i lam=0.01=====

=== Averages over 10 tests ===

Total time: 123.9180805683136

Average execution time: 2.48 seconds

Average heuristic cost: 479.10

Average heuristic happiness: 0.00

=====Test k=20 i lam=0.01=====

=== Averages over 10 tests ===

Total time: 121.73763704299927

Average execution time: 2.43 seconds

Average heuristic cost: 479.12

Average heuristic happiness: 0.00

=====Test k=0.001 i lam=0.1=====

=== Averages over 10 tests ===

Total time: 126.22829484939575

Average execution time: 2.52 seconds

Average heuristic cost: 479.10

Average heuristic happiness: 0.00

=====Test k=0.05 i lam=0.1=====

=== Averages over 10 tests ===

Total time: 128.90871453285217

Average execution time: 2.58 seconds

Average heuristic cost: 479.10

Average heuristic happiness: 0.00

=====Test k=1 i lam=0.1=====

=== Averages over 10 tests ===

Total time: 133.02860403060913

Average execution time: 2.66 seconds

Average heuristic cost: 479.13

Average heuristic happiness: 0.00

=====Test k=10 i lam=0.1=====

=== Averages over 10 tests ===

Total time: 138.14598155021667

Average execution time: 2.76 seconds

Average heuristic cost: 479.13

Average heuristic happiness: 0.00

=====Test k=20 i lam=0.1=====

=== Averages over 10 tests ===

Total time: 134.00457644462585

Average execution time: 2.68 seconds

Average heuristic cost: 479.16

Average heuristic happiness: 0.00

=====Test k=0.001 i lam=0.5=====

=== Averages over 10 tests ===

Total time: 40.41743278503418

Average execution time: 0.81 seconds

Average heuristic cost: 499.18

Average heuristic happiness: 0.08

=====Test k=0.05 i lam=0.5=====

=== Averages over 10 tests ===

Total time: 39.76810622215271

Average execution time: 0.80 seconds

Average heuristic cost: 479.25

Average heuristic happiness: 0.08

=====Test k=1 i lam=0.5=====

=== Averages over 10 tests ===

Total time: 45.389283657073975

Average execution time: 0.91 seconds

Average heuristic cost: 479.29

Average heuristic happiness: 0.08

=====Test k=10 i lam=0.5=====

=== Averages over 10 tests ===

Total time: 41.364739418029785

Average execution time: 0.83 seconds

Average heuristic cost: 499.19

Average heuristic happiness: 0.10

=====Test k=20 i lam=0.5=====

=== Averages over 10 tests ===

Total time: 47.08765697479248

Average execution time: 0.94 seconds

Average heuristic cost: 499.16

Average heuristic happiness: 0.12

EXPERIMENTO 4

NumPackages	Proportion	ExecutionTime	Seed
50	1	1.04657272300005	0
50	1.2	2.41548213299995	0
50	1.4	3.10417295699995	0
50	1.6	2.95691255899999	0
50	1.8	3.36836911299997	0
50	2	4.30305039500001	0
50	2.2	4.704062131	0
50	1	0.844009970999991	1
50	1.2	2.15821302100005	1
50	1.4	2.20039554300001	1
50	1.6	2.67897683899992	1
50	1.8	3.25313056499999	1
50	2	3.40200306100007	1
50	2.2	4.36768366199999	1
50	1	1.57126285699997	2
50	1.2	2.43304357	2
50	1.4	2.58091557099999	2
50	1.6	3.53824340800008	2
50	1.8	3.87867440000002	2
50	2	4.15292363499998	2
50	2.2	4.17238625900006	2
50	1	1.82668365200004	3
50	1.2	2.18076839699995	3
50	1.4	2.88211666200004	3
50	1.6	3.48476896099999	3
50	1.8	4.09315922400003	3

50	2	4.09524157300007	3
50	2.2	4.51522844200008	3
50	1	1.8532861110001	4
50	1.2	2.32530362099999	4
50	1.4	2.89437813400002	4
50	1.6	2.95432793999998	4
50	1.8	3.29706863799993	4
50	2	3.32467930000007	4
50	2.2	4.07055566000008	4
50	1	1.28379333600003	5
50	1.2	2.68064352299996	5
50	1.4	3.01049896199993	5
50	1.6	3.06960350100007	5
50	1.8	3.41378628000007	5
50	2	3.89760003000004	5
50	2.2	4.35667492099992	5
50	1	1.74670701999992	6
50	1.2	3.43349922900006	6
50	1.4	4.22728412699996	6
50	1.6	3.93998948500007	6
50	1.8	4.82559936999996	6
50	2	5.02872386800004	6
50	2.2	5.26358013200002	6
50	1	2.56032133099995	7
50	1.2	2.73787639299996	7
50	1.4	2.86514807000003	7
50	1.6	3.55913133300001	7
50	1.8	4.03965430200003	7

50	2	4.6935390110001	7
50	2.2	4.63182787800008	7
50	1	0.881004232000009	8
50	1.2	2.735909386999999	8
50	1.4	2.988195432	8
50	1.6	3.22770709400004	8
50	1.8	3.14637123400007	8
50	2	4.406161247	8
50	2.2	4.51682712900004	8
50	1	1.997696200999994	9
50	1.2	1.944038107999997	9
50	1.4	3.076604535	9
50	1.6	2.927298494999995	9
50	1.8	3.09944569200002	9
50	2	3.068609889999995	9
50	2.2	4.310208283999994	9
50	1.2	3.280328376000006	0
60	1.2	3.811120338000002	0
70	1.2	6.460910415999993	0
80	1.2	14.832285943	0
90	1.2	14.649339389	0
100	1.2	21.107164279	0
50	1.2	2.12837054100009	1
60	1.2	3.452176462999989	1
70	1.2	6.383914075999988	1
80	1.2	7.641628583000006	1
90	1.2	18.95249724299999	1
100	1.2	33.038604648	1

50	1.2	3.09050501299998	2
60	1.2	3.72783734400014	2
70	1.2	7.99931475899984	2
80	1.2	12.729608805	2
90	1.2	21.931635895	2
100	1.2	27.916254385	2
50	1.2	2.03604266899993	3
60	1.2	4.90750047100005	3
70	1.2	8.21671346800008	3
80	1.2	10.119318604	3
90	1.2	17.4262330199999	3
100	1.2	25.4352535949999	3
50	1.2	2.38643152300006	4
60	1.2	5.92541743499987	4
70	1.2	7.46794221800019	4
80	1.2	14.5082923970001	4
90	1.2	21.071230494	4
100	1.2	27.92951786	4
50	1.2	2.72790576700004	5
60	1.2	4.33681259700006	5
70	1.2	6.45800962099997	5
80	1.2	14.102068274	5
90	1.2	16.675558744	5
100	1.2	29.497635894	5
50	1.2	3.25877141500018	6
60	1.2	4.11441536000007	6
70	1.2	8.12787150899999	6
80	1.2	12.5893285659999	6

90	1.2	18.7564146120001	6
100	1.2	32.089917607	6
50	1.2	2.69917799099994	7
60	1.2	3.42507061099991	7
70	1.2	6.28599196100004	7
80	1.2	13.413879018	7
90	1.2	23.0488717369999	7
100	1.2	26.0141599849999	7
50	1.2	2.72702573600009	8
60	1.2	5.25418710200006	8
70	1.2	7.26286295399996	8
80	1.2	10.8869506899998	8
90	1.2	19.3180991729998	8
100	1.2	31.6089372059998	8
50	1.2	1.89467995599989	9
60	1.2	3.505570713	9
70	1.2	6.66727232300013	9
80	1.2	14.313000958	9
90	1.2	20.0890200270001	9
100	1.2	31.010923565	9

EXPERIMENTO 5

Proportion	TotalCost
1	593.16
1.2	574.09
1.4	578.03
1.6	570.99
1.8	552.06
2	539.465

EXPERIMENTO 6

=== Alpha: 0.1 ===

Seed: 0, Cost: 574.09, Combined Cost: 516.681, Execution Time: 3.14 seconds

Seed: 1, Cost: 546.3749999999998, Combined Cost: 491.7374999999998, Execution Time: 2.67 seconds

Seed: 2, Cost: 508.44, Combined Cost: 457.596, Execution Time: 3.18 seconds

Seed: 3, Cost: 539.7049999999999, Combined Cost: 485.7344999999997, Execution Time: 2.74 seconds

Seed: 4, Cost: 357.19999999999993, Combined Cost: 321.47999999999996, Execution Time: 3.01 seconds

Seed: 5, Cost: 402.4699999999997, Combined Cost: 362.22299999999996, Execution Time: 3.79 seconds

Seed: 6, Cost: 441.2799999999999, Combined Cost: 397.15199999999993, Execution Time: 5.06 seconds

Seed: 7, Cost: 389.69000000000001, Combined Cost: 350.72100000000001, Execution Time: 3.69 seconds

Seed: 8, Cost: 479.5499999999999, Combined Cost: 431.5949999999999, Execution Time: 3.67 seconds

Seed: 9, Cost: 552.225, Combined Cost: 497.00250000000005, Execution Time: 2.46 seconds

=== Alpha: 0.3 ===

Seed: 0, Cost: 574.0949999999999, Combined Cost: 401.8664999999999, Execution Time: 3.60 seconds

Seed: 1, Cost: 547.3249999999998, Combined Cost: 381.92749999999984, Execution Time: 4.24 seconds

Seed: 2, Cost: 508.44, Combined Cost: 355.90799999999996, Execution Time: 3.29 seconds

Seed: 3, Cost: 539.435, Combined Cost: 377.6044999999999, Execution Time: 3.22 seconds

Seed: 4, Cost: 358.03999999999996, Combined Cost: 250.02799999999996, Execution Time: 3.24 seconds

Seed: 5, Cost: 403.355, Combined Cost: 281.7485, Execution Time: 3.63 seconds

Seed: 6, Cost: 442.99, Combined Cost: 309.193, Execution Time: 4.65 seconds

Seed: 7, Cost: 390.26500000000004, Combined Cost: 272.5854999999997, Execution Time: 4.05 seconds

Seed: 8, Cost: 480.825, Combined Cost: 335.6775, Execution Time: 4.10 seconds

Seed: 9, Cost: 552.1849999999998, Combined Cost: 386.52949999999987, Execution Time: 2.54 seconds

=== Alpha: 0.5 ===

Seed: 0, Cost: 581.12500000000001, Combined Cost: 286.56250000000006, Execution Time: 4.59 seconds

Seed: 1, Cost: 550.3399999999998, Combined Cost: 271.1699999999999, Execution Time: 2.50 seconds

Seed: 2, Cost: 509.205, Combined Cost: 254.1025, Execution Time: 3.26 seconds

Seed: 3, Cost: 542.3499999999999, Combined Cost: 269.17499999999995, Execution Time: 2.74 seconds

Seed: 4, Cost: 365.25, Combined Cost: 177.125, Execution Time: 3.03 seconds

Seed: 5, Cost: 408.185, Combined Cost: 201.0925, Execution Time: 4.09 seconds
Seed: 6, Cost: 451.4550000000001, Combined Cost: 219.22750000000005, Execution Time: 4.69 seconds
Seed: 7, Cost: 394.18999999999994, Combined Cost: 193.09499999999997, Execution Time: 3.78 seconds
Seed: 8, Cost: 484.78499999999997, Combined Cost: 238.39249999999998, Execution Time: 3.81 seconds
Seed: 9, Cost: 558.8199999999999, Combined Cost: 276.40999999999997, Execution Time: 2.22 seconds

=== Alpha: 0.7 ===

Seed: 0, Cost: 597.8349999999999, Combined Cost: 167.4505, Execution Time: 3.66 seconds
Seed: 1, Cost: 571.4899999999998, Combined Cost: 158.14699999999993, Execution Time: 2.11 seconds
Seed: 2, Cost: 522.655, Combined Cost: 150.4965, Execution Time: 3.26 seconds
Seed: 3, Cost: 563.5699999999998, Combined Cost: 157.17099999999996, Execution Time: 3.40 seconds
Seed: 4, Cost: 879.8199999999999, Combined Cost: 249.24600000000004, Execution Time: 2.50 seconds
Seed: 5, Cost: 446.88499999999993, Combined Cost: 115.86549999999998, Execution Time: 3.96 seconds
Seed: 6, Cost: 480.40499999999986, Combined Cost: 123.12149999999997, Execution Time: 3.80 seconds
Seed: 7, Cost: 420.06000000000001, Combined Cost: 110.61800000000005, Execution Time: 3.70 seconds
Seed: 8, Cost: 510.71000000000001, Combined Cost: 137.11300000000006, Execution Time: 3.77 seconds
Seed: 9, Cost: 581.91500000000001, Combined Cost: 162.67450000000005, Execution Time: 2.29 seconds

=== Alpha: 0.9 ===

Seed: 0, Cost: 719.5699999999998, Combined Cost: 36.856999999999964, Execution Time: 2.22 seconds
Seed: 1, Cost: 680.7799999999996, Combined Cost: 30.277999999999942, Execution Time: 2.37 seconds
Seed: 2, Cost: 3120.6400000000003, Combined Cost: 284.164, Execution Time: 1.71 seconds
Seed: 3, Cost: 1175.08, Combined Cost: 78.80799999999996, Execution Time: 1.82 seconds
Seed: 4, Cost: 943.025, Combined Cost: 61.002499999999976, Execution Time: 1.96 seconds
Seed: 5, Cost: 540.0049999999999, Combined Cost: 12.600499999999975, Execution Time: 2.46 seconds
Seed: 6, Cost: 1121.9299999999998, Combined Cost: 58.192999999999955, Execution Time: 2.82 seconds
Seed: 7, Cost: 513.43500000000002, Combined Cost: 11.743500000000004, Execution Time: 2.76 seconds
Seed: 8, Cost: 1650.15500000000002, Combined Cost: 121.81549999999997, Execution Time: 1.45 seconds
Seed: 9, Cost: 1160.6049999999996, Combined Cost: 84.56049999999993, Execution Time: 1.45 seconds

=== Mean Values ===

Alpha: 0.1
Mean Cost: 479.10
Mean Combined Cost: 431.19
Mean Execution Time: 3.34 seconds

Alpha: 0.3
Mean Cost: 479.70
Mean Combined Cost: 335.31
Mean Execution Time: 3.66 seconds

Alpha: 0.5
Mean Cost: 484.57
Mean Combined Cost: 238.64
Mean Execution Time: 3.47 seconds

Alpha: 0.7
Mean Cost: 557.53
Mean Combined Cost: 153.19
Mean Execution Time: 3.25 seconds

Alpha: 0.9
Mean Cost: 1162.52
Mean Combined Cost: 78.00
Mean Execution Time: 2.10 seconds

EXPERIMENTO 7

=== Averages over 50 tests ===

Alpha 0.1

Total time: 262.8559272289276

Average execution time: 5.26 seconds

Average heuristic cost: 518.89

Average heuristic combine: 466.98

Average heuristic happiness: 0.20

=== Averages over 50 tests ===

Alpha0.2

Total time: 239.83058881759644

Average execution time: 4.80 seconds

Average heuristic cost: 538.93

Average heuristic combine: 431.08

Average heuristic happiness: 0.34

=== Averages over 50 tests ===

Alpha0.3

Total time: 278.03626132011414

Average execution time: 5.56 seconds

Average heuristic cost: 499.61

Average heuristic combine: 349.29

Average heuristic happiness: 1.46

=== Averages over 50 tests ===

Alpha0.4

Total time: 267.2868571281433

Average execution time: 5.35 seconds

Average heuristic cost: 481.59

Average heuristic combine: 287.46

Average heuristic happiness: 3.74

=== Averages over 50 tests ===

Alpha0.5

Total time: 269.2525382041931

Average execution time: 5.39 seconds

Average heuristic cost: 485.07

Average heuristic combine: 238.83

Average heuristic happiness: 7.40

=== Averages over 50 tests ===

Alpha0.6

Total time: 239.30919194221497

Average execution time: 4.79 seconds

Average heuristic cost: 502.08

Average heuristic combine: 193.57

Average heuristic happiness: 12.10

=== Averages over 50 tests ===

Alpha0.7

Total time: 269.31394815444946

Average execution time: 5.39 seconds

Average heuristic cost: 526.75

Average heuristic combine: 144.67

Average heuristic happiness: 19.08

=== Averages over 50 tests ===

Alpha0.8

Total time: 270.49018263816833

Average execution time: 5.41 seconds

Average heuristic cost: 682.77

Average heuristic combine: 112.31

Average heuristic happiness: 30.30

=== Averages over 50 tests ===

Alpha0.9

Total time: 228.951162815094

Average execution time: 4.58 seconds

Average heuristic cost: 981.92

Average heuristic combine: 60.43

Average heuristic happiness: 41.96

Alpha	Heurística coste	Heurística Combinada	Tiempo de Ejecución(s)
0.1	518.89	466.98	5.26
0.2	538.93	431.08	4.8
0.3	499.61	349.29	5.56
0.4	481.59	287.46	5.35
0.5	485.07	238.83	5.39
0.6	502.08	193.57	4.79
0.7	526.75	144.67	5.39
0.8	682.77	112.31	5.41
0.9	981.92	60.43	4.58