```
 1 C:\Users\User\Downloads\krill-levy-flight-uflp-main\
   krill-levy-flight-uflp-main\venv\Scripts\python.exe C
   :/Users/User/Downloads/krill-levy-flight-uflp-main/
   krill-levy-flight-uflp-main/main.py
 2 [2023-10-08 09:40:24,313] [    INFO]:   Iteration :
   Best Fitness = 34.92721750765424
 3 [2023-10-08 09:40:24,313] [    INFO]:   Iteration 1:
   Best Fitness = 22.963990038857645
 4 [2023-10-08 09:40:24,329] [    INFO]:   Iteration 2:
   Best Fitness = 26.54977647648455
 5 [2023-10-08 09:40:24,329] [    INFO]:   Iteration 3:
   Best Fitness = 22.963990038857645
 6 [2023-10-08 09:40:24,344] [    INFO]:   Iteration 4:
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 7 [2023-10-08 09:40:24,344] [    INFO]:   Iteration 5:
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 8 [2023-10-08 09:40:24,344] [    INFO]:   Iteration 6:
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 9 [2023-10-08 09:40:24,360] [    INFO]:   Iteration 7:
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10 [2023-10-08 09:40:24,360] [    INFO]:   Iteration 8:
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11 [2023-10-08 09:40:24,375] [    INFO]:   Iteration 9:
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12 [2023-10-08 09:40:24,375] [    INFO]:   Iteration 10:
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13 [2023-10-08 09:40:24,391] [    INFO]:   Iteration 11:
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14 [2023-10-08 09:40:24,391] [    INFO]:   Iteration 12:
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15 [2023-10-08 09:40:24,407] [    INFO]:   Iteration 13:
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16 [2023-10-08 09:40:24,407] [    INFO]:   Iteration 14:
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17 [2023-10-08 09:40:24,407] [    INFO]:   Iteration 15:
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18 [2023-10-08 09:40:24,407] [    INFO]:   Iteration 16:
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19 [2023-10-08 09:40:24,422] [    INFO]:   Iteration 17:
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20 [2023-10-08 09:40:24,422] [    INFO]:   Iteration 18:
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20 Best Fitness = 22.963990038857645
21 [2023-10-08 09:40:24,438] [    INFO]:    Iteration 19:
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22 [2023-10-08 09:40:24,438] [    INFO]:    Iteration 20:
   Best Fitness = 22.963990038857645
23 [2023-10-08 09:40:24,438] [    INFO]:    Iteration 21:
   Best Fitness = 22.963990038857645
24 [2023-10-08 09:40:24,454] [    INFO]:    Iteration 22:
   Best Fitness = 22.963990038857645
25 [2023-10-08 09:40:24,454] [    INFO]:    Iteration 23:
   Best Fitness = 22.963990038857645
26 [2023-10-08 09:40:24,469] [    INFO]:    Iteration 24:
   Best Fitness = 22.963990038857645
27 [2023-10-08 09:40:24,469] [    INFO]:    Iteration 25:
   Best Fitness = 22.963990038857645
28 [2023-10-08 09:40:24,469] [    INFO]:    Iteration 26:
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29 [2023-10-08 09:40:24,485] [    INFO]:    Iteration 27:
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30 [2023-10-08 09:40:24,485] [    INFO]:    Iteration 28:
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31 [2023-10-08 09:40:24,485] [    INFO]:    Iteration 29:
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32 [2023-10-08 09:40:24,500] [    INFO]:    Iteration 30:
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33 [2023-10-08 09:40:24,500] [    INFO]:    Iteration 31:
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34 [2023-10-08 09:40:24,500] [    INFO]:    Iteration 32:
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35 [2023-10-08 09:40:24,500] [    INFO]:    Iteration 33:
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36 [2023-10-08 09:40:24,516] [    INFO]:    Iteration 34:
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37 [2023-10-08 09:40:24,516] [    INFO]:    Iteration 35:
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38 [2023-10-08 09:40:24,516] [    INFO]:    Iteration 36:
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39 [2023-10-08 09:40:24,532] [    INFO]:    Iteration 37:
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40 [2023-10-08 09:40:24,532] [    INFO]:    Iteration 38:
   Best Fitness = 22.963990038857645
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41 [2023-10-08 09:40:24,547] [    INFO]:   Iteration 39:
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42 [2023-10-08 09:40:24,547] [    INFO]:   Iteration 40:
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43 [2023-10-08 09:40:24,563] [    INFO]:   Iteration 41:
   Best Fitness = 22.963990038857645
44 [2023-10-08 09:40:24,563] [    INFO]:   Iteration 42:
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45 [2023-10-08 09:40:24,579] [    INFO]:   Iteration 43:
   Best Fitness = 22.963990038857645
46 [2023-10-08 09:40:24,579] [    INFO]:   Iteration 44:
   Best Fitness = 22.963990038857645
47 [2023-10-08 09:40:24,594] [    INFO]:   Iteration 45:
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48 [2023-10-08 09:40:24,594] [    INFO]:   Iteration 46:
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49 [2023-10-08 09:40:24,610] [    INFO]:   Iteration 47:
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50 [2023-10-08 09:40:24,610] [    INFO]:   Iteration 48:
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51 [2023-10-08 09:40:24,625] [    INFO]:   Iteration 49:
   Best Fitness = 22.963990038857645
52 [2023-10-08 09:40:24,625] [    INFO]:   Iteration 50:
   Best Fitness = 22.963990038857645
53 [2023-10-08 09:40:24,641] [    INFO]:   Iteration 51:
   Best Fitness = 22.963990038857645
54 [2023-10-08 09:40:24,641] [    INFO]:   Iteration 52:
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55 [2023-10-08 09:40:24,641] [    INFO]:   Iteration 53:
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56 [2023-10-08 09:40:24,657] [    INFO]:   Iteration 54:
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57 [2023-10-08 09:40:24,657] [    INFO]:   Iteration 55:
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58 [2023-10-08 09:40:24,672] [    INFO]:   Iteration 56:
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59 [2023-10-08 09:40:24,672] [    INFO]:   Iteration 57:
   Best Fitness = 22.963990038857645
60 [2023-10-08 09:40:24,672] [    INFO]:   Iteration 58:
   Best Fitness = 22.963990038857645
61 [2023-10-08 09:40:24,688] [    INFO]:   Iteration 59:
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61 Best Fitness = 22.963990038857645
62 [2023-10-08 09:40:24,704] [    INFO]:    Iteration 60
   : Best Fitness = 22.963990038857645
63 [2023-10-08 09:40:24,704] [    INFO]:    Iteration 61
   : Best Fitness = 22.963990038857645
64 [2023-10-08 09:40:24,719] [    INFO]:    Iteration 62
   : Best Fitness = 22.963990038857645
65 [2023-10-08 09:40:24,719] [    INFO]:    Iteration 63
   : Best Fitness = 22.963990038857645
66 [2023-10-08 09:40:24,719] [    INFO]:    Iteration 64
   : Best Fitness = 22.963990038857645
67 [2023-10-08 09:40:24,735] [    INFO]:    Iteration 65
   : Best Fitness = 22.963990038857645
68 [2023-10-08 09:40:24,735] [    INFO]:    Iteration 66
   : Best Fitness = 22.963990038857645
69 [2023-10-08 09:40:24,750] [    INFO]:    Iteration 67
   : Best Fitness = 22.963990038857645
70 [2023-10-08 09:40:24,766] [    INFO]:    Iteration 68
   : Best Fitness = 22.963990038857645
71 [2023-10-08 09:40:24,766] [    INFO]:    Iteration 69
   : Best Fitness = 22.963990038857645
72 [2023-10-08 09:40:24,782] [    INFO]:    Iteration 70
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73 [2023-10-08 09:40:24,782] [    INFO]:    Iteration 71
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74 [2023-10-08 09:40:24,797] [    INFO]:    Iteration 72
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75 [2023-10-08 09:40:24,797] [    INFO]:    Iteration 73
   : Best Fitness = 22.963990038857645
76 [2023-10-08 09:40:24,813] [    INFO]:    Iteration 74
   : Best Fitness = 22.963990038857645
77 [2023-10-08 09:40:24,813] [    INFO]:    Iteration 75
   : Best Fitness = 22.963990038857645
78 [2023-10-08 09:40:24,813] [    INFO]:    Iteration 76
   : Best Fitness = 22.963990038857645
79 [2023-10-08 09:40:24,829] [    INFO]:    Iteration 77
   : Best Fitness = 22.963990038857645
80 [2023-10-08 09:40:24,844] [    INFO]:    Iteration 78
   : Best Fitness = 22.963990038857645
81 [2023-10-08 09:40:24,844] [    INFO]:    Iteration 79
   : Best Fitness = 22.963990038857645
```

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 82 [2023-10-08 09:40:24,860] [     INFO]:    Iteration 80
    : Best Fitness = 22.963990038857645
 83 [2023-10-08 09:40:24,860] [     INFO]:    Iteration 81
    : Best Fitness = 22.963990038857645
 84 [2023-10-08 09:40:24,875] [     INFO]:    Iteration 82
    : Best Fitness = 22.963990038857645
 85 [2023-10-08 09:40:24,875] [     INFO]:    Iteration 83
    : Best Fitness = 22.963990038857645
 86 [2023-10-08 09:40:24,875] [     INFO]:    Iteration 84
    : Best Fitness = 22.963990038857645
 87 [2023-10-08 09:40:24,891] [     INFO]:    Iteration 85
    : Best Fitness = 22.963990038857645
 88 [2023-10-08 09:40:24,891] [     INFO]:    Iteration 86
    : Best Fitness = 22.963990038857645
 89 [2023-10-08 09:40:24,891] [     INFO]:    Iteration 87
    : Best Fitness = 22.963990038857645
 90 [2023-10-08 09:40:24,907] [     INFO]:    Iteration 88
    : Best Fitness = 22.963990038857645
 91 [2023-10-08 09:40:24,907] [     INFO]:    Iteration 89
    : Best Fitness = 22.963990038857645
 92 [2023-10-08 09:40:24,907] [     INFO]:    Iteration 90
    : Best Fitness = 22.963990038857645
 93 [2023-10-08 09:40:24,907] [     INFO]:    Iteration 91
    : Best Fitness = 22.963990038857645
 94 [2023-10-08 09:40:24,922] [     INFO]:    Iteration 92
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 95 [2023-10-08 09:40:24,922] [     INFO]:    Iteration 93
    : Best Fitness = 22.963990038857645
 96 [2023-10-08 09:40:24,938] [     INFO]:    Iteration 94
    : Best Fitness = 22.963990038857645
 97 [2023-10-08 09:40:24,954] [     INFO]:    Iteration 95
    : Best Fitness = 22.963990038857645
 98 [2023-10-08 09:40:24,954] [     INFO]:    Iteration 96
    : Best Fitness = 22.963990038857645
 99 [2023-10-08 09:40:24,969] [     INFO]:    Iteration 97
    : Best Fitness = 22.963990038857645
100 [2023-10-08 09:40:24,969] [     INFO]:    Iteration 98
    : Best Fitness = 22.963990038857645
101 [2023-10-08 09:40:24,969] [     INFO]:    Iteration 99
    : Best Fitness = 22.963990038857645
102 [2023-10-08 09:40:24,985] [     INFO]:    Iteration 100
```

```
102 : Best Fitness = 22.963990038857645
103 [2023-10-08 09:40:24,985] [    INFO]: Optimal
    Solution: {Facility(key='X', x=4, y=1): [Client(key
    ='A', x=2, y=1), Client(key='B', x=3, y=2), Client(
    key='C', x=2, y=3), Client(key='D', x=4, y=4)],
    Facility(key='Y', x=8, y=3): [Client(key='G', x=8, y
    =4), Client(key='H', x=9, y=5), Client(key='I', x=10
    , y=1)], Facility(key='Z', x=3, y=7): [Client(key='E
    ', x=3, y=5), Client(key='F', x=4, y=6), Client(key
    ='J', x=6, y=10)]}
104 [2023-10-08 09:40:24,985] [    INFO]: Optimal
    Fitness: 22.963990038857645
105
106 Process finished with exit code 0
107
```