PA2 Inverse Kinematics Report

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Overview

Use Subproblems to solve Inverse Kinematics problems.

The following files including a python program and a pdf report are attached.

- ./inverse_kinematics.py
- ./report.pdf

Test Results

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********** Test **********

Test Results:

theta_sol1 =  1.0000008438174133
theta_sol2 =  ([1.0000003992194313, 2.842726291263703], [-0.49999928623982914,
-3.048439232442923])
theta_sol3 =  [2.4870044319130766, 0.9999787910181026]
```

Main Results

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********** Main **********

Final Results:

Solution  1 :
[-3.0047537005118721, 2.0226153308037387, 2.2942539202820043, 5.1375119496773483,
0.17853578269327161, 4.7116745102606234]
Solution  2 :
[0.13683895307792115, -2.0186153308037391, -0.84733873330778897, 5.1375119496773483,
0.17853578269327161, 4.7116745102606234]
Solution  3 :
[0.13683895307792318, 1.1229773227860538, -1.1486009837552009, 5.137511949677348,
0.96713757480896645, 1.5700818566708299]
Solution  4 :
[-3.0047537005118699, -1.1189773227860538, 1.992991669834592, 5.1375119496773483,
0.96713757480896645, 1.5700818566708299]
Solution  5 :
[-3.0047537005118712, 2.0226153308037391, 1.1486009837552016, 1.1456733575022375,
-0.96713757480896645, 4.7116745102606234]
Solution  6 :
[0.13683895307792185, -2.0186153308037396, -1.9929916698345913, 1.1456733575022375,
-0.96713757480896645, 4.7116745102606234]
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Solution  7 :
 [0.13683895307792215, 1.1229773227860547, -2.2942539202820034, 1.1456733575022375,
 -0.17853578269327089, 1.5700818566708299]
Solution  8 :
 [-3.0047537005118712, -1.1189773227860547, 0.84733873330778975, 1.1456733575022375,
 -0.17853578269327089, 1.5700818566708299]
```

Maximum number of theoretical solutions

As shown above, the maximum number of theoretical solutions is 8.

This inverse kinematics problem was divided into 4 subproblems ---- Subproblem 3, Subproblem 2, Subproblem 2, and Subproblem 1, solved in sequence. The process is explained in the following two pages in Appendix.

Appendix