|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Nodes in Memory | | | | | | | | | | |
| Tie-Breaking method | **DEPTH-F** | **DEPTH-L** | **FIFO** | **G-H** | **H-FIFO** | **H-G** | **H-LIFO** | **H-RAND** | **LIFO** | **RANDOM** |
| Domain (heuristic function) |
| Puzzle (Manhattan distance) |
| 4X4.a | 109013.7 | 149487.3 | 150841 | 150892 | 43133 | **42643** | 43952 | 43753.67 | 100250 | 150339 |
| 4X4.b | 250204.7 | 424748.3 | 424005 | 447197 | 103099 | **103036** | 103052 | 103069 | 147807 | 419138.3 |
| 4X4.c | 5724.667 | 11637 | 12406 | 12688 | 2290 | 2314 | **2270** | 2302 | 10812 | 11191.67 |
| 4X4.d | 1194.333 | 2186.667 | 2476 | 2585 | 501 | 484 | **481** | 495.3333 | 1649 | 2307.667 |
| 4X4.e | 20170 | 29807.33 | 30056 | 30205 | 8060 | **7991** | 8034 | 8015.667 | 22126 | 29842.67 |
| Maze (Euclidean distance) |  |  |  |  |  |  |  |  |  |  |
| 25 | 269.2 | 278.1 | 282.4 | **254.2** | 280.1 | 263.4 | 264 | 258.7 | 256.2 | 265.8 |
| 125 | 6794.5 | 6897.4 | 6859.2 | 6631.7 | 6733.2 | 6870.9 | 6677.8 | 6820.8 | 6709 | **6531.5** |
| 225 | 22123.5 | 21943.6 | **21550.2** | 22743.3 | 22819.3 | 22370.8 | 22320.4 | 22030.7 | 22576.4 | 22537 |
| 325 | 46561.7 | 46832.3 | 45525 | 47209.4 | 47481.1 | **44382** | 45854.3 | 45085.2 | 46069.8 | 47005.7 |
| Maze (Manhattan distance) |  |  |  |  |  |  |  |  |  |  |
| 25 | 181.3 | 220.8 | 218.3 | 220.5 | **157.7** | 174.6 | 163.1 | 217 | 178.1 | 217.8 |
| 125 | 5798.2 | 4565.2 | 4155.4 | 4091.7 | 4815.8 | 4049.3 | 4412.3 | **3684.6** | 4410.6 | 5331.8 |
| 225 | 14769 | 14674.8 | 15002.7 | 15205.6 | **11817.2** | 15472.3 | 17381.3 | 12538.9 | 13802.7 | 15206.4 |
| 325 | 35469.8 | 37559.8 | 31076.1 | 33146.9 | 31431 | 31720.1 | 27212.5 | **26911.8** | 29229.8 | 30939.4 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Run Time (sec) | | | | | | | | | | |
| Tie-Breaking method | **DEPTH-F** | **DEPTH-L** | **FIFO** | **G-H** | **H-FIFO** | **H-G** | **H-LIFO** | **H-RAND** | **LIFO** | **RANDOM** |
| Domain (heuristic function) |
| Puzzle (Manhattan distance) |
| 4x4.a | 424.652 | 781.779 | 743.383 | 782.330 | 67.894 | **65.804** | 73.939 | 70.567 | 363.289 | 680.101 |
| 4x4.b | 2702.945 | 9142.035 | 8838.821 | 9591.882 | **326.651** | 327.292 | 331.975 | 327.643 | 863.001 | 7908.499 |
| 4x4.c | 1.362 | 4.8227 | 5.0883 | 5.3943 | 0.2192 | 0.2271 | 0.2117 | **0.2018** | 3.7217 | 3.9112 |
| 4x4.d | 0.071 | 0.189 | 0.216 | 0.251 | 0.020 | 0.020 | 0.018 | **0.017** | 0.129 | 0.182 |
| 4x4.e | 14.480 | 29.810 | 28.737 | 30.636 | 2.531 | 2.364 | 2.413 | **2.354** | 18.048 | 25.327 |
| Maze (Euclidean distance) |  |  |  |  |  |  |  |  |  |  |
| 25 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | **0.003** | 0.004 |
| 125 | 1.513 | 1.529 | 1.498 | 1.434 | 1.442 | 1.534 | 1.425 | 1.506 | 1.448 | **1.362** |
| 225 | 15.677 | 15.001 | **14.562** | 16.283 | 16.417 | 15.792 | 15.652 | 15.208 | 16.275 | 15.939 |
| 325 | 82.635 | 78.092 | 68.226 | 81.666 | 74.285 | **66.909** | 68.727 | 72.221 | 69.119 | 83.222 |
| Maze (Manhattan distance) |  |  |  |  |  |  |  |  |  |  |
| 25 | 0.004 | 0.006 | 0.006 | 0.005 | **0.003** | 0.004 | 0.004 | 0.005 | 0.005 | 0.005 |
| 125 | 1.672 | 1.161 | 0.990 | 0.990 | 1.383 | 0.969 | 1.076 | **0.824** | 1.131 | 1.482 |
| 225 | 11.414 | 11.091 | 11.351 | 11.434 | **7.940** | 12.697 | 14.313 | 8.850 | 9.970 | 11.555 |
| 325 | 61.151 | 68.556 | 47.897 | 53.047 | 49.419 | 48.773 | 39.222 | **37.122** | 41.581 | 48.477 |