Velicu Mihai 342C3

Tema 1 IA
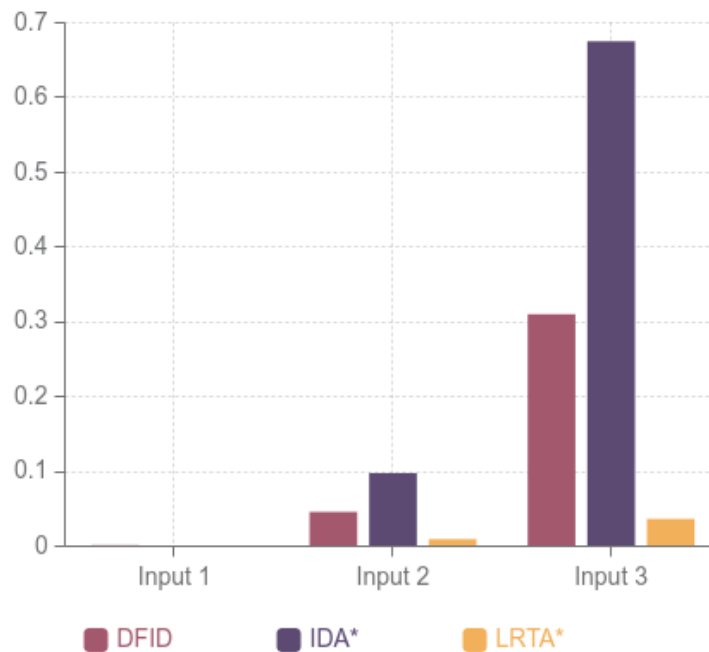**Cerinta 5**

Reprezentare grafica:

Euristica Euclidiana

Observatii generale:

In urma analizei rezultatelor obtinute, remarc urmatoarele aspecte:

→ pe inputuri de dimensiune mica toti algoritmii ruleaza aproximativ la fel de rapid

→ pe masura ce dimensiunea mediului creste, algoritmul de cautare online (LRTA*) se dovedeste a fi exponential mai eficient

→ cel mai ineficient algoritm in cazul mediilor mari se dovedeste a fi IDA*, negenerand insa timpi de rulare mult diferiti de DFID

→ functia euristica alternativa o reprezinta media geometrica dintre distanta euclidiana si distanta manhattan intre 2 pozitii din harta

→ cum rezultatul este mai mic decat oricare dintre cele 2 distante, care la randul lor sunt admisibile, putem deduce ca si euristica folosita este tot admisibila

→ remarcam faptul ca timpii generati folosind euristica alternativa sunt asemanatori, uneori putin redusi (nefiind necesar sa mai generam alt grafic)

Rezultate:

Testul 1:
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*Cerinta 1: DFID

 -Best cost is: 18

 -Cheapest path is:

[20, 11, 1, 2, 3, 4, 5, 6, 7, 8, 9, 18, 27, 36, 45, 55, 64, 73, 82]

 -It took 0.0026984214782714844 seconds to compute it.

Cerinta 2: IDA

 -Best cost is: 18

 -Cheapest path is:

[20, 11, 1, 2, 3, 4, 5, 6, 7, 8, 9, 18, 27, 36, 45, 55, 64, 73, 82]

 -It took 0.00182342529296875 seconds to compute it.

Cerinta 4: IDA cu euristica my_heuristic

 -Best cost is: 18

 -Cheapest path is:

[20, 11, 1, 2, 3, 4, 5, 6, 7, 8, 9, 18, 27, 36, 45, 55, 64, 73, 82]

 -It took 0.001957416534423828 seconds to compute it.

Cerinta 3: LRTA

 -Best cost is: 18

 -Cheapest path is:

[20, 11, 1, 2, 3, 4, 5, 6, 7, 8, 9, 18, 27, 36, 45, 55, 64, 73, 82]

 -It took 0.0010137557983398438 seconds to compute it.

Cerinta 4: LRTA cu euristica my_heuristic

    -Best cost is: 18

    -Cheapest path is:

[20, 11, 1, 2, 3, 4, 5, 6, 7, 8, 9, 18, 27, 36, 45, 55, 64, 73, 82]

    -It took 0.0017511844635009766 seconds to compute it.

Testul 2:
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*Cerinta 1: DFID

    -Best cost is: 89

    -Cheapest path is:

[252, 233, 214, 215, 199, 179, 178, 167, 147, 146, 145, 144, 143, 142, 141, 140, 139, 129, 113, 112, 111, 110, 91, 75, 76, 77, 78, 79, 60, 43, 24, 25, 26, 27, 28, 29, 30, 31]

    -It took 0.04709172248840332 seconds to compute it.

Cerinta 2: IDA

    -Best cost is: 89

    -Cheapest path is:

[252, 233, 214, 215, 199, 179, 178, 167, 147, 146, 145, 144, 143, 142, 141, 140, 139, 129, 113, 112, 111, 110, 91, 75, 76, 77, 78, 79, 60, 43, 24, 25, 26, 27, 28, 29, 30, 31]

    -It took 0.09895491600036621 seconds to compute it.

Cerinta 4: IDA cu euristica my_heuristic

    -Best cost is: 89

    -Cheapest path is:

[252, 233, 214, 215, 199, 179, 178, 167, 147, 146, 145, 144, 143, 142, 141, 140, 139, 129, 113, 112, 111, 110, 91, 75, 76, 77, 78, 79, 60, 43, 24, 25, 26, 27, 28, 29, 30, 31]

    -It took 0.13881516456604004 seconds to compute it.

Cerinta 3: LRTA

       -Best cost is: 89

       -Cheapest path is:

[252, 233, 214, 215, 199, 179, 178, 167, 147, 146, 145, 144, 143, 142, 141, 140, 139, 129, 113, 112, 111, 110, 91, 75, 76, 77, 78, 79, 60, 43, 24, 25, 26, 27, 28, 29, 30, 31]

       -It took 0.010671854019165039 seconds to compute it.

Cerinta 4: LRTA cu euristica my_heuristic

       -Best cost is: 89

       -Cheapest path is:

[252, 233, 214, 215, 199, 179, 178, 167, 147, 146, 145, 144, 143, 142, 141, 140, 139, 129, 113, 112, 111, 110, 91, 75, 76, 77, 78, 79, 60, 43, 24, 25, 26, 27, 28, 29, 30, 31]

       -It took 0.011883974075317383 seconds to compute it.

Testul 3:
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*Cerinta 1: DFID

       -Best cost is: 139

       -Cheapest path is:

[1, 2, 3, 4, 5, 35, 65, 95, 125, 155, 185, 215, 245, 275, 305, 335, 365, 395, 425, 455, 485, 515, 545, 575, 605, 635, 665, 695, 725, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 736, 706, 676, 646, 645, 644, 643, 613, 583, 553, 554, 555, 556, 557, 558, 559, 560]

       -It took 0.3117105960845947 seconds to compute it.

Cerinta 2: IDA

       -Best cost is: 139

       -Cheapest path is:

[1, 2, 3, 4, 5, 35, 65, 95, 125, 155, 185, 215, 245, 275, 305, 335, 365, 395, 425, 455, 485, 515, 545, 575, 605, 635, 665, 695, 725, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 736, 706, 676, 646, 645, 644, 643, 613, 583, 553, 554, 555, 556, 557, 558, 559, 560]

       -It took 0.676245927810669 seconds to compute it.

Cerinta 4: IDA cu euristica my_heuristic

-Best cost is: 139

-Cheapest path is:

[1, 2, 3, 4, 5, 35, 65, 95, 125, 155, 185, 215, 245, 275, 305, 335, 365, 395, 425, 455, 485, 515, 545, 575, 605, 635, 665, 695, 725, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 736, 706, 676, 646, 645, 644, 643, 613, 583, 553, 554, 555, 556, 557, 558, 559, 560]

-It took 0.9509909152984619 seconds to compute it.

Cerinta 3: LRTA

-Best cost is: 139

-Cheapest path is:

[1, 2, 3, 4, 5, 35, 65, 95, 125, 155, 185, 215, 245, 275, 305, 335, 365, 395, 425, 455, 485, 515, 545, 575, 605, 635, 665, 695, 725, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 736, 706, 676, 646, 645, 644, 643, 613, 583, 553, 554, 555, 556, 557, 558, 559, 560]

-It took 0.0377810001373291 seconds to compute it.

Cerinta 4: LRTA cu euristica my_heuristic

-Best cost is: 139

-Cheapest path is:

[1, 2, 3, 4, 5, 35, 65, 95, 125, 155, 185, 215, 245, 275, 305, 335, 365, 395, 425, 455, 485, 515, 545, 575, 605, 635, 665, 695, 725, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 736, 706, 676, 646, 645, 644, 643, 613, 583, 553, 554, 555, 556, 557, 558, 559, 560]

-It took 0.03762531280517578 seconds to compute it.