Resultados utilizando el algoritmo de A\*:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| \Heurística  Instancia\ | Manhattan | Manhattan con linear collision | PDB 5-5-5 | PDB 6-6-3 | PDB 5-5-5 v\_2 |
| 1 | 4.49 | 0.78 | 0.05 | 0.17 | 0.18 |
| 2 | 87.43 | 7.65 | 0.12 | 0.54 | 5.13 |
| 3 | 23.25 | 3.8 | 0.03 | 0.43 | 0.77 |
| 4 | 156.41 | 46.37 | 1.77 | 5.32 | 9.21 |
| 5 | 52.66 | 12.86 | 0.26 | 0.88 | 1.17 |
| 6 | 10.22 | 2.89 | 0.89 | 0.91 | 0.91 |
| 7 | 3.8 | 0.94 | 0.18 | 0.2 | 0.27 |
| 8 | 52.36 | 10.95 | 0.29 | 1.22 | 3.98 |
| 9 | 20.59 | 1.78 | 0.24 | 0.72 | 0.78 |
| 10 | 2.25 | 0.14 | 0.04 | 0.07 | 0.06 |
| 11 | 79.65 | 19.02 | 3.17 | 2.53 | 2.28 |
| 12 | 27.47 | 5.19 | 1.39 | 2.72 | 1.52 |
| 13 | 2.15 | 0.32 | 0.1 | 0.14 | 0.12 |
| 14 | 3.19 | 0.36 | 0.12 | 0.28 | 0.04 |
| 15 | 159.78 | 24.29 | 0.4 | 5.24 | 2.25 |
| 16 | Falla por memoria | 44.29 | 8.41 | 21.86 | 8.55 |
| 17 | 1.83 | 4.25 | 0.8 | 0.95 | 0.79 |
| 18 | Falla por memoria | 86.76 | 8.7 | 16.82 | 39.81 |
| 19 | 10.07 | 9.68 | 0.79 | 0.84 | 4.23 |
| 20 | 1.95 | 0.44 | 0.01 | 0.17 | 0.1 |
| 21 | 15.79 | 3.21 | 0.28 | 0.48 | 0.72 |
| 22 | 38.45 | 5.32 | 0.99 | 3.91 | 3.78 |
| 23 | 121.48 | 14.35 | 3.26 | 3.94 | 3.94 |
| 24 | 21.01 | 1.94 | 0.29 | 0.18 | 0.34 |
| 25 | 26.7 | 7.41 | 0.9 | 2.29 | 1.54 |
| 26 | 32.72 | 5 | 0.52 | 1.36 | 1.1 |
| 27 | 81.23 | 22.41 | 3.79 | 5.21 | 4.35 |
| 28 | 80.42 | 12.74 | 2.56 | 0.62 | 2.42 |
| 29 | 9.66 | 1.75 | 0.21 | 0.1 | 0.22 |
| 30 | 17.79 | 2.3 | 0.15 | 0.56 | 0.37 |
| 31 | 2.18 | 0.33 | 0.03 | 0.06 | 0.03 |
| 32 | 0.8 | 0.31 | 0.01 | 0.03 | 0 |
| 33 | 127.49 | 20.4 | 4.09 | 2.84 | 9.97 |
| 34 | 89.44 | 12.03 | 2.23 | 2.63 | 1.65 |
| 35 | 16.23 | 1.69 | 0.34 | 0.34 | 0.2 |
| 36 | 44.42 | 7.78 | 1.54 | 0.89 | 1.35 |
| 37 | 12.22 | 2.33 | 0.25 | 0.24 | 0.5 |
| 38 | 80.52 | 9.67 | 0.45 | 1.36 | 2.32 |
| 39 | 12.72 | 2.41 | 0.18 | 0.48 | 0.33 |
| 40 | 19.76 | 7.59 | 0.4 | 1.48 | 0.44 |
| 41 | 17.99 | 8.46 | 0.2 | 0.46 | 0.88 |
| 42 | 1.82 | 0.69 | 0.01 | 0.02 | 0.09 |
| 43 | 18.37 | 4.47 | 0.9 | 0.57 | 0.85 |
| 44 | 10 | 0.8 | 0.15 | 0.27 | 0.19 |
| 45 | 3.61 | 0.19 | 0.05 | 0.19 | 0.14 |
| 46 | 7.65 | 0.46 | 0.11 | 0.1 | 0.16 |
| 47 | 1.03 | 0.21 | 0.02 | 0.01 | 0.04 |
| 48 | 0.7 | 0.1 | 0.02 | 0.05 | 0.02 |
| 49 | Fala por memoria | 74.83 | 4.12 | 10.56 | 6.26 |
| 50 | 10.43 | 9.1 | 0.4 | 0.55 | 0.64 |
| 51 | 9.54 | 2.1 | 0.14 | 0.51 | 0.09 |
| 52 | 81.03 | 9.02 | 0.3 | 1.64 | 0.29 |
| 53 | Falla por memoria | 71.15 | 3.37 | 7.8 | 8.35 |
| 54 | 43.55 | 15.9 | 0.6 | 1.09 | 1.03 |
| 55 | 4.82 | 0.8 | 0.04 | 0.06 | 0.03 |
| 56 | 241.52 | 51.55 | 4.31 | 8.87 | 3.99 |
| 57 | 29.27 | 5.15 | 0.41 | 0.27 | 0.37 |
| 58 | 3.26 | 0.93 | 0.13 | 0.31 | 0.03 |
| 59 | Falla por memoria | 44.3 | 2.47 | 5.41 | 7.45 |
| 60 | Falla por memoria | 89.7 | 18.52 | 16.62 | 16.13 |
| 61 | 1.91 | 7.63 | 1.64 | 0.56 | 1.43 |
| 62 | 18.16 | 2.3 | 1.15 | 2.01 | 2.58 |
| 63 | 98.37 | 13.71 | 0.42 | 0.54 | 7.18 |
| 64 | 43.11 | 11.02 | 0.3 | 0.89 | 1.44 |
| 65 | 9.08 | 1.18 | 0.1 | 0.14 | 0.17 |
| 66 | Falla por memoria | 84.52 | 4.1 | 5.3 | 9.48 |
| 67 | 73.68 | 17.41 | 1.01 | 2.35 | 1.73 |
| 68 | 41.22 | 5.52 | 0.23 | 0.34 | 0.7 |
| 69 | 36.48 | 1.47 | 4.16 | 0.99 | 1.82 |
| 70 | 24.58 | 10.31 | 1.46 | 2.72 | 1.03 |
| 71 | 5.18 | 0.97 | 0.11 | 0.12 | 0.14 |
| 72 | 192.74 | 18.76 | 1.76 | 1.91 | 3.22 |
| 73 | 21.56 | 1.9 | 0.16 | 0.06 | 0.3 |
| 74 | 1.94 | 0.38 | 0.04 | 0.09 | 0.27 |
| 75 | 14.1 | 2.07 | 1.48 | 1.01 | 0.43 |
| 76 | 36.68 | 9.21 | 2.56 | 5.37 | 0.84 |
| 77 | 11.12 | 2.63 | 0.88 | 1.23 | 0.68 |
| 78 | 3.86 | 0.52 | 0.17 | 0.26 | 0.12 |
| 79 | 0.47 | 0.08 | 0.02 | 0.04 | 0.02 |
| 80 | 25.8 | 7.66 | 0.69 | 2.43 | 1.86 |
| 81 | 6.24 | 0.95 | 0.07 | 0.09 | 0.21 |
| 82 | Falla por memoria | 170.34 | 4.32 | 8.78 | 12.18 |
| 83 | 7.58 | 15.64 | 0.42 | 0.5 | 1.01 |
| 84 | 111.7 | 19.65 | 0.34 | 1.21 | 1.61 |
| 85 | 12.6 | 1.74 | 0.04 | 0.05 | 0.15 |
| 86 | 0.66 | 0.06 | 0.01 | 0.03 | 0.02 |
| 87 | 18.65 | 2.5 | 0.06 | 0.19 | 0.42 |
| 88 | Falla por memoria | 184.76 | 21.17 | 31.99 | 90.82 |
| 89 | 20.94 | 20.53 | 2.8 | 1.58 | 9.28 |
| 90 | 5.05 | 0.54 | 0.29 | 0.23 | 0.21 |
| 91 | 212.3 | 21.15 | 0.86 | 0.72 | 1.71 |
| 92 | 206.33 | 21.74 | 2.04 | 2.43 | 2.01 |
| 93 | 22.46 | 2.17 | 0.17 | 0.13 | 0.19 |
| 94 | 0.43 | 0.09 | 0.02 | 0.06 | 0.02 |
| 95 | 5.31 | 1.48 | 0.02 | 0.18 | 0.14 |
| 96 | 8.39 | 0.46 | 0.13 | 0.24 | 0.38 |
| 97 | 1.39 | 0.23 | 0.02 | 0.01 | 0.06 |
| 98 | 47.38 | 21.41 | 0.74 | 2.37 | 1.29 |
| 99 | 50.11 | 9.11 | 1.23 | 1.69 | 1.01 |
| 100 | 23.41 | 8.38 | 1.03 | 2.18 | 1.42 |
| Promedio de los 100 casos | Hubo casos que no se pudo determinar su tiempo | 15.1582 | 1.4472 | 2.2939 | 3.2955 |

Resultados utilizando el algoritmo de IDA\*:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| \Heurística  Instancia\ | Manhattan | Manhattan con linear collision | PDB 5-5-5 | PDB 6-6-3 | PDB 5-5-5 v\_2 |
| 1 | 0.96 | 0.32 | 0.02 | 0.08 | 0.05 |
| 2 | 14.64 | 5.83 | 0.05 | 0.14 | 1.11 |
| 3 | 1.48 | 1.3 | 0.02 | 0.22 | 0.12 |
| 4 | 43.8 | 34.95 | 0.67 | 5.27 | 5.67 |
| 5 | 5.69 | 3.03 | 0.05 | 0.16 | 0.09 |
| 6 | 0.79 | 0.83 | 0.25 | 0.34 | 0.25 |
| 7 | 0.91 | 0.26 | 0.03 | 0.04 | 0.05 |
| 8 | 8.46 | 7.95 | 0.05 | 0.18 | 0.67 |
| 9 | 2.49 | 0.481 | 0.15 | 0.32 | 0.25 |
| 10 | 0.32 | 0.05 | 0 | 0.04 | 0.02 |
| 11 | 14.2 | 32.09 | 0.7 | 1.42 | 0.79 |
| 12 | 7.69 | 1.94 | 0.61 | 2.56 | 0.64 |
| 13 | 0.04 | 0.04 | 0 | 0.02 | 0.01 |
| 14 | 1.03 | 0.46 | 0.07 | 0.09 | 0.02 |
| 15 | 39.08 | 3.82 | 0.3 | 1.33 | 0.55 |
| 16 | 20.1 | 14.28 | 2.46 | 9.45 | 2.38 |
| 17 | 1.18 | 0.57 | 0.08 | 0.19 | 0.03 |
| 18 | 28.05 | 49.97 | 1.83 | 8.88 | 4.06 |
| 19 | 1.64 | 1.33 | 0.04 | 0.13 | 0.2 |
| 20 | 0.09 | 0.24 | 0.01 | 0.05 | 0.01 |
| 21 | 2.84 | 2.45 | 0.08 | 0.52 | 0.28 |
| 22 | 17.3 | 2.98 | 0.58 | 2.91 | 2.89 |
| 23 | 25.54 | 7.13 | 0.85 | 2.63 | 0.88 |
| 24 | 1 | 0.51 | 0.01 | 0.04 | 0.02 |
| 25 | 3.1 | 3.93 | 0.29 | 1.65 | 1 |
| 26 | 6.19 | 4.44 | 0.33 | 1.08 | 0.39 |
| 27 | 18.51 | 12.15 | 1.32 | 4.25 | 3.05 |
| 28 | 13 | 6.67 | 1.31 | 0.25 | 1.93 |
| 29 | 0.59 | 0.48 | 0.02 | 0.06 | 0.04 |
| 30 | 3.99 | 1.85 | 0.1 | 0.34 | 0.29 |
| 31 | 0.14 | 0.16 | 0.01 | 0.03 | 0 |
| 32 | 0.11 | 0.19 | 0.01 | 0.02 | 0.01 |
| 33 | 23.85 | 31.24 | 2.26 | 6.01 | 5.22 |
| 34 | 35.25 | 9.46 | 0.48 | 0.88 | 0.73 |
| 35 | 3.34 | 0.85 | 0.16 | 0.4 | 0.04 |
| 36 | 2.72 | 1.8 | 0.17 | 0.36 | 0.38 |
| 37 | 4.6 | 0.63 | 0.06 | 0.16 | 0.26 |
| 38 | 21.22 | 6.02 | 0.16 | 0.95 | 1.03 |
| 39 | 1.46 | 1.21 | 0.17 | 0.32 | 0.08 |
| 40 | 5.2 | 7.15 | 0.19 | 0.28 | 0.14 |
| 41 | 4.85 | 6.43 | 0.07 | 0.13 | 0.34 |
| 42 | 0.08 | 0.03 | 0 | 0 | 0.01 |
| 43 | 3.43 | 1.93 | 0.23 | 0.24 | 0.25 |
| 44 | 4.55 | 0.62 | 0.08 | 0.71 | 0.08 |
| 45 | 0.73 | 0.35 | 0.06 | 0.11 | 0.15 |
| 46 | 1.27 | 0.4 | 0.04 | 0.05 | 0.11 |
| 47 | 0.11 | 0.06 | 0.01 | 0.02 | 0.01 |
| 48 | 0.07 | 0.02 | 0.01 | 0.03 | 0.01 |
| 49 | 122.25 | 68.11 | 2.06 | 7.63 | 1.53 |
| 50 | 3.39 | 0.7 | 0.05 | 0.04 | 0.17 |
| 51 | 2.35 | 1.29 | 0.05 | 0.17 | 0.04 |
| 52 | 23.21 | 6.72 | 0.24 | 0.9 | 0.41 |
| 53 | 30.8 | 29.74 | 0.81 | 2.58 | 2.21 |
| 54 | 15.96 | 7.4 | 0.15 | 0.67 | 0.33 |
| 55 | 0.05 | 0.02 | 0.01 | 0.03 | 0.01 |
| 56 | 78.2 | 38.47 | 2.64 | 4.91 | 1.83 |
| 57 | 0.46 | 0.69 | 0.01 | 0.01 | 0.03 |
| 58 | 0.83 | 0.77 | 0.1 | 0.17 | 0.04 |
| 59 | 88.31 | 24.36 | 1.54 | 3.32 | 2.92 |
| 60 | 219.74 | 49.81 | 5.5 | 6.25 | 4.49 |
| 61 | 0.47 | 0.17 | 0.01 | 0.04 | 0.04 |
| 62 | 3.96 | 5.21 | 0.82 | 1.64 | 1.28 |
| 63 | 70.01 | 3.1 | 0.19 | 0.56 | 2.87 |
| 64 | 16.88 | 5.69 | 0.14 | 0.46 | 0.57 |
| 65 | 1.43 | 0.62 | 0.08 | 0.05 | 0.05 |
| 66 | 106.78 | 65.97 | 1.42 | 2.61 | 6.27 |
| 67 | 11.6 | 12.78 | 0.38 | 0.53 | 0.29 |
| 68 | 11.43 | 1.99 | 0.13 | 0.44 | 0.26 |
| 69 | 9.78 | 2.27 | 0.86 | 0.69 | 1.13 |
| 70 | 10.61 | 10.18 | 0.71 | 1.76 | 0.83 |
| 71 | 0.34 | 0.08 | 0.01 | 0.01 | 0.02 |
| 72 | 116.32 | 21.28 | 0.64 | 1.38 | 1.53 |
| 73 | 0.11 | 0.13 | 0.01 | 0.01 | 0.01 |
| 74 | 0.11 | 0.07 | 0.01 | 0.02 | 0.04 |
| 75 | 3.67 | 2.45 | 0.52 | 0.54 | 0.26 |
| 76 | 8.66 | 24.38 | 1.89 | 1.02 | 0.22 |
| 77 | 1.21 | 1.2 | 0.1 | 0.15 | 0.26 |
| 78 | 0.79 | 0.58 | 0.07 | 0.18 | 0.16 |
| 79 | 0.02 | 0.58 | 0 | 0 | 0 |
| 80 | 10.08 | 10.13 | 0.38 | 1.71 | 1.16 |
| 81 | 1.38 | 0.45 | 0.01 | 0.03 | 0.11 |
| 82 | 324.24 | 115.63 | 2.44 | 2.79 | 6.53 |
| 83 | 3.48 | 0.29 | 0.05 | 0.05 | 0.11 |
| 84 | 9.53 | 18.26 | 0.12 | 0.36 | 0.3 |
| 85 | 0.06 | 0.07 | 0.01 | 0 | 0.01 |
| 86 | 0.16 | 0.03 | 0.01 | 0.02 | 0.01 |
| 87 | 4.75 | 2.8 | 0.04 | 0.05 | 0.24 |
| 88 | 500.4 | 121.08 | 5.96 | 8.72 | 43.38 |
| 89 | 9.71 | 4.61 | 0.87 | 0.97 | 0.6 |
| 90 | 0.89 | 0.29 | 0.04 | 0.11 | 0.11 |
| 91 | 84.74 | 41.88 | 0.42 | 0.88 | 2.18 |
| 92 | 79.21 | 23.19 | 0.68 | 1.93 | 0.89 |
| 93 | 0.62 | 0.5 | 0 | 0.02 | 0.04 |
| 94 | 0.03 | 0.04 | 0.01 | 0.02 | 0.01 |
| 95 | 0.62 | 1.13 | 0.02 | 0.04 | 0.05 |
| 96 | 0.82 | 0.2 | 0.06 | 0.16 | 0.2 |
| 97 | 0.25 | 0.14 | 0 | 0 | 0.02 |
| 98 | 11.49 | 9.57 | 0.75 | 2.4 | 1.01 |
| 99 | 9.42 | 6.49 | 0.5 | 0.24 | 0.13 |
| 100 | 3.52 | 2.83 | 0.22 | 0.62 | 1.21 |
| Promedio de los 100 casos | 24.1281 | 10.1674 | 0.5018 | 1.1523 | 1.3293 |