# Heuristic Analysis (Planning Search) :

* Run uninformed planning searches for air\_cargo\_p1, air\_cargo\_p2, and air\_cargo\_p3; provide metrics on number of node expansions required, number of goal tests, time elapsed, and optimality of solution for each search algorithm. Include the result of at least three of these searches, including breadth-first and depth-first, in your write-up (breadth\_first\_search and depth\_first\_graph\_search).
* If depth-first takes longer than 10 minutes for Problem 3 on your system, stop the search and provide this information in your report.
* Use the run\_search script for your data collection: from the command line type python run\_search.py -h to learn more

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| Problem | Algorithm | Expansions | Goal tests | New nodes | Time elapsed |
| P1 | BFS | 43 | 56 | 180 | 0.0946 |
| P1 | DFGS | 12 | 13 | 48 | 0.01445 |
| P1 | UCS | 55 | 57 | 224 | 0.0623 |
| P2 | BFS | 3401 | 4672 | 31049 | 23.06 |
| P2 | DFGS |  |  |  |  |
| P2 | UCS | 4761 | 4763 | 43206 | 17.684 |
| P3 | BFS | 14491 | 17947 | 128184 | 154 |
| P3 | DFGS |  |  |  |  |
| P3 | UCS | 17783 | 17785 | 155920 | 76.0043 |

* Run A\* planning searches using the heuristics you have implemented on air\_cargo\_p1, air\_cargo\_p2 and air\_cargo\_p3. Provide metrics on number of node expansions required, number of goal tests, time elapsed, and optimality of solution for each search algorithm and include the results in your report.

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| Problem | Algorithm | Expansions | Goal tests | New nodes | Time elapsed |
| P1 | A\_h1 | 55 | 57 | 224 | 0.0856 |
| P1 | A\_h\_ignore\_pre | 41 | 43 | 170 | 0.0482 |
| P1 | A\_pg\_level | 11 | 13 | 50 | 1.115 |
| P2 | A\_h1 | 3401 | 4672 | 31049 | 23.06 |
| P2 | A\_h\_ignore\_pre |  |  |  |  |
| P2 | A\_pg\_level | 4761 | 4763 | 43206 | 17.684 |
| P3 | A\_h1 | 14491 | 17947 | 128184 | 154 |
| P3 | A\_h\_ignore\_pre |  |  |  |  |
| P3 | A\_pg\_level | 17783 | 17785 | 155920 | 76.0043 |