# Decision Making - ex 5

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## 1 nQueens

| search | Failures | Objective Value |
|---|---|---|
| **default** | 6.245.783 | 810 |
| **dWd-rand** | 15.177.251 | 732 |
| **dWd-rand + restart** | 12.354.995 | 672 |
| **dWd-rand + restart + LNS** | 4.183.095 | 650 |

## 2 Analysis

*Analyse the results and compare the different search strategies*

The first thing that we notice is that all the executions timed out in 5 mins, so we aren't able to find the searched value. We think that is a problem strictly related to the number of the queens to place.
By modifying the solver heuristic and the annotations of the solver, we can observe that the number of the failures decrease as the number of the objective value do. The starting value is 810, with domWdeg-random serach, restart and LNS strategy it becomes 650, so the queens are closer to the diagonal of the scheme.
With the restart luby we introduce the possibility to restart the execution, so the solver shouldn't remain locked in a neighborhood of solution.
Then we put the LNS annotation that allow the solver to search in a much bigger neighborhood of solutions so it should explore randomly other solution, modifying the existing solution, and minimize the objective value faster. With the last annotation, we help the solver to explore solutions different from local ones, it makes sure to not block the resolution in some local best solutions as other algorithms do.