1 Exercise 1

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1.1 Computing task

Grid is $10x10$, that means we have 100 fields.
2 - for these many times we can choose status for the field (dirty or clean). We have 100 fields, so we have to apply this rule to 100 fields:
2^{100} - this is number of all combinations of board's settings.
100^5 - we have 5 robots. Each of them we can put on a board in 100 ways.
20^5 - each robot has 20 charge levels.
Number of all states is a multiplication of values mentioned above: $S = 2^{100} \cdot 100^5 \cdot 20^5$
$T = S \cdot 10^{-6}s = 2^{100} \cdot 100^5 \cdot 20^5 \cdot 10^{-6}s = 2^{100} \cdot 10^4 \cdot 20^5 s$

1.2 Questions

1. In the start it says that Planning works when "Your problem is subject to frequent change", but heuristics by its nature enforce a rigidity in description of the problem. Is this an intended trade-off or if it is an open research problem?

2. What was so special about LM-cut heuristic that it coused a major boost in optimal planning in the last years?