# Homework 2 on Search

We provide a formal proof on the following properties

* If a heuristic is consistent, it must be admissible. We also give an example heuristic which is admissible, but not consistent.
* A\* of graph search is NOT optimal with admissible heuristic.

For the second property, the course book only says that “A\* of graph search is optimal with consistent heuristic”. Some students are wondering whether the conclusion that

*A\* of graph search is optimal with admissible heuristic*

is true or not (see the [page](https://cs.stackexchange.com/questions/23351/optimality-of-a?rq=1)). Here, we show this conclusion is wrong. The key point is that the frontier set in graph search include both the visited and unvisited nodes.

Please check the following [pdf](main.pdf).