

1. hashing.  $O(n)$ .

lower bound: this is the uniqueness problem.  $\Omega(n \log n)$  for deterministic algorithms in the comparison model. see the lecture notes [https://sarielhp.org/teach/notes/algos/files/34\\_lwr\\_bound.pdf](https://sarielhp.org/teach/notes/algos/files/34_lwr_bound.pdf)

## References