ALGORITHMS - COMPLEXITY

Complexity Classes

- P $\overset{?}{=}$ NP

COMPLEXITY CLASSES $P \stackrel{?}{=} NP$

- $P \subseteq NP$
  - Why?
  - Is $P \subset NP$ or is $P = NP$?
    - The question is often referred to as the $P \stackrel{?}{=} NP$ problem

COMPLEXITY CLASSES $P \stackrel{?}{=} NP$

- Arguments:
  - $P \subset NP$
    - There is a long list of problems known to be in NP (i.e. certificates can be verified in polynomial time)

      but not known to be in P (i.e. no one has found a polynomial time algorithm for solving them)
      - Examples: ISO, KNAPSACK, TSP
  - $P = NP$
    - No problem has been proved to be in $NP - P$

3