

CSC373 Worksheet 7 Solution

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1. Notes

- **Decision Problem**

- Is the problem if determining answer to a class of yes/no questions about some objects of interest

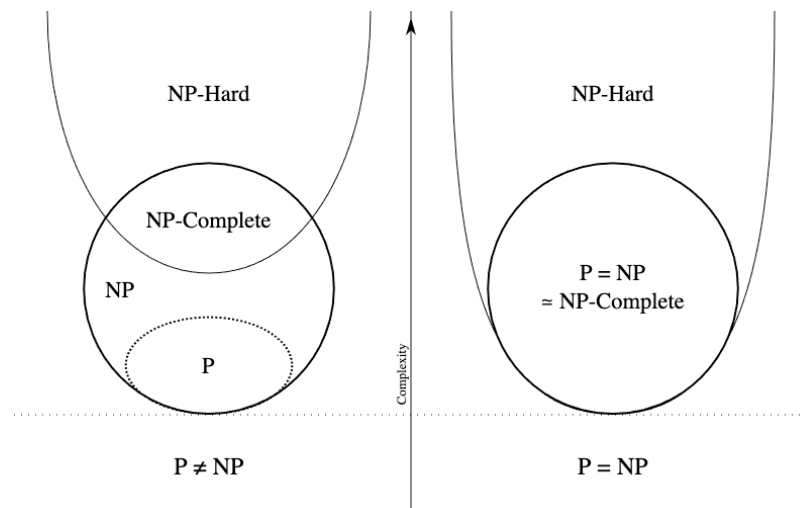
- **P**

- Is set of problems that can be solved by a deterministic Turing machine in Polynomial time [2].

Example:

- 1) Shortest path problems
- 2) Calculating the greatest common divisor
- 3) Finding maximum bipartite matching

- **NP (Non-deterministic Polynomial):**



- Is set of decision problems that can be solved by a Non-deterministic Turing Machine in Polynomial time.^[2]
- Has no particular rule is followed to make a guess ^[1].
- Can be solved in polynomial time via a “lucky algorithm”, a magical algorithm that always make a right guess ^[2]

References

- 1) Encyclopedia Britannica, NP-Complete Problem, [link](#)
- 2) Geeks for Geeks, NP-Completeness, [link](#)