

Assignment 4: P, NP, NP-Hard and NP-Complete Problems

The purpose of this assignment is to carry out some research and create a short PDF document with the following content.

1. Polynomial Problems:
 - a. Definition, in your own words, of what a polynomial problem is.
 - b. Fully detailed example
2. Non-deterministic Polynomial Problems:
 - a. Definition, in your own words, of what a non-deterministic polynomial problem is.
 - b. Fully detailed example
3. NP-Hard Problems
 - a. Definition, in your own words, of what an NP-Hard problem is.
 - b. Fully detailed example
4. NP-Complete Problems
 - a. Definition, in your own words, of what an NP-Complete problem is n
 - b. Fully detailed example
5. Describe, and outline the history behind, what is meant by the “*P versus NP*” Problem

Submission Notes:

- Your submission should focus on clarity and ease of understanding for the reader
 - Think *quality* over quantity.
- The explanations should be written **in your own words** and you should include references to all of your source material (books, websites, lecture notes, videos etc.)
- You should use diagrams as appropriate but always include references for these.
- You should use *different* examples for each section.
- Your submission should be no longer than **2-3 pages** in total with appropriate headings for each of the sections. Marks will be awarded for the quality and clarity of your explanations.
- If you copy text directly from sources, you will receive 0 marks for plagiarism.

You should submit your assignment before the end of the day on **Wednesday the 15th of March**.