Keep your solutions simple, but functionally complete.

The problems could be open ended, so feel free to choose things as you deem fit respecting the problem constraints. Any creativity in your solution is more than welcome.

Problem :

Explain what the author is trying to explain in this paper (Myer's Algorithm)

There are three parts in this blog, read carefully the entire detail end to end and explain what is Myer's algorithm

https://blog.jcoglan.com/2017/02/12/the-myers-diff-algorithm-part-1/

Provide some pseudo-code and ideas on how to improve it.

Solution : implementation, ideas, presentation

Problem :

Identify the functions, and their properties used in Cryptography

A nice attempt would be to study Bent functions [wikipedia], and expand to other functions provided in the official standards.

- What are Bent functions ? What's their role in cryptography ?
- Explore and list what other functions are often used in cryptography from sources like NIST. Identify their application.
- What do you think is the most wanted mathematical property of cryptographic function ?

Solution : study, ideas, presentation

Problem :

Explain different types of Hashing algorithms

Study a few Hashing algorithms, and propose your own based on your study. Explain how your idea differentiates from the rest. Refer to research papers / source code as and when necessary

Choose at least 3 unique variants of the algorithms, not something which is a minor improvement.

Solution : presentation, ideas

Problem :

Explain Bloom Filter

Bloom Filter [ref] is a probabilistic data structure that's efficient in some scenarios and has been found to have widespread applicability. Go through this paper : https://arxiv.org/pdf/1804.04777 and share your understanding.

Solution : ideas, presentation