1. (50 points) Check all the correct statements.

□ The Nim position \((6, 4, 8)\) is an P-position.

□ In the subtraction game where players may subtract 3 and 5 chips on their turn 8 is an N-position.

□ The binary representation of 21 is 10101.

□ Bitwise XOR of 110111 and 111011 is 001100.

□ Nim-sum of 125 and 90 is 41.

2. (10 points) Consider the subtraction game where players may subtract 2, 4 or 5 chips on their turn, identify the N and P positions.
3. (10 points) Two players play the following game.

- Initially, there are several coins on a line, with all their coordinates being positive integers.
- On each step a player can move one coin to the left as far as they want but they can not jump over another coin (they cannot move a coin to a non positive point).
- The game ends when one of them cannot make a move and the player that cannot make a move loses.

Describe all the initial states in which the first player wins.
4. (10 points) Two players one by one put bishops on the chessboard such that every new bishop attacks at least one previously not attacked square. The player that can not make a move loses. Determine the winning strategy.