Problem 1 (Greatest common divisor & least common multiple) 5 Points
(a) Write a Python function that accepts as input a list $ns$ of non-zero integers and returns the gcd of the elements in $ns$. The list $ns$ may contain negative numbers; the gcd returned by your function should always be positive.
(b) Write a function that accepts as input a list $ns$ of non-zero integers and returns the least common multiple of the entries in $ns$.

Problem 2 (Take away) 5 Points
Write a Python program to play the following game against the computer—you program should always win if it has the first move:
The game starts with a pile of 42 coins being on the table. Now the first player may remove 1, 2 or 3 coins. Then the second player may remove 1, 2 or 3 coins, then Player 1 may remove 1, 2 or 3 coins etc. The player taking the last coin wins.

Problem 3 (Mixed basis representation) 5 Points
Write a Python function which has two inputs:
- a non-empty list of positive integers $ns = [n_1, n_2, \ldots, n_r]$
- a non-negative integer $n < n_1 \cdot n_2 \cdot \ldots \cdot n_r$

Your function should return a list of non-negative integers $b_1, \ldots, b_r$ such that

$$n = b_1 + b_2 \cdot n_1 + b_3 \cdot n_1 \cdot n_2 + \ldots + b_r \cdot n_1 \cdot n_2 \cdot \ldots \cdot n_{r-1}$$

with $0 \leq b_i < n_i \ (i=1,\ldots,r)$.

*Hint: Use division with remainder and start with computing $b_r$.*

Good luck—and do not hesitate to ask questions!!