CSL 105: Discrete Mathematical Structures
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1. Remaining problems from the previous tutorial.

2. Translate the statement

   "Anyone can buy one pizza and get one free at store S."

   into logical expression using quantifiers, logical connectives and the following predicates:

   - $P(x, y, z)$: x pays z rupees to y.
   - $G(x, y, o)$: y gives object o to x.
   - $Z(o)$: o is a pizza.
   - $F(z)$: z is the full price for a pizza.

   Here, the domain of x is all people, y is all stores, z is positive real numbers, and o is all objects.

3. Give an example of two increasing functions $f(n)$ and $g(n)$ from the set of positive integers to the set of positive integers such that neither $f(n)$ is $O(g(n))$ nor $g(n)$ is $O(f(n))$.

4. Assume n is power of 2. Given an array containing distinct integers, is it possible to find the largest and the second largest element in the array using $(n - 1 + \log n)$ comparisons?

5. Show that if a and b are both positive integers, then $(2^a - 1) \ (mod \ (2^b - 1)) = 2^{a \ (mod \ b)} - 1$.