Notes

February 7, 2014

gray codes

cyclic vs noncyclic
reflected→ specific. inductive definition, algorithm.
went over proof of generating algorithm. It's in the book

generating r subsets

$$S = \{x_{n-1}, x_{n-2}, \ldots, x_1, x_0\} \equiv \{1, 2, \ldots, n\}$$

subsets are equivalent to words in letters $\{1, \ldots, n\}$ where the word is increasing (strictly).

example

want to generate 2-subsets of $\{x_3, x_2, x_1, x_0\} = \{1, 2, 3, 4\}$

$$0_4 0_3 1_2 1_1 \approx \{x_1, x_0\} \approx 12$$

binary order's are lexicographical, squashed...
it's better to do lexicographic order on the *words* (r-subsets).

12 13 14 23 24 34

algorithm

begin with $a_1 a_2 \cdots a_r = 12 \ldots r$. Find the farthest right position such that $a_k + 1 \leq n$ and $a_k + 1$ is not in the word. Then the next word is $a_1 \ldots a_{k-1}(a_k + 1)(a_k + 2)(a_k + 3) \ldots (a_k + r - k + 1)$

do 26 and 28

12

28

2,3,4,6,9,10→2,3,4,7,8,9

problems 31&32

generating r-premutations:
gnerate r-subsets
for each r-subset generate the permutations