P. ERDÖS: I will talk about some problems which arose during this meeting.

Daykin and I considered the following problem. First some background. An old conjecture of mine is as follows. Let S be a set with $2n$ elements, and let $F = \{A_1,\ldots,A_m\}$ be a family of subsets of S. Form a graph $G_{2n}(F)$ whose vertices are the A's and such that two vertices are joined if the corresponding sets are comparable, i.e., one contains the other. My conjecture states that if $m = (2-\varepsilon)2^n$ and $n > n_0(\varepsilon)$ then $G_{2n}(F)$ has fewer than 2^{2n} edges. It is easy to see that for $\varepsilon = 0$ this is false. Daykin and P. Frankl proved that if $G_n(F)$ has $(1-o(1))\binom{m}{2}$ edges (i.e., apart from $o(m^2)$ edges it is complete) then $m^{1/n} \to 1$. Daykin and I conjecture the following:

10.26 *Conjecture. If $G_n(F)$ has αm^2 edges (for some $\alpha > 0$, α independent of n) then $m < (\sqrt{2}+o(1))^n$.*

Perhaps there exists $C = C(\alpha)$ so that, for sufficiently large n, $m < C2^{n/2}$. If true this conjecture is easily seen to be best possible. Also, perhaps to every $\varepsilon > 0$ there is an n so that if $G_n(F)$ has more than m^{2-n} edges then $m < (\sqrt{2}+\varepsilon)^n$.

The next problem is due to Erné and myself. Let $G(n)$ be a graph of n vertices. Denote by $f(G(n))$ the number of complete graphs contained in $G(n)$. Denote by $F(n)$ the number of possible values of $f(G(n))$ over all graphs $G(n)$. $F(n) = 0(2^n)$ is easy and we almost certainly can prove $\lim_{n\to\infty} (F(n))^{1/n} = 2$.

10.27 *Determine $F(n)$ explicitly and also determine the set of possible values of $f(G(n))$.*

Similar questions can be asked about cliques and other types of subgraphs.

Trotter and I considered the following question. Let S be a set with $|S| = n$. Consider a family (A_k) of subsets of S where no A_k contains any other and such that, for every t, if there is an A_k with $|A_k| = t$ then there are exactly r different A's of size t. If $r = 1$ and $n > 3$, one can always give $n - 2$ sets A_k

and one can not give
$n_0(r)$, one can always
$r(n-2)$ such sets. We

10.28 *Give estima*

Let $1 \le a_1 < a_2$

(1) $(a_j-a_i$

Let $F(n;t)$ be the max

10.29 *Is it true*

$F(n;1) = \left[\frac{n+1}{2}\right]$ is tri
(1) is satisfied then
holds; the a's are th
not prove $F(n;2) < (1$
old age and worse I o

Ordered Sets

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