BILL, RECORD LECTURE!!!!

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Slight Improvement on R(k)

Exposition by William Gasarch

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We proved



We proved **Theorem** $R(a, b) \leq R(a - 1, b) + R(a, b - 1)$

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We proved **Theorem** $R(a, b) \le R(a - 1, b) + R(a, b - 1)$ Now lets used it

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Thm For all $a, b \ge 2$, $R(a, b) \le {a+b \choose b}$.

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IH For all a', b' with a' + b' < a + b, $R(a', b') \leq \binom{a'+b'}{a'}$.

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IH For all a', b' with a' + b' < a + b, $R(a', b') \le {a'+b' \choose a'}$. IS $R(a, b) \le R(a - 1, b) + R(a, b - 1)$

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Actually they are equal. We prove this on the next slide.

$$egin{pmatrix} \mathsf{a}+\mathsf{b}-1 \ \mathsf{b} \end{pmatrix} + egin{pmatrix} \mathsf{a}+\mathsf{b}-1 \ \mathsf{b}-1 \end{pmatrix} \leq egin{pmatrix} \mathsf{a}+\mathsf{b} \ \mathsf{b} \end{pmatrix}$$

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A Slight improvement over $R(k) \leq 2^{2k-1}$.

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A Slight improvement over $R(k) \leq 2^{2k-1}$.

Best Known $R(k) \leq (4 - \epsilon)^k$ for a very small ϵ .

$$R(k) = R(k,k) \leq \binom{2k}{k} \sim \frac{2^{2k}}{\sqrt{k}}.$$

A Slight improvement over $R(k) \leq 2^{2k-1}$.

Best Known $R(k) \leq (4 - \epsilon)^k$ for a very small ϵ . Proof is long, hard, and I don't know it.