Jan 25

- See examples on page 2 -

Example 1

- There is an $8x8$ board, with 1 square covered already. You are given a 3 piece, or a *trinomal.* Is it possible to cover the entire board with them?
- Yes it is possible to cover then. So does $4x4$.
- Each is 2^k. Assume that you are given a 2^k size board. Is it possible?
- Yes, because if one is blocked off in a $4x4$ you put what is missing in the middle. It is possible to build around what is missing. This is **induction**. It is also a **recursive** algorithm.
  - **Induction** - start simple and go up
  - **Recursion** - start high up, and go down

Example 2

Given a triangle, $a^2 + b^2 = c^2$. $a = 1$ and $b = 1$. then $c = sqrt(2)$.

- **Thm** - $sqrt(2)$ is not a rational number
  - Prove this without loss of generality
- Suppose that $sqrt(2)$ is a rational number. So, $sqrt(2)$ is p/q and supposed that without loss of generality, that p and q have no common denominator.
- See notebook, page 3

Traveling Salesman Problem

- See notebook, page 3 -
- There are N cities: $n(n-1)(n-2)...1 = n!$
  $n * n!$
- The time unit is the **flop** - floating pint operations
- 1 flop = $10^(-9)$ seconds
- For $n = 4$, is $4 * 4! * 10^(-9) = 10^2 * 10^(-9) = 10^(-7) = 10^(-3)$ so 1 ms
- For $n = 50$, is $50 * 50! = 10^(66) ms$, $10^(66) * 10^(-9) sec$
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