CSCI0220
Lecture 5

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February 7, 2008

Last time

- Translating English → Logical Statements
- Proving Statements with Universal Conditionals: generic particular
- Definitions and Proofs: Even/odd numbers, rational numbers, divisibility.

Decimal Representation

Definition: Given any non-negative integer n, the decimal representation of n is an expression of the form $d_k\, d_{k-1} \ldots d_2\, d_1\, d_0$,

where k is a non-negative integer, $d_k\, d_{k-1} \ldots d_2\, d_1\, d_0$ (decimal digits) are integers from 0 to 9, $d_k \neq 0$ unless $n = 0$ and $k = 0$, and

$$n = d_k\, 10^k + d_{k-1}\, 10^{k-1} + \ldots + d_2\, 10^2 + d_1\, 10 + d_0\,.$$

Rational Numbers

Definition: A real number *r* is rational if and only if, *r* can be expressed as a quotient of two integers with nonzero denomination.

r rational $\leftrightarrow$ $\exists$ integers m and n such that *r* = m/n and n $\neq$ 0

Note: Can always find *m* and *n* that have no common factors.