## Why

We want to associate elements of $\mathbf{Z}$ with bitstrings for use on digital computers.[1]

## Definition

A *digital integer* is a bit-string. The set of *d-bit integers* is the set of length-$d$ bit strings $\{0,1\}^d$. For example, the set of 8-bit digital integers is the set $\{0,1\}^8$.

## Correspondence with Z

The bit string $x \in \{0,1\}^d$ corresponds to the integer $\sum_{i=1}^{d} x_i 2^i$.

## Notation

We denote the set of 8-bit (16-bit, 32-bit, 64-bit) integers by `int64` (`int8`, `int16`, `int32`).

It is easy to embed $x$ in `int8` by considering $x'$ in `int16` defined by

$$x' = (x_1, x_2, x_3, x_4, x_5, x_6, x_7, x_8, 0, 0, 0, 0, 0, 0, 0, 0)$$

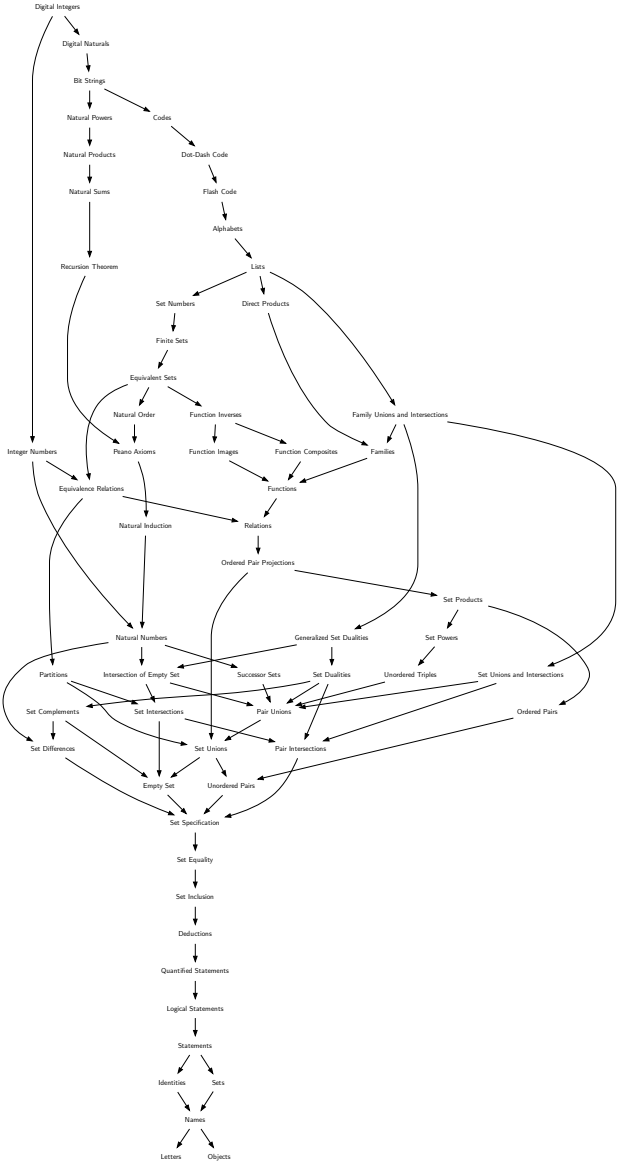
In other words, we associate an 8-bit integer with a 16-bit integer. Naturally, we associate the integers with bit strings.

## Signed integers

[2]

[1] Future editions will discuss digital computers.

[2] Future editions will include an account of signed integers, or will place this in another sheet.


Digital Integers
Digital Naturals
Bit Strings
Natural Powers
Codes
Natural Products
Dot-Dash Code
Natural Sums
Flash Code
Alphabets
Recursion Theorem
Lists
Set Numbers
Direct Products
Finite Sets
Equivalent Sets
Natural Order
Function Inverses
Family Unions and Intersections
Integer Numbers
Peano Axioms
Function Images
Function Composites
Families
Equivalence Relations
Functions
Natural Induction
Relations
Ordered Pair Projections
Set Products
Natural Numbers
Generalized Set Dualities
Set Powers
Partitions
Intersection of Empty Set
Successor Sets
Set Dualities
Unordered Triples
Set Unions and Intersections
Set Complements
Set Intersections
Pair Unions
Ordered Pairs
Set Differences
Set Unions
Pair Intersections
Empty Set
Unordered Pairs
Set Specification
Set Equality
Set Inclusion
Deductions
Quantified Statements
Logical Statements
Statements
Identities
Sets
Names
Letters
Objects