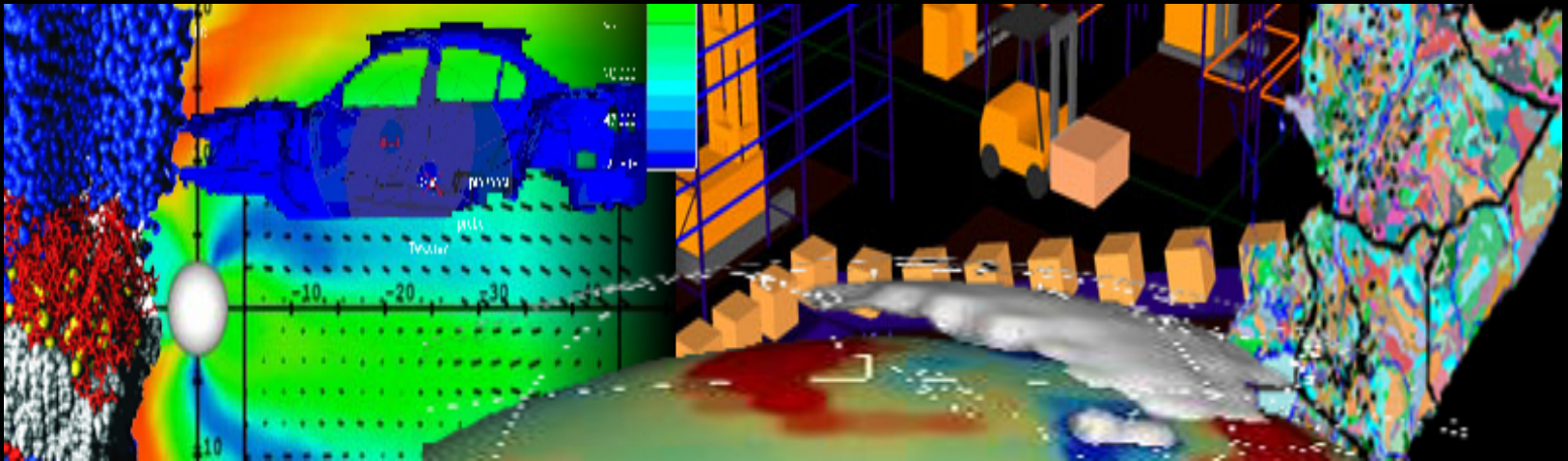


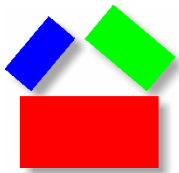
M Language Update I

DATA CENTER

Make sense of your data



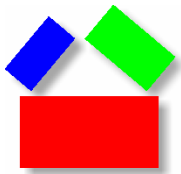
David Brock, Founder and Director
Data Center
Massachusetts Institute of Technology



M

M

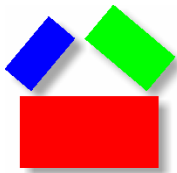
A Language for Interoperable Data and Algorithms



DATA ATOM

Data Atom

“Atomic Schema”



M LANGUAGE AND TECHNOLOGY

Tools – Suite of tools based on the M Language to provide visualization, manipulation and translation.

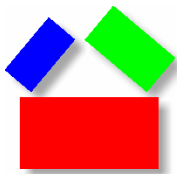
StdLib – Standard library of functions operating on M data.

Ontology – relationships between words in the M Language.

M LANGUAGE

Rules – grammatical rules or *patterns* for composing “atomic” data schema into files and messages.

Words – stored in a repository or *dictionary* of “atomic” data schema, which is shared among all applications.



M Dictionary


MIT Data Center - Dictionary Version 2007Q1 - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://18.78.2.98/datacenter/dictionary2007Q1.php

My Web Directory News Initiatives Projects Local Host Learning Products Recreation Reference

Sign in

 **The Data Center**
Make sense of your data

data center feeds functions **dictionary** services demos

search dictionary

data center

- about
- news
- research
- industries
- developers
- people
- publications
- events
- contact

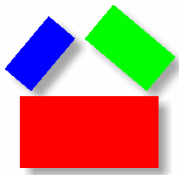
M Dictionary help

Welcome to the M Dictionary, an editable dictionary for internet communication.
Current Status:

Words:	206,550
Users:	15
Administrators:	15

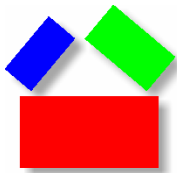
Done

Open Notebook



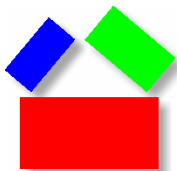
M Dictionary – Definition Section

Word:	cell.1
Function:	noun, verb, adjective, adverb
Definition:	the basic structural and functional unit of all organisms; they may exist as independent units of life (as in monads) or may form colonies or tissues as in.
Examples:	Some organisms, such as bacteria, are unicellular, consisting of a single cell.
Plural:	cells
Derivation:	public.1 + relations.1



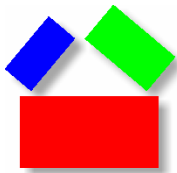
M Dictionary – Information Section

Key	Value
wikipedia.1	Kenya
capital.1	Nairobi.1
official.1_language.1	Swahili.1
government.1	republic.1
area.1	530367 km.1 ²
currency.1	Kenyan shilling



M Dictionary – Relations Section

Relation	Words
Synonym	couch.1, lounge.2 (<i>for sofa.1</i>)
Antonym	short.1 (<i>for tall.1</i>)
Type of	seat.2 (<i>for sofa.1</i>)
Part of	brim.1 (<i>for hat.1</i>)
Abbreviation for	m.1 (<i>for meter.1</i>)
Acronym for	MTTF.1 (<i>for mean_time_to_failure.1</i>)
Slang for	Klick.1 (<i>for kilometer.1</i>)
Alt. spelling for	Metre.1 (<i>for meter.1</i>)
Modifier	Italian.1 (<i>for Italy.1</i>)
Attributes	center.1, radius.1 (<i>for circle.1</i>)

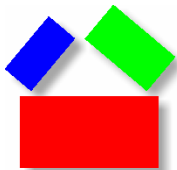


M Dictionary – Data Format Section

Key	Value
Reference	<i>point.1 (for center.1)</i>

... or one or more data formats ...

Key	Value
Name	Decimal degrees (<i>for latitude.1</i>)
Type	String, Boolean, Enumeration, Number, Integer, Float, URL
Description	Red, green, blue (RGB) 24-bit color (<i>for color.1</i>)
Example	<i>(255, 0, 0) (for color.1)</i>
Pattern	Perl regular expression for String
Range	Arithmetic expression for Number, Float or Integer
Array	Boolean
Number of dimensions	<i>1 (vector), 2 (matrix), 3 (tensor), etc.</i>
Size of each dimension	<i>3 (3D vector), 4x4 (transformation matrix)</i>



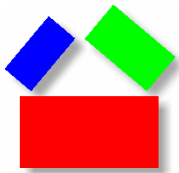
M Dictionary – Data Format Code Section

ISO_3166.1

Code	Code Name	Description	Mappings
004	AFG	Afghanistan	
248	ALA	Aland Islands	
008	ALB	Albania	
012	DZA	Algeria	

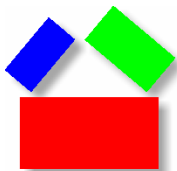
IATA_code.1

Code	Code Name	Description	Mappings
	BOS	Boston Logan Airport	ICOA_code.1:code KBOS
	BEG	Belgrade Nikola Tesla Airport, Belgrade	ICOA_code.1:code LYBE
	MUC	Franz Josef Strauss International Airport	ICOA_code.1:code EDDM



M Dictionary – Translation Section

Language Code	Translation
zh	電話
ko	전화
fr	telephone
th	โทรศัพท์



Words, compound words and phrases

Words

postcard.1

Compound words

post_card.1

Unique meaning

Unique data format

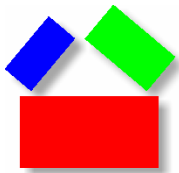
ZIP_code.1

Phrases

Meaning from individual words

account.1_description.1

shipping.1_address.1



Registered Phrases

Registered phrase

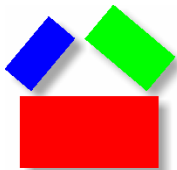
country.1

Type of

Asian.1_country.1

Type of

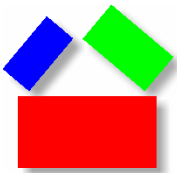
China.1



WORDS

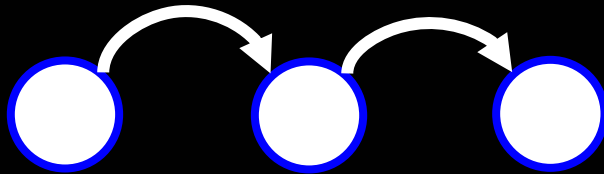
M Dictionary (release schedule)

Version	Availability	Status
M Dictionary 2007.1	Now	open
M Dictionary 2007.1	2007.1.15	release
M Dictionary 2007.2	2007.1.15	open
M Dictionary 2007.2	2007.4.15	release



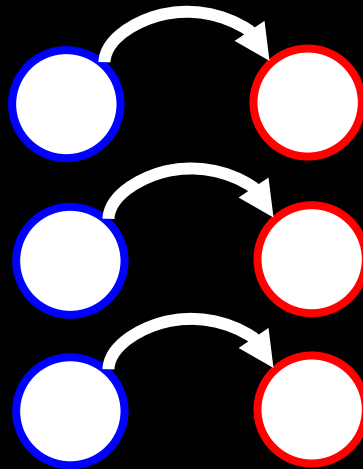
RULES

phrase

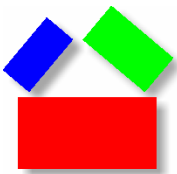


<senior.1_computer.1_engineer.1>

key-value pairs

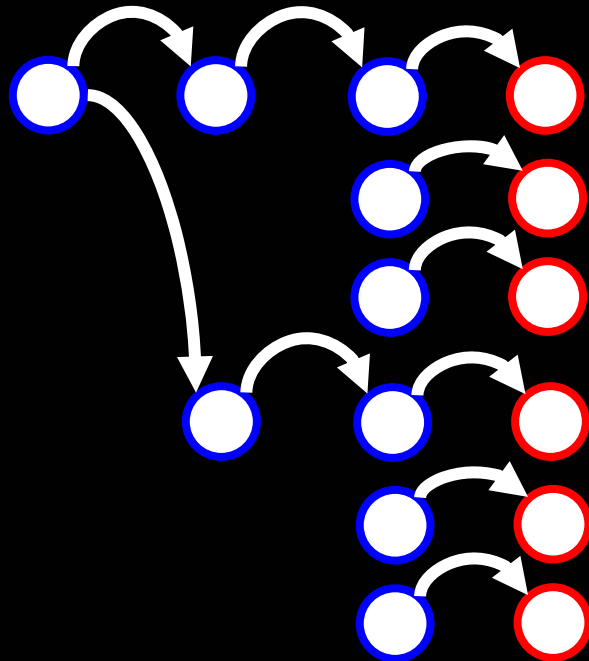


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02139
</ZIP_code.1>
<phone_number.1>
508-320-1289
</phone_number.1>
<SSN.1>
029-192-9981
</SSN.1>

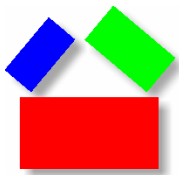


RULES

tables

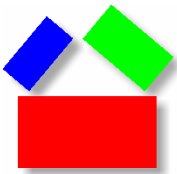


```
<observations.1 >  
<reading.1 >  
  <time.1 >  
    2006-09-18 9:50  
  </time.1 >  
  <wave.1_height.1 >  
    1.2 ft.1  
  </wave.1_height.1 >  
</reading.1 >  
<reading.1 >  
  <time.1 >  
    2006-09-18 10:50  
  </time.1 >  
  <wave.1_height.1 >  
    1.4 ft.1  
  </wave.1_height.1 >  
</reading.1 >  
</observations.1 >
```

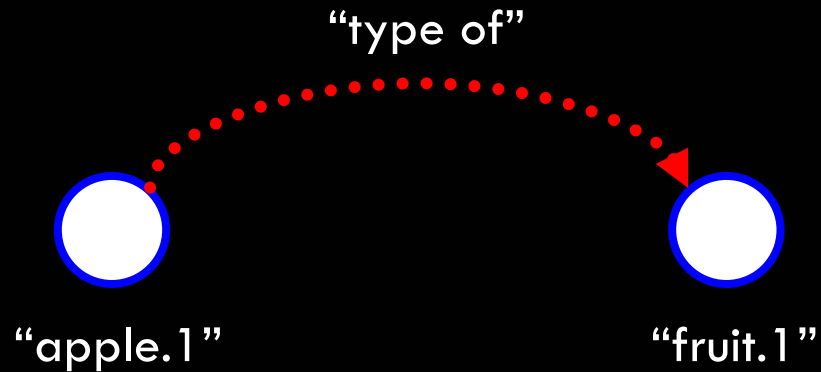
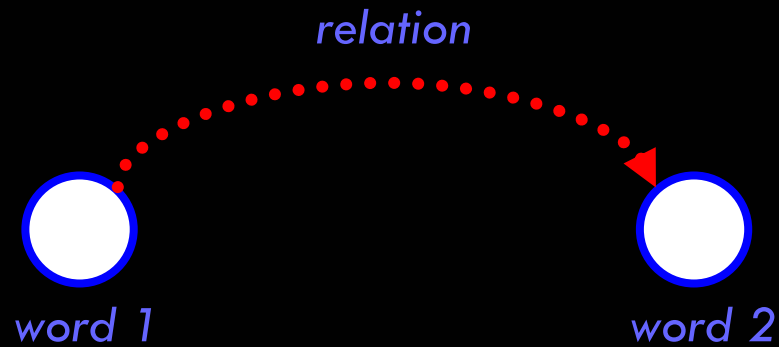
EQUATIONS

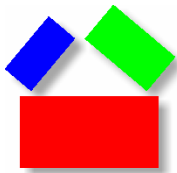
```
<Boltzmann_constant.1>  
  1.3806503e+23  
  <unit.1>  
    m^2 * kg * s^-2 K^-1  
  </unit.1>  
</Boltzmann_constant.1>
```



ONTOLOGY

Ontology – relationships between words in the M Language.





STDLIB – M STANDARD LIBRARY

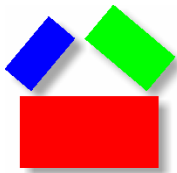
MStdLib – Standard library of functions operating on M data.

Graphing and Charting

Interpolation and Extrapolation

Basic Analytic Functions

Unit Conversions



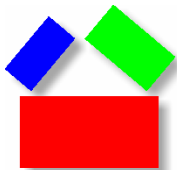
M TOOLS

Tools – Suite of tools based on the M Language to provide visualization, manipulation and translation.

M IDE – Integrated Development Environment

M Factory – Mapping tool for legacy data

M Browser – Web based and standalone



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