61A Lecture 28

Friday, November 4

The Logo Programming Language

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A teaching language: designed for introductory programming

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One syntactic form for all purposes: invoking a procedure

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Demo

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What are people saying about Lisp?
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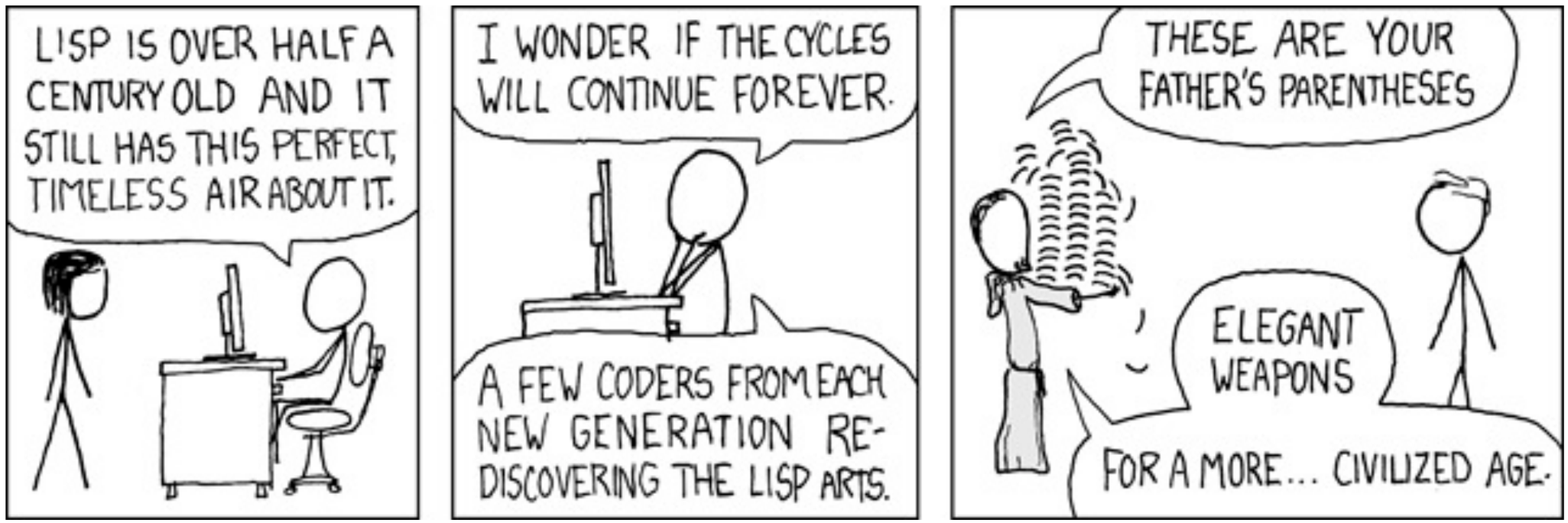

http://imgs.xkcd.com/comics/lisp_cycles.png

Logo Fundamentals

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Call expressions are delimited by spaces

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? print 1 print 2
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Nested Call Expressions

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? print sum 10 difference 7 3
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print takes one argument (input)

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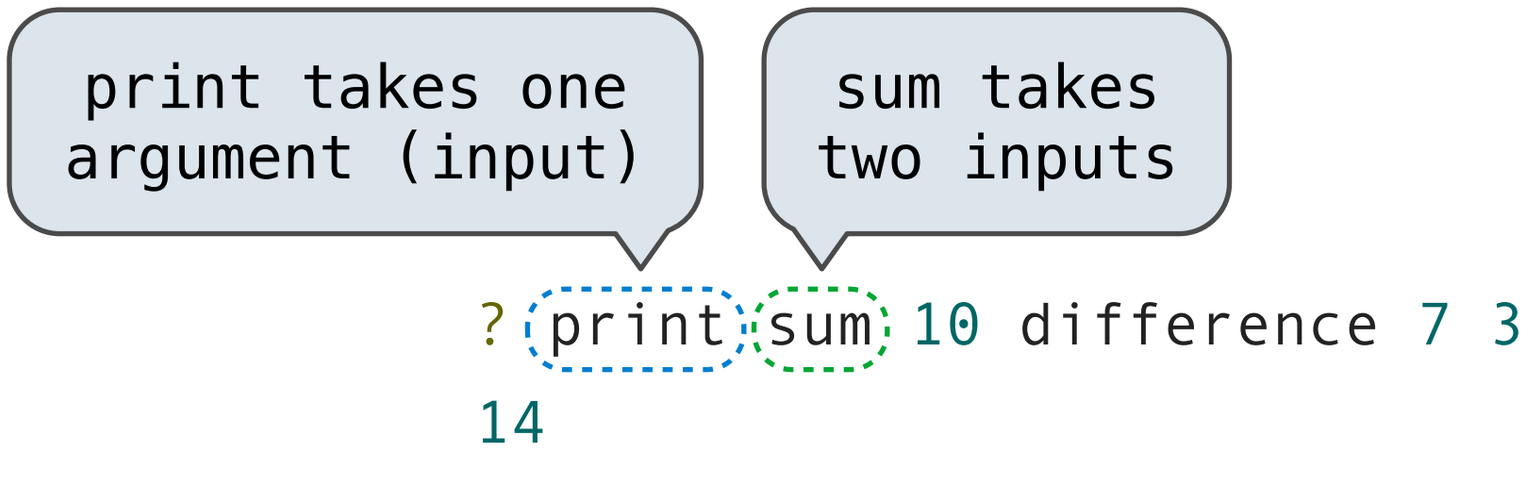

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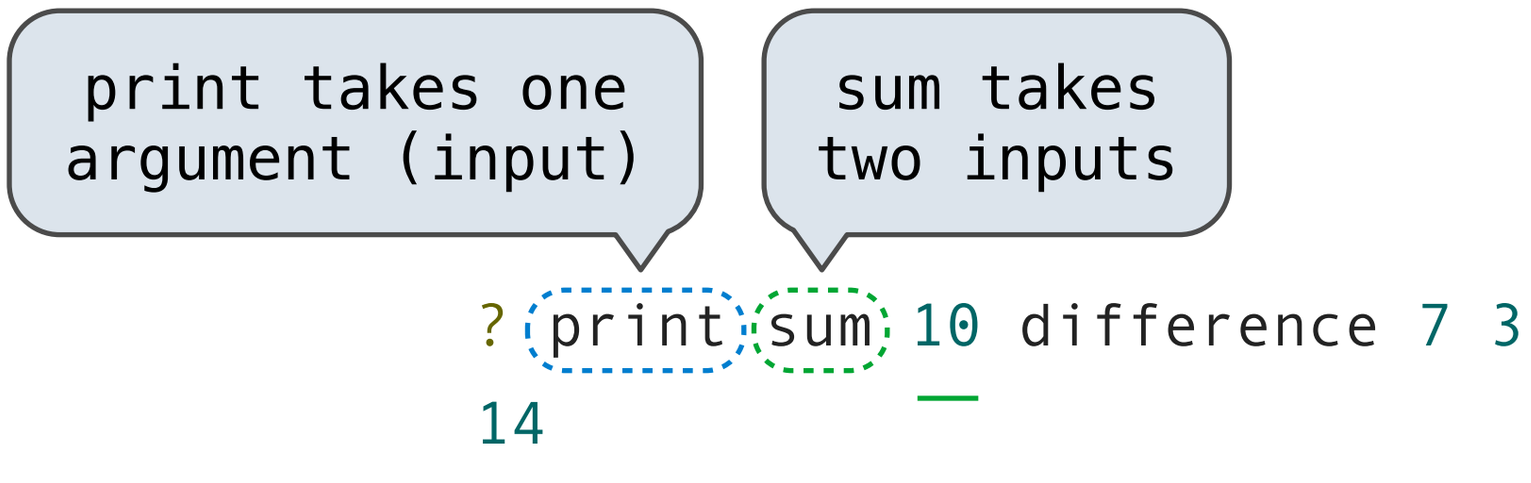

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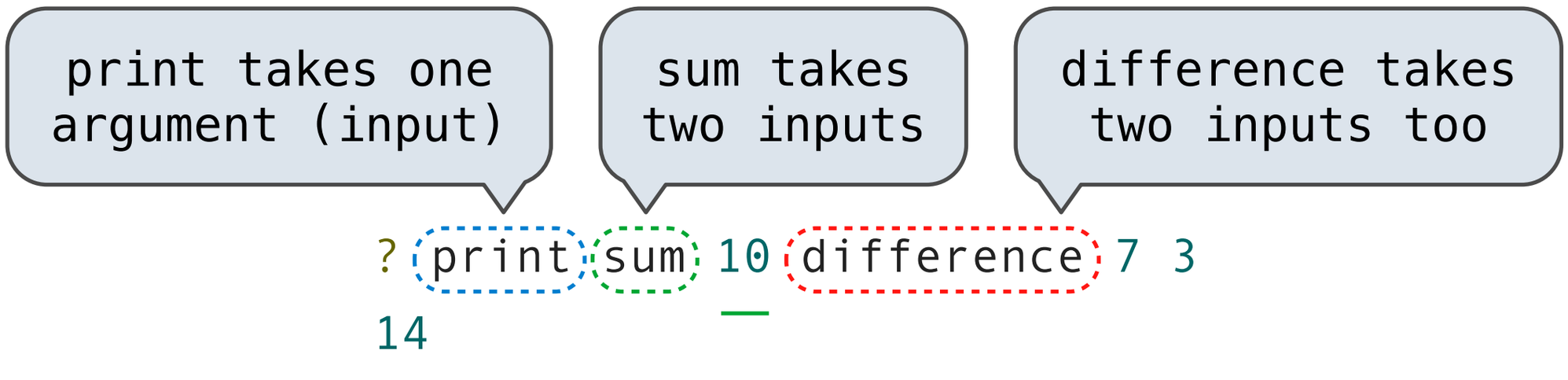

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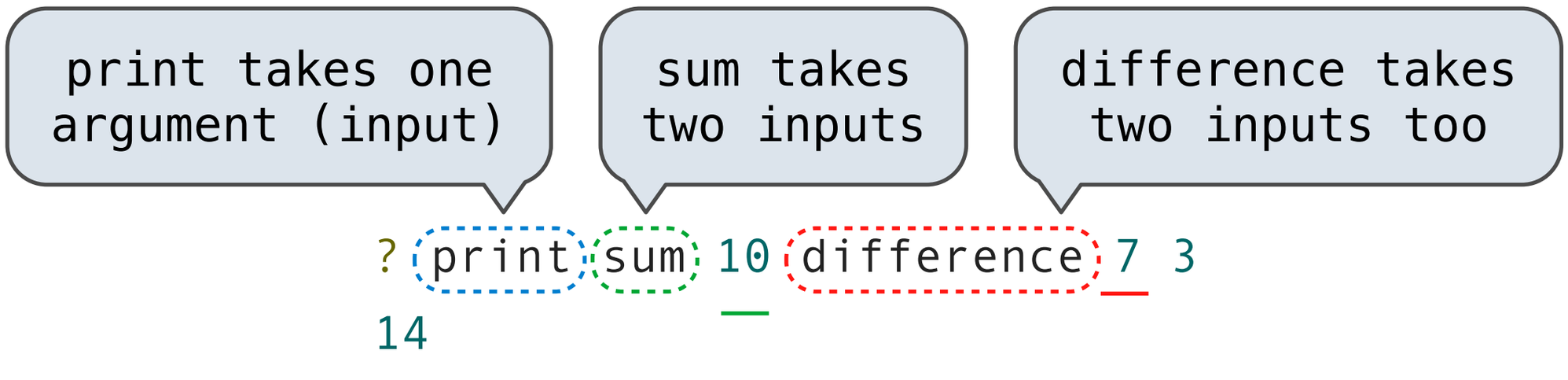

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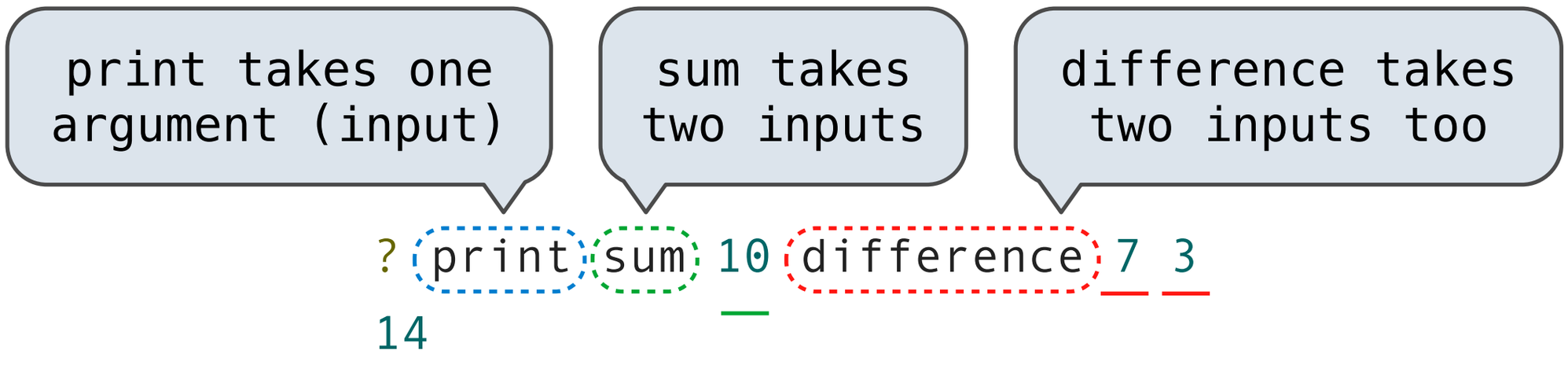

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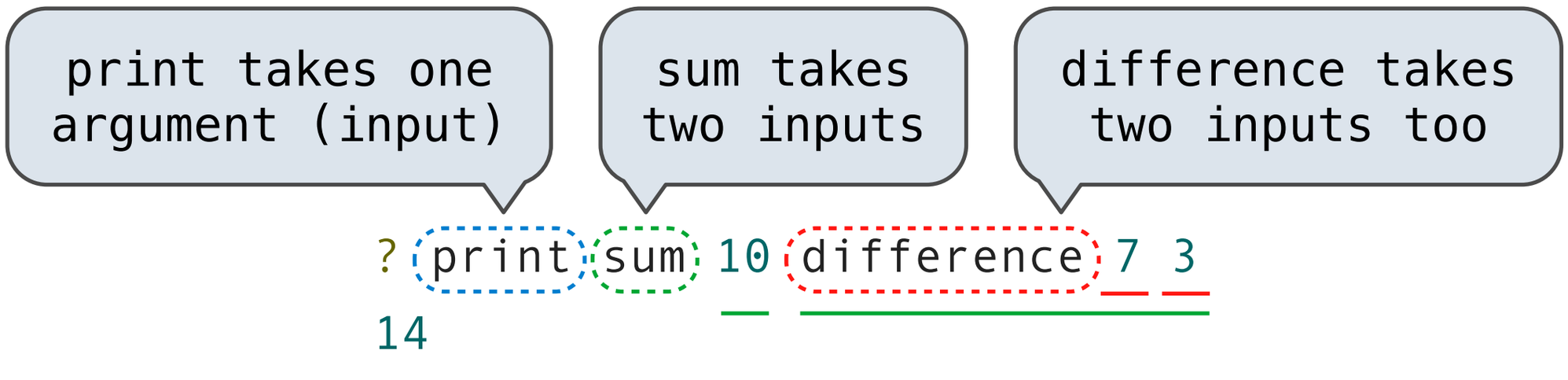

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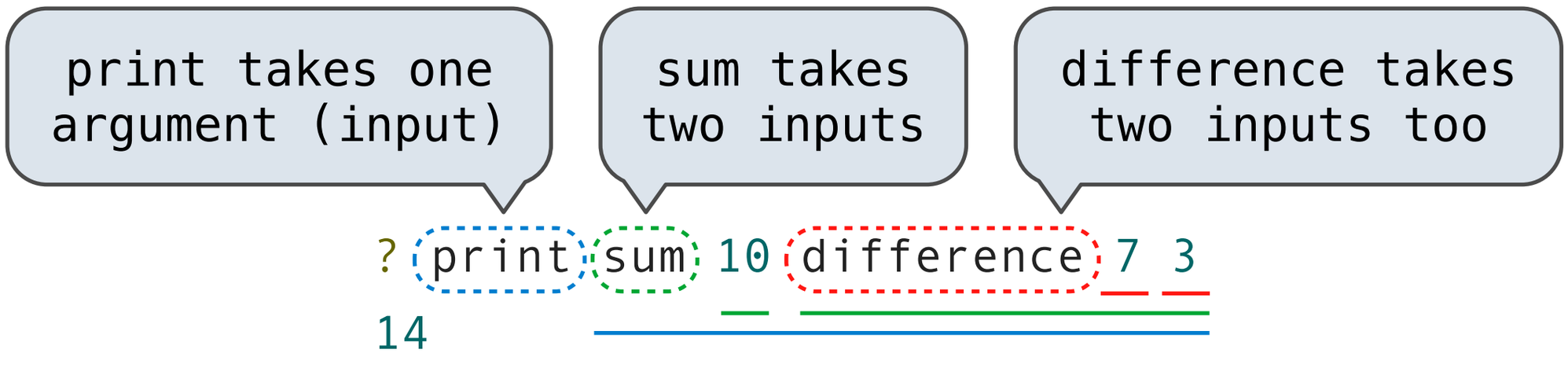

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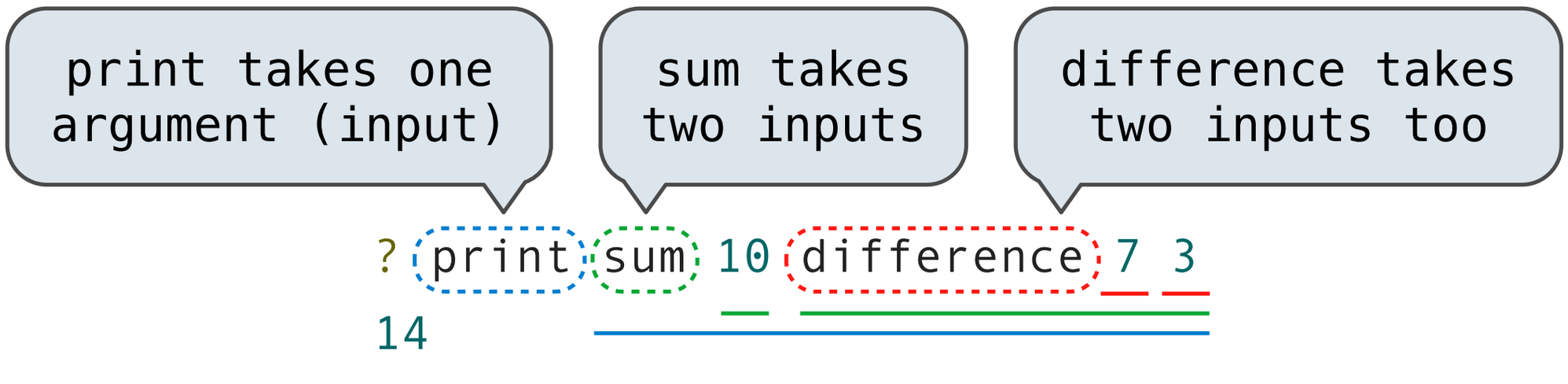

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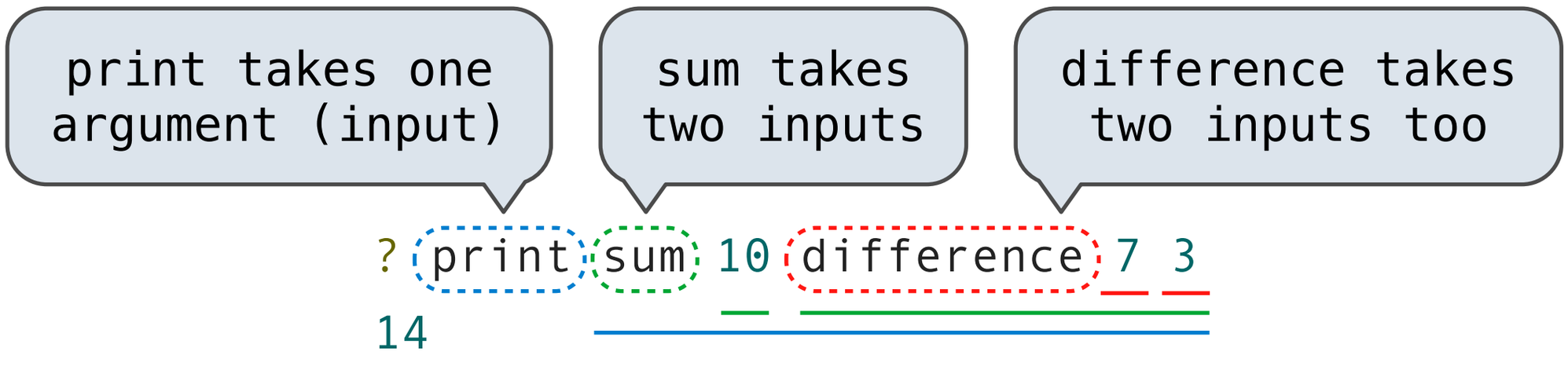

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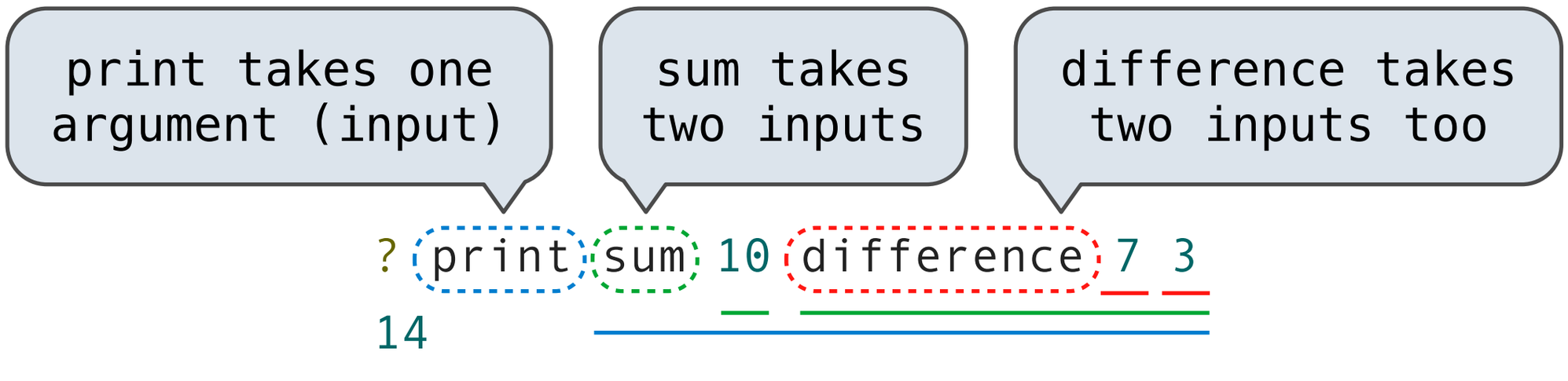

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Two expressions on one line

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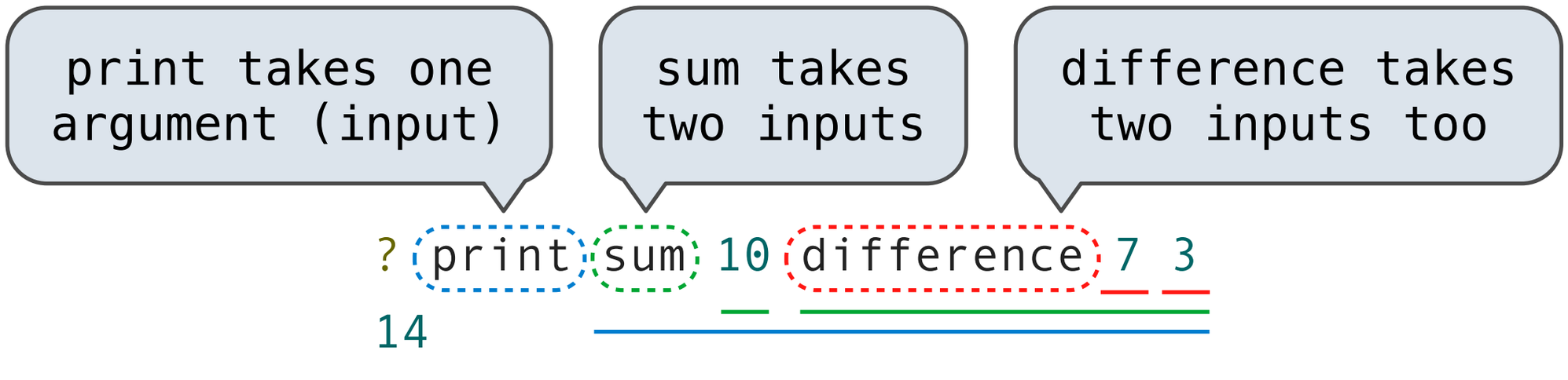

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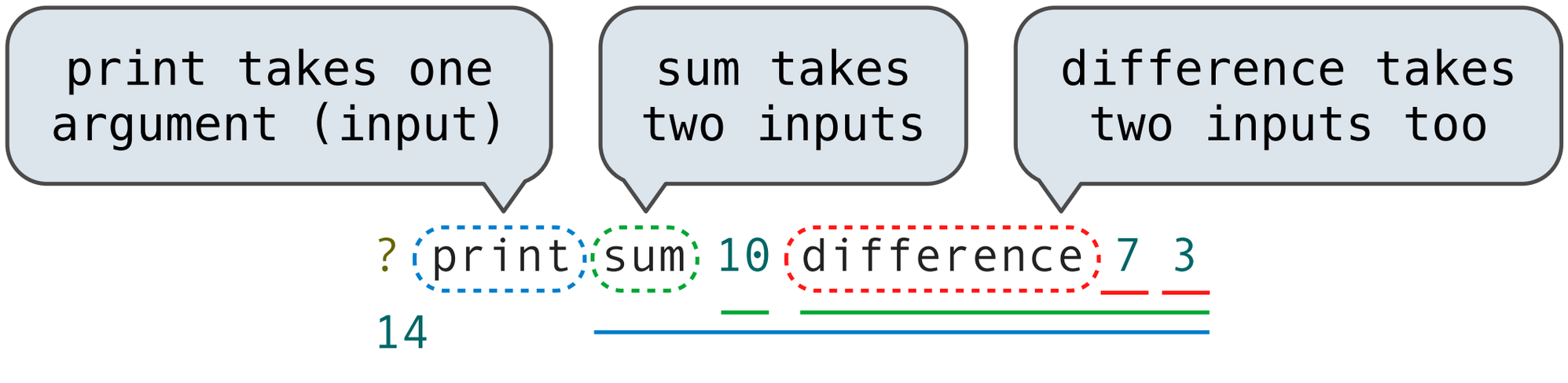

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Demo

Data Types and Quotation

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Words are strings without spaces, representing text, numbers, and boolean values

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```
? print "hello
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```

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Sentences are immutable sequences of words and sentences

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```

Sentences are immutable sequences of words and sentences

```
? print [hello world]
hello world
```

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? print "hello
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```
? print [hello world]
hello world
? show [hello world]
[hello world]
```

Sentence (List) Processing in Logo

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Sentences can be constructed from words or sentences

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Procedure **Effect**

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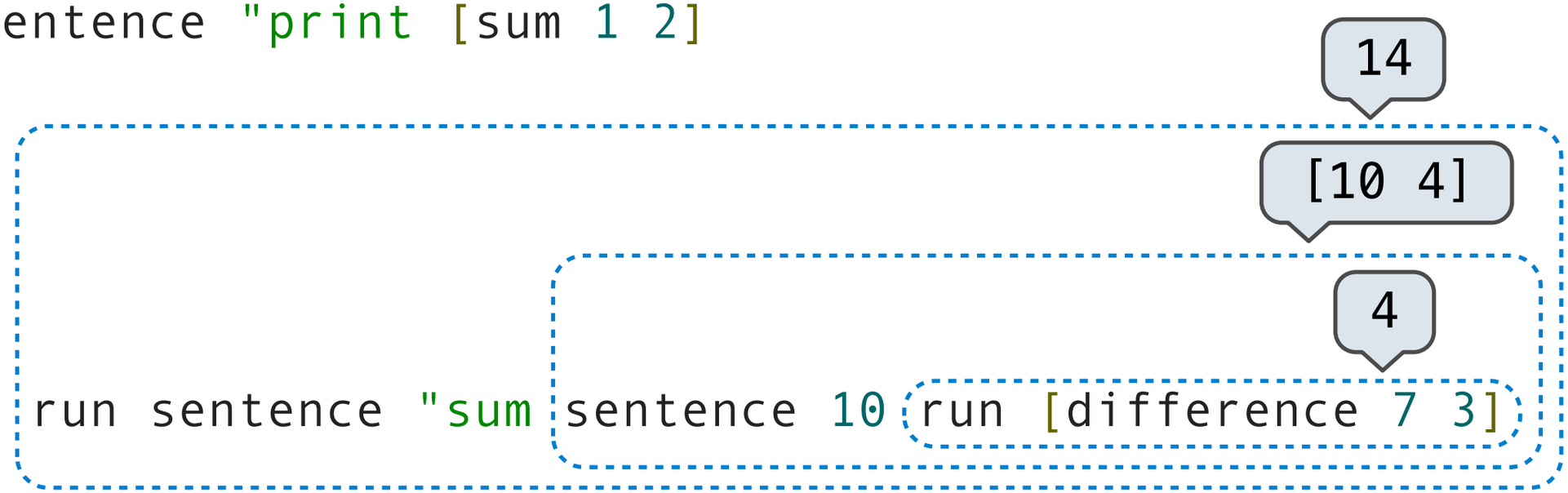

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```
? to double :x
> output sum :x :x
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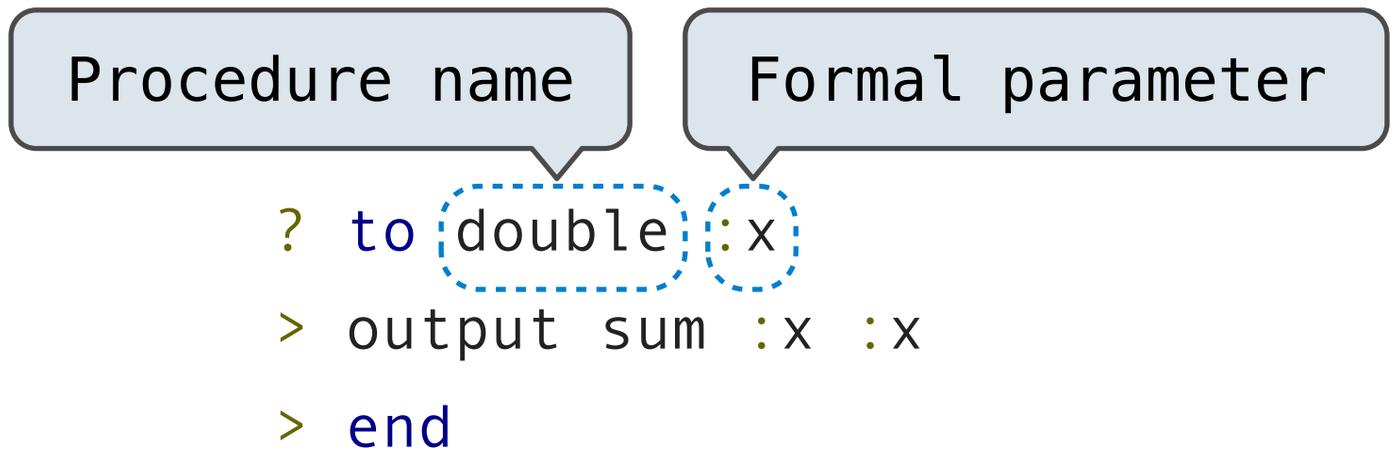

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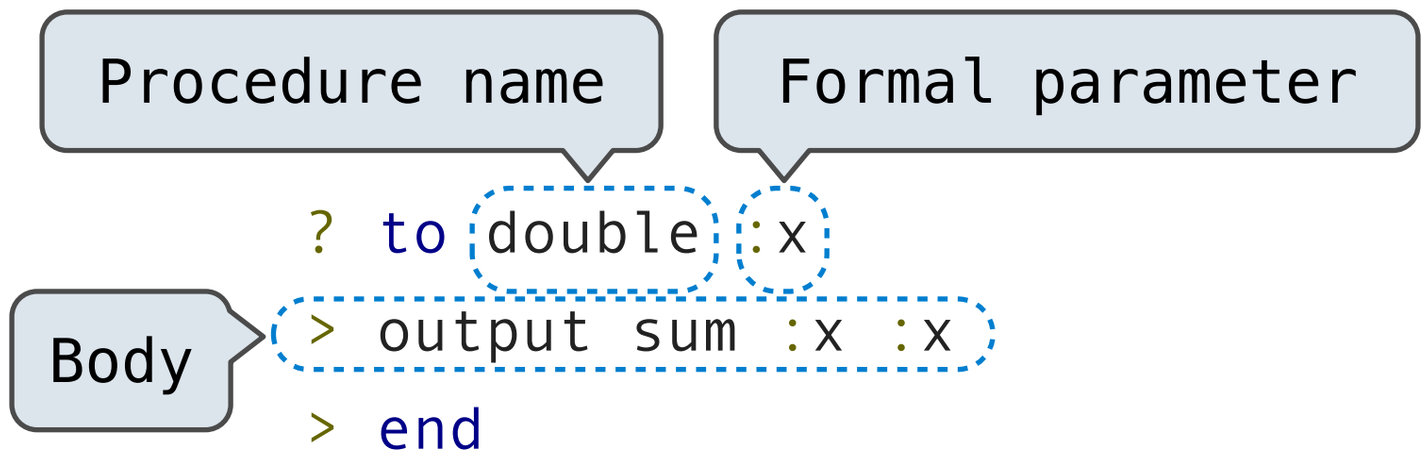

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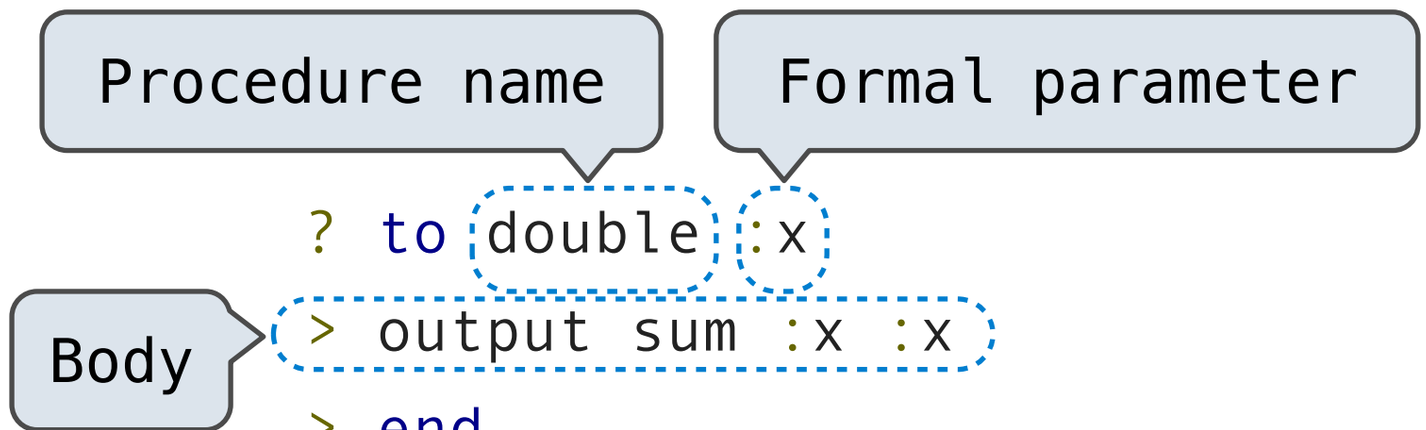


```
? print double 4
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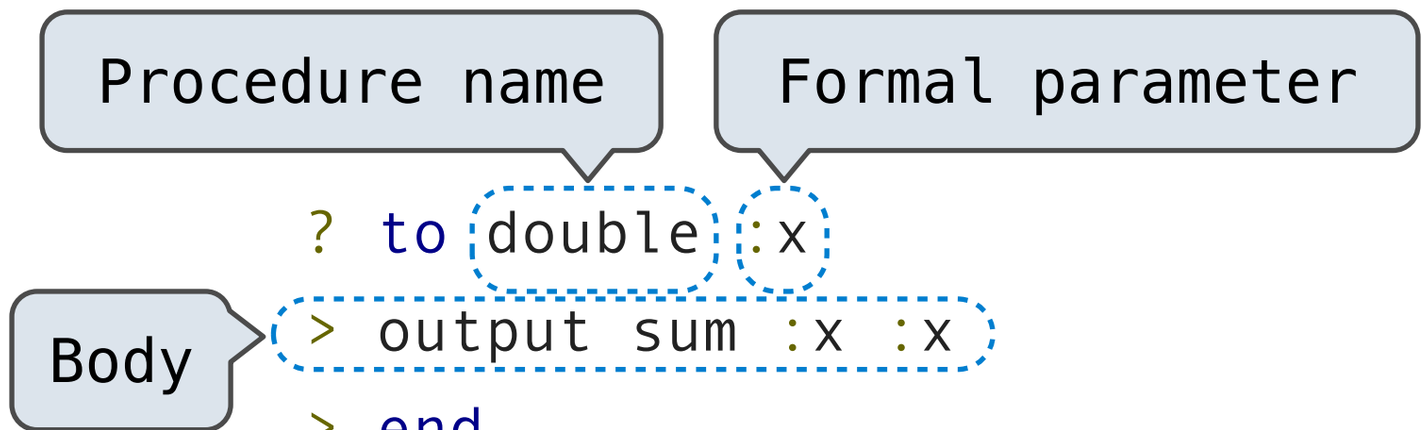


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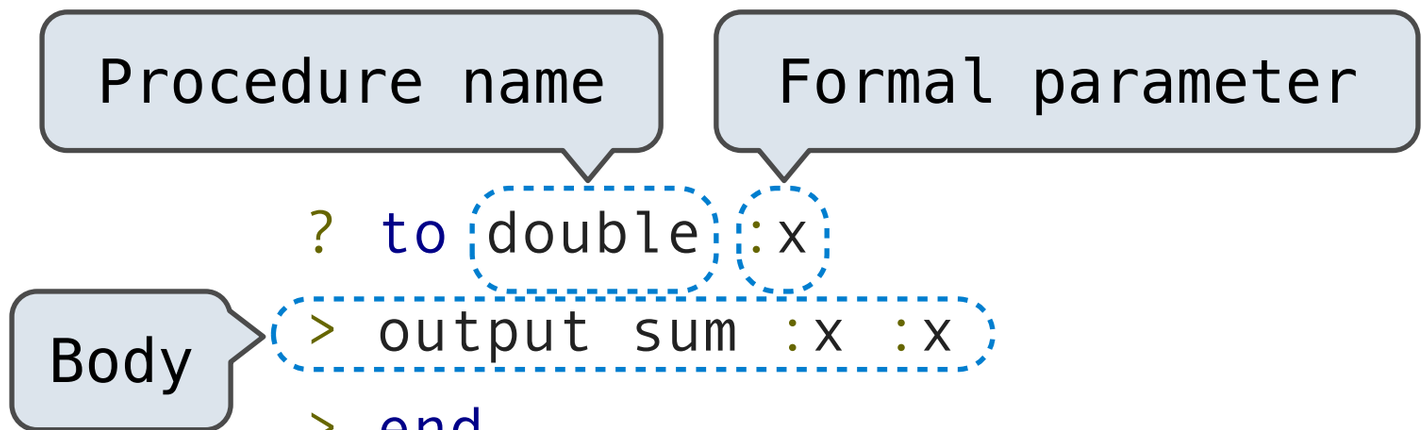


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Procedure names can be inputs or outputs

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Logo Examples

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Efficient encoding of strings as ones and zeros (bits).

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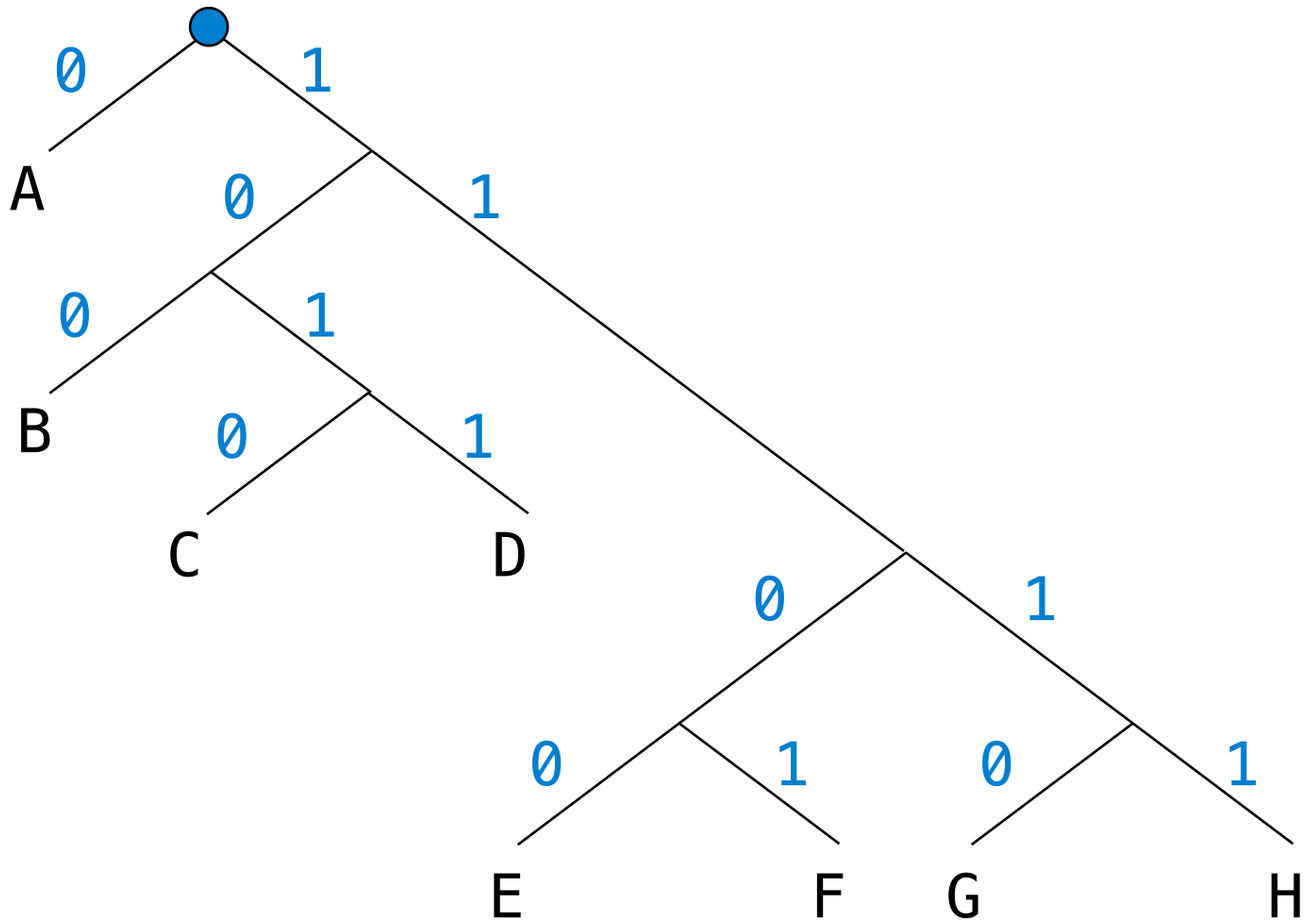

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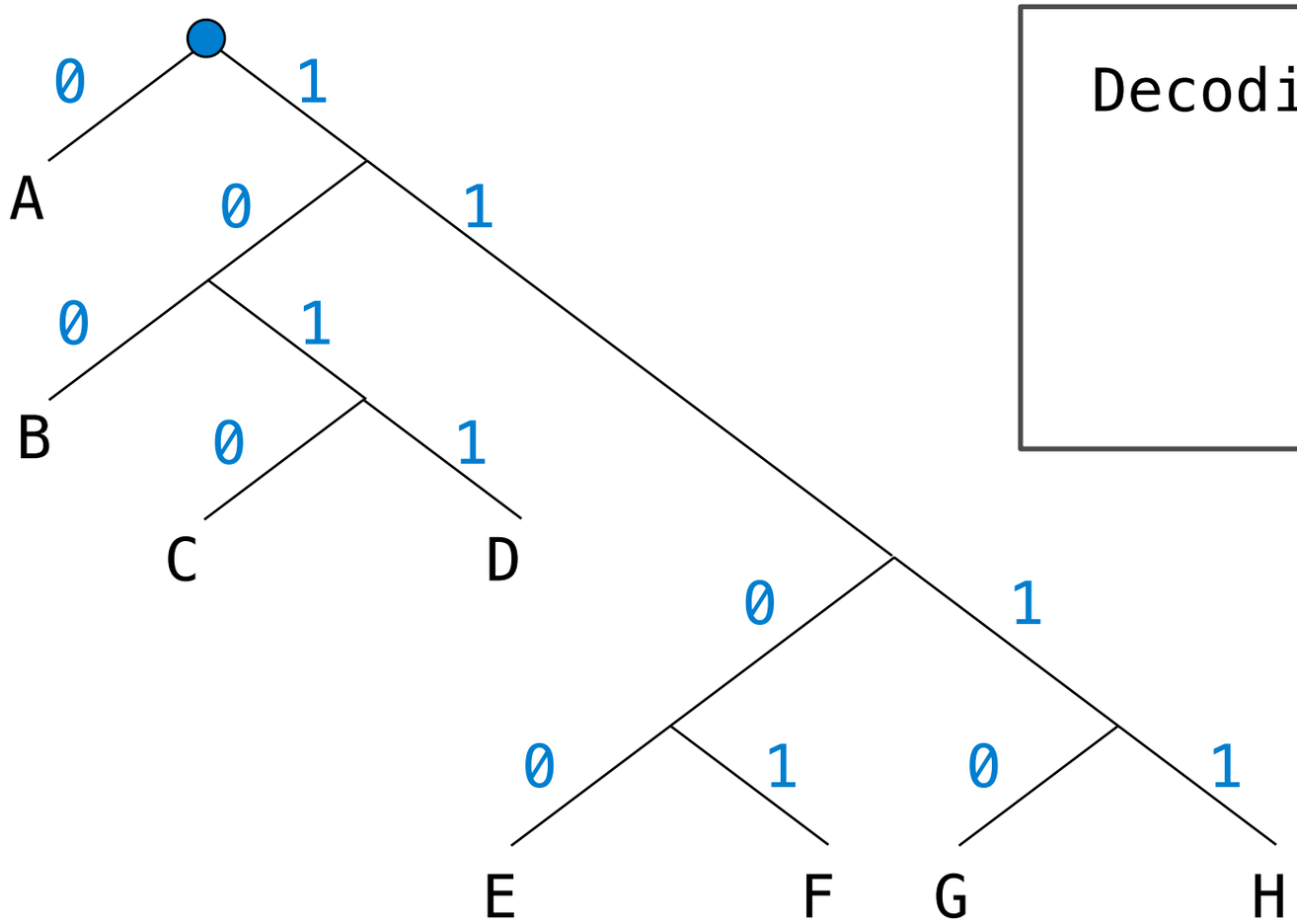

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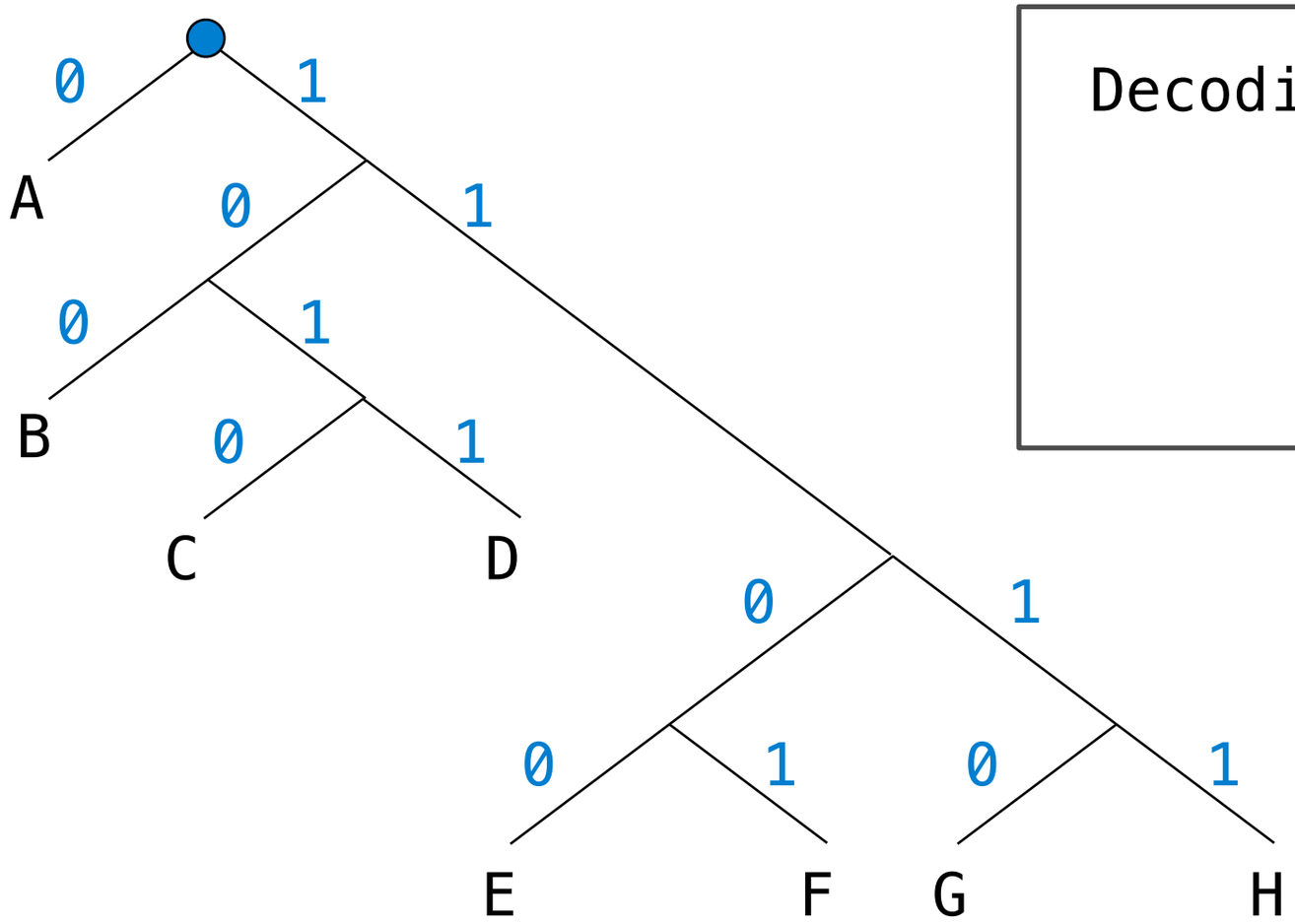

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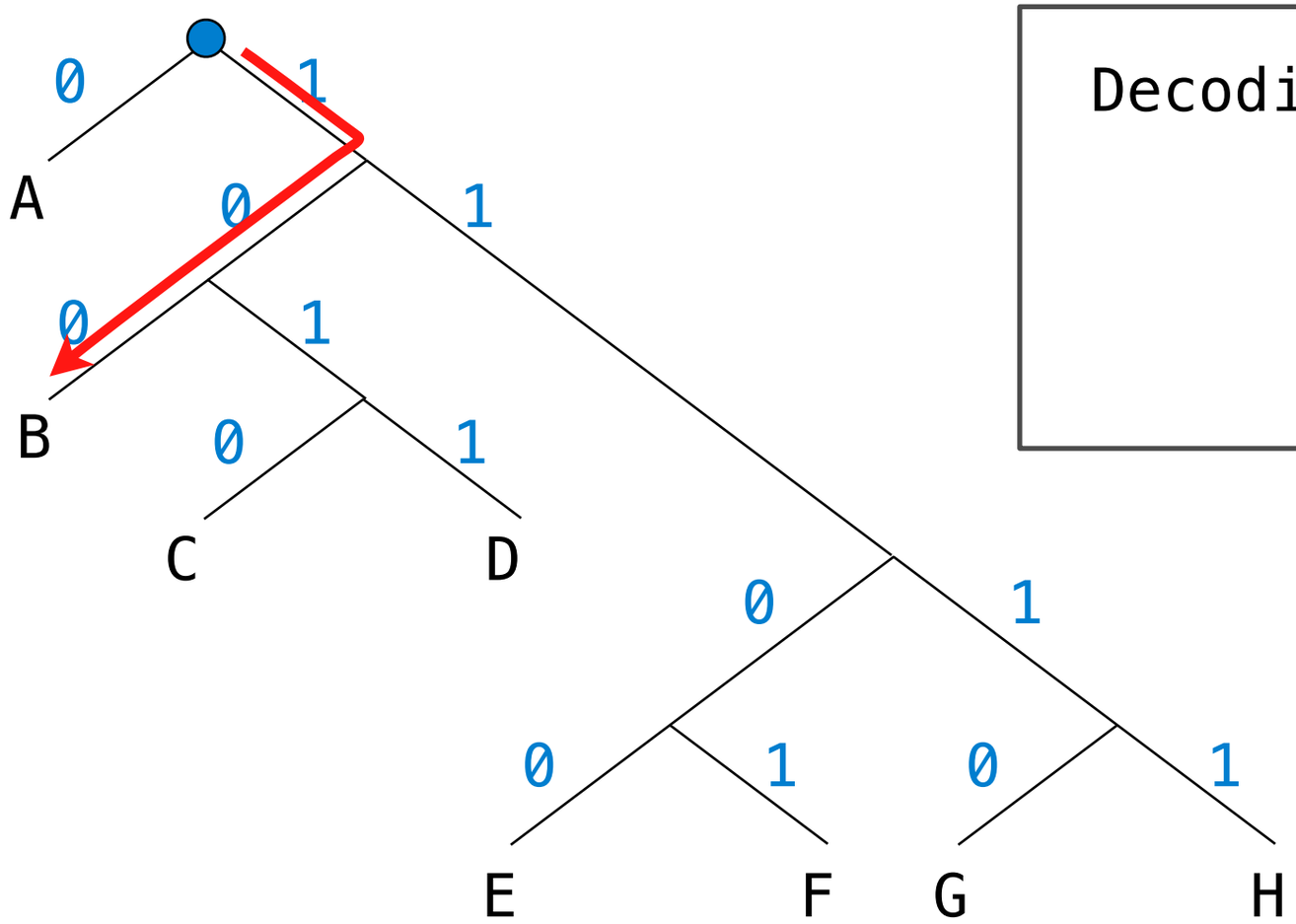

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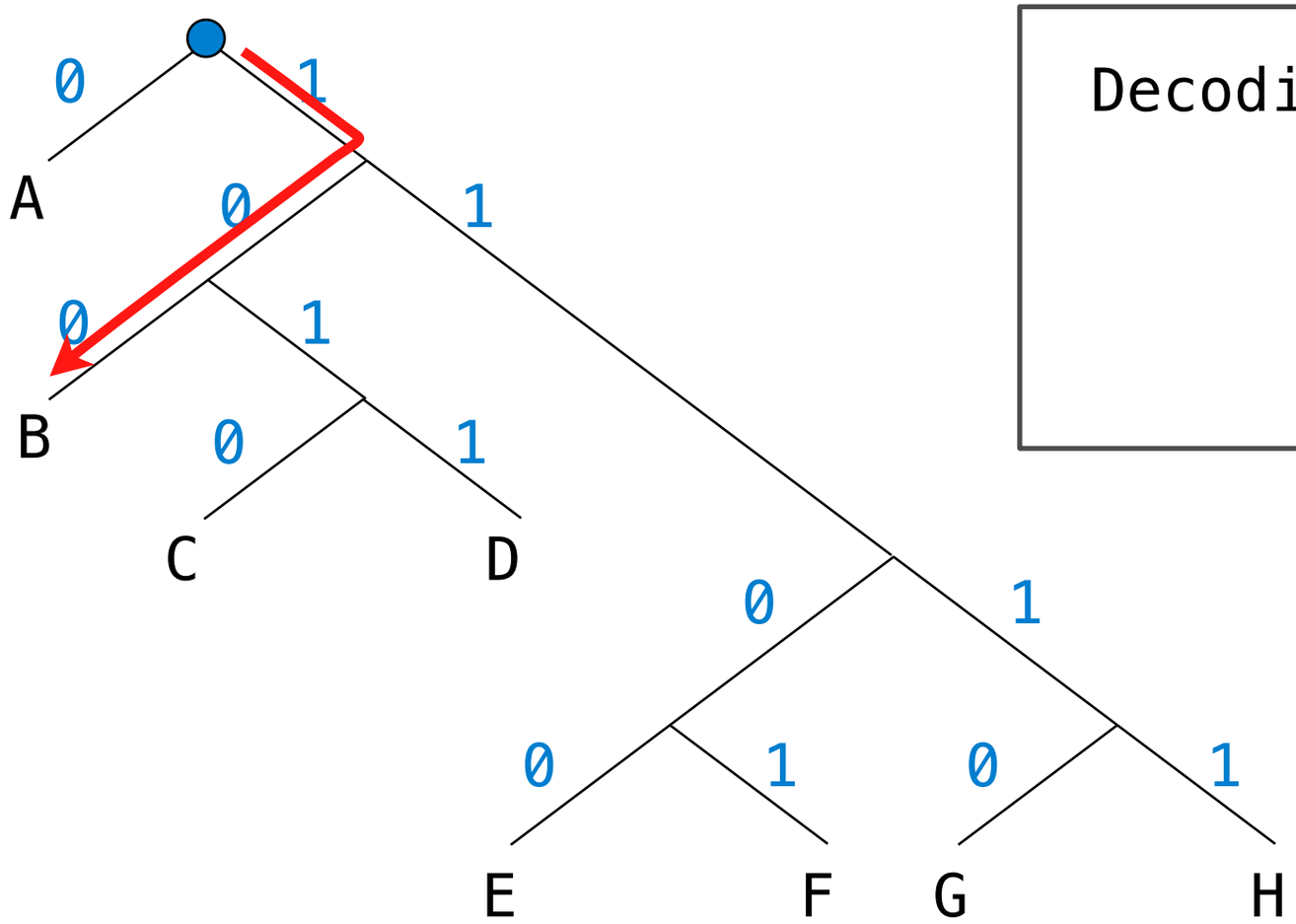

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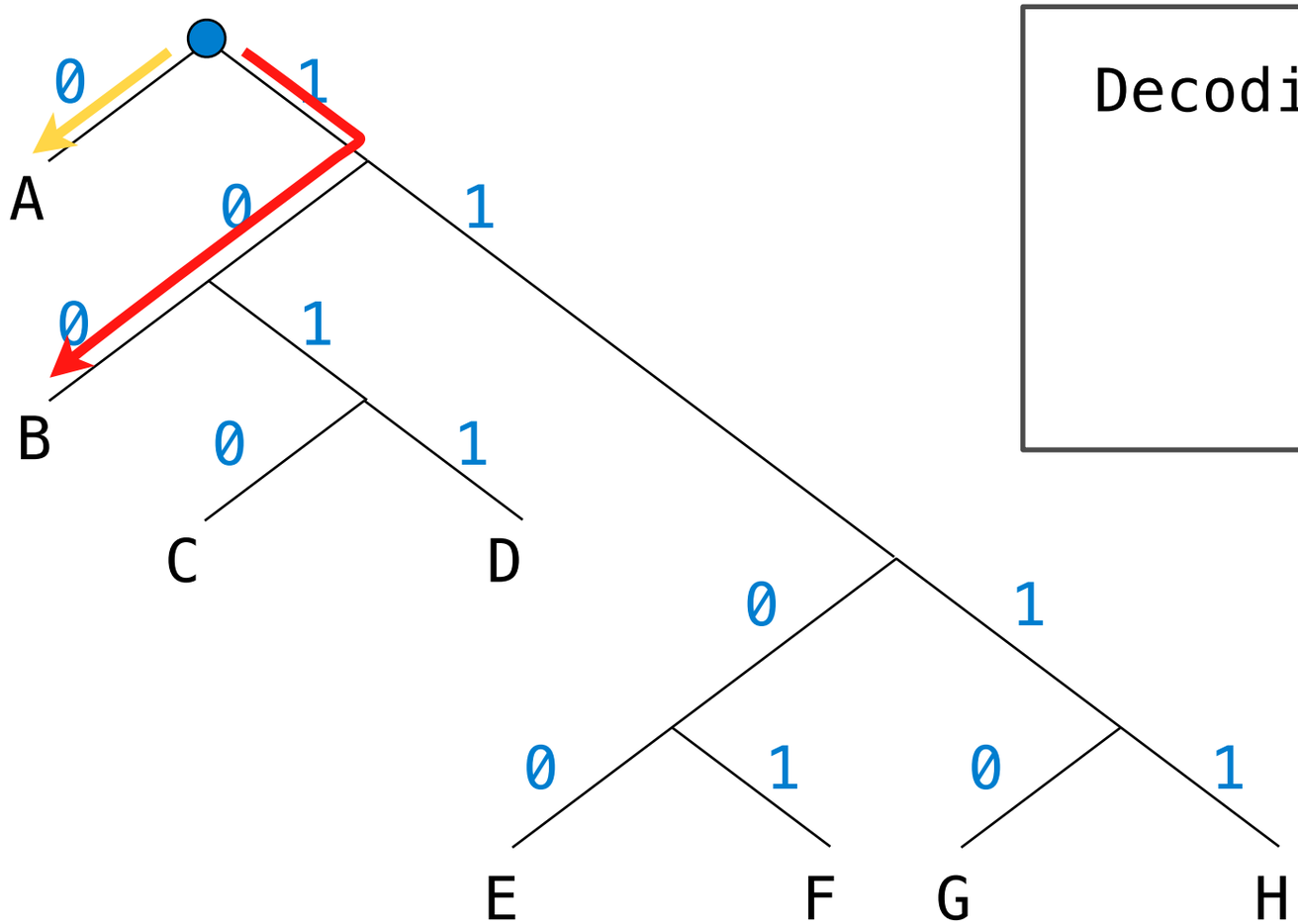

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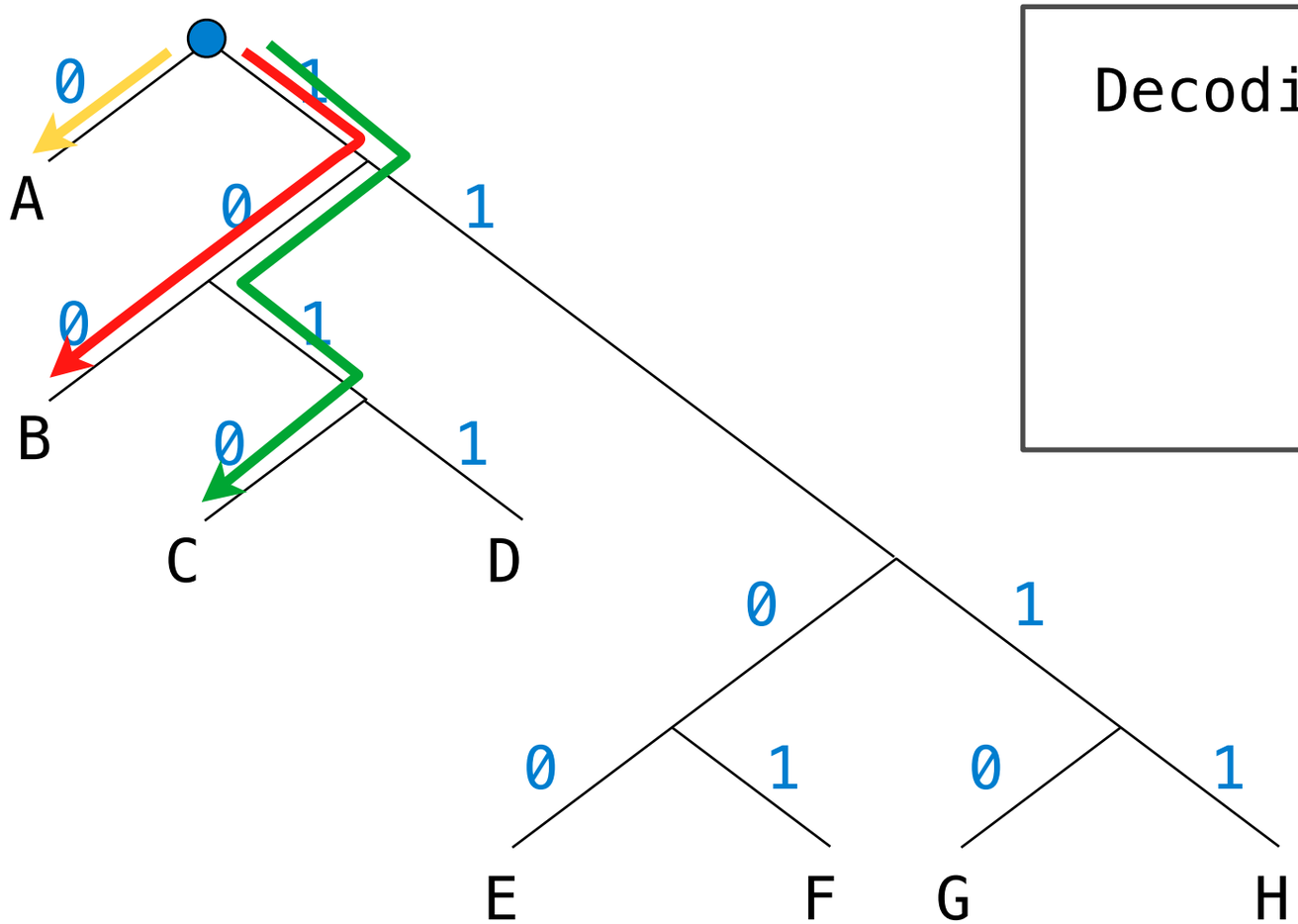
A 0	C 1010	E 1100	G 1110
B 100	D 1011	F 1101	H 1111



Decoding a sequence of bits:

1 0 0 0 1 0 1 0

B A C