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CS 230

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Short Assignment 1

**Expression Rule**

1. (mystery 7 2) Evaluate mystery
2. [{proc ((a <number>) (b <integer>)) …} {7} {2}] Apply compound proc to 7 and 2
3. (cond ((zero? {2}) 0) Evaluate cond

((odd? {2})

(+ {7} (mystery (+ {7} {7})

(quotient {2} 2))))

(else

(mystery (+ {7} {7})

(quotient {2} 2))))

1. (zero? {2} 0) Evaluate (zero? {2} 0)

#f

1. [cond ({#f}) Apply #f to the zero? cond

((odd? {2} …))]

1. (odd? {2} …) Evaluate (odd? {2} …)

#f

1. [cond ({#f}) Apply #f to the odd? cond

({#f})

(else …)]

1. (else (mystery (+ {7} {7}) Evaluate (else…)

(quotient {2} 2)))

1. (+ {7} {7}) Evaluate (+ {7} {7})
2. [add 7 7] Apply add to get 14

14

1. (quotient {2} 2) Evaluate (quotient {2} 2)
2. [quotient {2} 2] Apply quotient to get 1

1

1. (mystery {14} {1}) Evaluate mystery
2. [{proc ((a <number>) (b <integer>)) …} {14} {1}] Apply compound proc to 14 and 1
3. (cond ((zero? {1}) 0) Evaluate cond

((odd? {1})

(+ {14} (mystery (+ {14} {14})

(quotient {1} 2))))

(else

(mystery (+ {14} {14})

(quotient {1} 2))))

1. (zero? {1} 0) Evaluate (zero? {1} 0)

#f

1. [cond ({#f}) Apply #f to the zero? cond

((odd? {1} …))]

1. ((odd? {1}) Evaluate (odd? {2} …)

(+ {14} (mystery (+ {14} {14})

(quotient {1} 2))))

#t

1. [{#t} Apply #t to the odd? cond

(+ {14} (mystery (+ {14} {14})

(quotient {1} 2)))]

1. (+ {14} {14}) Evaluate (+ {14} {14})
2. [add 14 14] Apply add to get 28

28

1. (quotient {1} 2) Evaluate (quotient {1} 2)
2. [quotient {1} 2) Apply quotient to get 0

0

1. (mystery {28} {0}) Evaluate mystery
2. [{proc ((a <number>) (b <integer>)) …} {28} {0}] Apply compound proc to 28 and 0
3. (cond ((zero? {0}) 0) Evaluate cond

((odd? {0})

(+ {28} (mystery (+ {28} {28})

(quotient {0} 2))))

(else

(mystery (+ {28} {28})

(quotient {0} 2))))

1. (zero? {0}) 0 Evaluate (zero? {0}) 0 to get #t

#t

1. [{#t}] Apply #t to zero? cond

0

1. (+ {14} {0}) Evaluate (+ {14} {0})
2. [add {14} {0}] Apply add to get 14
3. **14 *Evaluation Complete***

The mystery function essentially multiplies the first parameter by the second.