Computer Science I

CMPE/CSCI 1370 - 01

Today

Time	Topic
9:30 - 9:45	Design recipe review
9:45 - 9:50	Next project demo
9:50 - 10:10	Enumerations
10:10 - 10:30	Intervals
10:30 - 10:40	Examples

Design recipe

1.
2. **Signature, purpose, stub**
3. **Examples**
4.
5. **Function body**
6.

Design a function that pluralizes a given word. For simplicity you may assume that just adding s is enough to pluralize a word.

Which of the following purpose statements is best?

A. `; Pluralize s.`

B. `; Produce plural string.`

C. `; Add "s".`

D. `; Produce the given string with "s" added to the end.`

Which of the following are appropriate examples?

```
;; String -> String
;; Produce the given string with "s" added to the end.

(define (pluralize str) "")  ;stub
```

A. `(check-expect (pluralize "cat") "s")`

B. `(check-expect (pluralize "cat") "cat")`

C. `(check-expect (pluralize "dog") "dogs")`

D. `(check-expect (pluralize "grass") "grasss")`

E. More than one of the above

Which part of the partially-completed design is inconsistent from the rest?

```
;; Image -> String                                          [A
;; produce the aspect ratio (width/height) of an image [B
(check-expect
  (aspect-ratio (rectangle 20 30 "solid" "blue"))
  (/ 2 3))                                                ;[C
(check-expect
  (aspect-ratio (square 10 "solid" "blue"))
  1)
(check-expect
  (aspect-ratio (rectangle 30 20 "solid" "blue"))
  3/2)

; define (aspect-ratio img) 0) ;stub                       [D
```

Which part of the partially-completed design is inconsistent from the rest?

```
;; String -> Boolean                                          [A
;; produce true if string length is 0                         [B
(check-expect (empty-string? "") true)                       ;[C
(check-expect (empty-string? 0) false)
(check-expect (empty-string? "abc") false)

;(define (empty-string? s) true) ;stub                        [D

(define (empty-string? s)                                    ;[E
  (zero? (string-length s)))
```

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Next project: Rock, paper, scissors

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Today: Traffic lights + design recipe

Design recipe

1.
2. **Signature, purpose, stub**
3. **Examples**
4.
5. **Function body**
6.

Design recipe

1. **Data definitions**
2. Signature, purpose, stub
3. Examples
4. **Template**
5. Function body
6.

Structure of the DATA

->

Structure of the FUNCTION

ENUMERATIONS

Traffic lights v1

Just the light

Wishlists!

ENUMERATIONS

fixed set of values

Data definitions and templates: Enumerations

- Day of the week
- Letter grade
- Primary color

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INTERVALS

Traffic lights v2

Numbers for lights

INTERVALS

number ranges

Data definitions and templates: Intervals

- Temperature (cold, just right, hot)
- Hour of day (morning, afternoon, evening)
- Electromagnetic spectrum

Data definitions and templates: Intervals

- Temperature (cold, just right, hot)
- Hour of day (morning, afternoon, evening)
- Electromagnetic spectrum

Color	Wavelength
violet	380–450 nm
blue	450–495 nm
green	495–570 nm
yellow	570–590 nm
orange	590–620 nm
red	620–750 nm

ATOMIC

Traffic lights v2

Countdown

Enumeration

- fixed set of values

Interval

- number ranges

Atomic

- no conditional behavior

Structure of the DATA

->

Structure of the FUNCTION

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A. Atomic / B. Enumeration / C. Interval

1. Produce the complement of a given primary color
2. Given a month of the year, return the season
3. Convert a temperature from F to C
4. Classify an image as either small, medium, or large based on its area
5. Guess the season based on the temperature
6. Determine if a ph level is acidic, basic, or neutral
7. Produce an appropriate greeting, given the hour of the day

Attendance!

http://bit.ly/1370-1rollcall