

Computer Science I

CMPE/CSCI 1370 - 01

Today

Time	Topic
9:30 - 9:50	Wrap-up: data definitions and templates
9:50 - 10:10	How many tests?
10:10 - 10:30	Decomposition and wishlists

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

Enumeration

- fixed set of values

Interval

- number ranges

Atomic

- no conditional behavior

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

How do we:

- *write a data definition?*
- *derive the template from the data definition?*

Enumeration

- fixed set of values

Interval

- number ranges

Atomic

- no conditional behavior

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Design recipe

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

How many tests?

provably works

How many tests?

- Enumeration
- Interval
- Atomic

Design recipe

1. Data definitions
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Wishlists

Formalizing decomposition

Design recipe

0. Read problem statement, write wishlist
1. Data definitions
2. Signature, purpose, stub
3. Examples
4. Template
5. Function body
6. Test and debug

One function per task

Main function to compose helper functions

One function per task

Main function to compose helper functions

- Calculate discounted price
- Overlay 2 images (smaller over larger)
- Calculate profit at a movie theater: [https://htdp.org/2018-01-06/Book/part_one.html#\(counter._\(exercise._fun6-constant\)\)](https://htdp.org/2018-01-06/Book/part_one.html#(counter._(exercise._fun6-constant)))

One function per task

Main function to compose helper functions

- Determine the total price for a set of plane tickets given the number of passengers and the seat class (Economy, Business, First class)
- Produce the letter grade for 1370 given raw average and exam average
- Convert between temperature units (Fahrenheit, Celsius, Kelvin)

Attendance!

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