

Computer Science I

CMPE/CSCI 1370 - 01

Today

925-945	Lab review and Syllabus updates
945-10	Intro: 2 hard things
10-1010	Named constants
1010-1030	Functions

**There are only two hard
things in Computer Science:
cache invalidation and
naming things.**

Phil Karlton, Netscape

Reading exercises

**Programs are meant to be
read by humans and only
incidentally for computers to
execute.**

Abelson & Sussman, Structure and Interpretation of
Computer Programs

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NAMED CONSTANTS

Named expressions

```
(define PI 3.14)
```

Statement

Another basic unit of text: ~~represents a value~~
produces an "effect" (changes the state of the
"world")

Expression

Basic unit of text in a programming language:
represents a value

Statement

Another basic unit of text, ~~represents a value~~ produces an "effect" (changes the state of the "world")

```
(require 2http/image)
```

NAMED CONSTANTS

Named expressions

```
(define PI 3.14)
```

```
(define PI 3.14)
```

What's the syntax for a named constant definition?

```
(define <name> <expr>)
```

What's the syntax for a named constant definition?

What's a valid name?

“ A name or a variable is a sequence of characters, not including a space or one of the following:

" , ' ` () [] { } | ; # :

”

[https://htdp.org/2018-01-06/Book/i1-2.html#\(counter.\(figure.fig~3alex-beginner\)\)](https://htdp.org/2018-01-06/Book/i1-2.html#(counter.(figure.fig~3alex-beginner)))

Which of the below is a valid name?

A. VAL OF PI

B. "VAL"

C. (pi)

D. val-of-pi?

E. More than one of the above

```
(define PI 3.14)  
(define VAL <expr>)
```

Which of the below can legally replace `<expr>`?

A. (+ 5 2)

B. "VAL"

C. PI

D. "PI"

E. More than one of the above

```
(require 2htdp/image)

(define doorknob (circle 3 "solid" "yellow"))
(define door (overlay/align "right" "center"
                             doorknob
                             (rectangle 15 25 "solid" "brown")))

(define roof-big (triangle 40 "solid" "red"))
(define roof-small (triangle 30 "solid" "red"))
(define roof (beside/align "bottom" roof-big roof-small))

(define main (rectangle 70 40 "solid" "black"))

(define house (overlay/align "center" "bottom" door
                             (above roof main)))

house
```

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NAMED EXPRESSIONS WITH VARIABLES

Functions

```
(define doorknob (circle 3 "solid" "yellow"))
```

VS

```
(define (doorknob color) (circle 3 "solid" color))
```

```
(define (fn-name param1 param2) body-expr)
```

```
(fn-name "a" "b")
```

What's the syntax of a function definition?

- Function header (name, parameters)
- Function body

What's the syntax of a function call?

- Arguments

Identify the function name, parameter, argument, body and call

```
(define (f n)
  (* n n))

(f 5)
```

A. (f 5)

B. 5

C. f

D. n

E. (* n n)

What is the value of the following function call?

```
(define (calculate w x y)
  (+ x (+ w 1) 3))

(calculate 3 2 0)
```

A. 5

B. 9

C. 0

D. 3

E. None of the above

What is the value of the following expression?

```
(define (double x)
  (* 2 x))

(Double 3)
```

A. 6

B. 9

C. 0

D. 3

E. None of the above

```
(define (double x)
  (* 2 x))

(define (double y)
  (* y y))

(double 3)
```

A. 6

B. 9

C. 0

D. 3

E. None of the above

```
(define (double x)
  (* 2 x))

(define (square x)
  (* x x))

(double 3)
(square 5)
```

A. 6 9

B. 6 25

C. 10 25

D. 10 9

E. None of the above

```
(define (house clr)
  (overlay/align "center" "bottom" door
    (above roof
      (rectangle 70 40 "solid" clr))))
```


Attendance!

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