

Computer Science I

CMPE/CSCI 1370 - 01

MW 9:25 am - 10:40 am

<http://bit.ly/votingcards>

Today

925-930	<u>Syllabus highlights</u>
930-945	Project demo and specs
945-10	How do we write and run programs?
10-1015	Expressions in BSL
1015-1030	Images and the image teachpack

Project 1: Happy Pusheen

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- Display Pusheen and happiness level
- Countdown for happiness level
- Respond to key presses

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How do we write and run programs?

WHAT IS A PROGRAMMING LANGUAGE?

Arbitrary set of words that represent:

Data

Operations

Control structures

```
Pixel : Number
px : Pixel

negative : px -> px * -1

Image : Pixel[40000]
img : Image

negative-img : img -> for each px in img -> negative
```

- Data
- Operations
- Control structures

**What humans can
understand**

VS

**What computers can
understand**

"Source code"

a + b

VS

"Machine code"

**000000 10001 10010 01000
00000 100000**

DrRacket environment: interpreter for BSL

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Vocabulary words!

- Expressions
- Literal values (literals)
- Data types
- Syntax
- Operations
- Arguments
- Evaluate (resolve)
- Sub-expressions

Expression

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

Literal values (literals)

Operations

Literal values

- Numbers
- Strings (text)
- Booleans
- Images

Data types

Syntax

Rules for writing valid expressions

- *What is the syntax of a negative number?*
- *What is the syntax of a string?*

What is the type of the expression:

"352"?

A. number

B. string

C. boolean

D. image

E. syntax error

Why explicitly distinguish between different types of data?

Expression

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

Literal values (literals)

Operations

Operations

Produces a value, given other **expressions**

Arguments

Operands provided to an operation

Evaluation (evaluate, resolve)

Process of producing a value given an expression

Built-in operations

<https://docs.racket-lang.org/htdp-langs/beginner.html>

Operations

Produces a value, given other **expressions**

Arguments

Operands provided to an operation

What's the general syntax of an operation?

**Which of the following is a valid BSL operation
whose value is the square root of 36?**

A. (sqrt 36)

B. sqrt(36)

C. 6

D (6)

Operations

Produces a value, given other **sub-expressions**

Arguments

Operands provided to an operation

Evaluation

Process of producing a value given an expression

Operations

Produces a value, given other **sub-expressions**

Arguments

Operands provided to an operation

Evaluation (evaluate, resolve)

Process of producing a value given an expression

Data type of expression = data type of value

What is the type of the following expression:

```
(+ (string-length "hello world") 60)
```

A. number

B. string

C. boolean

D. image

E. syntax error

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Images and the image teachpack

<https://docs.racket-lang.org/teachpack/2htdpimage.html>

<https://docs.racket-lang.org/teachpack/2htdpimage-guide.html>

With respect to providing arguments to `circle`, what are the ways we can do this incorrectly?

With respect to providing arguments to `circle`, what are the ways we can do this incorrectly?

- wrong number
- wrong order
- wrong type of arguments

Attendance!

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

(And photos!)