CS 160
CS Orientation

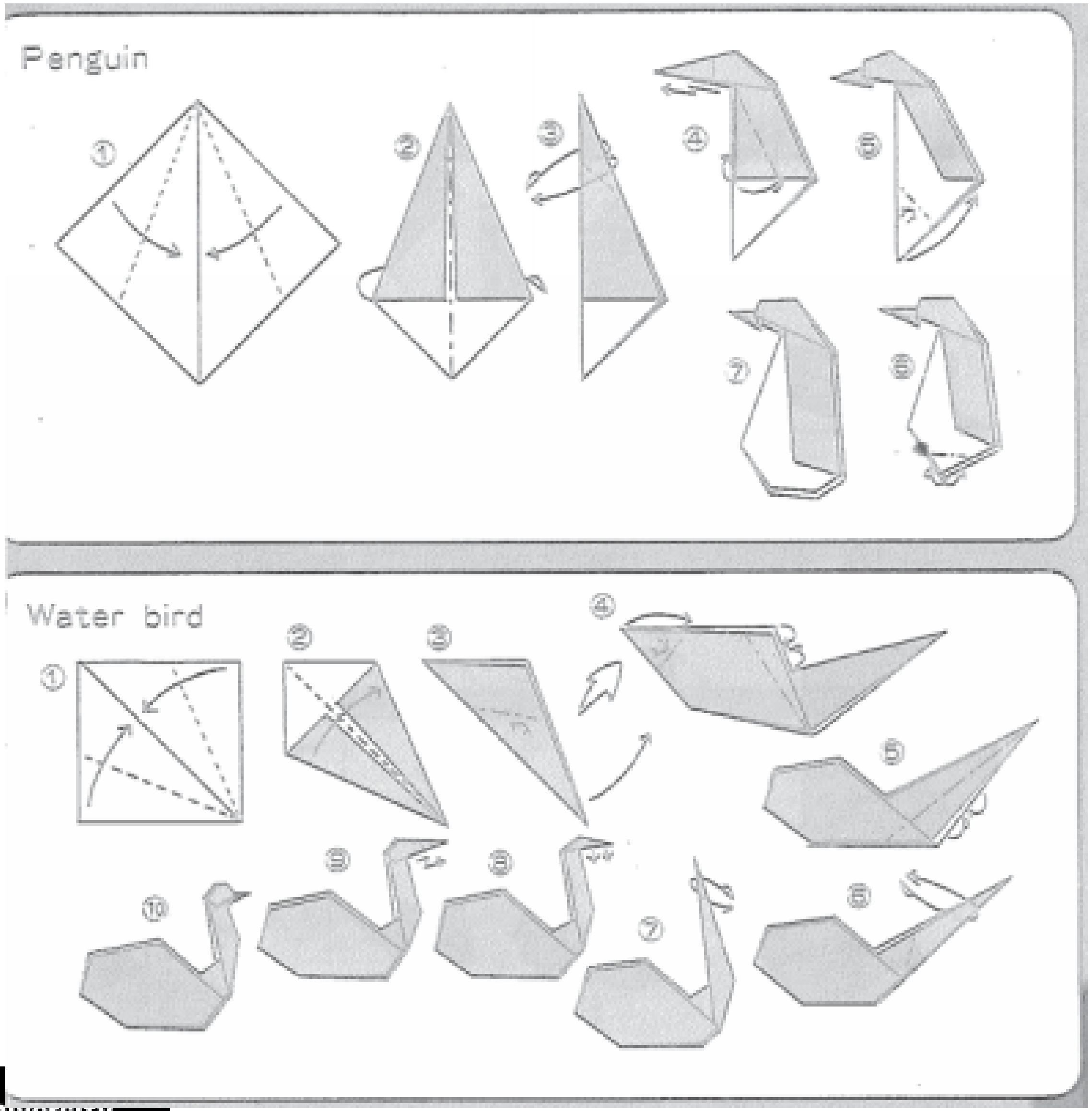
Expressions, Data Types, &
Input/Output

OSU Oregon State University

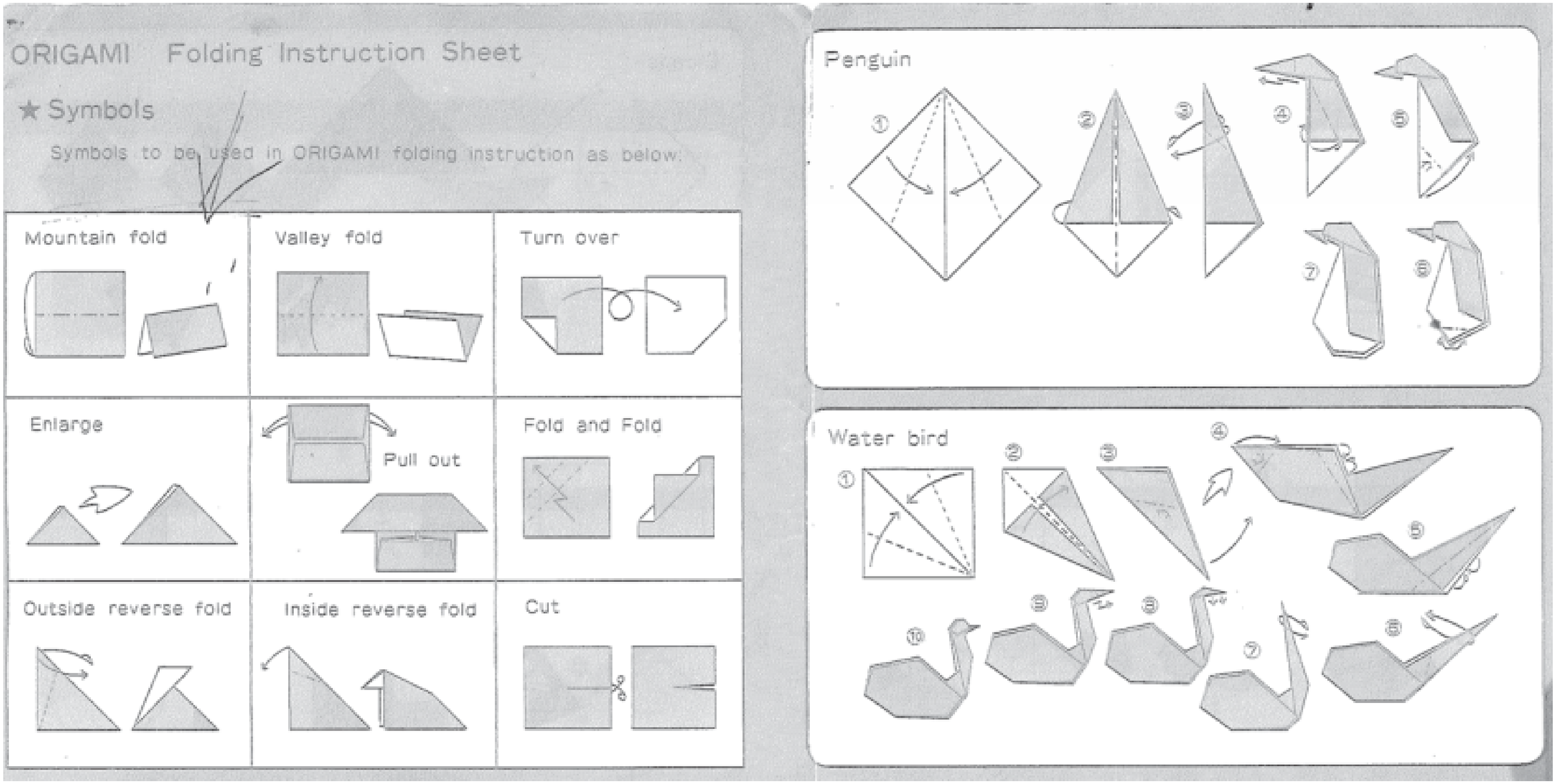
Assignment 3: Semantics vs. Syntax

- What are these words?
- Why is this important?

Syntax



Syntax and Semantics…
Which is more important?



What does this have to do with CS?

- How is this like CS programs?

Data Types/Converting

- string - “string of text”
- character – ‘a’
- integer – 79
- boolean – True
- float – 79.0

Demo…

Python Operators and Their Computer Symbols

- +
- -
- *
- /
- //
- %
- **

Hierarchy of Operations

- Functions, i.e. math.sqrt()
- Power
- Mod
- Mult, Div
- Add, Sub
- Relational
- Logical

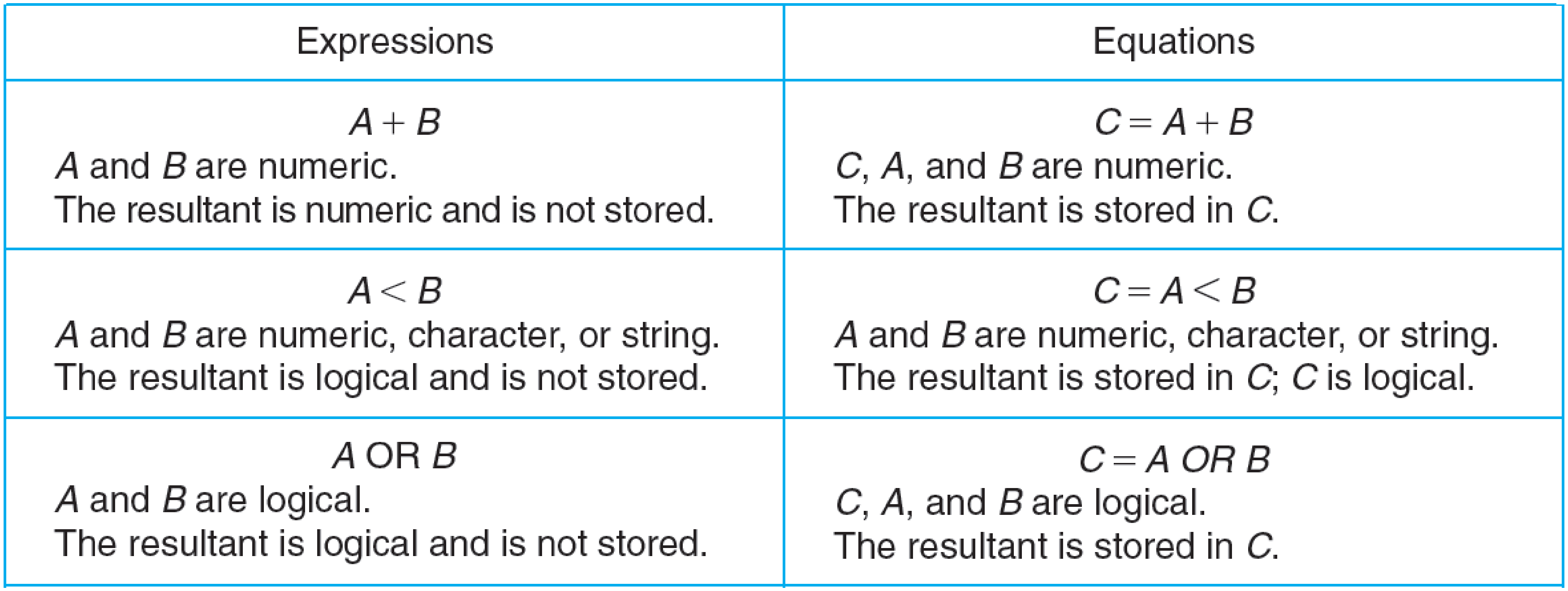
Python Examples

- 5 * 2 + 3 - 10
- 5 * (2 + 3) – 10
- 5/2
- 5//2

How about storing values?

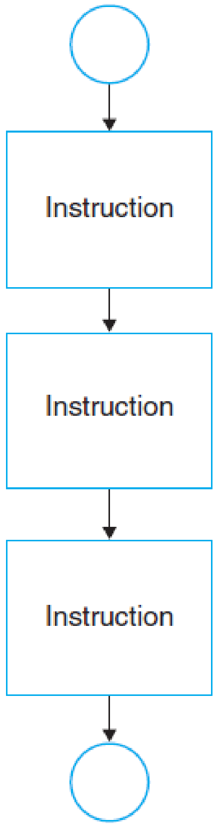
- ch = ‘a’
- num = 79
- cont = True
- num = num + 1
- Can we mix types?
  - num = num + cont
  - num = num + ch
  - ch = ch + num

Expressions and Equations



Expressions	Equations
$A + B$ *A* and *B* are numeric. The resultant is numeric and is not stored.	$C = A + B$ *C*, *A*, and *B* are numeric. The resultant is stored in *C*.
$A < B$ *A* and *B* are numeric, character, or string. The resultant is logical and is not stored.	$C = A < B$ *A* and *B* are numeric, character, or string. The resultant is stored in *C*; *C* is logical.
A OR *B* *A* and *B* are logical. The resultant is logical and is not stored.	*C* = *A OR B* *C*, *A*, and *B* are logical. The resultant is stored in *C*.

Sequential Logic Structure

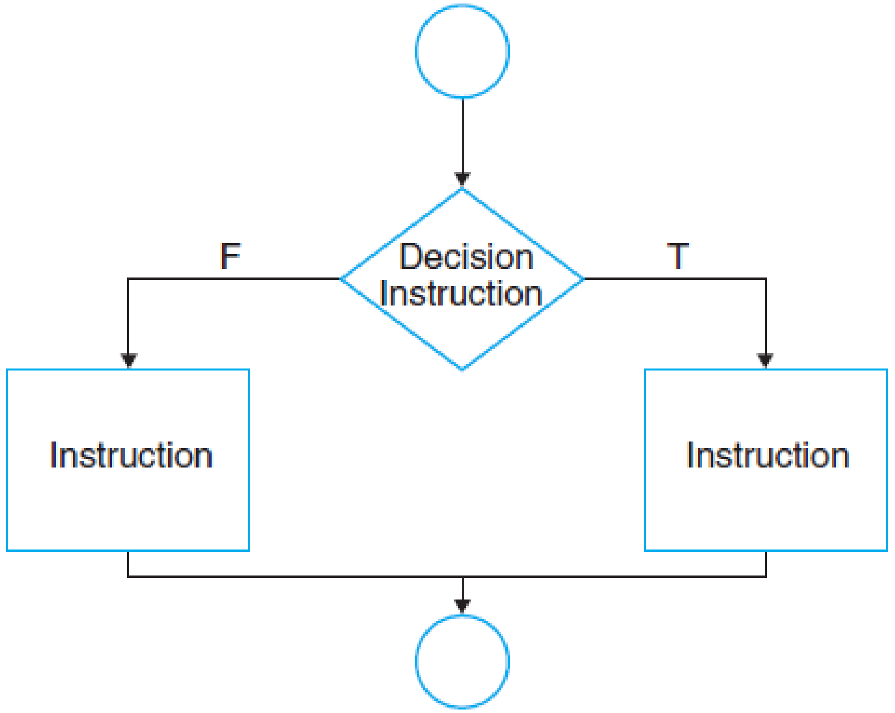
Algorithm	Flowchart	Pseudocode
⋮ 5. Instruction 6. Instruction 7. Instruction 8. ⋮		⋮ Instruction Instruction Instruction ⋮

Python Sequential Logic

```
print("   *   ")
print("  ***  ")
print(" ***** ")
print("*******")
```

Demo…

Decision Logic Structure

Algorithm	Flowchart	Pseudocode
⋮ 5. If <decision> then Instruction else Instruction 6. ⋮	 Decision Instruction F T Instruction Instruction	⋮ If <decision> then Instruction else Instruction Endif ⋮

Relational Operators and Symbols

- >
- >=
- <
- <=
- ==
- !=