MIT 6.00.1x Introduction to Computer Science and Programming Using Python

# Week one: Introduction to Python

## What does a computer do?

* Calculations and Store

## Types of Knowledge

* Declarative knowledge is **statements of fact**.
* Imperative knowledge is a **recipe** or "how-to" knowledge

## What is a recipe?

* 1. sequence of simple **steps**
  2. **flow of control** process that specifies when each step is executed
  3. a means of determining **when to stop**

### STEPS 1+2+3 = an algorithm

#### Aspects of LANGUAGES

* numbers,strings,simple operations.
  + **syntax**
    - **English**:"Cat dog boy" > not syntactically valid
    - "Cat hugs boy" > syntactically valid
    - **Programming language**: "hi" \* 5 > not syntactically valid
    - 3.2 \* 5 > syntactically valid

## where things go wrong

* + syntactic errors
  + static semantic errors
  + no semantic errors but **different meaning than what programmer intended**

## Objects

* + Programs manipulate **data objects**
  + Objects have a type that defines the kinds of things programs can do to them.
  + objects are
    - **scalar** (cannot be subdivided) 标量（有数值，无方向）
    - **non-scalar**(have internal structure that can be accessed)

### Scalar objects

* + - int --- integers整数型:5
    - float --- real numbers浮点型: 3.27
    - bool--- BOOLEAN VALUES布尔型: True and False
    - NoneType --- special and has one value: None

## 'for' loop

* >>> for n in range(5):
    
   print(n)
    
     
     
  0
    
  1
    
  2
    
  3
    
  4