CS 0
Adventures in Media Computing

Introduction to Programming,
Chapter 2
Admin

- Check your CIS account which allows you to get onto these machines.
- Go to F&M where you can get ID cards for lab access
- Twiki Page – https://www.cs.hmc.edu/twiki/bin/view/CS0Spring2009/WebHome
- Book:
  - “Intro to Computing and Programming in Python,” by Mark Guzdial
  - Bring your book to class
- Software
  - JES, http://coweb.cc.gatech.edu/mediaComp-teach/26
  - Media, http://coweb.cc.gatech.edu/cs1315/814
- Friday Afternoon Open Lab: 2:45 – 5:00
Today’s Goals

- To Make and Show Pictures
- To Play with JES by commands and programs
  - Variables – store objects and values
  - Create functions
  - Recognize Types
  - Sequence of Operations
Programming

- Set of Names and Values
  - Some defined by programming language with special (value) meaning.
    - `def` – specifies creation of a function
    - `print` – command to action, that action is printing
  - The language allows the creation of new names, i.e., variables.
    - `Mynumber = 25`
  - We create programs as a series of language known name/values and new names

- Types
  - Each variable has a type, either declared by the programmer or established by the language
    - Characters, strings, integers, floats or reals, files, pictures, etc.
Programming in Python

- Well defined programming language, see Python foundation

- Media Computation uses Python and specially created libraries of functions to manipulate media, i.e., pictures and sound

- No programming language is perfect and no programming language ever goes away....
Playing with Python

- Working in the Command Area
  - Asking Python to execute our ‘commands’
    - print 34 + 56
    - print “34” + 56
    - print “34” + “56”
    - print 34.0 / 16
    - print 34 / 16

- How about some functions: name and parameter
  - abs( -1)
  - print abs (-1)
  - print Myvariable
  - pickAFile
    - Programming languages are really ‘tight’ on spelling and capitalization
Playing with Python

- pickAFile
  - Functions want parameters ()
    - pickAFile()
  
  - Just gets the file

  - We want to see the file
    - show() will display a picture, but we have a file not a picture

- Need to:
  - Get a file -- pickAFile()
  - Convert to a picture -- makePicture(filename)
  - Show the picture -- show(picturename)

  - long way:
  - Short way:
Names and Values

Variable Names
- Be clear in names for ‘now’ and in the future
  - ‘MyNumber’ rather than ‘a’
- Choose some standard format: ‘MyNumber’ ‘mynumber’ ‘myNumber’

- ‘=’ makes a value out of the right hand side and assigns the value to the Name on the left hand side. Not the ‘=’ function in Algebra

- Results of functions can be assigned to a name.

- We can substitute a value, a name assigned to that value, and the function returning the same value. In the end, the computer (system) creates a value out of the right hand side and assigns that value to the name on the left hand side.
Python Program

Program in Python is:

- A collection of one or more functions that together perform some ‘useful’ task.
- `def` used to define a new function

First Line

- Needs a name
- Inputs to this function: in parentheses and comma separated
- Line ends with ‘:’

Needs commands

- within a block, blocks are distinguished by indentation, some languages use special characters to define a block, e.g., “begin..end” or “(...)”

Example:

```
def pickAndShow ()
    myfile = pickAFile()
    mypicture = makePicture(myfile)
    show ( mypicture )
    # do you see the error....
```
Summary

- Names – variables, commands, etc. make up the programming language

- Python and media libraries provide the tools to build our own programs.
Summary

- Program – description in a programming language of a process that achieves some result that is useful to someone; one or more functions in Python
- Algorithm – description of a process apart from any programming language
- Recipe – For this class, describes programs or portions of programs that achieve some useful media-related task; again Python functions
- Digitization – Process of encoding media into bits, makePicture() is an example, so we can manipulate them with a program