MATLAB Lab. 6

2013.05.01
Starting Python

• Installing Python
  – http://www.python.org/
  – http://sourceforge.net/projects/pywin32/

• You need to pick a proper version of Python installer
Variables

• Print

```python
>>> red = 5
>>> blue = 10
>>> print (red, blue)
5 10

>>> yellow = red
>>> print (yellow, red, blue)
5 5 10

>>> red = blue
>>> print (yellow, red, blue)
5 10 10
```
Number

- integer number
  - $2 \times 2 = 4$
  - $5 / 2 = 2.5$
- float number
  - $2.0 \times 2.0 = 4.0$
  - $5.0 / 2.0 = 2.5$
- complex number
  - $(3 + 1j) \times 3 = 9 + 3j$
Strings(1)

• A list of characters

```python
>>> print ('I am a single quoted string')
I am a single quoted string
>>> print ("I am a double quoted string")
I am a double quoted string
>>> print ("\"I am a triple quoted string\"\")
I am a triple quoted string
```

Question:

so I said, “You don’t know me! You’ll never understand me!”
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This will result in only three backlashes:  

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String (2)

• can be concatenated with + operator
  >>> word = ‘Help’ + ‘A’
  >>> word
  ‘HelpA’
• can be repeated with * operator
  >>> Word * 5
  >>> ‘HelpAHelpAHelpAHelpAHelpAHelpA’
String (3)

• can be indexed
  >>> word[4]
  >>> ‘A’

• substring can be specified with slice notation
  >>> word[0:2]
  >>> ‘He’
  >>> word[2:4]

• >>> ‘lp’

• string cannot be changed
  – word[0] = ‘x’ -> error
Functions(1)

• input(), len(), str()
  >>> w = input( "Input any word:\n" )
  >>> l = len(w)
  >>> s = w + " has " + str(l) + " characters."

• int()
  >>> height = input( "Input your height" )
  >>> shoe = input( "Your secret height?" )
  >>> realHeight = int(height) + int(shoe)

– Q: What will happen if we don`t use `int` above?
Functions(2)

• range()
  – generates lists containing arithmetic progressions

>>> range(0, 10)

>>> r = range(0,10)
>>> 1 in r
True
>>> 11 in r
False
>>> 10 in r
???
Functions(3)

- eval()
  - Evaluate the a string representing a python expression
    >>> a = input()
    >>> a = eval(a)

    >>> a = "print(123)"
    >>> a
    'print(123)'
    >>> eval(a)
    123
Mathematical Operators

- +, -, *, /
- // : floor division
- %
- abs(a)
- a**b
- sqrt(a)
  - from math import sqrt at the top of your file
If clause

• Usage

```python
>>> if condition:
    statements
elif condition:
    statements
else:
    statements

>>> [Results] bla bla~
```

Example (a=7, b=6)

```python
>>> if a>b:
    Print("Big a ")
    elif b>a:
        print("Big b ")
        else:
            print("error")

>>> Big a
```
For

• Usage
  >>> for <target> in <object> :
      statements

• Example
  >>> range(10)
  >>> for x in range(10):
      print (x)

0 1 2 3 4 5 6 7 8 9
For - example

• Sum of 1 to 10
  >>> sum = 0
  >>> for x in range(1, 11):
      sum = sum + x
  >>> print (sum)
  55

• Multiplication from 1 to 10
  >>> prod = 1
  >>> for x in range(1, 11):
      prod = prod * x
  >>> prod
  3628800
For - continue

• Example

```python
>>> for x in range(10):
    if x<8: continue
    # if x<8, move to for loop again
    print (x)
8
9
```
For - break

• Example

```python
>>> for x in range(10):
    if x > 3: break
    # if x>3, move out for loop
    print (x)

0
1
2
3
```
For & List

• Example
  >>>> alist = [4, 3, 2, 1]
  >>>> for i in alist:
      print(i)

  4
  3
  2
  1
Problem 1

• Make a program that finds the maximum number among three numbers using ‘if’ statement.

• 3 number are input from keyboard separated by comma(,)

• Example

  Input 3 number : 10, 15, 14
  Answer is : 15
Problem 2

• Make a maximum number finding program of Problem 1 with 4 numbers.
Problem 3

• Make a program - multiplication

• Example

>>> Input the number(1~9): 3

3 * 1 = 3
3 * 2 = 6
3 * 3 = 9
3 * 4 = 12
3 * 5 = 15
3 * 6 = 18
3 * 7 = 21
3 * 8 = 24
3 * 9 = 27