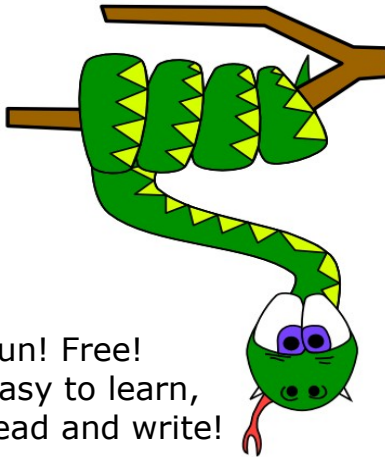


Python



Introduction

- a programming language like Java and C++.
- a high-level language that translate a set of instructions into machine language, which is represented by 0s and 1s.

Getting Python

At home:

You want to download the latest version, which is 2.5.2.

Go to <http://www.python.org/download/>

Assuming you are using Windows, after you have installed it, go to Start > All Programs > Python > IDLE.

In the lab:

Go to Start > All Programs > Python 2.5 > IDLE.

Now try this out!

In the window that appears, you should see the python prompt `>>>`. This is asking you to enter python commands. Type in the following to see what happens.

To display or output:

```
>>> print "Hello World"
```

```
>>> print 'Hello World'
```

```
>>> print Hello World
```

Q1: Why is there an error?

To do arithmetics (use Python as a calculator):

```
>>> print 25+38
```

```
>>> print 3*6
```

```
>>> print 3/6
```

```
>>> print 3.0/6.0
```

Q2: Why does $3/6=0$?

```
>>> print 2+4*2
```

Q3: Why is the value above 10 but not 12?

```
>>> print 2**2
```

```
>>> print 2**3
```

To connect or link 2 or more words:

```
>>> print 'abc'+ 'def'
```

```
>>> print 'joe'+ ' '+ 'smith'
```

```
>>> print '25'+ '58'
```

To know what type a value is:

```
>>> type(21)
```

```
>>> type("Hello World")
```

```
>>> type('Hello Word')
```

```
>>> type(2.5)
```

```
>>> type("15")
```

```
>>> type("2.5")
```

To link to another piece of data (variables):

```
>>> words = "Hello World!"
```

```
>>> print words
```

```
>>> firstname = 'joe'
```

```
>>> lastname = 'smith'
```

```
>>> print firstname + lastname
```

```
>>> print "%s is my name. " % ("Jane")
```

```
>>> print "%d is my favorite number. " % (7)
```

```
>>> print "%s is number %d! " % ("Python", 1)
```

```
>>> x=2
```

```
>>> print x+5
```

```
>>> print x-0
```

```
>>> print x*7
```

```
>>> print 'x'*7
```

Q4: Explain why.

```
>>> print x/2
```

```
>>> y=3
>>> print x+y
>>> print x-y
>>> print x*y
>>> print x/y
```

To obtain user input from command-line:

```
>>> result = raw_input()
(Python will wait for you (the end-user) to enter something. Enter some text and
hit Enter.)
>>> print result
>>> x = raw_input('Please enter a string: ')
>>> print x
>>> name = raw_input("Enter your name here: ")
>>> age = raw_input("Enter your age here: ")
>>> print "Your name is:", name
>>> print "And you are", age
```

To combine variables, expressions and statements:

```
>>> print "The distance from my house to my school is ", 10, "miles."
>>> minute = 5
>>> print minute, " minute is equals to ", minute*60, "seconds."
```

More challenges!

Looping – The art of repeating itself

You can use loops when you want to repeat a set of instruction multiple times.

while loop pseudocode:

while (expression):

 # statements to execute while loop expression is True

else:

 # statements to execute when loop expression is False

```
>>> i = 0
```

```
>>> while(i < 10):
```

```
    i = i + 1
```

```
    print i
```

(Hit Enter twice)

```
>>> x = 10
```

```
>>> while (x > 0):
```

```
    x = x - 1
```

```
    print x
```

(Hit Enter twice)

```
>>> x = 10
```

```
>>> while (x != 0):
```

```
    print x
```

```
    x = x - 1
```

```
    print "wow, we've counted x down, and now it equals", x
```

(Hit Enter twice)

for loop pseudocode

for item in container:

 # action to repeat for each item in the container

else:

 # action to take once we have finished the loop.

```
>>> for i in range(1,11):
```

```
    print i
```

(Hit Enter twice)

```
>>> for i in range(1,1000):
```

```
    print i
```

(Hit Enter twice)

```
>>> for x in 'summer':
```

```
    print x
```

(Hit Enter twice)

```
>>> for word in ('one','word', 'after', 'another'):
```

```
    print word
```

(Hit Enter twice)

The if statement

Execute a block of statements depending on some condition.

if statement pseudocode

```
if(expression one):
```

```
    # Action to take if expression one evaluates True
```

```
else:
```

```
    # Action to take if all expression one evaluates False
```

```
>>> i = 8
```

```
>>> if(i % 2):
```

```
    print "Odd Number"
```

```
else:
```

```
    print "Even Number"
```

(Hit Enter twice)

```
>>> z = 4
```

```
>>> if (z > 70):
```

```
    print "Something is very wrong"
```

```
elif (z < 7):
```

```
    print "This is normal"
```

(Hit Enter twice)

```
>>> i = -8
```

```
>>> if(i > 0):
```

```
    print "Positive Integer"
```

```
elif(i < 0):
```

```
    print "Negative Integer"
```

```
else:
```

```
    print "Zero"
```

(Hit Enter twice)

Combo – while loop and if statement

```
>>> a = 10
>>> while a > 0:
    print a
    if (a > 5):
        print "Big number!"
    elif ((a % 2) != 0):
        print "This is an odd number"
        print "It isn't greater than five, either"
    else:
        print "this number isn't greater than 5"
        print "nor is it odd"
        print "feeling special?"
    a = a - 1
    print "we just made 'a' one less than what it was!"
    print "and unless a is not greater than 0, we'll do the loop again."
```

(Hit Enter twice)

Challenge questions

1. Write an **if statement** that translates scores to grades. You can follow the guide below:

A: 90 - 100

B: 80 - 90

C: 70 - 80

D: 60 - 70

E: 0 - 60

2. Write a **for loop** to produce the following output:

```
*  
**  
***  
****  
*****
```

3. Write a **while loop** to produce the following output:

```
*****  
****  
***  
**  
*
```