import module/file (as mo) *(file no extension)*
from module/file import A (as B)
Calling: *module.func or mo.var or A or B*
from module import * *(call original name)*

help(function) function?
shift + tab = floating help in Notebook

pass = "no-op" statement
; =separate commands on same line
**** =escape
_ = Don't care variable! *(not shown in %who)*

for value in sequence:
for c in "text": for line in open("file"):
while cond :
continue/break
if a<b or c>d:
elif x>3 & x<5:
else:
with open(FileName, "r") **as** file_input:

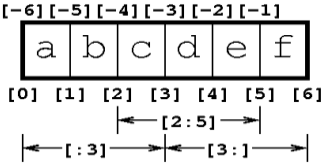
def func_name(x,y): *funcs are objects*
global z x,y are local copy
*z=z+x*2+y*
*return x*2+y*
lambda x,y:x*2+y *anonymous func*
*func_name=lambda x,y: x*2+y*
*name=**lambda** x: y+1 **if** x>0 else 7*
for func in func_array: func_array=[f1,f2]
func(value)

range([start,] stop[, step])=ret range object
a=iter(range(10)→a.__next__()→iter can be used 1x
a=list(xrange(10))

dir(a)= all visible attributes of object a
dir() = ret names in current scope (in cmd,out val,var)
hasattr(a, 'split')=does obj a have attr split
id(object) = returns object memory address
len(object)=length
type(a) **isinstance**(a, (int, float))
str(a) **bool**(a) **int**(a) **float**(a)

STRING **str**(a) **inmutable** char list S[N]=element N
a+b= concatenated string
b=a.**replace**("this", "that")
a.**find**("smth")=lowest index or (-1) if not found
a.**index**("smth")=find with ValueError if not found
a.**capitalize**() a.**lower**() a.**upper**() a.**title**()
a.**count**("aa")=num nonoverlaping occurances
a.**isdigit**()=ret bool *'3.45'.isdigit()*
a.**splitlines**()=ret list
a.**split**('^')=ret list def delimiter=" "
'^'.**join**(iterable)=ret concatenated string
a.**rstrip**(['b'])=strip all b at end (def whitespace)
a.**strip**(['b'])=del leading & trailing b

print (**'**a is %s' **%** (type(a))) ('a is ', type(a))
template="%s is no %s"--> template % (a,b)
%s=string **%l**=line **%.2f**=float **%03d**=int
""" (or ''') = string over various lines



Negative indices = slice relative to the end
N[-1]=last element
Negative step = reverse direction of moving

FILE f=**open**('path' [,'rwa']) (a=append)
lines=[ ]; for line in f: lines.append(line)
f.**readlines**()=ret list of lines
f.**writelines**(sequence)=write sequence of strings
f.**read**() = read one line
f.**next**()=next value, or raise StopIteration
f.**write**(str)= Write string to file.
f.**close**() Close the handle
f.**flush**() Flush the internal I/O buffer to disk
f.**seek**(pos)= Move to indicated file position
f.**tell**() =Ret current file position
f.**closed**()=True if the file is closed.

LIST L=**list**(a) **L=[ ]=empty** **L[N]**=1 element
L_copy=L[:]=L
L.**append**(S) =add 1 element S at the end
L.**extend**([ ]) =append multiple elements
L=L+[ ]= more expensive (new L created)
L.**insert**(N,S) =insert element S at position N
L.**remove**(S) =removes first occurrence of S
L.**pop**(N) =del & ret elem N *(default= last elem)*
L.**difference**(L2)=ret elements of L not in L2
S **in** L= ret Bool; *Is element S in list L?*
L.**reverse**() =reverses objects of list in place
L.**sort**(key=method, reverse=T/F)= in-place sort
(key=str.lower) (key=lambda x:x.count('x'))

TUPLE T=**tuple**(a) **T=( )=empty** **T[N]**
***inmutable*,but** *content of some elements may change*
T[1].append('n')→T[1]= same list, but list has changed
T.**index**('algo') = return first index of 'algo'
T.**count**('S') = num of occurrences of S
T=T+( ) =concatenate *T+='ex',)→ok; T+='ex') →err*
T=T*N=concatenate N tuples of T
T=tuple('string') T=tuple(['string'])
(a,b)=(b,a) → **swap** variable names
T=4,(5,6) **unpack** a,(b,c)=T a,bc=T
seq=[(1,2,3), (4,5,6)]; for a,b,c, in seq: print a,b,c

DICT **D={key:value}** **D={}=empty→** **D[k]=val**
KeyValuePair; associative array; K any hashable type
D=dict([(k1,v1), (k2,v2)])=**dict**(**zip**(kys,vlues))
D.**keys**() = lists keys
D.**values**() = lists values
D.**clear**() = remove all items from dict
del D{'key'} = delete from dict
D.**pop**{ k[,d]}=del & return value, [KeyError or d]
D.**popitem**()=del&ret **some** (key, val) KeyErr if {}
D.**items**()=ret list of (key, value) tuples
D.**iteritems**() = iterator over (key, value) items
iterator=D.iteritems() → iterator.next()
D.**get**(k, V) =return value of k (V if k not found)
D.**update**(D2)=**merge** D2 to D;**overwrite** if key exists

SET **S=set(seq)** **S=set()=empty**
***unordered** set of **unique** elements;(dict **keys only**)*
'k' **in** S= ret Bool, is key in set S
S.**add**(k)=add new element to S
S.**discard**(k)= del k; if not found do nothing.
S.**remove**(k)=del k, if not found KeyError.
S.**update**(seq/S2)= Update as union with seq/S2
S.**issubset**(seq/S2)=is S found in set seq/S2
S.**issuperset**(S2)=is S2 part of S
S.**union**(b)= **S | b**=or
S.**intersection**(b) = **S & b**=and
S.**difference**(b) = **S - b**=
S.**symmetric_difference**(b)= **S ^ b**=nor

list_comp=[expr for val in collection if condition]
res=[x.upper() for x in strings if len(x)>2]
res=[]; for x in strings:if len(x)>2:res.append(x.upper())
d_comp={k-expr : v-expr for value in coll if cond}
key_loc={val:indx for indx, value in enumerate(strings)}
s_comp = {expr for value in coll if cond}
uniq_length={len(x) for x in strings}
Nested comprehensions *("[x for…" ="return x for…")*
list_of_tuples=[(1,2,3),(4,5,6),(7,8,9)]
flatten=[x for tup in list_of_tuples for x in tup]
for tup in list of tuples: for x in tup: return x

reversed(sequence)
sorted(sequence[, key=method, reverse=T/F])
enumerate(seq[, start])=ret(index, value) of seq
zip(sq1 [, sq2 [,..]]) →"pairs" elements to list of tuples
[(sq1[0], sq2[0] …), (sq1[1],sq2[1]…),…]
zip(*zipped_seq) =seq1, seq2 …=**unzip**

x ** y = x to the power y = **pow**(x,y)
x**//**y = floor division
x**%**y = reminder of division
round(x[, n])= x rounded to n digits, def n=0
math.**floor**(x)= greatest integer as a float <= x
math.**ceil**(x)= least integer as a float >= x

map(funct, seq)=apply f to all el of seq→ list
reduce(funct,seq[, initial]) =apply f to first 2, then to result & next el till end→scalar
def mireduce(func, lista):
if len(lista) == 0: return None
elif len(lista) == 1: return lista[0]
else:return func(lista[0], mireduce(func, lista[1:]))
filter(func or None, seq)= filter by boolean function over seq → list,tuple or string

!= **Shell** commands
a= ! ls →Slist =Special list type
a.l (or .list)→as list.
a.n (or .nlstr)→as newline-sep string.
a.s (or .spstr)→as space-sep string.
! wc -l **$a.s** =! wc **{a}.s** →python var2shell var
! echo {list(df.columns)} > cols.txt

%=Magic cmd %lsmagic %automagic
%cd %quickref %xdel vs del %reset
%who %whos %who_ls
%time list('abcde') vs %%time
%config TerminalInteractiveShell.editor='kwrite'
echo "export EDITOR=kwrite" >>~/.zshrc
%matplotlib inline ->set to work interactively
%precision N= for pretty printing.
%dhist, _dh
%history -n *(num)* -l 100 *(last)* -g *(global)* -f FILE
%edit -x *(do not execute)* %save FILE cells
%rerun -l 10 *(last 10 without this one)*
%macro name 34-36 *(lines)*
23/1-5, ~2/3-4 *(~=session ago)*

try:
except ErrorName: (IOError, ValueError…)
except:

(sudo) pip install package *(sudo) pip list*
conda install package *conda list*
sudo pip install -U virtualenv
virtualenv dir_name
*source dir_name /bin/**activate**……**deactivate***
pip install name(s) → goes in dir_name
dir_name/bin/jupyter notebook
pandas jupyter keras tensorflow matplotlib seaborn sklearn