programming

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```
list1=[1,'abc',true,'c',5]
list2=[1,3,4,5,6,7]
list1.append(list2)

list3=[]
list=range(4,20,2)
t=1,2,3,4
tuple1='a',1
tuple2='a',
list1,type(list1);list2,type(list2);list1[1],type(list1)
```

```
([1, 'abc', True, 'c', 5, [1, 3, 4, 5, 6, 7]], <type 'list'>)
([1, 3, 4, 5, 6, 7], <type 'list'>)
('abc', <type 'list'>)
```

```
int(23);float(23);str(23)
```

```
23
23.0
'23'
```

```
def newline():
        print
```

```
l=range(10)
m=str(l)
type(m),m
```

```
(<type 'str'>, '[0, 1, 2, 3, 4, 5, 6, 7, 8, 9]')
```

```
print range(10,100,1.5)
newline()
[1..20,step=2]
```

```
[10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27,
28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45,
46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63,
64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81,
82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99]

[1, 3, 5, 7, 9, 11, 13, 15, 17, 19]
```

```
t='a','b','c'
m=1,2,3
m;t
```

```
(1, 2, 3)
('a', 'b', 'c')
```

```
int(23),float(23),str(23),int("23"),int("23")==23,int(-23.9)
```

```
(23, 23.0, '23', 23, True, -23)
```

```
print 3*'fun';
print 'fun'+' '+ 'alt'
```

```
funfunfun
fun alt
```

```
l=str('1' '3' '4' '5')
print l[1]+l[2],len(l)
type(l)
```

```
34 4
<type 'str'>
```

```
a=srange(1,end=2,step=.1,universe=None,\
check=True,include_endpoint=False,endpoint_tolerance=1.0e-5)
a
```

```
[1.00000000000000,
 1.10000000000000,
 1.20000000000000,
 1.30000000000000,
 1.40000000000000,
 1.50000000000000,
 1.60000000000000,
 1.70000000000000,
 1.80000000000000,
 1.90000000000000]
```

```
list=srange(2,2*pi,step=n(pi/2),universe=RDF)
print list
print type(list)
list.extend(list1)
print list
```

```
[2.0, 3.5707963267948966, 5.141592653589793]
<type 'list'>
[2.0, 3.5707963267948966, 5.141592653589793, 1, 'abc', True, 'c', 5, [1,
3, 4, 5, 6, 7]]
```

```
first_name='John';last_name='Smith'
full_name=first_name+' '+last_name
print full_name ;\
len(full_name);\
full_name[:len(first_name)];full_name[-len(last_name):];full_name.upper();
```

```
John Smith
'John'
'Smith'
'JOHN SMITH'
```

```
def abs(x):#define absolute value function
    if x>=0:
        return x
    else:
        return -x
```

```
abs(-2);abs(0);abs(sqrt(2))
```

```
2
0
sqrt(2)
```

```
def unit_vector(x,y,z):#defin unite vector
   norm=sqrt(x^2+y^2+z^2)
   return x/norm,y/norm,z/norm
```

```
unit_vector(1,-2,2)
```

```
(1/3, -2/3, 2/3)
```

```
x=3;y=2;z=1
u_1,u_2,u_3=unit_vector(x,y,z)
u=(u_1,u_2,u_3)
print "u="+str(u)
```

```
u=(3/14*sqrt(14), 1/7*sqrt(14), 1/14*sqrt(14))
```

```
#factorial function
def fact(n):
    if n<0 or type(n)!=type(1):
        print "n must be a positive integer number"
    else:
      x=1
      for i in range(1,n+1):
        x=i*x
      return(x)
```

```
fact(-3); fact(2.3); fact(5)
```

```
n must be a positive integer number
n must be a positive integer number
120
```

```
d=1,2,3
e=-1,0
d,e=e,d
d;e
x=2
x+=3
x
```

```
def factorial(n):
    if n==0:
        return 1
    else:
        r=factorial(n-1)
        fact=n*r
        return fact
```

```
def dbltable(x):
    for i in [1..10]:
        print x,'\t',log(x)/log(2)
```

```
dbltable(x)
```

```
0.500000000000000*pi    log(0.500000000000000*pi)/log(2)
0.500000000000000*pi    log(0.500000000000000*pi)/log(2)
0.500000000000000*pi    log(0.500000000000000*pi)/log(2)
0.500000000000000*pi    log(0.500000000000000*pi)/log(2)
0.500000000000000*pi    log(0.500000000000000*pi)/log(2)
0.500000000000000*pi    log(0.500000000000000*pi)/log(2)
0.500000000000000*pi    log(0.500000000000000*pi)/log(2)
0.500000000000000*pi    log(0.500000000000000*pi)/log(2)
0.500000000000000*pi    log(0.500000000000000*pi)/log(2)
0.500000000000000*pi    log(0.500000000000000*pi)/log(2)
```

```
Traceback (click to the left of this block for traceback)
...
IndentationError: unexpected indent
```

```
for i in range(1,4):
    for j in [1..4]:
        print i*j,
        newline()
```

```
1
2
3
4
2
4
6
8
3
6
9
12
```

```
def multiplies(n,high):
    i=1
    while i<=high:
          print n*i,'\t',
          i=i+1
```

```
multiplies(10,10)
```

```
    10      20      30      40      50      60      70      80      90      100
```

```
def multitable(n,high):
    i=1
    while i<=high:
        print multiplies(i)
        print
        i=i+1
```

```
def find (str,ch):
    index=0
    while index<len(str):
        if str[index]=='ch':
            return index
            index+=1
            return "No character find!"
```

evaluate