FUNCTIONS(module)

a block of code to do a particular task.

```
def sum(a,b):
        c=a+b
        print(c)
sum(10,20)#calling sum() function
```

Need of the function:

- Avoids repetition in code
- Functions can be reused(reusability)

```
sum=0
for i in range(4,10):
        sum=sum+i
print(sum)
sum=0
for i in range(10,15):
        sum=sum+i
print(sum)
sum=0
for i in range(3,9):
        sum=sum+i
print(sum)
```

```
def sum(x,y):
        sum=0
        for i in range(x,y):
                sum=sum+i
        print(sum)
sum(4,10)
sum(10,15)
sum(3,9)
```

Note

- first define the function then call
- unless you call, you dont enter into function definition

arguments

```
def my_function(name):
    print(name)
my_function("tree")
my_function(3.4)
my_function(6)
```

formal and actual arguments

```
def sum(a,b):
    c=a+b
    print(c)
x=10
y=20
sum(x,y)
```

positional parameters

```
def mydata(age,sal,city,gen):
    print(age,sal,city,gen)
mydata(20,25000,"tokyo",'f')
```

keyword parameters

```
def mydata(age,sal,city,gen):
    print(age,sal,city,gen)
mydata(city="tokyo",gen='f',age=20,sal=25000)
```

keyword arguments must come after positional arguments

```
def mydata(x,y,z,age,sal,city,gen):
    print(age,sal,city,gen,x,y,z)
mydata(3,4,5,city="tokyo",gen='f',age=20,sal=25000)
```

flow of execution

```
print("welcome IT GUYS")
def peep():
    print("entered into  peep")
    print("milk")
    print("leaving peep")
def see():
    print("entered into  see")
```

```
        print("tea")
        peep()
        print("leaving see")
def look():
        print("entered into  look")
        print("coffee")
        see()
        print("leaving look")
look()
print("bye IT GUYS")
```

Function returning multiple values

```
a=10
b=[2,3,4,5]
c="rossel leaves"
def multi():
    print("yoghurt")
    return a,b,c
x,y,z=multi()
print(x,y,z,sep=",")
```

local and global variables

```
a=10#global variables
def eat():
        a=20#local to eat()
        print(a)
def vomit():
        print(a)
        eat()
vomit()
print(a)
```

fruitful function

```
functions that return a value

def square(val):
        return val*val
n=int(input("enter num:"))
result=square(n)
print("the suare of ",n," is:",result);
```

Recursive function

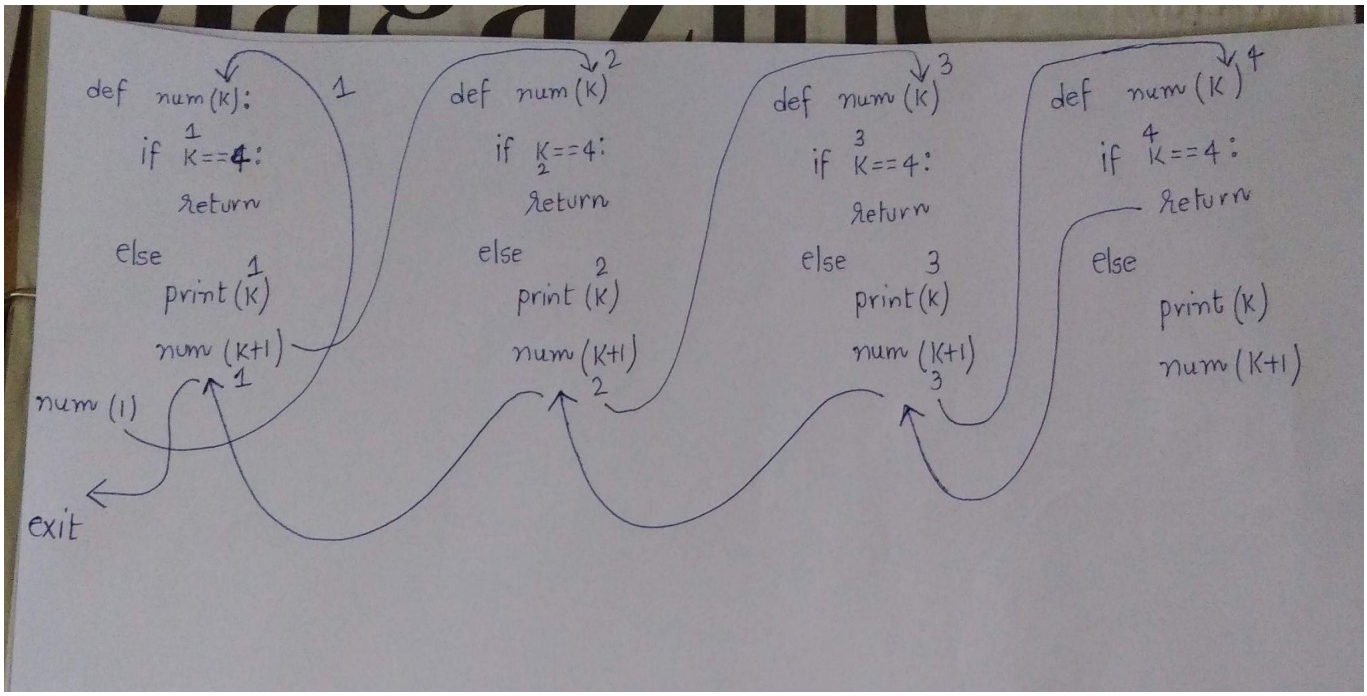
It is a process of calling a function by itself

Infinite Recursion

```
def show():
    print("i am tired")
    show()
print("welcome")
show()
print("bye")#unreachable (dead code)
```

Displaying 1-10 numbers using recursion

```
def num(k):
   if k==3:        //base condition to come out of recursion
       return
   else:
       print(k)
       num(k+1)
num(1)
```

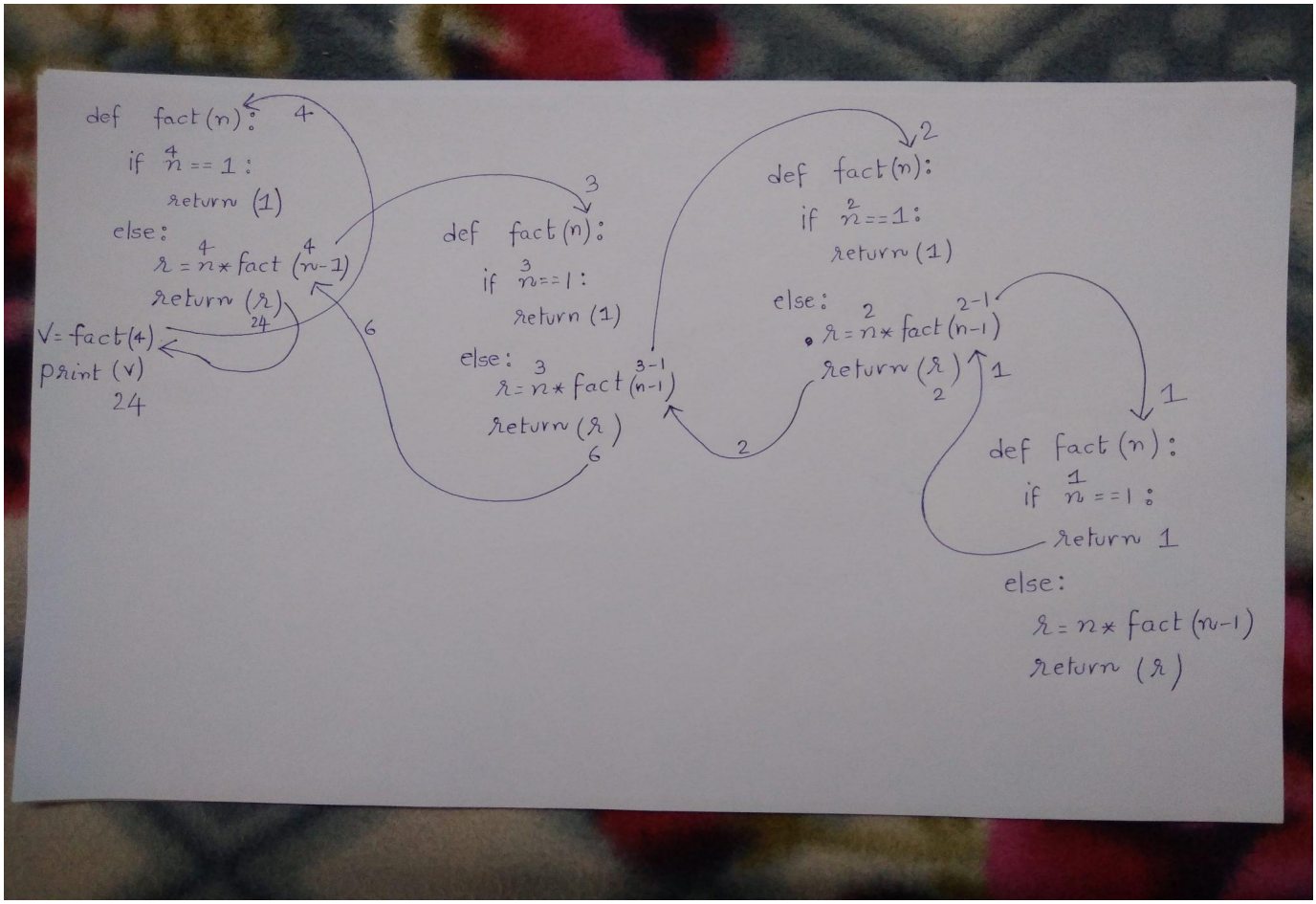

def num(K):
if K==4:
return
else
print(K)
num(K+1)
num(1)
exit
def num(K)
if K==4:
return
else
print(K)
num(K+1)
def num(K)
if K==4:
return
else
print(K)
num(K+1)
def num(K)
if K==4:
return
else
print(K)
num(K+1)

Note:

- every iterative problem can be expressed in terms of recursion(Whatever can be computed using recursion can also be computed using iteration, and vice versa.)
- Generally, a recursive function generally takes more time to execute than an equivalent iterative approach
- it is generally best to use an iterative approach .

Finding factorial

```
def fact(n):
    if n==1:
        return 1
    else:
        r=n*fact(n-1)
        return r
val=fact(1)
print(val)
```


def fact(n):
if n == 1:
return (1)
else:
r = n * fact (n-1)
return (r)
v = fact(4)
print (v)
24
4
4
4-1
24
6
3
def fact(n):
if n==1:
return (1)
else:
r = n * fact (n-1)
return (r)
3
3-1
6
2
def fact(n):
if n==1:
return (1)
else:
r = n * fact (n-1)
return (r)
2
2-1
2
1
def fact (n):
if n == 1:
return 1
else:
r = n * fact (n-1)
return (r)
1

Find sum of 1 to n numbers

```
def sum(n):
    if n==1:
        return 1
    else:
        r=n+sum(n-1)
        return r
val=sum(4)
print(val)
```

Displaying a string using recursion

```
name="svec"
def show(i):
    if i==-5:
       return
    else:

       print(name[i],end="")
       show(i-1)
```

```
show(-1)
print("\n")

--------------------------


name="i like potato in lunch"
slen=len(name)
def show(i):
    if i==slen:
        return
    else:

        print(name[i],end="")
        show(i+1)
show(0)
print("\n")

--------------------------
```

Exception handling

Exception:

An abnormal event or situation which stops normal flow of execution of a program or task

Few real time examples

- Pen not functioning in the middle of the exam

- Running out of petrol in the middle of a journey
- running out of gas in the middle of cooking
- Entering restricted characters in e –mail address
- The amount passed to withdraw exceeds the account's balance.
- Power cut in the middle of using word document
- You issue a command to read a file from a disk, but the file does not exist there.
- You attempt to write data to a disk, but the disk is full

All of the above are special cases because they occur rarely

Note:

- These errors are called exceptions because they are not usual occurrences; they are "exceptional.
- Exception means special case
- When a Python script raises an exception, it must either handle the exception immediately otherwise it terminates and quits.

Handling an exception