```
def displaynumbers(start,stop):
  if start > stop:
    return None
  print(start,end=' ')
  displaynumbers(start + 1, stop)

displaynumbers(10,30)
```

```
10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
```

```
def evennumbers(start,stop):
  if start > stop:
    return None
  if start % 2 == 0:
    print(start,end=' ')
  evennumbers(start + 1, stop)

evennumbers(100,130)
```

```
100 102 104 106 108 110 112 114 116 118 120 122 124 126 128 130
```

```
def evennumbers(start,stop,direction=1):
  if direction == 1:
    if start > stop:
      return None
    if start % 2 == 0:
      print(start,end=' ')
    evennumbers(start + 1, stop)
  elif direction == -1:
    if start < stop:
      return None
    if start % 2 == 0:
      print(start,end=' ')
    evennumbers(start - 1,stop,-1)
  else:
    print('Invalid direction')

evennumbers(100,130)
```

```
100 102 104 106 108 110 112 114 116 118 120 122 124 126 128 130
```

```
evennumbers(130,100,-1)
```

```
130 128 126 124 122 120 118 116 114 112 110 108 106 104 102 100
```

```
num = 13
for i in range(2,num):
  if num % i == 0:
    print(num,'is not a prime number')
    break
else:
  print(num,'is a prime number')
```

```
13 is a prime number
```

```
num = 13
i = 2
while i < num:
  if num % i == 0:
    print(num,'is not a prime number')
    break
  i = i + 1
else:
  print(num,'is a prime number')
```

```
13 is a prime number
```

```
def primenumber(num,i=2):
  if i == num:
    print(num,'is a prime number')
    return None
  if num % i == 0:
    print(num,'is not a prime number')
    return None
  primenumber(num,i+1)

primenumber(13)
```

```
13 is a prime number
```

```
primenumber(10)
```

```
10 is not a prime number
```

```
num = 5
fact = 1
for i in range(1,num + 1):
  fact = fact * i
else:
  print(fact)
```

```
120
```

```
num = 5
fact  = 1
while num != 0:
  fact = fact * num
  num = num - 1
else:
  print(fact)
```

```
120
```

```
def factorial(num,fact=1):
  if num == 0:
    print(fact)
    return None
  fact = fact * num
  factorial(num-1,fact)

factorial(5)
```

```
120
```

```
def combinations(a,s1=''):
  if len(a) == 0:
    pass
    print(s1)
  else:
    for i in range(len(a)):
      #print('s1 = ',s1)
      #print(a[:i]+a[i+1:])
      #print(a)
      combinations(a[:i] + a[i+1:],s1 + a[i])

combinations('abc')
```

```
abc
acb
bac
bca
cab
cba
```

```
for num in range(10,30):
  for i in range(2,num):
    if num % i == 0:
      break
  else:
    print(num,end=' ')
```

```
11 13 17 19 23 29
```

```
num = 10
while num < 30:
  i = 2
  while i < num:
    if num % i == 0:
      break
    i = i + 1
  else:
    print(num,end=' ')
  num = num + 1
```

```
11 13 17 19 23 29
```

```
def isprime(num,i=2):
  if num == i:
    return True
  if num % i == 0:
    return False
  return isprime(num,i+1)

def generateprime(start,stop):
  if start == stop:
    return None
  if isprime(start):
    print(start,end=' ')
  generateprime(start + 1,stop)

generateprime(10,30)
```

```
11 13 17 19 23 29
```

```
total = 0
for i in range(10,31):
  if i%2 == 0:
    total = total + i
else:
  print('total :',total)
```

```
total : 220
```

```
total = 0
i = 10
while i < 31:
  if i%2 == 0:
```

```
      total = total + i
    i = i + 1
  else:
    print('total :',total)
```

```
total : 220
```

```
  def sumtotal(start,stop,total = 0):
    if start == stop:
      print('total :',total)
      return None
    if start%2 == 0:
      total = total + start
    sumtotal(start+1,stop,total)

  sumtotal(10,31)
```

```
total : 220
```