고급통계 프로그래밍 #3

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Ex 6.7

In [1]:

```
def is_power(a,b):

####1.나누어 떨어지는지 체크
    if (a%b !=0):
        return False
####2.a/b==1 인지 체크
    elif (a/b==1):
        return True
####3. 1, 2 중 하나를 만족 할 때까지 반복
    else:
        return is_power(a/b,b)
```

In [2]:

```
is_power(81,3)
```

Out[2]:

```
True
```

In [3]:

```
is_power(4,17)
```

Out[3]:

```
False
```

Ex 6.8

In [4]:

```
def gcd(a,b):

####1.기저 사례: gcd(a,0)=a
    if b==0:
        return a
####2.r에 대해 gcd(a,b) = gcd(b,r)
    else:
        r = a%b
        if r == 0:
            return b
        else:
            return gcd(b, r)
```

In [5]:

```
gcd(252, 105)
```

Out[5]:

21

Ex 7.3

In [6]:

```
## [sqaureroot]절 함수 구현
from random import randint
def square_root(a):
    i=randint(1,100)
    x =  i* float(a)
    epsilon = 0.000001
    while True:
        y = (x + a/x) / 2
        if abs(y-x) < epsilon:
            break
        x = y
    return x
```

In [7]:

```
# test_sqaure_root 함수
from math import sqrt
def test_square_root(a):
    for i in range(1,a):
        a = float(i)
        ans1 = square_root(i)
        ans2 = sqrt(i)
        b = abs(ans1-ans2)
        print('%-2.2f, %-2.9f, %-2.9f, %-2.9f' %(a, ans1, ans2, b))
```

In [8]:

```
test_square_root(10)
```

```
1.00, 1.000000000, 1.000000000, 0.000000000
2.00, 1.414213564, 1.414213562, 0.000000002
3.00, 1.732051414, 1.732050808, 0.000000606
4.00, 2.000000155, 2.000000000, 0.000000155
5.00, 2.236067978, 2.236067977, 0.000000000
6.00, 2.449489747, 2.449489743, 0.000000004
7.00, 2.645751571, 2.645751311, 0.000000260
8.00, 2.828427309, 2.828427125, 0.000000184
9.00, 3.000000001, 3.000000000, 0.000000001
```

Ex 7.4

In [9]:

```
from math import *
def eval_loop():
    while True:
        x = str(input('Enter what you want:')) # 입력받고
        if x == 'done' : break #done 입력시 break
        print(eval(x)) #그 외의 경우 eval(x) print
```

In [10]:

```
eval_loop()
```

```
Enter what you want:12+43/4
22.75
Enter what you want:334+21-32/4
347.0
Enter what you want:3/17
0.17647058823529413
Enter what you want:1
1
Enter what you want:done
```