017

```
import math
math.gcd(60,100,80)
```

```
20
```

```
60/2.,100/20,80/20
```

```
(30.0, 5.0, 4.0)
```

018

```
import math
math.lcm(15,25)
```

```
75
```

019

```
0.1*3==0.3
```

```
False
```

```
0.1*3
```

```
0.30000000000000004
```

```
import math

print(math.isclose(0.1*3,0.3)) #0.1*3==0.3
print(math.isclose(1.2-0.1,1.1))
print(math.isclose(0.1*0.1,0.01))
```

```
True
True
True
```

```
from decimal import Decimal
print(Decimal('0.1')*3)
print(Decimal('1.2')-Decimal('0.1')) # return 자료형 : decimal
print(Decimal('0.1')*Decimal('0.1'))
print(float(Decimal('1.2')-Decimal('0.1'))==1.1) #다시 float형으로 바꿔서 비교함.
```

```
0.3
1.1
0.01
True
```

020 (fractions.Fracion)

```
from fractions import Fraction
a=Fraction(1,5)
a
```

```
Fraction(1, 5)
```

```
from fractions import Fraction
a=Fraction(1/5) # 1을 5로 나눈 float형태 값이 Fraction인자로 들어감. 우리가 생각하는 1/5(분수)가 아님.
a
```

```
Fraction(3602879701896397, 18014398509481984)
```

```
a=Fraction('1/5')
a
```

```
Fraction(1, 5)
```

```
a.numerator
```

```
1
```

```
a.denominator
```

```
5
```

```
a.real
```

```
Fraction(1, 5)
```

```
result=Fraction(1,5)+Fraction(2,5) #분수의 덧셈,뺄셈, 나눗셈, 곱셈 모두 지원
result
```

```
Fraction(3, 5)
```

```
float(result)
```

```
0.6
```

021 random

```
# random_sample.py
import random

result = []
while len(result) < 6:
    num = random.randint(1, 45)  # 1~45 사이의 숫자중 임의의 숫자 생성
    if num not in result:
      result.append(num)

print(result)  # 무작위 생성된 6개의 숫자 출력
```

```
[19, 9, 22, 29, 32, 35]
```

```
result =[]
for num in range(45):
  result.append(num+1)

print(result)
```

```
[1, 2, 3, 4, 5, 6, 7, 8, 9, 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,
```

```
random.shuffle(result)
print(result)
```

```
[1, 28, 31, 5, 39, 13, 11, 30, 37, 12, 9, 44, 29, 41, 26, 40, 43, 17, 20, 38, 32, 15, 42, 7, 33, 14, 22, 21, 23, 10, 4, 3, 25, 35, 18, 16, 34, 1
```

```
result[:6]
```

```
[1, 28, 31, 5, 39, 13]
```

```
import random
lotto=[]
while len(lotto)<6:
  num=random.choice(result)
  if num not in lotto:
    lotto.append(num)

print(lotto)
```

```
[38, 13, 29, 9, 44, 18]
```

```
a=[1,2,3,4,5]
random.shuffle(a)
a
```

```
[3, 5, 4, 2, 1]
```

```
a=[1,2,3,4,5]
random.choice(a)
```

```
2
```

022 statistics

```
import statistics
marks=[78,93,99,95,51,71,52,43,81,78]
statistics.mean(marks)
```

```
74.1
```

```
statistics.median(marks)
```

```
78.0
```

023 (itertools.cycle)

```
for i in [1,2,3]:
  print(i)
```

```
1
2
3
```

```
lst=iter([1,2,3])
lst
```

```
<list_iterator at 0x7f1f95ebcfd0>
```

```
lst=iter([1,2,3])
```

```
next(lst)
```

```
1
```

```
next(lst)
```

```
2
```

```
next(lst)
```

```
3
```

```
1
```

```
import itertools
emp_pool=itertools.cycle(['김은경','이명자','이성진'])
print(next(emp_pool))
print(next(emp_pool))
print(next(emp_pool))
print(next(emp_pool))
```

```
김은경
이명자
이성진
김은경
```

024 (itertools.accumulate())

```
#itertools_accumulate_sample.py
import itertools

monthly_income = [1161, 1814, 1270, 2256, 1413, 1842, 2221, 2207, 2450, 2823, 2540, 2134]
result = list(itertools.accumulate(monthly_income))

print(result)
```

```
[1161, 2975, 4245, 6501, 7914, 9756, 11977, 14184, 16634, 19457, 21997, 24131]
```

```
# 일반적으로 생각나는 방법
monthly_income = [1161, 1814, 1270, 2256, 1413, 1842, 2221, 2207, 2450, 2823, 2540, 2134]
accum_income=[]

```

```
for i,income in enumerate(monthly_income):
  if i<1:
    accum_income.append(income)
  else:
    accum_income.append(accum_income[i-1]+income)

print(accum_income)
```

```
[1161, 2975, 4245, 6501, 7914, 9756, 11977, 14184, 16634, 19457, 21997, 24131]
```

```
import itertools
montly_income=[1161,1814,1270,2256,1413,1842,2221,2207,2450,2823,2540,2134]
result=list(itertools.accumulate(monthly_income,max))

print(result)
```

```
[1161, 1814, 1814, 2256, 2256, 2256, 2256, 2256, 2450, 2823, 2823, 2823]
```