```
#################################################################

# =============== sequence  ===============
score = [ 88, 95, 70, 100, 99 ]
for s in score:
    print("성적 :", s)

# =============== sequence2  ===============
score = [ 88, 95, 70, 100, 99 ]
no = 1
for s in score:
    print(str(no) + "번 학생의 성적 :", s)
    no += 1

# =============== sequence3  ===============
score = [ 88, 95, 70, 100, 99 ]
for no in range(len(score)):
    print(str(no + 1) + "번 학생의 성적 :", score[no])

# =============== enumerate  ===============
score = [ 88, 95, 70, 100, 99 ]
for no, s in enumerate(score, 1):
    print(str(no) + "번 학생의 성적 :", s)

# =============== zip  ===============
yoil = ["월", "화", "수", "목","금", "토", "일"]
food = ["갈비탕", "순대국", "칼국수", "삼겹살"]
menu = zip(yoil, food)
for y, f in menu:
    print("%s요일 메뉴 : %s" % (y, f))

# =============== anyall  ===============
adult = [True, False, True, False ]
print(any(adult))
print(all(adult))

# =============== filter  ===============
def flunk(s):
    return s < 60

score = [ 45, 89, 72, 53, 94 ]
```

```
for s in filter(flunk, score):
    print(s)

# =============== map  ===============
def half(s):
    return s / 2

score = [ 45, 89, 72, 53, 94 ]
for s in map(half, score):
    print(s, end = ', ')

# =============== map2  ===============
def total(s, b):
    return s + b

score = [ 45, 89, 72, 53, 94 ]
bonus = [ 2, 3, 0, 0, 5 ]
for s in map(total, score, bonus):
    print(s, end=", ")

# =============== lambda  ===============
score = [ 45, 89, 72, 53, 94 ]
for s in filter(lambda x:x < 60, score):
    print(s)

# =============== lambda2  ===============
score = [ 45, 89, 72, 53, 94 ]
for s in map(lambda x:x / 2, score):
    print(s, end=", ")

# =============== varcopy  ===============
a = 3
b = a
print("a = %d, b = %d" % (a, b))

a = 5
print("a = %d, b = %d" % (a, b))

# =============== listcopy  ===============
list1 = [ 1, 2, 3 ]
list2 = list1
```

```
list2[1] = 100
print(list1)
print(list2)

# =============== listcopy2  ===============
list1 = [ 1, 2, 3 ]
list2 = list1.copy()

list2[1] = 100
print(list1)
print(list2)

# =============== deepcopy  ===============
list0 = [ 'a', 'b' ]
list1 = [ list0, 1, 2 ]
list2 = list1.copy()

list2[0][1] = 'c'
print(list1)
print(list2)

# =============== deepcopy2  ===============
import copy

list0 = [ "a", "b" ]
list1 = [ list0, 1, 2 ]
list2 = copy.deepcopy(list1)

list2[0][1] = "c"
print(list1)
print(list2)

# =============== is  ===============
list1 = [ 1, 2, 3 ]
list2 = list1
list3 = list1.copy()

print("1 == 2" , list1 is list2)
print("1 == 3" , list1 is list3)
print("2 == 3" , list2 is list3)
```

```
# =============== varis  ===============
a = 1
b = a
print("a =", a, " b =", b, ":", a is b)
b = 2
print("a =", a, " b =", b, ":", a is b)

#################################################################

# =============== import  ===============
import math

print(math.sqrt(2))

# =============== fromimport  ===============
from math import sqrt

print(sqrt(2))

# =============== importas  ===============
import math as m

print(m.sqrt(2))

# =============== fromas  ===============
from math import sqrt as sq

print(sq(2))

# =============== sin  ===============
import math

print(math.sin(math.radians(45)))
print(math.sqrt(2))
print(math.factorial(5))

# =============== sincurve  ===============
import math
import turtle as t
```

```
t.penup()
t.goto(-720,0)
t.pendown()
for x in range(-720, 720) :
    t.goto(x, math.sin(math.radians(x)) * 100)
t.done()

# =============== statistics  ===============
import statistics

score = [30, 40, 60, 70, 80, 90]
print(statistics.mean(score))
print(statistics.harmonic_mean(score))
print(statistics.median(score))
print(statistics.median_low(score))
print(statistics.median_high(score))

# =============== time  ===============
import time

print(time.time())

# =============== ctime  ===============
import time

t = time.time()
print(time.ctime(t))

# =============== structtime  ===============
import time

t = time.time()
print(time.localtime(t))

# =============== localtime  ===============
import time

now = time.localtime()
print("%d년 %d월 %d일" % (now.tm_year, now.tm_mon, now.tm_mday))
print("%d:%d:%d" % (now.tm_hour, now.tm_min, now.tm_sec))
```

```
# =============== datetime  ===============
import datetime

now = datetime.datetime.now()
print("%d년 %d월 %d일" % (now.year, now.month, now.day))
print("%d:%d:%d" % (now.hour, now.minute, now.second))

# =============== ellapse  ===============
import time

start = time.time()
for a in range(1000):
    print(a)
end = time.time()
print(end - start)

# =============== sleep  ===============
import time

print("안녕하세요.")
time.sleep(1)
print("밤에 성시경이 두 명 있으면 뭘까요?")
time.sleep(5)
print("야간투시경입니다.")

# =============== sleep2  ===============
import time

for dan in range(2, 10):
    print(dan, "단")
    for hang in range(2, 10):
        print(dan, "*", hang, "=", dan*hang)
        time.sleep(0.2)
    print()
    time.sleep(1)

# =============== calendar  ===============
import calendar

print(calendar.calendar(2018))
print(calendar.month(2019, 1))
```

```
#calendar.prcal(2018)
#calendar.prmonth(2019, 1)

# =============== weekday  ===============
import calendar

yoil = ['월', '화', '수', '목', '금', '토', '일']
day = calendar.weekday(2020,8,15)
print("광복절은", yoil[day] + "요일이다." )

# =============== random  ===============
import random

for i in range(5):
    print(random.random())

# =============== randint  ===============
import random

for i in range(5):
    print(random.randint(1,10))

# =============== uniform  ===============
import random

for i in range(5):
    print(random.uniform(1,100))

# =============== choice  ===============
import random

food = ["짜장면", "짬뽕", "탕수육", "군만두"]
print(random.choice(food))

# =============== shuffle  ===============
import random

food = ["짜장면", "짬뽕", "탕수육", "군만두"]
print(food)
random.shuffle(food)
print(food)
```

```
# =============== sample  ===============
import random

food = ["짜장면", "짬뽕", "탕수육", "군만두"]
print(random.sample(food, 2))

# =============== lotto  ===============
import random

nums = random.sample(range(1, 46), 6)
nums.sort()
print(nums)

# =============== mathquiz  ===============
import random

a = random.randint(1, 9)
b = random.randint(1, 9)
question = "%d + %d = ? " % (a, b)
c = int(input(question))

if c == a + b:
    print("정답입니다.")
else:
    print("틀렸습니다.")

# =============== mathquiz2  ===============
import random

correct = 0
while True:
    a = random.randint(1, 9)
    b = random.randint(1, 9)
    question = "%d + %d = ?(끝낼 때는 0) " % (a, b)
    c = int(input(question))

    if c == 0:
        break
    elif c == a + b:
        print("정답입니다.")
```

```
        correct = correct + 1
    else:
        print("틀렸습니다.")

print("%d 개 맞췄습니다." % correct)

# =============== mathquiz3  ===============
import random

correct = 0
while True:
    a = random.randint(10, 99)
    b = random.randint(10, 99)
    op = random.randint(1, 3)

    if op == 1:
        ans = a + b
        mark = "+"
    elif op == 2:
        if (a < b):
            a, b = b, a
        ans = a - b
        mark = "-"
    else:
        ans = a * b
        mark = "*"

    question = "%d %s %d = ?(끝낼 때는 0) " % (a, mark, b)
    c = int(input(question))

    if c == 0:
        break
    elif c == ans:
        print("정답입니다.")
        correct = correct + 1
    else:
        print("틀렸습니다.")

print("%d 개 맞췄습니다." % correct)

# =============== randnum  ===============
```

```
import random

secret = random.randint(1,100)
while True:
    num = int(input("숫자를 입력하세요(끝낼 때 0) : "))
    if num == 0:
        break
    if num == secret:
        print("맞췄습니다")
        break
    elif num > secret:
        print("입력한 숫자보다 더 작습니다.")
    else:
        print("입력한 숫자보다 더 큽니다")

# =============== randnum2  ===============
import random

secret = random.randint(1,100)
count = 0
while True:
    num = int(input("숫자를 입력하세요(끝낼 때 0) : "))
    if num == 0:
        break
    count += 1
    if num == secret:
        print("%d번만에 맞췄습니다" % count)
        break
    elif num > secret:
        print("입력한 숫자보다 더 작습니다.")
    else:
        print("입력한 숫자보다 더 큽니다")

# =============== sys  ===============
import sys

print("버전 :", sys.version)
print("플랫폼 :", sys.platform)
if (sys.platform == "win32"):
    print(sys.getwindowsversion())
print("바이트 순서 :", sys.byteorder)
```

```
print("모듈 경로 :", sys.path)
sys.exit(0)

# =============== sysarg  ===============
import sys

print(sys.argv)

# =============== argcal  ===============
import calendar
import time
import sys

if (len(sys.argv) == 1):
    t = time.time()
    tm = time.localtime(t)
    calendar.prmonth(tm.tm_year, tm.tm_mon)
elif (len(sys.argv) == 2):
    print(calendar.calendar(int(sys.argv[1])))
elif (len(sys.argv) == 3):
    calendar.prmonth(int(sys.argv[1]), int(sys.argv[2]))
else:
    print("인수는 2개 이하여야 합니다.")

# =============== datecalc  ===============
import sys
import time

if (len(sys.argv) != 2):
    print("시작 날짜를 yyyymmdd로 입력하십시오.")
    sys.exit(0)

birth = sys.argv[1]
if (len(birth) != 8 or birth.isnumeric() == False):
    print("날짜 형식이 잘못되었습니다.")
    sys.exit(0)

tm = (int(birth[:4]), int(birth[4:6]), int(birth[6:8]), 0, 0, 0, 0, 0, 0)
ellapse = int((time.time() - time.mktime(tm)) / (24 * 60 * 60))
print(ellapse)
```

```
# =============== ellapsedate2  ===============
import sys
import time

year = int(input("태어난 년도를 입력하세요(4자리) : "))
month = int(input("태어난 월을 입력하세요 : "))
day = int(input("태어난 일을 입력하세요 : "))

tm = (year, month, day, 0, 0, 0, 0, 0, 0)
ellapse = int((time.time() - time.mktime(tm)) / (24 * 60 * 60))
print(ellapse)
```