출력 화면

problem 1.

```
minhyeok@minhyeok-VirtualBox:~/problem$ vim problem1.py
minhyeok@minhyeok-VirtualBox:~/problem$ cat problem1.py
def is_multiple(n,m):
    if n%m==0:
        return True
    else :
        return False
if __name__=='__main__':
    print (is_multiple(12,6))
minhyeok@minhyeok-VirtualBox:~/problem$ python3 problem1.py
True
minhyeok@minhyeok-VirtualBox:~/problem$ vim problem1.py
minhyeok@minhyeok-VirtualBox:~/problem$ cat problem1.py
def is_multiple(n,m):
    if n%m==0:
        return True
    else :
        return False
if __name__=='__main__':
    print (is_multiple(12,7))
minhyeok@minhyeok-VirtualBox:~/problem$ python3 problem1.py
False
minhyeok@minhyeok-VirtualBox:~/problem$
```

problem 2.

```
minhyeok@minhyeok-VirtualBox:~/problem$ vim problem2.py
minhyeok@minhyeok-VirtualBox:~/problem$ cat problem2.py
def is_even(k):
    while k>1:
        k=k-2
    if k==0 :
        return True
    else :
        return False

if __name__=='__main__':
    print (is_even(50))
minhyeok@minhyeok-VirtualBox:~/problem$ python3 problem2.py
True
minhyeok@minhyeok-VirtualBox:~/problem$ vim problem2.py
minhyeok@minhyeok-VirtualBox:~/problem$ cat problem2.py
def is_even(k):
    while k>1:
        k=k-2
    if k==0 :
        return True
    else :
        return False

if __name__=='__main__':
    print (is_even(51))
minhyeok@minhyeok-VirtualBox:~/problem$ python3 problem2.py
False
```

problem 4.

```
minhyeok@minhyeok-VirtualBox:~/problem$ vim problem4.py
minhyeok@minhyeok-VirtualBox:~/problem$ cat problem4.py
def samearr_length():
    a=[1,2,3,4,5]
    b=[6,7,8,9,10]
    c=list()

    for i in range(len(a)):
        c.append(a[i]*b[i])
    return c

if __name__=='__main__':
    print (samearr_length())
minhyeok@minhyeok-VirtualBox:~/problem$ python3 problem4.py
[6, 14, 24, 36, 50]
minhyeok@minhyeok-VirtualBox:~/problem$
```

problem 6.

```
minhyeok@minhyeok-VirtualBox:~/problem$ vim problem6.py
minhyeok@minhyeok-VirtualBox:~/problem$ cat problem6.py
def convert_pound(p):
    k=p*0.454
    return k

if __name__=='__main__':
    print(convert_pound(10))
minhyeok@minhyeok-VirtualBox:~/problem$ python3 problem6.py
4.54
minhyeok@minhyeok-VirtualBox:~/problem$
```

problem 8.

```
minhyeok@minhyeok-VirtualBox:~/problem$ vim problem8.py
minhyeok@minhyeok-VirtualBox:~/problem$ cat problem8.py
def people_average():
    people=[1500,33,7,45,49,101,21]
    return float(sum(people))/len(people)

if __name__=='__main__':
    print (people_average())
minhyeok@minhyeok-VirtualBox:~/problem$ python3 problem8.py
250.85714285714286
minhyeok@minhyeok-VirtualBox:~/problem$
```

problem 9.

```
minhyeok@minhyeok-VirtualBox:~$ cd problem
minhyeok@minhyeok-VirtualBox:~/problem$ clear
minhyeok@minhyeok-VirtualBox:~/problem$ vim alkaline_metals.txt
minhyeok@minhyeok-VirtualBox:~/problem$ vim problem9.py
minhyeok@minhyeok-VirtualBox:~/problem$ cat alkaline_metals.txt
4 9.012
12 24.305
20 20.078
38 87.62
56 137.327
88 226
minhyeok@minhyeok-VirtualBox:~/problem$ cat problem9.py
def alkali():
    f=open("alkaline_metals.txt")
    data=f.readlines()
    mlist=list()
    for i in data :
        m=list()
        i=i.split()
        for w in i :
            m.append(float(w))
            mlist.append(m)

    akali_m_weight=0.0
    for mdata in mlist :
        if int(mdata[0])%8==3 or int(mdata[0])%8==-1:
            akali_m_weight+=mdata[1]

    return akali_m_weight

if __name__=='__main__':
    print(alkali())
minhyeok@minhyeok-VirtualBox:~/problem$ python3 problem9.py
0.0
minhyeok@minhyeok-VirtualBox:~/problem$
```

problem 10.

```
minhyeok@minhyeok-VirtualBox:~/problem$ vim problem10.py
minhyeok@minhyeok-VirtualBox:~/problem$ cat problem10.py
def change_temperature(ft):
    ct=(ft-32.0)/1.8
    return ct
if __name__=='__main__':
    t=float(input("What is Fahrenheit degrees?"))
    print (change_temperature(t))
minhyeok@minhyeok-VirtualBox:~/problem$ python3 problem10.py
What is Fahrenheit degrees?100
37.77777777777778
minhyeok@minhyeok-VirtualBox:~/problem$
```

problem 11.

```
minhyeok@minhyeok-VirtualBox:~/problem$ vim problem11.py
minhyeok@minhyeok-VirtualBox:~/problem$ cat problem11.py
def change_temperature(ft):
    ct=(ft-32.0)/1.8
    return ct

def change_two_temperature(ct):
    ft=ct*1.8+32
    return ft

if __name__=='__main__':
    t1=float(input("What is Fahrenheit degrees?"))
    print (change_temperature(t1))
    t2=float(input("What is Celsius degrees?"))
    print (change_two_temperature(t2))
minhyeok@minhyeok-VirtualBox:~/problem$ python3 problem11.py
What is Fahrenheit degrees?100
37.77777777777778
What is Celsius degrees?37.7777777777
99.99999999986001
```

problem 12.

```
minhyeok@minhyeok-VirtualBox:~/problem$ vim problem12.py
minhyeok@minhyeok-VirtualBox:~/problem$ cat problem12.py
def pathlength(x,y):
    length_sum=0
    calc_num=len(x)-1
    for i in range(calc_num):
        length_sum+=((x[i]-x[i+1])**2+(y[i]-y[i+1])**2)**0.5
    return length_sum
if __name__=='__main__':
    a=list()
    b=list()
    for i in range(4):
        a.append(float(input("x[%d] -> "%i)))
        b.append(float(input("y[%d] -> "%i)))
    print("Pathlength is ",pathlength(a,b))
minhyeok@minhyeok-VirtualBox:~/problem$ python3 problem12.py
x[0] -> 1
y[0] -> 1
x[1] -> 2
y[1] -> 1
x[2] -> 2
y[2] -> 2
x[3] -> 1
y[3] -> 2
Pathlength is  3.0
```

problem 13.

```
minhyeok@minhyeok-VirtualBox:~/problem$ vim problem13.py
minhyeok@minhyeok-VirtualBox:~/problem$ cat problem13.py
import math
def pathlength(x,y):
    length_sum=0
    calc_num=len(x)-1
    for i in range(calc_num):
        length_sum+=((x[i]-x[i+1])**2+(y[i]-y[i+1])**2)**0.5
    return math.pi-length_sum
if __name__=='__main__':
    for k in range(2,11):
        x=list()
        y=list()
        N=2*k
        print ("N= "+ str(N) +" error ",end="")
        for i in range(N+1):
            x.append(1/2*math.cos((2*math.pi*i)/N))
            y.append(1/2*math.sin((2*math.pi*i)/N))
        print (pathlength(x,y))

minhyeok@minhyeok-VirtualBox:~/problem$ python3 problem13.py
N= 4 error 0.31316552884360327
N= 6 error 0.14159265358979312
N= 8 error 0.0801251946690753
N= 10 error 0.0514227098403186
N= 12 error 0.035764112359544686
N= 14 error 0.026299578201392393
N= 16 error 0.02014750133174159
N= 18 error 0.015925455585047654
N= 20 error 0.012903352785176736
minhyeok@minhyeok-VirtualBox:~/problem$
```

problem 14.

```
    return ct
def change_C2K(ct2):
    kt=ct2+273.15
    return kt
def change_K2C(kt1):
    ct=kt1-273.15
    return ct
def change_F2K(ft2):
    kt=change_C2K(change_F2C(ft2))
    return kt
def change_K2F(kt2):
    ft=change_C2F(change_K2C(kt2))
    return ft

if __name__=='__main__':
    c_t1=float(input("What is Celsius degrees?"))
    print(change_C2F(c_t1))
    f_t1=float(input("What is Fahrenheit degrees?"))
    print(change_F2C(f_t1))
    c_t2=float(input("What is Celsius degrees?"))
    print(change_C2K(c_t2))
    k_t1=float(input("What is Kelvin degrees?"))
    print(change_K2C(k_t1))
    f_t2=float(input("What is Fahrenheit degrees?"))
    print(change_F2K(f_t2))
    k_t2=float(input("What is Kelvin degrees?"))
    print(change_K2F(k_t2))
minhyeok@minhyeok-VirtualBox:~/problem$ python3 problem14.py
What is Celsius degrees?10
50.0
What is Fahrenheit degrees?20
-6.666666666666666
What is Celsius degrees?30
303.15
What is Kelvin degrees?40
-233.14999999999998
What is Fahrenheit degrees?50
283.15
What is Kelvin degrees?60
-351.66999999999996
```

problem 15.

```
def change_C2F(ct1):
    ft=ct1*1.8+32
    return ft
def change_F2C(ft1):
    ct=(ft1-32)/1.8
    return ct
def change_C2K(ct2):
    kt=ct2+273.15
    return kt
def change_K2C(kt1):
    ct=kt1-273.15
    return ct
def change_F2K(ft2):
    kt=change_C2K(change_F2C(ft2))
    return kt
def change_K2F(kt2):
    ft=change_C2F(change_K2C(kt2))
    return ft

if __name__=='__main__':
    c_t1=float(input("What is Celsius degrees?"))
    print(change_C2F(c_t1))
    print(change_C2K(c_t1))
    f_t1=float(input("What is Fahrenheit degrees?"))
    print(change_F2C(f_t1))
    print(change_F2K(f_t1))
    k_t1=float(input("What is Kelvin degrees?"))
    print(change_K2C(k_t1))
    print(change_K2F(k_t1))

minhyeok@minhyeok-VirtualBox:~/problem$ python3 problem15.py
What is Celsius degrees?10
50.0
283.15
What is Fahrenheit degrees?20
-6.666666666666666
266.4833333333333
What is Kelvin degrees?30
-243.14999999999998
-405.66999999999996
```

problem 16.

```
minhyeok@minhyeok-VirtualBox:~/problem$ vim problem16.py
minhyeok@minhyeok-VirtualBox:~/problem$ vim data.txt
minhyeok@minhyeok-VirtualBox:~/problem$ cat data.txt
Hello DKU World.
I'm ParkMinHyeok.
my major is computer software.
minhyeok@minhyeok-VirtualBox:~/problem$ cat problem16.py
if __name__=='__main__':
    path="data.txt"
    line_count=0
    word_count=0
    delimiters_count=0

    fd=open(path)
    for line in fd.readlines() :
        line_count+=1
        word_count+=len(line.split())
        delimiters_count+=line.count(' ')

    print('Number of words ? ' + str(word_count))
    print('Number of delimiter characters ? ' + str(delimiters_count))
    print('Number of lines ? ' + str(line_count))
minhyeok@minhyeok-VirtualBox:~/problem$ python3 problem16.py
Number of words ? 10
Number of delimiter characters ? 7
Number of lines ? 3
minhyeok@minhyeok-VirtualBox:~/problem$
```

problem 17.

```
minhyeok@minhyeok-VirtualBox:~/problem$ python3
Python 3.6.7 (default, Oct 22 2018, 11:32:17)
[GCC 8.2.0] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> a=[1,3,5,7,9]
>>> b=[13,17]
>>> c=a+b
>>> print(c)
[1, 3, 5, 7, 9, 13, 17]
>>> b[0]=-1
>>> d=[e+1 for e in a]
>>> print(d)
[2, 4, 6, 8, 10]
>>> d.append(b[0]+1)
>>> d.append(b[-1]+1)
>>> print(d[:-2])
[2, 4, 6, 8, 10]
>>>
```

problem 18.

```
minhyeok@minhyeok-VirtualBox:~/problem$ vim problem18.py
minhyeok@minhyeok-VirtualBox:~/problem$ cat problem18.py
if __name__=='__main__':
    q=[['a', 'b', 'c'], ['d', 'e', 'f'], ['g', 'h']]

    print(q[0][0])
    print(q[1])
    print(q[2][1])
    print(q[1][0])
    print(q[-1][-2])
minhyeok@minhyeok-VirtualBox:~/problem$ python3 problem18.py
a
['d', 'e', 'f']
h
d
g
minhyeok@minhyeok-VirtualBox:~/problem$
```

problem 20.

```
minhyeok@minhyeok-VirtualBox:~/problem$ vim problem20.py
minhyeok@minhyeok-VirtualBox:~/problem$ python3 problem20.py
[1, 100, 10000, 1000000, 100000000]
[1, 100, 10000, 1000000, 100000000]
minhyeok@minhyeok-VirtualBox:~/problem$ cat problem20.py
if __name__=='__main__':
    q=[r**2 for r in [10**i for i in range(5)]]
    print (q)

    p=list()
    for i in range(5) :
        p.append(10**i)
    for i in range(5) :
        p[i]=p[i]**2
    print(p)

minhyeok@minhyeok-VirtualBox:~/problem$
```