Python 的作业

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Problem 1

```
def Print_values(a,b,c):
        if a>b:
                if b>c :
                        print('a,b,c');
                else:
                        if a>c:
                                print('a,c,b')
                        else:
                                print('c,a,b');
        else:
                if b>c:
                        print('c,a,b');
                else:
                        print('c,b,a')

import random
#random.randint(1, 100)
#生成 1-100 之间的随机整数
A=random.randint(1,100)
B=random.randint(1,100)
C=random.randint(1,100)
print(A)
print(B)
print(C)
Print_values(A,B,C)
```

运行一次程序，有如下输出结果值：

```
7
12
30
c,b,a
```

Problem 2

```
import random
import numpy as np
# 一般来说，可以使用公式 r = a + (b-a).*rand(N,1)
# 生成区间 (a,b) 内的 N 个随机数。
M1=np.zeros((5,10))
M2=np.zeros((10,5))
c =np.zeros((5,5))
```

```
for j in range(0,10,1):
    for i in range(0,5,1):
        M1[i,j]=random.randint(0,50)
        M2[j,i]=random.randint(0,50)

print(M1)
print(M2)

for i in range(0,5,1):
    for j in range(0,5,1):
        c[i,j]=0
        for k in range(0,5,1):
            c[i,j]= c[i,j]+M1[i,k]*M2[k,j]
#c 为 M1*M2 的结果
print(c)
```

例如随即运行一次程序的结果就是如下，分别是 M1 矩阵，M2 矩阵和最后 MI*M2 矩阵-c

```
[39.  0. 48. 39. 36. 36. 41. 35. 28. 13.]
 [47. 28. 42. 49.  5. 29. 16. 48.  5.  0.]
 [49. 17. 47. 14. 36.  7. 17. 29. 24. 38.]
 [ 3. 27. 12. 36. 30. 33. 23. 27. 26.  6.]
 [40. 10. 32. 36. 42.  4. 37. 27. 43. 48.]
[[ 3. 12. 40. 25. 25.]
 [39. 15. 39. 26. 22.]
 [24. 25. 46. 33. 19.]
 [26.  5.  7. 32. 17.]
 [12. 32. 36. 21. 15.]
 [ 2. 15.  3. 26. 24.]
 [42. 27.  7. 18. 18.]
 [ 4. 44. 34. 36. 13.]
 [10. 13. 44. 45. 43.]
 [43. 39. 48. 35. 15.]]
[[2715. 3015. 5337. 4563. 3090.]
 [3575. 2439. 5427. 4962. 3497.]
 [2734. 3240. 6179. 4422. 3270.]
 [2646. 1881. 3057. 2955. 1959.]
 [2718. 2954. 5226. 4350. 3070.]]
```

Problem3

该程序用于生成帕斯卡三角形并且打印这个三角形最后一行来达到题目的目的, 因为是输入

第几行就打印第几行故该程序可以实现这个目的

```
def Pascal_triangle(N):
    #li = [0 for i in range((N**2))]
    import numpy as np
    arr = np.eye(N, N, dtype=int)
    for i in range(N):
        arr[i][0] = 1
    for i in range(1, N):
        for j in range(N):
            arr[i][j] = arr[i-1][j-1]+arr[i-1][j]

    #  打印全部的 arr 和打印 arr 的最后一行
    #print(arr)
    print(arr[i,:])
```

调用这个函数程序，显示的结果如下

```
Pascal_triangle(100)
[          1          99        4851      156849     3764376    71523144
  1120529256  2002129656  -597829084   159125356  1432128204  1825929796
  -926405816  1729377624  -420881928  1909969704   363664530 -1003557898
  -754015050  -953976110   479062856 -1674689448 -2033019592   850050024
   544341428  1633024284  -968657348  -391942380  1446415192 -1049948536
 -1018224152   643124088  -243974049  -495341251   554326029 -1424804401
  -624111248  -598355120  1058194576   553851184 -1316706872 -1475752104
  -197243112  -361344760 -1631248048   392345328  -286371536  -688458736
 -1461658180  -469488972  -469488972 -1461658180  -688458736  -286371536
   392345328 -1631248048  -361344760  -197243112 -1475752104 -1316706872
   553851184  1058194576  -598355120  -624111248 -1424804401   554326029
  -495341251  -243974049   643124088 -1018224152 -1049948536  1446415192
  -391942380  -968657348  1633024284   544341428   850050024 -2033019592
 -1674689448   479062856  -953976110  -754015050 -1003557898   363664530
  1909969704  -420881928  1729377624  -926405816  1825929796  1432128204
   159125356  -597829084  2002129656  1120529256    71523144     3764376
      156849        4851          99           1]

Pascal_triangle(200)
[          1         199       19701     1293699    63391251 -1822708507
 -1668011113   641624241 -1780887400   383098920 -1311055112  -270570936
    56022632 -1176428584 -2131225400 -1946965256  1232219684  1642806268
  1816820468  -550416404  -658780340 -1115828588 -1999939364  -265083324
 -1943944376  -722708744   779906408  -411299240   -72285448 -1759155768
 -1378614760  -865402072   825348242 -1810161794  -500559302 -1746212810
 -1751127818  -981776518  1239753534  -498538798 -1994155192 -1762379016
 -1721367960  1405993304 -2043242952   120441992 -2024371368   446460904
   697964980  -829309716  1807038148  1826569116  -417798980  1758535332
 -1926501748  1168266004  1163412312   658227048  -906218056  -855378552
 -1995883288 -1097940648  -504140728 -1573524616  2024969311 -1080408103
 -1672953749   461197341 -1883831059   656172571 -1235660823  -490791473
  1513574768  -896904688  -714600656   240654672  1522901648 -1973837840
  -223973296  -125581008  1959112136 -1947008392  1388419432  1077477464
    56289304  -681779288 -2002466504   -33797880  -433467056 -1312745168
 -1127247728 -1114232592   559364912  2121408592   -75094928   821203984
  -542018116   132903204  -475238932 -2090029516 -2090029516  -475238932
   132903204  -542018116   821203984   -75094928  2121408592   559364912
 -1114232592 -1127247728 -1312745168  -433467056   -33797880 -2002466504
  -681779288    56289304  1077477464  1388419432 -1947008392  1959112136
  -125581008  -223973296 -1973837840  1522901648   240654672  -714600656
  -896904688  1513574768  -490791473 -1235660823   656172571 -1883831059
   461197341 -1672953749 -1080408103  2024969311 -1573524616  -504140728
 -1097940648 -1995883288  -855378552  -906218056   658227048  1163412312
  1168266004 -1926501748  1758535332  -417798980  1826569116  1807038148
  -829309716   697964980   446460904 -2024371368   120441992 -2043242952
  1405993304 -1721367960 -1762379016 -1994155192  -498538798  1239753534
  -981776518 -1751127818 -1746212810  -500559302 -1810161794   825348242
  -865402072 -1378614760 -1759155768   -72285448  -411299240   779906408
  -722708744 -1943944376  -265083324 -1999939364 -1115828588  -658780340
  -550416404  1816820468  1642806268  1232219684 -1946965256 -2131225400
 -1176428584    56022632  -270570936 -1311055112   383098920 -1780887400
   641624241 -1668011113 -1822708507    63391251     1293699       19701
         199           1]
```

Problem4

```
import random
import math
a=random.randint(1,100)

step=0
print(a)
while a>1:
    if   math.fmod(a,2)==0:
        step=step+1
        a=a/2
    else:
        step=step+1
        a=(a-1)/2
        step=step+1
# step 就是最后的总步数
print(step)
```

这是一个输出结果，从 1 开始，想要快速的到达数字十九，至少需要 6 步

```
19

6
```

分析 1->2->4->8->9->18->19 共经历 6 步

Problem 5

question1：

```
def fun(res, num, sb: str):
    if len(num) == 1:
        for i in range(len(num)):
            a = num[i]
            b = num[:]
            b.pop(i)
            operate = str(a)
            sb = sb + operate
            if eval(sb) == res:
          print(sb + "=" + str(res))
            return True
        else:
            return False
    for i in range(len(num)):
        a = num[i]
        b = num[:]
        b.pop(i)
        operate = str(a)
        sb = sb + operate
        fun( res, b, sb+’+’)
        fun( res, b, sb+’-’)
        fun( res, b, sb+’*’)
        fun( res, b, sb+’/’)
        return "True"


num = [1, 2, 3, 4, 5, 6, 7, 8, 9]
result = fun(50, num, ‘ ’)
```

运行该程序将组后的一个 fun 函数里面的参数设置成为 50 时，结果如下。

```
1+2+3+4+5*6-7+8+9=50
1+2+3-4+5+6*7-8+9=50
1+2+3-4-5+6+7*8-9=50
1+2+3*4+5+6+7+8+9=50
1+2+3*4+5-6*7+8*9=50
1+2+3*4-5*6+7*8+9=50
1+2+3*4-5*6-7+8*9=50
1+2-3+4+5+6*7+8-9=50
1+2-3+4+5-6+7*8-9=50
1+2-3+4*5+6+7+8+9=50
1+2-3+4*5-6*7+8*9=50
1+2-3-4+5*6+7+8+9=50
1+2-3-4-5+6*7+8+9=50
1+2-3-4-5-6+7*8+9=50
1+2-3-4-5-6-7+8*9=50
1+2*3*4-5+6+7+8+9=50
1+2*3*4-5-6*7+8*9=50
1+2*3*4*5-6+7-8*9=50
1+2*3*4*5-6-7*8-9=50
1-2+3/4*5+6*7/8*9=50
1-2-3-4+5+6+7*8-9=50
1-2*3+4*5*6+7-8*9=50
1-2*3+4*5*6-7*8-9=50
1*2+3+4*5+6*7-8-9=50
1*2+3-4-5*6+7+8*9=50
1*2+3*4+5*6+7+8-9=50
1*2+3*4-5+6*7+8-9=50
1*2+3*4-5-6+7*8-9=50
1*2+3*4*5-6-7-8+9=50
1*2-3-4*5+6+7*8+9=50
1*2-3-4*5+6-7+8*9=50
1*2*3+4+5*6-7+8+9=50
1*2*3-4+5+6*7-8+9=50
1*2*3-4-5+6+7*8-9=50
```

注：本题我是参考了
https://blog.csdn.net/zhangyunwei_Blog/article/details/105335446?ops_request_misc=&request_id=&biz_id=102&utm_term=python%E4%B8%AD%E5%AE%9E%E7%8E%B0%E5%AF%B9123456789%E7%AD%89%E4%BA%8E100with%20t&utm_medium=distribute.pc_search_result.none-task-blog-2~all~sobaiduweb~default-0-105335446.pc_search_all_es&spm=1018.2226.3001.4187
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