2018年8月3日 星期五

数据结构第二次实验

2-1.py

```
'''逆运算 k = (k + 1) * 2 执行9次'''
k = 1
for i in range(9):
    k = (k + 1) * 2
print("猴子第一天摘了" + str(k) + “个桃子")
```

```
In [1]: runfile('/Users/zhujun/Downloads/USTC/专业补课/DS/DS-experiment/2-1.py', wdir='/Users/
zhujun/Downloads/USTC/专业补课/DS/DS-experiment')
猴子第一天摘了1534个桃子
```

2-2.py

```
'''根据行和列以及flag的值调整权重w， 最终产生z字形'''
n = eval(input())
i, j = 1, 1
w = [[0, 1],
     [1, -1],
     [1, 0],
     [-1, 1]]
flag = True
k = 1
index = 0
while k<n:
    if i == 1 and flag: # 垂直向下移动
        index = 0
        flag = False
    elif i == 1 and not flag: # 朝左下移动
        index = 1
        flag = True
    elif j == 1 and flag: # 水平向右移动
        index = 2
        flag = False
    elif j == 1 and not flag: # 朝右上移动
        index = 3
        flag = True
    i += w[index][0]
    j += w[index][1]
    k += 1

print("第N项为" + str(i) + "/" + str(j))
```

```
In [2]: runfile('/Users/zhujun/Downloads/USTC/专业补课/DS/DS-experiment/2-2.py', wdir='/Users/
zhujun/Downloads/USTC/专业补课/DS/DS-experiment')

7
第N项为1/4

In [3]: runfile('/Users/zhujun/Downloads/USTC/专业补课/DS/DS-experiment/2-2.py', wdir='/Users/
zhujun/Downloads/USTC/专业补课/DS/DS-experiment')

20
第N项为5/2
```

1

2-3.py

```
'''先求出某数所有因子，如果因子之和等于本身，则满足完数的条件'''
import math
def get(number):
    ylist = [1]
    for i in range(math.floor(math.sqrt(number))):
        j = i+1
        if j==1:
            continue
        else:
            if number%j==0:
                ylist.append(j)
                ylist.append(number/j)
    return ylist

if __name__=="__main__":
    j = 0
    for i in range(1001):
        if i>0:
            numberlist = get(i)
            if sum(numberlist) == i:
                print(i, end=" ")
                j += 1
            if j == 5:
                j = 0
                print("\n")
```

```
In [4]: runfile('/Users/zhujun/Downloads/USTC/专业补课/DS/DS-experiment/2-3.py', wdir='/Users/
zhujun/Downloads/USTC/专业补课/DS/DS-experiment')
1 6 28 496
```

2-4.py

```
'''累加即可'''
# 假设日期输入都是合法的
days = [31, 28, 31, 30, 31, 30, 31, 31, 30, 31, 30, 31]
cnt = 0
string = input()
year = eval(string.split()[0])
month = eval(string.split()[1])
day = eval(string.split()[2])
if year%4==0 and year%100!=0:
    days[1] = 29
if year%400==0:
    days[1] = 29
for i in range(month):
    if i==month-1:
        break
    cnt += days[i]
cnt += day
print("这是一年中的第" + str(cnt) + "天")
```

```
In [6]: runfile('/Users/zhujun/Downloads/USTC/专业补课/DS/DS-experiment/2-4.py', wdir='/Users/
zhujun/Downloads/USTC/专业补课/DS/DS-experiment')

2018 8 3
这是一年中的第215天
```

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2-5.py

```
'''利用python的split函数'''
string = input()
print("单词的个数为" + str(len(string.split())))
```

```
In [9]: runfile('/Users/zhujun/Downloads/USTC/专业补课/DS/DS-experiment/2-5.py', wdir='/Users/
zhujun/Downloads/USTC/专业补课/DS/DS-experiment')

abs qwe aaa dd
单词的个数为4
```

2-6.py

```
'''利用python的find函数'''
string = input()
tofind = "debug"
if string.find(tofind)!=-1:
    print("包含debug")
else:
    print("不包含debug")
```

```
In [10]: runfile('/Users/zhujun/Downloads/USTC/专业补课/DS/DS-experiment/2-6.py', wdir='/Users/
zhujun/Downloads/USTC/专业补课/DS/DS-experiment')

is a debug
包含debug
```

2-7.py

```
'''先排序再进行插入排序'''
string = input()
nlist = string.split()
for i in range(len(nlist)):
    nlist[i] = eval(nlist[i])
# 考试的时候写详细 不要调用库函数
nlist.sort(reverse=False)
number = eval(input())
index = 0
# 假设输入的数都是正整数
# 插入排序
for i in range(len(nlist)):
    if number < nlist[i]:
        index = i
        break
for i in range(len(nlist), index, -1):
    if i == len(nlist):
        nlist.append(0)
    nlist[i] = nlist[i-1]
nlist[index] = number
print(nlist)
```

```
In [11]: runfile('/Users/zhujun/Downloads/USTC/专业补课/DS/DS-experiment/2-7.py', wdir='/Users/
zhujun/Downloads/USTC/专业补课/DS/DS-experiment')

8 7 6 5 4 3

2
[2, 3, 4, 5, 6, 7, 8]
```

2-8.py

```
'''求出平均数再迭代比较'''
string = input()
nlist = string.split()
for i in range(len(nlist)):
    nlist[i] = eval(nlist[i])
sum = 0
for i in range(len(nlist)):
    sum += nlist[i]
avg = sum / len(nlist)
for i in range(len(nlist)):
    if nlist[i] > avg:
        print(nlist[i], end=' ')
```

```
In [12]: runfile('/Users/zhujun/Downloads/USTC/专业补课/DS/DS-experiment/2-8.py', wdir='/Users/
zhujun/Downloads/USTC/专业补课/DS/DS-experiment')

1 2 3 4 5 6 7 8
5 6 7 8
```