Assignment #5: Greedy穷举 Implementation

Updated 1939 GMT+8 Oct 21, 2024

2024 fall, Complied by 金俊毅，物理学院

1. 题目

04148: 生理周期

brute force, http://cs101.openjudge.cn/practice/04148

代码：

```
def cohim(a, b, c, d):
    i = 0
    while True:
        if (23*i + a -b)%28 == 0 and (23*i + a -c)%33 == 0 and (23*i + a - d) >
0:
            break
        else:
            i += 1
    return 23*i + a - d

s = 1
while True:
    a1,b1,c1,d1 = map(int, input().split())
    if a1 == -1:
        break
    print("Case "+str(s)+": the next triple peak occurs in
"+str(cohim(a1,b1,c1,d1))+" days.")
    s += 1
```

代码运行截图 （至少包含有"Accepted"）

18211: 军备竞赛

greedy, two pointers, http://cs101.openjudge.cn/practice/18211

代码:

```
p = int(input())
money = sorted(list(map(int, input().split())))
i = 0
j = len(money)-1
while i <= j and j >= 0:
    if p >= money[i]:
        p -= money[i]
        i += 1
        continue
    elif i+j+1-len(money) > 0:
        if i == j:
            break
        else:
            p += money[j]
            j -= 1
    else:
        break
print(i+j+1-len(money))
```

代码运行截图 ==（至少包含有"Accepted"）==

#46658875提交状态

查看 提交 统计 提问

状态: Accepted

源代码

```
p = int(input())
money = sorted(list(map(int, input().split())))
i = 0
j = len(money)-1
while i <= j and j >= 0:
    if p >= money[i]:
        p -= money[i]
        i += 1
        continue
    elif i+j+1-len(money) > 0:
        if i == j:
            break
        else:
            p += money[j]
            j -= 1
    else:
        break
print(i+j+1-len(money))
```

基本信息

#: 46658875
题目: 18211
提交人: 24n2400011454
内存: 3624kB
时间: 21ms
语言: Python3
提交时间: 2024-10-22 15:35:20

21554: 排队做实验

greedy, http://cs101.openjudge.cn/practice/21554

代码:

```
n = int(input())
times = list(map(int, input().split()))
experi = []
que = []
ave = 0
for i in range(n):
    experi.append((times[i], i+1))
experi.sort()
for i in range(n):
    que.append(str(experi[i][1]))
    ave += experi[i][0]*(n-1-i)
print(" ".join(que))
print("{:.2f}".format(ave/n))
```

代码运行截图 （至少包含有"Accepted"）

#46659134提交状态

查看 提交 统计 提问

状态: Accepted

源代码

```
n = int(input())
times = list(map(int, input().split()))
experi = []
que = []
ave = 0
for i in range(n):
    experi.append((times[i], i+1))
experi.sort()
for i in range(n):
    que.append(str(experi[i][1]))
    ave += experi[i][0]*(n-1-i)
print(" ".join(que))
print("{:.2f}".format(ave/n))
```

基本信息

#: 46659134
题目: 21554
提交人: 24n2400011454
内存: 3632kB
时间: 21ms
语言: Python3
提交时间: 2024-10-22 15:48:43

01008: Maya Calendar

implementation, http://cs101.openjudge.cn/practice/01008/

代码:

```
hab = {'pop':1, 'no':2, 'zip':3, 'zotz':4, 'tzec':5, 'xul':6, 'yoxkin':7,
'mol':8,
       'chen':9, 'yax':10, 'zac':11, 'ceh':12, 'mac':13, 'kankin':14, 'muan':15,
       'pax':16, 'koyab':17, 'cumhu':18, 'uayet':19}

tz = ['imix', 'ik', 'akbal', 'kan', 'chicchan', 'cimi', 'manik', 'lamat',
      'muluk', 'ok', 'chuen', 'eb', 'ben', 'ix', 'mem', 'cib', 'caban',
      'eznab', 'canac', 'ahau']


def alter(a, b, c): #a是1-20
    day = c*365 + (b-1)*20 + a
    year = day // 260
    other_day = day % 260
    if day % 260 == 0:
        year -= 1
        other_day = 260
```

```
    sym2 = tz[(other_day-1) % 20]
    sym1 = ((other_day-1) % 13) + 1
    return str(sym1) + ' ' + sym2 + ' ' + str(year)


n = int(input())
print(n)
for _ in range(n):
    hab_day = input().split()
    sym = hab_day[0].find(".")
    a1 = int(hab_day[0][:sym]) + 1
    b1 = hab[hab_day[1]]
    c1 = int(hab_day[2])
    print(alter(a1, b1, c1))
```

代码运行截图 （至少包含有"Accepted"）

#46660278提交状态

查看 提交 统计 提问

状态：Accepted

源代码

```
hab = {'pop':1, 'no':2, 'zip':3, 'zotz':4, 'tzec':5, 'xul':6, 'yoxkin':7, 'mol'
       'chen':9, 'yax':10, 'zac':11, 'ceh':12, 'mac':13, 'kankin':14, 'muan':1
       'pax':16, 'koyab':17, 'cumhu':18, 'uayet':19}

tz = ['imix', 'ik', 'akbal', 'kan', 'chicchan', 'cimi', 'manik', 'lamat',
      'muluk', 'ok', 'chuen', 'eb', 'ben', 'ix', 'mem', 'cib', 'caban',
      'eznab', 'canac', 'ahau']


def alter(a, b, c): #a是1-20
    day = c*365 + (b-1)*20 + a
    year = day // 260
    other_day = day % 260
    if day % 260 == 0:
        year -= 1
        other_day = 260
    sym2 = tz[(other_day-1) % 20]
    sym1 = ((other_day-1) % 13) + 1
    return str(sym1) + ' ' + sym2 + ' ' + str(year)


n = int(input())
print(n)
for _ in range(n):
    hab_day = input().split()
    sym = hab_day[0].find(".")
    a1 = int(hab_day[0][:sym]) + 1
    b1 = hab[hab_day[1]]
    c1 = int(hab_day[2])
    print(alter(a1, b1, c1))
```

基本信息

#:	46660278
题目:	01008
提交人:	24n2400011454
内存:	3724kB
时间:	25ms
语言:	Python3
提交时间:	2024-10-22 16:28:54

545C. Woodcutters

dp, greedy, 1500, https://codeforces.com/problemset/problem/545/C

代码：

```
n = int(input())
tree = []
for _ in range(n):
    tree.append(tuple(map(int, input().split())))
tree.sort()
```

```
sym = [0 for _ in range(n)]
if n >= 2:
    num = 2
    for i in range(1, n - 1):
        if sym[i - 1] == 0:
            if tree[i][0] - tree[i][1] > tree[i - 1][0]:
                num += 1
            elif tree[i][0] + tree[i][1] < tree[i + 1][0]:
                num += 1
                sym[i] = 1
        else:
            if tree[i][0] - tree[i][1] > tree[i - 1][0] + tree[i - 1][1]:
                num += 1
            elif tree[i][0] + tree[i][1] < tree[i + 1][0]:
                num += 1
                sym[i] = 1
else:
    num = 1
print(num)
```

代码运行截图 （至少包含有"Accepted"）

General

#	Author	Problem	Lang	Verdict	Time	Memory	Sent	Judged
287340278	Practice: jnullm	545C - 14	Python 3	Accepted	311 ms	15976 KB	2024-10-22 13:21:06	2024-10-22 13:21:06

→ Source

```
n = int(input())
tree = []
for _ in range(n):
    tree.append(tuple(map(int, input().split())))
tree.sort()
sym = [0 for _ in range(n)]
if n >= 2:
    num = 2
    for i in range(1, n - 1):
        if sym[i - 1] == 0:
            if tree[i][0] - tree[i][1] > tree[i - 1][0]:
                num += 1
            elif tree[i][0] + tree[i][1] < tree[i + 1][0]:
                num += 1
                sym[i] = 1
        else:
            if tree[i][0] - tree[i][1] > tree[i - 1][0] + tree[i - 1][1]:
                num += 1
            elif tree[i][0] + tree[i][1] < tree[i + 1][0]:
                num += 1
                sym[i] = 1
else:
    num = 1
print(num)
```

01328: Radar Installation

greedy, http://cs101.openjudge.cn/practice/01328/

思路：

代码：

```
import math


def min_num(n, position):
    have = 0
```

```
    i = 0
    while i < n:
        cover = list(position[i])
        if i == n-1:
            have += 1
            break
        j = i + 1
        while cover[1] >= position[j][0]:
            cover[1] = min(cover[1], position[j][1])
            cover[0] = max(cover[0], position[j][0])
            j += 1
            if j == n:
                break
        i = j
        have += 1
    return str(have)


count = 0
while True:
    d = 0
    line = input().split()
    if line == []:
        continue
    elif line == ["0", "0"]:
        break
    else:
        count += 1
        n1, d1 = map(int, line)
        position1 = [list(map(int, input().split())) for _ in range(n1)]
        position1.sort()
        xn = []
        for k in range(n1):
            if position1[k][1] > d1:
                d = -1
                break
        if d == -1:
            print("Case "+str(count)+": -1")
        else:
            for i in range(n1):
                long = math.sqrt(d1 ** 2 - position1[i][1] ** 2)
                xn.append((position1[i][0] - long, position1[i][0] + long))
            print("Case "+str(count)+": "+min_num(n1, xn))
```

代码运行截图 （至少包含有"Accepted"）

状态：Accepted

源代码

```
import math


def min_num(n, position):
    have = 0
    i = 0
    while i < n:
        cover = list(position[i])
        if i == n-1:
            have += 1
            break
        j = i + 1
        while cover[1] >= position[j][0]:
            cover[1] = min(cover[1], position[j][1])
            cover[0] = max(cover[0], position[j][0])
            j += 1
            if j == n:
                break
        i = j
        have += 1
    return str(have)


count = 0
while True:
    d = 0
    line = input().split()
    if line == []:
        continue
    elif line == ["0", "0"]:
        break
    else:
        count += 1
        n1, d1 = map(int, line)
        position1 = [list(map(int, input().split())) for _ in range(n1)]
        position1.sort()
        xn = []
        for k in range(n1):
            if position1[k][1] > d1:
                d = -1
                break
        if d == -1:
            print("Case "+str(count)+": -1")
        else:
            for i in range(n1):
                long = math.sqrt(d1 ** 2 - position1[i][1] ** 2)
                xn.append((position1[i][0] - long, position1[i][0] + lon
            print("Case "+str(count)+": "+min_num(n1, xn))
```

基本信息

#:	46663533
题目:	01328
提交人:	24n2400011454
内存:	3992kB
时间:	56ms
语言:	Python3
提交时间:	2024-10-22 18:14:36

2. 学习总结和收获

因为看算法书耽误的二十多天每日选做这两天已经基本赶回来了，还差四五题，多写写题一点点进步吧。