



TaiLieu.vn

# **Bài Tập Tin học chọn lọc**

## Bài Tập Tin học chọn lọc

### {Bai toan Xep BALO (KNAPSACLE PROBLEM)

\* Co N hop kim loại trong luong Pi(KG) ,co gia ban la Vi (USD).Mot balo co

the mang duoc M KG .Hay xac dinh ti le can lay o moi hop sao cho thu duoc 1 Balo co gia tri nhat.

Vi du:Co 3 hop sat

	1	2	3
Khoi luong P =	18KG	15KG	10KG
Gia ban V =	25USD	24USD	15USD
M=20			

Ta co nhung cach sap xep sau:

	1	2	3	Value
P/an 1:	9KG	5KG	6KG	
		12,5USD	8USD	9 USD
P/an 2:	9KG	10KG	1KG	
		12,5USD	16USD	1,5USD
P/an 3:	0KG	15KG	5KG	
		0USD	24USD	7,5USD
				31,5 USD

Ta con rat nhieu phuong an de sap xep.Nhung cach xep de co duoc gia tri nhieu nhat la XEP NHUNG HOP KIM LOAI MA GIA TRI CUA 1 KG LA LON NHAT vao truoC GIAI THUAT:Xep lai cac hop Kim loại,Hop nao ma gia tri 1 KG cao nhat thi xep truoC.Sau do bo tung hop vao cho den khi day Tui thi thoi.Ta co the tach KL cua hop ra}

Program Bai\_toan\_BALO;

Uses crt;

const N=5;

type arr=array[1..N]of byte;

var P,V,id:arr;{Khoi luong moi hop sat,Gia tri moi hop sat,Giu chi so}  
M:real;{Khoi luong tui xach}

{\*\*\*\*\*}

Procedure Input;

Var i:byte;

begin

write('Khoi luong tui xach:');readln(M);

write('Do vat :');For i:=1 to n do write(i:5);

writeln;

write('Khoi luong:');for i:=1 to n do

begin

repeat

P[i]:=random(20);

until P[i]>0;

write(P[i]:5);

end;

writeln;

write('Gia tri :'); for i:=1 to n do

begin

repeat

V[i]:=random(20);

until V[i]>0;

write(V[i]:5);

end;

end;

{\*\*\*\*\*}

Procedure sortmax;

var i,j,temp:byte;

begin

for i:=1 to n do id[i]:=i;

for i:=1 to n-1 do

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for j:=i+1 to n do
  if V[id[j]]/P[id[j]]>V[id[i]]/P[id[i]] then
    begin
      temp:=id[i];
      id[i]:=id[j];
      id[j]:=temp;
    end;
end;
{*****}
Procedure Output;
var i:byte;
begin
  write('Do vat   ');For i:=1 to n do write(id[i]:5);
  writeln;
  write('Khoi luong:');for i:=1 to n do write(P[id[i]]:5);
  writeln;
  write('Gia tri   '); for i:=1 to n do write(V[id[i]]:5);
end;
{*****}
Procedure Control;
var Value,Temp,Cost:real;i:byte;
begin
i:=1;Value:=0;{Gia tri cua nhung hop duoc xep vao tui}
  repeat
    if P[id[i]]>=M then temp:=M else temp:=P[id[i]];
    Cost:=(V[id[i]]/P[id[i]])*temp;{Chua gia tri cua hop sat duoc chon de bo
vao}
    writeln('Vat thu ',id[i],' duoc chon:');
    write(temp:0:3,'KG ');writeln(cost:0:3,'$ ');
    value:=value+cost;
    M:=M-temp;
    inc(i);
  until (M=0) or (i=n+1);
  writeln('Tong gia tri cua cac mat hang duoc chon:',value:0:3,'$');
end;
{*****}
Begin
  clrscr;
  Randomize;
  Input;
  writeln;
  Sortmax;
  writeln('Cac do vat sau khi duoc sap xep:');
  Output;
  writeln;
  Control;
readln;
end.
{Cho mot cai can gom 2 dia can va N qua can co trong luong la A[1],A[2]..A[n]
la nhung so nguyen .Hay tim tat ca cac cach dat mot so qua can len dia ben
trai va len dia ben phai sao cho can thang bang(Can thang bang khi trong luong
tren hai dia can bang nhau
  GIAI THUAT:Vi du cho 4 qua can voi trong luong la:1 2 1 3
                Ta co cac cach xep le hai ben nhu sau:
                TRAI                PHAI
                1                    1
                1                    1
                1 1                  2
                1 2                  3
                2                    1 1
                3                    1 2
+ Ta dung phuong phap vet can
+ Cac bien duoc dung:
                Luul:Luu tru nhung trong luong de dat ben trai

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Luu2:Luu tru nhung trong luong de dat ben phai
K1:So luong qua can dat ben trai
K2:So luong qua can dat ben phai
Can1:Luu lai tong khoi luong cua cac qua can duoc chon o ben
trai
Can2:Luu lai tong khoi luong cua cac qua can duoc chon o ben
phai
Chon:Danh dau nhung qua can da duoc chon
+ Khoi tri:
ben phai)
len)
+ Tien trinh:
Neu (Can1=Can2) va (Can1>0) thi Xuat (*Hai ben cua can bang
nhau*)
Nguoc lai
Xet qua cac qua can J bat dau tu 1 den N
+ Neu qua can J chua duoc dat len ben nao thi
* Neu ben trai nhe hon ben phai thi
- Dat qua can do ben trai
- Danh dau qua J da duoc chon
- Tang so qua can ben trai le va luu
lai khoi luong cua no
- Tang trong luong cua can ben trai
- Xet qua can ke tiep
* Neu ben phai nhe hon ben trai thi lam nguoc
lai doi voi ben phai
* Chu Y:Khi chon duoc 1 cach can thi ta quay lui lai de tim cach can khac}
Program bancan;
Uses Crt;
Const Mn=100;
Type Arr=Array[1..MN]of Byte;
Var Chon,Qua,Luu1,Luu2:Arr;Soqua:Byte;Can1,Can2:Integer;K1,K2:Byte;
{*****}
Procedure Input;
Var J:Byte;
Begin
Write('Nhap so qua can:');Readln(Soqua);
For J:=1 to Soqua do
Begin
Qua[j]:=Random(5)+1;
Write(Qua[j]:4);
End;
Writeln;
K1:=0;K2:=0;Can1:=0;Can2:=0;
Fillchar(Chon,Sizeof(Chon),0);
End;
{*****}
Procedure Print;
Var J:byte;
Begin
Write('Can ben trai:');
For J:=1 to K1 do Write(Luu1[j]:4);
Writeln;
Write('Can ben phai:');
For J:=1 to K2 do Write(Luu2[j]:4);
Writeln;
Write('Trong luong moi ben la:',Can1);
Readln;
End;
{*****}
Procedure Tim(I:Byte);
Var J:Byte;

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Begin
  If (Can1=Can2) and (Can1>0) then Print
    Else
      For J:=1 to Soqua do
        If Chon[j]=0 then
          Case Can1<Can2 Of
            True:Begin
              Chon[j]:=1;
              Inc(K1);Luu1[k1]:=Qua[j];
              Can1:=Can1+Qua[j];
              Tim(J);
              Chon[j]:=0;
              Dec(K1);
              Can1:=Can1-Qua[j];
            End;
            False:Begin
              Chon[j]:=1;
              Inc(K2);Luu2[k2]:=Qua[j];
              Can2:=Can2+Qua[j];
              Tim(J);
              Chon[j]:=0;
              Dec(K2);
              Can2:=Can2-Qua[j];
            End;
          End;
        End;
      End;
    End;
  {*****}
Begin
  Clrscr;Randomize;
  Input;
  Tim(0);
  Readln;
  End.
  {(Chai mang ty le 1:k);Tim cach chia A[1..N] cho truoac thanh hai doan
  co tong cac phan tu trong doan nay gap k lan tong cac phan tu trong doan
  kia ,K nguyen duong
  GIAI THUAT:Tim tong cua toan bo cac phan tu
  Neu tong chia het cho K+1 phan thi
  + Tinh gia tri cua phan 1:TB=Tong div (K+1);
  + Tim nhung so trong day co tong la TB}

Program baitap3;
Uses Crt;
Const Mn=100;
Type Arr=Array[1..MN]of integer;
  Arrbool=Array[1..MN]of Boolean;
Var A,Luu:arr;N,K,Dem,Gap:Byte;Sum,Tong,Trungbinh:Integer;Chon:Arrbool;
  {*****}
Procedure Input;
Var I:Byte;
Begin
  Write('Nhap N:');Readln(N);
  Write('Nhap K:');Readln(Gap);
  Tong:=0;
  For I:=1 to N do
    Begin
      A[i]:=random(10);
      Write(A[i]:4);
      Tong:=Tong+A[i];
    End;
  End;
End;
{*****}
Procedure Print;
Var J:Byte;
Begin
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    If Sum=Trungbinh then
    Begin
    For J:=1 to K do Write(Luu[j]:4);Write(' ');
    For J:=1 to N do If Chon[j]=False then Write(j:4);Writeln;
    For J:=1 to K do Write(A[Luu[j]]:4);Write(' ');
    For J:=1 to N do If Chon[j]=False then Write(A[j]:4);
    Writeln;
    Inc(Dem);
    End;
End;
{*****}
Procedure Tim(I:byte);
Var J:Byte;
Begin
    If Sum>=Trungbinh then Print
    Else
        For J:=1 to N do
            If (Chon[j]=False) and (J>i) then
                Begin
                    Inc(K);
                    Luu[K]:=J;
                    Sum:=Sum+A[j];
                    Chon[j]:=True;
                    Tim(J);
                    Dec(K);
                    Chon[j]:=False;
                    Sum:=Sum-A[j];
                End;
End;
{*****}
Procedure Tim1(I:byte);
Var J:Byte;
Begin
    If Sum=Trungbinh then Print
    Else
        For J:=1 to N do
            If (Chon[j]=False) and (J>i) then
                Begin
                    Inc(K);
                    Luu[K]:=J;
                    Sum:=Sum+A[j];
                    Chon[j]:=True;
                    Tim(J);
                    Dec(K);
                    Chon[j]:=False;
                    Sum:=Sum-A[j];
                End;
End;
{*****}
Begin
    Clrscr;
    Randomize;
Repeat
    Input;
    Writeln;
    Writeln('Tong=', tong);
    If (Tong mod (Gap+1))=0 then
        Begin
            Dem:=0;
            Fillchar(Chon,Sizeof(chon),False);
            K:=0;
            Sum:=0;
            Trungbinh:=Tong div (Gap+1);
            Tim(1);
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End;
Until Dem>0;
Readln;
End.

program ma_tran_chuyen_vi;
uses crt;
const dim=20;
type mang=array[1..dim,1..dim] of integer;
var a:mang;
    n:integer;
procedure nhap(var a:mang;var n:integer);
var i,j:integer;
begin
    write('Kich thuoc ma tran : ');readln(n);
    for i:=1 to n do
        for j:=1 to n do a[i,j]:=random(99);
end;
procedure xuat;
var i,j:integer;
begin
    writeln;
    for i:=1 to n do
        begin
            for j:=1 to n do write(a[i,j]:3);
            writeln;
        end;
end;
procedure chuyenvi(var a:mang;n:integer);
var i,j,k,tg,m:integer;
begin k:=1;m:=n;
    for i:=1 to n div 2 do
        begin
            for j:=k to m-1 do
                begin
                    tg:=a[i,j];
                    a[i,j]:=a[j,m];
                    a[j,m]:=a[m,n-j+1];
                    a[m,n-j+1]:=a[n-j+1,k];
                    a[n-j+1,k]:=tg;
                end;
            inc(k);
            dec(m);
        end;
end;
begin clrscr;
    randomize;
    nhap(a,n);
    xuat;
    chuyenvi(a,n);
    xuat;
    readln
end.
{De-so-153:Cho M loai tien voi gia tri tu nhien A1,A2,...,Am va l gia tri tien
N(tu nhien).Viet thuat toan va chuong trinh de tinh tat cac cach bieu dien N
thanh M loai tien ke tren
Giai thuat:Quay lui(Back tracking)}
Program Del154;
Uses Crt;
Const MN=100;
Type Arr=Array[1..MN]of integer;
    ArrBool=Array[1..MN]of Boolean;
Var A,Luu:arr;Tong,N:Integer;M,K:Byte;
{*****}
```

```
Procedure Input;
Var I:Byte;
Begin
  Write('Nhap So loai tien:');Readln(M);
  Write('Nhap so tien can doi:');Readln(N);
  For I:=1 to M do
    Begin
      A[i]:=Random(10)+1;
      Write(A[i]:4);
    End;
  Writeln;
  K:=0;
  Tong:=0;
End;
{*****}
Procedure Print;
Var J:Byte;
Begin
  For J:=1 to K do
    Write(Luu[J]:4);
  Writeln;
End;
{*****}
Procedure Tim(I:Byte);
Var J:Byte;
Begin
  If Tong=N then Print
  Else
    For J:=1 to M do
      If (Tong+A[j]<=N) and (J>I) then
        Begin
          Tong:=Tong+A[j];
          Inc(K);
          Luu[k]:=A[j];
          Tim(J);
          Dec(K);
          Tong:=Tong-A[j];
        End;
End;
{*****}
Begin
  Clrscr;
  Randomize;
  Repeat
    Input;
    Tim(1);
  Until False;
Readln;
End.
{De_so_158:0 mot dat nuoc co N thanh pho.Giua cac thanh pho co cac tuyen duong
(1 chieu).Biet rang:
  1) Giua hai thanh pho bat ky co the di den nhau (co the qua nhieu tuyen
duong).
  2) Tu 1 thanh pho so cac duong di ra bang so cac duong di vao.
Lap thuat toan tim mot con duong xuất phát từ 1 thành phố nào đó ,đi qua tất
ca các tuyến đường ,mỗi tuyến đường 1 lần ,cuối cùng trở về thành phố ban đầu
  GIAI THUAT:Quay lui}
Program De_so_158;
uses crt;
const n=5;
type so=0..1;
  arr=array[1..n,1..n]of so;
  arr1=array[1..n]of byte;
  arr2=array[1..n]of boolean;
```



```
var A:arr;{Quan he cua Thanh pho I voi J}
    TD:arr1;{Luu tru thanh pho da di qua}
    Ok:arr2;{Kiem tra thnh pho da duoc di qua}
    K:byte;
    dem:byte;{So duong di}
{*****}
Procedure Nhap;
var i,j:byte;
begin
    for i:=1 to n do
        for j:=i to n do
            if i=j then a[i,j]:=0
            else
                begin
                    a[i,j]:=random(2);
                    a[j,i]:=a[i,j];
                end;
    for i:=1 to n do
        begin
            for j:=1 to n do write(a[i,j]:4);
            writeln;
        end;
end;
{*****}
Procedure Print;
var j:byte;
begin
    if A[TD[n],Td[1]]=1 then {Kiem tra thanh pho cuoi cung voi thanh pho
                                dau tien di qua co
                                duong di voi nhau khong}
        begin
            inc(dem);{Tang so duong di}
            for j:=1 to n do write(Td[j]:4);
            writeln(Td[1]:4);
        end;
end;
{*****}
Procedure Truyhoi(i:byte);
var j:byte;
begin
    if k=n then print
    else
        for j:=1 to n do
            if (a[i,j]=1) and Ok[j] then
                {Dieu kien de di tu TP I de TP J la hai thanh pho phai thong nhau
                Va thanh pho J chua di qua}
                begin
                    Inc(k);
                    TD[k]:=j;{luu tru thanh pho duoc di qua}
                    Ok[j]:=false;{Thanh pho J da di qua}
                    truyhoi(j);{Xet thanh pho J voi thanh pho chua duoc
                                chon}
                    dec(k);
                    Ok[j]:=true;{Xoa bo viec ghi thanh Tp J da duoc di
                                qua}
                end;
end;
{*****}
Begin
    clrscr;
    randomize;
repeat
    clrscr;
    nhap;
```

```
dem:=0;
fillchar(Ok,sizeof(ok),true);
Ok[2]:=false;k:=1;
Td[1]:=2;{Xuat phat tu thanh pho thu 2}
writeln('Cac cach di:');
truyhoi(2);
if dem=0 then writeln('Khong co cach di nao')
else writeln('Co ',dem,' cach di');
until dem>0;
readln;
end.
{Co N nguoi va N cong viec.Goi Cij la cong suc lam viec j cua nguoi i.Lap
chuong trinh
de sap xep moi nguoi 1 cong viec sao cho cong suc bo ra la it nhat
THUAT TOAN: Vet can tat ca cac truong hop xay ra .Chon truong hop toi uu}
Program baitoan_congviec;
Uses crt;
Const mn=7;
Type arr=array[1..mn,1..mn] of word;
arr1=array[1..mn] of word;
arrbol=array[1..mn] of boolean;
Var C:arr;{Cong suc lam viec}
A:arr1;{Chua cong viec duoc chon khi xet tung truong hop}
B:arr1;{Luu lai ket qua cong viec duoc chon tam thoi}
j,n:byte;
Tong:word;{Chua tong cac cong viec cua tung buoc chon}
min:word;{Giu gia tri de tim ra TONG cac cong viec nho nhat}
Chon:arrbol;{keim tra xem Cong Viec do duoc chon hay chua}
{*****}
Procedure nhap;
Var i,j:byte;
Begin
n:=mn;
for i:=1 to n do
Begin
for j:=1 to n do
Begin
c[i,j]:=random(10)+1;
write(c[i,j]:4);
End;
writeln;
End;
End;
{*****}
Procedure Output;
Var J:byte;
Begin
If tong<min then
Begin
min:=tong;{So sanh de tim ra TONG nho nhat}
for j:=1 to n do b[j]:=a[j];{Giu lai suc lam
viec cau nguoi j}
End;
End;
{*****}
Procedure truyhoi(i:byte);
var j,k:byte;
begin
if i=n+1 then Output
Else
for j:=1 to n do
if Chon[j]=False then {Neu cong viec chua duoc chon}
Begin
A[i]:=j;{Nguoi thu i se chon cong viec j}
```