

Tehnica greedy

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Aspecte teoretice, avantaje si dezavantaje

Tehnica Greedy se foloseste atunci cand se da o multime cu n elemente si o submultime ce se include din ea, iar submultimea indeplineste anumite conditii pentru a putea fi acceptata ca solutie. Avantajele acestui algoritm sunt timpul de executie relativ mic(mai mic ca in metoda trierii), si complexitatea problemelor ce pot fi rezolvate prin aceasta tehnica. Un dezavantaj este, totusi, faptul ca complexitatea programelor este foarte inalta si complicat de programat.

Probleme folosind tehnica Greedy

Program P1; {Se dau n obiecte cu greutate, venit si se citeste greutatea max admisibila. Se determina ce obiecte se vor pune, nedepasind G_{max} astfel incat venitul sa fie maxim}

var C,G,A,B: array [1..100] of real;

Gmax, suma:real; i,n,m:integer;

Procedure Aranjare;

var i:integer; f:Boolean; k:real;

begin

repeat

```

    f:=true;
    for i:=1 to n do
        if A[i]<A[i+1] then begin
            k:=A[i]; A[i]:=A[i+1]; A[i+1]:=k; f:=false;
        end;
    until f=true;
end;

Function ExistaElemente:boolean;
    var i:integer;
begin
    ExistaElemente:=false;
    for i:=1 to n do
        if A[i]>0 then ExistaElemente:=true;
    end;
    Procedure IncludeElement;
        var i:integer;
    begin
        for i:=1 to n do
            if Suma+G[i]<Gmax then begin
                m:=m+1; B[m]:=A[i]; A[i]:=0; end;
            end;
        begin { Programul principal }
            write('Gmax=');readln(Gmax);
            write('Dati n: ');readln(n);
            for i:=1 to n do begin
                write('G[,i,']=');readln(G[i]);
                write('C[,i,']=');readln(C[i]);
                A[i]:=C[i]/G[i];
            end;
            Aranjare; m:=0;
            while ExistaElemente do IncludeElement;
            for i:=1 to m do writeln('B[,m,]=',B[m]);
        end.
    end.

```

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```
const MM = 15;
      NN = 15;
type
TMaze = array [1..MM, 1..NN] of byte;
var
vyh: boolean;
m, n, i, j: Integer;
A : TMaze;
{$endif}
{$ifdef NoInput}
const m: integer = 5;
      n: integer = 5;
      i: integer = 3;
      j: integer = 3;
      A: TMaze =
        ((1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0), { 1}
         (0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0), { 2}
         (1, 1, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0), { 3}
         (1, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0), { 4}
         (1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0), { 5}
         (0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0), { 6}
         (0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0), { 7}
         (0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0), { 8}
         (0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0), { 9}
         (0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0), {10}
         (0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0), {11}
         (0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0), {12}
         (0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0), {13}
         (0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0), {14}
         (0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0) {15});
{$endif}
procedure L(i, j: integer);
begin
  if not vyh then
```

```

    if  $\mathcal{A}[i, j] = 0$  then
    begin
        if  $(i = 1) \text{ or } (i = m) \text{ or } (j = 1) \text{ or } (j = n)$  then
             $vyh := \text{True};$ 
             $\mathcal{A}[i, j] := 1;$ 
             $\mathcal{L}(i, j - 1);$ 
             $\mathcal{L}(i, j + 1);$ 
             $\mathcal{L}(i - 1, j);$ 
             $\mathcal{L}(i + 1, j);$ 
            if  $vyh$  then
                 $\text{WriteLn}(i, ', ', j);$ 
            end;
        end;
    begin
        {$ifndef NoInput}
         $\text{WriteLn}('M, N:=');$ 
         $\text{ReadLn}(m, n);$ 
        for  $i:=1$  to  $m$  do
            for  $j:=1$  to  $n$  do begin
                 $\text{Write}('A[, i, ', j, ']:=');$ 
                 $\text{ReadLn}(\mathcal{A}[i, j]);$ 
            end;
             $\text{WriteLn};$   $\text{WriteLn}('I, J:=');$   $\text{ReadLn}(i, j);$   $\text{WriteLn};$ 
        {$endif}
         $vyh := \text{False};$ 
         $\mathcal{L}(i, j);$ 
        if not  $vyh$  then
             $\text{WriteLn}('Nu exista iesire');$ 
        end.
    
```

Concluzii

Tehnica Greedy este o metoda buna pentru alcatuirea algorimilor complecsi decatre programatorii avansati.

Bibliografie

<https://www.cyberforum.ru/>

[http://www.educatieonline.md/Files/Manuals/11/XI_Informatica%20\(i%20limba%20romana\).pdf](http://www.educatieonline.md/Files/Manuals/11/XI_Informatica%20(i%20limba%20romana).pdf)