

Εργαστήριο Υπολογιστικής Επιστήμης II
Πέμπτη 19 Φεβρουαρίου 2009

Άσκηση 3η

```
% _____ Simplex Method _____ %
clear all
clc
prompt = {'Function(f)=','Constraints(as an n x m Matrix)=','b(j)(In Matrix form)='};
lineno=1;
title= 'Enter Data';
def={'[1 2 1]','[2 1 -1;2 -1 5;4 1 1]','[2 6 6]'};
a = inputdlg(prompt,title,lineno,def);
a=char(a);
[m,n] = size(a);
f=eval(a(1,1:n));const =eval(a(2,1:n));b=eval(a(3,1:n)) ;
f=-f;
flag=0;
const1 = [const;f];
[m,n]=size(const1);

l=1;
it=1;
while n<6
    const1(l,n+1)=1;
    l=l+1;
    n=n+1;
end
f=const1(m,1:n);
b(4)=0;
oldi=0;
while any(f(1:n)<0)
    [p,q] = size(f);
    basevar=0;
    for i=1:q-1
        if f(i)<0 & f(i+1) <0
            basevar=[abs(f(i));abs(f(i+1))];
            basevar=max(basevar);
            basevar=-basevar;
        else if f(i)<0 | f(i+1) <0 | f(i)==f(i+1)
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        if f(i)~=0 & f(i+1)~=0
            basevar=[f(i);f(i+1)];
            basevar=min(basevar);
        end
    end
end

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end

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for i=1:q
    if f(i)==basevar
        break;
    end
end
fprintf('We Choose now the basic variable to be x%d',i);

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% Selection Of Pivot Element

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[m,n]=size(const1);

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ratio=[];

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for row=1:(m-1)

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    if const1(row,i)>0

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        ratio =[ratio ;b(row)/const1(row,i) row] ;

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    end

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end

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[r,s]=size(ratio);

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[ratio1 index] = min(ratio(1:r,1)) ;

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ratio = [ratio1 ratio(index,2)];

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pivot = const1(ratio(1,2),i);

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%% %% %% %% %% %% Pivot Acieved %% %%

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%Using Pivot element for futher application

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[m,n]=size(const1);

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const1(it,1:n)=const1(it,1:n)./pivot;

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b(it) = b(it)./pivot;

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if it~=1

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    x=1;

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else

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    x=2;

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end

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while x<=m
  ratio = const1(it,i)/const1(x,i);
  switch x
  case{1}
    sub = const1(x,1:n)-const1(it,1:n);
    if sub(i)~=0
      sub = const1(x,1:n)+const1(it,1:n);
      if sub(i)~=0
        const1=[const1(x,1:n).*ratio;const1(x,1:n);const1(3:m,1:n)];
        b(x) = b(x)*ratio;
      end
    end
  end
  case{2}

    sub = const1(x,1:n)-const1(it,1:n);
    if sub(i)~=0
      sub = const1(x,1:n)+const1(it,1:n);
      if sub(i)~=0
        const1=[const1(1,1:n);const1(x,1:n).*ratio;const1(3:m,1:n)];
        b(x) = b(x)*ratio;
      end
    end
  end
  case{3}
    sub = const1(x,1:n)-const1(it,1:n);
    if sub(i)~=0
      sub = const1(x,1:n)+const1(it,1:n);
      if sub(i)~=0
        const1=[const1(1,1:n);const1(2,1:n);const1(x,1:n).*ratio;const1(4,1:n)];
        b(x) = b(x)*ratio;
      end
    end
  end
  case{4}
    sub = const1(x,1:n)-const1(it,1:n);
    if sub(i)~=0
      sub = const1(x,1:n)+const1(it,1:n);
      if sub(i)~=0
        const1=[const1(1,1:n);const1(2,1:n);const1(3,1:n);const1(x,1:n).*ratio];
        b(x) = b(x)*ratio;
      end
    end
  end
end

```

```

        end
    end
end

sub = const1(x,1:n)-const1(it,1:n);
if sub(i)~=0
    const1(x,1:n) = const1(x,1:n)+const1(it,1:n);
    b(x) = b(x)+b(it);
else
    if ratio>0
        const1(x,1:n) = sub;
        b(x) = b(x)-b(it);
    else
        const1(x,1:n) = -sub;
        b(x) = -(b(x))+b(it);
    end
end

end
if x+1==it
    x=x+2;
else
    x=x+1;
end
end
[m,n]=size(const1);
f=const1(m,1:n)
if i==oldi+1 & oldi~=0
    f_(oldi) = f(oldi)*b(1);
    f_(i) =f(i)*b(2);
    f_(n) = f(n)*b(3);
    answer = sum([f_(oldi) f_(i) f_(n)]);
    answer = b(4)-answer
% report simplex
    disp('Press any Key to Continue....');
    pause
else
    f_(i)=f(i)*b(1);
    f_(n-2)=f(n-1)*b(2);
    f_(n-1)=f(n)*b(3);
    answer=sum([f_(i) f_(n-2) f_(n-1)]);
    answer = -(b(4)-answer)

```

```
% report simplex
disp('Press any Key to Continue....');
pause
end
oldi=i;
it=it+1;
end
```