



LAMPIRAN

Listing Program Algoritma Memetika

-MAutama

```
clear;
clc;

%Input
n=input('Jumlah individu (genap) = ');
m=input('Prediksi berapa hari sebelum = ');
g=input('Jumlah Generasi= ');

%scan file data
a=fopen('data.csv');
d=textscan(a,'%s%f','delimiter',' ',' ');
fclose(a);
d=d{2};

%split data (80 persen untuk model, 2 untuk tes)
d1=d(1:round(0.80*size(d,1)));
d2=d(round(0.80*size(d,1))+1:end);

%Inisialisasi Populasi
Popn=rand(n,m+1)*1;

gen=0;
while gen<g

    %Evaluasi
    [Popn,error]=evall(n,m,Popn,d1);

    %Seleksi
    ortu=roulet(Popn,n,m);

    %CrossOver
    hasilcross=SPcross(ortu,m,n);

    %Mutasi
    hasilmutasi=mutasi(hasilcross,m,n);

    %Local Search
    hasillocal=hillclimb(hasilmutasi,n,m,d1);
```

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        %Penggantian populasi dengan generasi selanjutnya
        Popn=hasillocal;

        gen=gen+1;
    end

    %Uji Model

    %Pilih solusi terbaik
    [Pops,error]=evall(n,m,Popn,d1);
    sol=Pops(n,1:m+1);

    %akurasi model prediksi
    fit=evaluji(sol,n,m,d2);
    erorujimodel=1/fit;
    aa=sum(d2(m+1:end));
    bb=size((d2(m+1:end)),1);
    ratkurs=aa/bb;
    persentase=(erorujimodel/ratkurs)*100

    toc;
    t=toc
    return

```

-hillclimb

```

function Popn=hillclimb(Popn,n,m,d1);

    for i=1:n
        temp=Popn(i,:);
        x=0;
        y=0;
        while ((y<=20) & (x<=20))

            for j=1:m+1
                a=Popn(i,j)-0.0001;
                b=Popn(i,j)+0.0001;
                tempn(j)=a+(b-a)*rand;
            end
            fit=evaluji(temp,n,m,d1);
            fitn=evaluji(tempn,n,m,d1);
            if fitn>fit

```

```

        temp=tempn;
        x=x+1;

    else
        y=y+1;

    end

end

end

Popn(i,:)=temp;
end

return

-evall

function [Popn,error]=evall(n,m,Popn,d1)
    s=size(d1,1);
    y=s-m;
    for i=1:m
        dat(:,i)=[d1(i:y)];
        y=y+1;
    end
    dat(:,m+1)=[1];
    pred=dat*Popn';
    I=ones(1,n);
    I=d1(m+1:end)*I;
    error=abs(pred-I);
    Popn(:,m+2)=(1./sum(error)/size(error,1))';
    Popn=sortrows(Popn,m+2);

return

```

-roulet

```

function ortu=roulet(Popn,n,m)

Popn(:,m+3)=cumsum(Popn(:,m+2)./sum(Popn(:,m+2)));

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```

for i=1:n
    a=rand;
    p=Popn(:,m+3)-a;
    p=find(p>0);
    index=p(1);
    ortu(i,:)=Popn(index,1:m+1);
end
return

```

-Spcross

```

function hasilcross=SPcross(ortu,m,n)
for i=1:n/2
    a=round(rand*(m-1)+1);
    hasilcross(i*2-1,:)= [ortu(i*2-1,1:a)
    ortu(i*2,a+1:m+1)];
    hasilcross(i*2,:) = [ortu(i*2,1:a) ortu(i*2-
1,a+1:m+1)];
end
return

```

-mutasi

```

function hasilmutasi=mutasi(hasilcross,m,n);
for i=1:n
    r=rand;
    if r<0.01
        a=round(rand*m+1);
        hasilcross(i,a)=rand*2-1;
        hasilmutasi(i,:)=hasilcross(i,:);
    else
        hasilmutasi(i,:)=hasilcross(i,:);
    end
end

```

```
        end;  
    end  
  
return
```

-evaluasi

```
function fit=evaluasi(sol,n,m,d2)  
s2=size(d2,1);  
y=s2-m;  
  
    for i=1:m  
        dat2(:,i)=[d2(i:y)];  
        y=y+1;  
    end  
  
    dat2(:,m+1)=[1];  
    pred=dat2*sol';  
    erorakhir=abs(pred-d2(m+1:end));  
    MSE=sum(eratorakhir)/size(eratorakhir,1);  
    fit=1/MSE;  
  
return
```