LAMPIRAN A
PROGRAM MATLAB

Program Membaca Huruf Kapital

```
% Preprocessing citra huruf besar

clc;
clear all;
close all;

A{1}=imread('Aarial.bmp');
A{2}=imread('Abatang.bmp');
A{3}=imread('Acalibri.bmp');
A{4}=imread('Asans.bmp');
A{5}=imread('Atahoma.bmp');
A{6}=imread('Atimes.bmp');
for i1=1:6,
   ubahukuran{1,i1}=imresize(A{i1},[20 20]);
   ubahwarna{1,i1}=im2bw(ubahukuran{1,i1});
   ubahbentuk{1,i1}=ubahwarna{1,i1}';
   ubahbentuk{1,i1}=ubahbentuk{1,i1}(:);
   ubahbentuk{1,i1}=ubahbentuk{1,i1}';

end

B{1}=imread('Barial.bmp');
B{2}=imread('Bbatang.bmp');
B{3}=imread('Bcalibri.bmp');
B{4}=imread('Bsans.bmp');
B{5}=imread('Btahoma.bmp');
B{6}=imread('Btimes.bmp');
for i2=1:6,
   ubahukuran{2,i2}=imresize(B{i2},[20 20]);
   ubahwarna{2,i2}=im2bw(ubahukuran{2,i2});
   ubahbentuk{2,i2}=ubahwarna{2,i2}';
   ubahbentuk{2,i2}=ubahbentuk{2,i2}(:);
   ubahbentuk{2,i2}=ubahbentuk{2,i2}';

end

C{1}=imread('Carial.bmp');
C{2}=imread('Cbatang.bmp');
C{3}=imread('Ccalibri.bmp');
C{4}=imread('Csans.bmp');
C{5}=imread('Ctahoma.bmp');
C{6}=imread('Ctimes.bmp');
for i3=1:6,
   ubahukuran{3,i3}=imresize(C{i3},[20 20]);
   ubahwarna{3,i3}=im2bw(ubahukuran{3,i3});
   ubahbentuk{3,i3}=ubahwarna{3,i3}';
   ubahbentuk{3,i3}=ubahbentuk{3,i3}(:);
   ubahbentuk{3,i3}=ubahbentuk{3,i3}';

end

D{1}=imread('Darial.bmp');
D{2}=imread('Dbatang.bmp');
D{3}=imread('Dcalibri.bmp');
D{4}=imread('Dsans.bmp');
D{5}=imread('Dtahoma.bmp');
D{6}=imread('Dtimes.bmp');
for i4=1:6,
   ubahukuran{4,i4}=imresize(D{i4},[20 20]);
   ubahwarna{4,i4}=im2bw(ubahukuran{4,i4});
   ubahbentuk{4,i4}=ubahwarna{4,i4}';
   ubahbentuk{4,i4}=ubahbentuk{4,i4}(:);
   ubahbentuk{4,i4}=ubahbentuk{4,i4}';

end

E{1}=imread('Earial.bmp');
E{2}=imread('Ebatang.bmp');
E{3}=imread('Ecalibri.bmp');
E{4}=imread('Esans.bmp');
E{5}=imread('Etahoma.bmp');
E{6}=imread('Etimes.bmp');
for i5=1:6,
   ubahukuran{5,i5}=imresize(E{i5},[20 20]);
   ubahwarna{5,i5}=im2bw(ubahukuran{5,i5});
   ubahbentuk{5,i5}=ubahwarna{5,i5}';
   ubahbentuk{5,i5}=ubahbentuk{5,i5}(:);
   ubahbentuk{5,i5}=ubahbentuk{5,i5}';

end

F{1}=imread('Farial.bmp');
F{2}=imread('Fbatang.bmp');
F{3}=imread('Fcalibri.bmp');
F{4}=imread('Fsans.bmp');
F{5}=imread('Ftahoma.bmp');
F{6}=imread('Ftimes.bmp');
for i6=1:6,
   ubahukuran{6,i6}=imresize(F{i6},[20 20]);
   ubahwarna{6,i6}=im2bw(ubahukuran{6,i6});
   ubahbentuk{6,i6}=ubahwarna{6,i6}';
   ubahbentuk{6,i6}=ubahbentuk{6,i6}(:);
   ubahbentuk{6,i6}=ubahbentuk{6,i6}';

end

G{1}=imread('Garial.bmp');
G{2}=imread('Gbatang.bmp');
G{3}=imread('Gcalibri.bmp');
G{4}=imread('Gsans.bmp');
G{5}=imread('Gtahoma.bmp');
G{6}=imread('Gtimes.bmp');
for i7=1:6,
   ubahukuran{7,i7}=imresize(G{i7},[20 20]);
   ubahwarna{7,i7}=im2bw(ubahukuran{7,i7});
   ubahbentuk{7,i7}=ubahwarna{7,i7}';
   ubahbentuk{7,i7}=ubahbentuk{7,i7}(:);
   ubahbentuk{7,i7}=ubahbentuk{7,i7}';

end

H{1}=imread('Harial.bmp');
H{2}=imread('Hbatang.bmp');
H{3}=imread('Hcalibri.bmp');
H{4}=imread('Hsans.bmp');
H{5}=imread('Htahoma.bmp');
H{6}=imread('Htimes.bmp');
for i8=1:6,
   ubahukuran{8,i8}=imresize(H{i8},[20 20]);
   ubahwarna{8,i8}=im2bw(ubahukuran{8,i8});
```

```
    ubahbentuk{8,i8}=ubahwarna{8,i8}';
    ubahbentuk{8,i8}=ubahbentuk{8,i8}(:);
    ubahbentuk{8,i8}=ubahbentuk{8,i8}';

end

I{1}=imread('Iarial.bmp');
I{2}=imread('Ibatang.bmp');
I{3}=imread('Icalibri.bmp');
I{4}=imread('Isans.bmp');
I{5}=imread('Itahoma.bmp');
I{6}=imread('Itimes.bmp');
for i9=1:6,
    ubahukuran{9,i9}=imresize(I{i9},[20 20]);
    ubahwarna{9,i9}=im2bw(ubahukuran{9,i9});
    ubahbentuk{9,i9}=ubahwarna{9,i9}';
    ubahbentuk{9,i9}=ubahbentuk{9,i9}(:);
    ubahbentuk{9,i9}=ubahbentuk{9,i9}';

end

J{1}=imread('Jarial.bmp');
J{2}=imread('Jbatang.bmp');
J{3}=imread('Jcalibri.bmp');
J{4}=imread('Jsans.bmp');
J{5}=imread('Jtahoma.bmp');
J{6}=imread('Jtimes.bmp');
for i10=1:6,
    ubahukuran{10,i10}=imresize(J{i10},[20 20]);

ubahwarna{10,i10}=im2bw(ubahukuran{10,i10}
);
    ubahbentuk{10,i10}=ubahwarna{10,i10}';
    ubahbentuk{10,i10}=ubahbentuk{10,i10}(:);
    ubahbentuk{10,i10}=ubahbentuk{10,i10}';

end

K{1}=imread('Karial.bmp');
K{2}=imread('Kbatang.bmp');
K{3}=imread('Kcalibri.bmp');
K{4}=imread('Ksans.bmp');
K{5}=imread('Ktahoma.bmp');
K{6}=imread('Ktimes.bmp');
for i11=1:6,
    ubahukuran{11,i11}=imresize(K{i11},[20
20]);

ubahwarna{11,i11}=im2bw(ubahukuran{11,i11}
);
    ubahbentuk{11,i11}=ubahwarna{11,i11}';
    ubahbentuk{11,i11}=ubahbentuk{11,i11}(:);
    ubahbentuk{11,i11}=ubahbentuk{11,i11}';

end

L{1}=imread('Larial.bmp');
L{2}=imread('Lbatang.bmp');
L{3}=imread('Lcalibri.bmp');
L{4}=imread('Lsans.bmp');
L{5}=imread('Ltahoma.bmp');
L{6}=imread('Ltimes.bmp');
for i12=1:6,
    ubahukuran{12,i12}=imresize(L{i12},[20
20]);

ubahwarna{12,i12}=im2bw(ubahukuran{12,i12}
);
    ubahbentuk{12,i12}=ubahwarna{12,i12}';
    ubahbentuk{12,i12}=ubahbentuk{12,i12}(:);
    ubahbentuk{12,i12}=ubahbentuk{12,i12}';

end

M{1}=imread('Marial.bmp');
M{2}=imread('Mbatang.bmp');
M{3}=imread('Mcalibri.bmp');
M{4}=imread('Msans.bmp');
M{5}=imread('Mtahoma.bmp');
M{6}=imread('Mtimes.bmp');
for i13=1:6,
    ubahukuran{13,i13}=imresize(M{i13},[20
20]);

ubahwarna{13,i13}=im2bw(ubahukuran{13,i13}
);
    ubahbentuk{13,i13}=ubahwarna{13,i13}';
    ubahbentuk{13,i13}=ubahbentuk{13,i13}(:);
    ubahbentuk{13,i13}=ubahbentuk{13,i13}';

end

N{1}=imread('Narial.bmp');
N{2}=imread('Nbatang.bmp');
N{3}=imread('Ncalibri.bmp');
N{4}=imread('Nsans.bmp');
N{5}=imread('Ntahoma.bmp');
N{6}=imread('Ntimes.bmp');
for i14=1:6,
    ubahukuran{14,i14}=imresize(N{i14},[20
20]);

ubahwarna{14,i14}=im2bw(ubahukuran{14,i14}
);
    ubahbentuk{14,i14}=ubahwarna{14,i14}';
    ubahbentuk{14,i14}=ubahbentuk{14,i14}(:);
    ubahbentuk{14,i14}=ubahbentuk{14,i14}';

end

O{1}=imread('Oarial.bmp');
O{2}=imread('Obatang.bmp');
O{3}=imread('Ocalibri.bmp');
O{4}=imread('Osans.bmp');
O{5}=imread('Otahoma.bmp');
O{6}=imread('Otimes.bmp');
for i15=1:6,
    ubahukuran{15,i15}=imresize(O{i15},[20
20]);

ubahwarna{15,i15}=im2bw(ubahukuran{15,i15}
);
    ubahbentuk{15,i15}=ubahwarna{15,i15}';
    ubahbentuk{15,i15}=ubahbentuk{15,i15}(:);
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```
    ubahbentuk{15,i15}=ubahbentuk{15,i15}';

end

P{1}=imread('Parial.bmp');
P{2}=imread('Pbatang.bmp');
P{3}=imread('Pcalibri.bmp');
P{4}=imread('Psans.bmp');
P{5}=imread('Ptahoma.bmp');
P{6}=imread('Ptimes.bmp');
for i16=1:6,
    ubahukuran{16,i16}=imresize(P{i16},[20
20]);

ubahwarna{16,i16}=im2bw(ubahukuran{16,i16}
);
    ubahbentuk{16,i16}=ubahwarna{16,i16}';
    ubahbentuk{16,i16}=ubahbentuk{16,i16}(:);
    ubahbentuk{16,i16}=ubahbentuk{16,i16}';

end

Q{1}=imread('Qarial.bmp');
Q{2}=imread('Qbatang.bmp');
Q{3}=imread('Qcalibri.bmp');
Q{4}=imread('Qsans.bmp');
Q{5}=imread('Qtahoma.bmp');
Q{6}=imread('Qtimes.bmp');
for i17=1:6,
    ubahukuran{17,i17}=imresize(Q{i17},[20
20]);

ubahwarna{17,i17}=im2bw(ubahukuran{17,i17}
);
    ubahbentuk{17,i17}=ubahwarna{17,i17}';
    ubahbentuk{17,i17}=ubahbentuk{17,i17}(:);
    ubahbentuk{17,i17}=ubahbentuk{17,i17}';

end

R{1}=imread('Rarial.bmp');
R{2}=imread('Rbatang.bmp');
R{3}=imread('Rcalibri.bmp');
R{4}=imread('Rsans.bmp');
R{5}=imread('Rtahoma.bmp');
R{6}=imread('Rtimes.bmp');
for i18=1:6,
    ubahukuran{18,i18}=imresize(R{i18},[20
20]);

ubahwarna{18,i18}=im2bw(ubahukuran{18,i18}
);
    ubahbentuk{18,i18}=ubahwarna{18,i18}';
    ubahbentuk{18,i18}=ubahbentuk{18,i18}(:);
    ubahbentuk{18,i18}=ubahbentuk{18,i18}';

end

S{1}=imread('Sarial.bmp');
S{2}=imread('Sbatang.bmp');
S{3}=imread('Scalibri.bmp');
S{4}=imread('Ssans.bmp');
S{5}=imread('Stahoma.bmp');
S{6}=imread('Stimes.bmp');
for i19=1:6,
    ubahukuran{19,i19}=imresize(S{i19},[20
20]);

ubahwarna{19,i19}=im2bw(ubahukuran{19,i19}
);
    ubahbentuk{19,i19}=ubahwarna{19,i19}';
    ubahbentuk{19,i19}=ubahbentuk{19,i19}(:);
    ubahbentuk{19,i19}=ubahbentuk{19,i19}';

end

T{1}=imread('Tarial.bmp');
T{2}=imread('Tbatang.bmp');
T{3}=imread('Tcalibri.bmp');
T{4}=imread('Tsans.bmp');
T{5}=imread('Ttahoma.bmp');
T{6}=imread('Ttimes.bmp');
for i20=1:6,
    ubahukuran{20,i20}=imresize(T{i20},[20
20]);

ubahwarna{20,i20}=im2bw(ubahukuran{20,i20}
);
    ubahbentuk{20,i20}=ubahwarna{20,i20}';
    ubahbentuk{20,i20}=ubahbentuk{20,i20}(:);
    ubahbentuk{20,i20}=ubahbentuk{20,i20}';

end

U{1}=imread('Uarial.bmp');
U{2}=imread('Ubatang.bmp');
U{3}=imread('Ucalibri.bmp');
U{4}=imread('Usans.bmp');
U{5}=imread('Utahoma.bmp');
U{6}=imread('Utimes.bmp');
for i21=1:6,
    ubahukuran{21,i21}=imresize(U{i21},[20
20]);

ubahwarna{21,i21}=im2bw(ubahukuran{21,i21}
);
    ubahbentuk{21,i21}=ubahwarna{21,i21}';
    ubahbentuk{21,i21}=ubahbentuk{21,i21}(:);
    ubahbentuk{21,i21}=ubahbentuk{21,i21}';

end

V{1}=imread('Varial.bmp');
V{2}=imread('Vbatang.bmp');
V{3}=imread('Vcalibri.bmp');
V{4}=imread('Vsans.bmp');
V{5}=imread('Vtahoma.bmp');
V{6}=imread('Vtimes.bmp');
for i22=1:6,
    ubahukuran{22,i22}=imresize(V{i22},[20
20]);

ubahwarna{22,i22}=im2bw(ubahukuran{22,i22}
);
```

```
    ubahbentuk{22,i22}=ubahwarna{22,i22}';
    ubahbentuk{22,i22}=ubahbentuk{22,i22}(:);
    ubahbentuk{22,i22}=ubahbentuk{22,i22}';

end

W{1}=imread('Warial.bmp');
W{2}=imread('Wbatang.bmp');
W{3}=imread('Wcalibri.bmp');
W{4}=imread('Wsans.bmp');
W{5}=imread('Wtahoma.bmp');
W{6}=imread('Wtimes.bmp');
for i23=1:6,
    ubahukuran{23,i23}=imresize(W{i23},[20
20]);

ubahwarna{23,i23}=im2bw(ubahukuran{23,i23}
);
    ubahbentuk{23,i23}=ubahwarna{23,i23}';
    ubahbentuk{23,i23}=ubahbentuk{23,i23}(:);
    ubahbentuk{23,i23}=ubahbentuk{23,i23}';

end

X{1}=imread('Xarial.bmp');
X{2}=imread('Xbatang.bmp');
X{3}=imread('Xcalibri.bmp');
X{4}=imread('Xsans.bmp');
X{5}=imread('Xtahoma.bmp');
X{6}=imread('Xtimes.bmp');
for i24=1:6,
    ubahukuran{24,i24}=imresize(X{i24},[20
20]);

ubahwarna{24,i24}=im2bw(ubahukuran{24,i24}
);
    ubahbentuk{24,i24}=ubahwarna{24,i24}';
    ubahbentuk{24,i24}=ubahbentuk{24,i24}(:);
    ubahbentuk{24,i24}=ubahbentuk{24,i24}';

end

Y{1}=imread('Yarial.bmp');
Y{2}=imread('Ybatang.bmp');
Y{3}=imread('Ycalibri.bmp');
Y{4}=imread('Ysans.bmp');
Y{5}=imread('Ytahoma.bmp');
Y{6}=imread('Ytimes.bmp');
for i25=1:6,
    ubahukuran{25,i25}=imresize(Y{i25},[20
20]);

ubahwarna{25,i25}=im2bw(ubahukuran{25,i25}
);
    ubahbentuk{25,i25}=ubahwarna{25,i25}';
    ubahbentuk{25,i25}=ubahbentuk{25,i25}(:);
    ubahbentuk{25,i25}=ubahbentuk{25,i25}';

end

Z{1}=imread('Zarial.bmp');
Z{2}=imread('Zbatang.bmp');
Z{3}=imread('Zcalibri.bmp');
Z{4}=imread('Zsans.bmp');
Z{5}=imread('Ztahoma.bmp');
Z{6}=imread('Ztimes.bmp');
for i26=1:6,
    ubahukuran{26,i26}=imresize(Z{i26},[20
20]);

ubahwarna{26,i26}=im2bw(ubahukuran{26,i26}
);
    ubahbentuk{26,i26}=ubahwarna{26,i26}';
    ubahbentuk{26,i26}=ubahbentuk{26,i26}(:);
    ubahbentuk{26,i26}=ubahbentuk{26,i26}';

end

ubahbentuk=ubahbentuk';
ubahbentuk=ubahbentuk(:);
inputbesar=ubahbentuk
save input inputbesar;
```

Program Membaca Huruf Kecil

```
% Preprocessing citra

clc;
clear all;
close all;

a{1}=imread('aarial.bmp');
a{2}=imread('abatang.bmp');
a{3}=imread('acalibri.bmp');
a{4}=imread('asans.bmp');
a{5}=imread('atahoma.bmp');
a{6}=imread('atimes.bmp');
for i1=1:6,
    ubahukuran{1,i1}=imresize(a{i1},[20 20]);
    ubahwarna{1,i1}=im2bw(ubahukuran{1,i1});
    ubahbentuk{1,i1}=ubahwarna{1,i1}';
    ubahbentuk{1,i1}=ubahbentuk{1,i1}(:);
    ubahbentuk{1,i1}=ubahbentuk{1,i1}';

end

b{1}=imread('barial.bmp');
b{2}=imread('bbatang.bmp');
b{3}=imread('bcalibri.bmp');
b{4}=imread('bsans.bmp');
b{5}=imread('btahoma.bmp');
b{6}=imread('btimes.bmp');
for i2=1:6,
    ubahukuran{2,i2}=imresize(b{i2},[20 20]);
    ubahwarna{2,i2}=im2bw(ubahukuran{2,i2});
    ubahbentuk{2,i2}=ubahwarna{2,i2}';
    ubahbentuk{2,i2}=ubahbentuk{2,i2}(:);
    ubahbentuk{2,i2}=ubahbentuk{2,i2}';
```

```
end

c{1}=imread('carial.bmp');
c{2}=imread('cbatang.bmp');
c{3}=imread('ccalibri.bmp');
c{4}=imread('csans.bmp');
c{5}=imread('ctahoma.bmp');
c{6}=imread('ctimes.bmp');
for i3=1:6,
   ubahukuran{3,i3}=imresize(c{i3},[20 20]);
   ubahwarna{3,i3}=im2bw(ubahukuran{3,i3});
   ubahbentuk{3,i3}=ubahwarna{3,i3}';
   ubahbentuk{3,i3}=ubahbentuk{3,i3}(:);
   ubahbentuk{3,i3}=ubahbentuk{3,i3}';

end

d{1}=imread('darial.bmp');
d{2}=imread('dbatang.bmp');
d{3}=imread('dcalibri.bmp');
d{4}=imread('dsans.bmp');
d{5}=imread('dtahoma.bmp');
d{6}=imread('dtimes.bmp');
for i4=1:6,
   ubahukuran{4,i4}=imresize(d{i4},[20 20]);
   ubahwarna{4,i4}=im2bw(ubahukuran{4,i4});
   ubahbentuk{4,i4}=ubahwarna{4,i4}';
   ubahbentuk{4,i4}=ubahbentuk{4,i4}(:);
   ubahbentuk{4,i4}=ubahbentuk{4,i4}';

end

e{1}=imread('earial.bmp');
e{2}=imread('ebatang.bmp');
e{3}=imread('ecalibri.bmp');
e{4}=imread('esans.bmp');
e{5}=imread('etahoma.bmp');
e{6}=imread('etimes.bmp');
for i5=1:6,
   ubahukuran{5,i5}=imresize(e{i5},[20 20]);
   ubahwarna{5,i5}=im2bw(ubahukuran{5,i5});
   ubahbentuk{5,i5}=ubahwarna{5,i5}';
   ubahbentuk{5,i5}=ubahbentuk{5,i5}(:);
   ubahbentuk{5,i5}=ubahbentuk{5,i5}';

end

f{1}=imread('farial.bmp');
f{2}=imread('fbatang.bmp');
f{3}=imread('fcalibri.bmp');
f{4}=imread('fsans.bmp');
f{5}=imread('ftahoma.bmp');
f{6}=imread('ftimes.bmp');
for i6=1:6,
   ubahukuran{6,i6}=imresize(f{i6},[20 20]);
   ubahwarna{6,i6}=im2bw(ubahukuran{6,i6});
   ubahbentuk{6,i6}=ubahwarna{6,i6}';
   ubahbentuk{6,i6}=ubahbentuk{6,i6}(:);
   ubahbentuk{6,i6}=ubahbentuk{6,i6}';

end

g{1}=imread('garial.bmp');
g{2}=imread('gbatang.bmp');
g{3}=imread('gcalibri.bmp');
g{4}=imread('gsans.bmp');
g{5}=imread('gtahoma.bmp');
g{6}=imread('gtimes.bmp');
for i7=1:6,
   ubahukuran{7,i7}=imresize(g{i7},[20 20]);
   ubahwarna{7,i7}=im2bw(ubahukuran{7,i7});
   ubahbentuk{7,i7}=ubahwarna{7,i7}';
   ubahbentuk{7,i7}=ubahbentuk{7,i7}(:);
   ubahbentuk{7,i7}=ubahbentuk{7,i7}';

end

h{1}=imread('harial.bmp');
h{2}=imread('hbatang.bmp');
h{3}=imread('hcalibri.bmp');
h{4}=imread('hsans.bmp');
h{5}=imread('htahoma.bmp');
h{6}=imread('htimes.bmp');
for i8=1:6,
   ubahukuran{8,i8}=imresize(h{i8},[20 20]);
   ubahwarna{8,i8}=im2bw(ubahukuran{8,i8});
   ubahbentuk{8,i8}=ubahwarna{8,i8}';
   ubahbentuk{8,i8}=ubahbentuk{8,i8}(:);
   ubahbentuk{8,i8}=ubahbentuk{8,i8}';

end

i{1}=imread('iarial.bmp');
i{2}=imread('ibatang.bmp');
i{3}=imread('icalibri.bmp');
i{4}=imread('isans.bmp');
i{5}=imread('itahoma.bmp');
i{6}=imread('itimes.bmp');
for i9=1:6,
   ubahukuran{9,i9}=imresize(i{i9},[20 20]);
   ubahwarna{9,i9}=im2bw(ubahukuran{9,i9});
   ubahbentuk{9,i9}=ubahwarna{9,i9}';
   ubahbentuk{9,i9}=ubahbentuk{9,i9}(:);
   ubahbentuk{9,i9}=ubahbentuk{9,i9}';

end

j{1}=imread('jarial.bmp');
j{2}=imread('jbatang.bmp');
j{3}=imread('jcalibri.bmp');
j{4}=imread('jsans.bmp');
j{5}=imread('jtahoma.bmp');
j{6}=imread('jtimes.bmp');
for i10=1:6,
   ubahukuran{10,i10}=imresize(j{i10},[20 20]);

ubahwarna{10,i10}=im2bw(ubahukuran{10,i10}
);
   ubahbentuk{10,i10}=ubahwarna{10,i10}';
   ubahbentuk{10,i10}=ubahbentuk{10,i10}(:);
   ubahbentuk{10,i10}=ubahbentuk{10,i10}';

end
```

```
k{1}=imread('karial.bmp');
k{2}=imread('kbatang.bmp');
k{3}=imread('kcalibri.bmp');
k{4}=imread('ksans.bmp');
k{5}=imread('ktahoma.bmp');
k{6}=imread('ktimes.bmp');
for i11=1:6,
   ubahukuran{11,i11}=imresize(k{i11},[20 20]);

ubahwarna{11,i11}=im2bw(ubahukuran{11,i11}
);
   ubahbentuk{11,i11}=ubahwarna{11,i11}';
   ubahbentuk{11,i11}=ubahbentuk{11,i11}(:);
   ubahbentuk{11,i11}=ubahbentuk{11,i11}';

end

l{1}=imread('larial.bmp');
l{2}=imread('lbatang.bmp');
l{3}=imread('lcalibri.bmp');
l{4}=imread('lsans.bmp');
l{5}=imread('ltahoma.bmp');
l{6}=imread('ltimes.bmp');
for i12=1:6,
   ubahukuran{12,i12}=imresize(l{i12},[20 20]);

ubahwarna{12,i12}=im2bw(ubahukuran{12,i12}
);
   ubahbentuk{12,i12}=ubahwarna{12,i12}';
   ubahbentuk{12,i12}=ubahbentuk{12,i12}(:);
   ubahbentuk{12,i12}=ubahbentuk{12,i12}';

end

m{1}=imread('marial.bmp');
m{2}=imread('mbatang.bmp');
m{3}=imread('mcalibri.bmp');
m{4}=imread('msans.bmp');
m{5}=imread('mtahoma.bmp');
m{6}=imread('mtimes.bmp');
for i13=1:6,
   ubahukuran{13,i13}=imresize(m{i13},[20
20]);

ubahwarna{13,i13}=im2bw(ubahukuran{13,i13}
);
   ubahbentuk{13,i13}=ubahwarna{13,i13}';
   ubahbentuk{13,i13}=ubahbentuk{13,i13}(:);
   ubahbentuk{13,i13}=ubahbentuk{13,i13}';

end

n{1}=imread('narial.bmp');
n{2}=imread('nbatang.bmp');
n{3}=imread('ncalibri.bmp');
n{4}=imread('nsans.bmp');
n{5}=imread('ntahoma.bmp');
n{6}=imread('ntimes.bmp');
for i14=1:6,
   ubahukuran{14,i14}=imresize(n{i14},[20 20]);

ubahwarna{14,i14}=im2bw(ubahukuran{14,i14}
);
   ubahbentuk{14,i14}=ubahwarna{14,i14}';
   ubahbentuk{14,i14}=ubahbentuk{14,i14}(:);
   ubahbentuk{14,i14}=ubahbentuk{14,i14}';

end

o{1}=imread('oarial.bmp');
o{2}=imread('obatang.bmp');
o{3}=imread('ocalibri.bmp');
o{4}=imread('osans.bmp');
o{5}=imread('otahoma.bmp');
o{6}=imread('otimes.bmp');
for i15=1:6,
   ubahukuran{15,i15}=imresize(o{i15},[20 20]);

ubahwarna{15,i15}=im2bw(ubahukuran{15,i15}
);
   ubahbentuk{15,i15}=ubahwarna{15,i15}';
   ubahbentuk{15,i15}=ubahbentuk{15,i15}(:);
   ubahbentuk{15,i15}=ubahbentuk{15,i15}';

end

p{1}=imread('parial.bmp');
p{2}=imread('pbatang.bmp');
p{3}=imread('pcalibri.bmp');
p{4}=imread('psans.bmp');
p{5}=imread('ptahoma.bmp');
p{6}=imread('ptimes.bmp');
for i16=1:6,
   ubahukuran{16,i16}=imresize(p{i16},[20 20]);

ubahwarna{16,i16}=im2bw(ubahukuran{16,i16}
);
   ubahbentuk{16,i16}=ubahwarna{16,i16}';
   ubahbentuk{16,i16}=ubahbentuk{16,i16}(:);
   ubahbentuk{16,i16}=ubahbentuk{16,i16}';

end

q{1}=imread('qarial.bmp');
q{2}=imread('qbatang.bmp');
q{3}=imread('qcalibri.bmp');
q{4}=imread('qsans.bmp');
q{5}=imread('qtahoma.bmp');
q{6}=imread('qtimes.bmp');
for i17=1:6,
   ubahukuran{17,i17}=imresize(q{i17},[20 20]);

ubahwarna{17,i17}=im2bw(ubahukuran{17,i17}
);
   ubahbentuk{17,i17}=ubahwarna{17,i17}';
   ubahbentuk{17,i17}=ubahbentuk{17,i17}(:);
   ubahbentuk{17,i17}=ubahbentuk{17,i17}';

end
```

```
r{1}=imread('rarial.bmp');
r{2}=imread('rbatang.bmp');
r{3}=imread('rcalibri.bmp');
r{4}=imread('rsans.bmp');
r{5}=imread('rtahoma.bmp');
r{6}=imread('rtimes.bmp');
for i18=1:6,
   ubahukuran{18,i18}=imresize(r{i18},[20 20]);

ubahwarna{18,i18}=im2bw(ubahukuran{18,i18}
);
   ubahbentuk{18,i18}=ubahwarna{18,i18}';
   ubahbentuk{18,i18}=ubahbentuk{18,i18}(:);
   ubahbentuk{18,i18}=ubahbentuk{18,i18}';

end

s{1}=imread('sarial.bmp');
s{2}=imread('sbatang.bmp');
s{3}=imread('scalibri.bmp');
s{4}=imread('ssans.bmp');
s{5}=imread('stahoma.bmp');
s{6}=imread('stimes.bmp');
for i19=1:6,
   ubahukuran{19,i19}=imresize(s{i19},[20 20]);

ubahwarna{19,i19}=im2bw(ubahukuran{19,i19}
);
   ubahbentuk{19,i19}=ubahwarna{19,i19}';
   ubahbentuk{19,i19}=ubahbentuk{19,i19}(:);
   ubahbentuk{19,i19}=ubahbentuk{19,i19}';

end

t{1}=imread('tarial.bmp');
t{2}=imread('tbatang.bmp');
t{3}=imread('tcalibri.bmp');
t{4}=imread('tsans.bmp');
t{5}=imread('ttahoma.bmp');
t{6}=imread('ttimes.bmp');
for i20=1:6,
   ubahukuran{20,i20}=imresize(t{i20},[20 20]);

ubahwarna{20,i20}=im2bw(ubahukuran{20,i20}
);
   ubahbentuk{20,i20}=ubahwarna{20,i20}';
   ubahbentuk{20,i20}=ubahbentuk{20,i20}(:);
   ubahbentuk{20,i20}=ubahbentuk{20,i20}';

end

u{1}=imread('uarial.bmp');
u{2}=imread('ubatang.bmp');
u{3}=imread('ucalibri.bmp');
u{4}=imread('usans.bmp');
u{5}=imread('utahoma.bmp');
u{6}=imread('utimes.bmp');
for i21=1:6,
   ubahukuran{21,i21}=imresize(u{i21},[20 20]);

ubahwarna{21,i21}=im2bw(ubahukuran{21,i21}
);
   ubahbentuk{21,i21}=ubahwarna{21,i21}';
   ubahbentuk{21,i21}=ubahbentuk{21,i21}(:);
   ubahbentuk{21,i21}=ubahbentuk{21,i21}';

end

v{1}=imread('varial.bmp');
v{2}=imread('vbatang.bmp');
v{3}=imread('vcalibri.bmp');
v{4}=imread('vsans.bmp');
v{5}=imread('vtahoma.bmp');
v{6}=imread('vtimes.bmp');
for i22=1:6,
   ubahukuran{22,i22}=imresize(v{i22},[20 20]);

ubahwarna{22,i22}=im2bw(ubahukuran{22,i22}
);
   ubahbentuk{22,i22}=ubahwarna{22,i22}';
   ubahbentuk{22,i22}=ubahbentuk{22,i22}(:);
   ubahbentuk{22,i22}=ubahbentuk{22,i22}';

end

w{1}=imread('warial.bmp');
w{2}=imread('wbatang.bmp');
w{3}=imread('wcalibri.bmp');
w{4}=imread('wsans.bmp');
w{5}=imread('wtahoma.bmp');
w{6}=imread('wtimes.bmp');
for i23=1:6,
   ubahukuran{23,i23}=imresize(w{i23},[20
20]);

ubahwarna{23,i23}=im2bw(ubahukuran{23,i23}
);
   ubahbentuk{23,i23}=ubahwarna{23,i23}';
   ubahbentuk{23,i23}=ubahbentuk{23,i23}(:);
   ubahbentuk{23,i23}=ubahbentuk{23,i23}';

end

x{1}=imread('xarial.bmp');
x{2}=imread('xbatang.bmp');
x{3}=imread('xcalibri.bmp');
x{4}=imread('xsans.bmp');
x{5}=imread('xtahoma.bmp');
x{6}=imread('xtimes.bmp');
for i24=1:6,
   ubahukuran{24,i24}=imresize(x{i24},[20 20]);

ubahwarna{24,i24}=im2bw(ubahukuran{24,i24}
);
   ubahbentuk{24,i24}=ubahwarna{24,i24}';
   ubahbentuk{24,i24}=ubahbentuk{24,i24}(:);
   ubahbentuk{24,i24}=ubahbentuk{24,i24}';

end
```

```
y{1}=imread('yarial.bmp');
y{2}=imread('ybatang.bmp');
y{3}=imread('ycalibri.bmp');
y{4}=imread('ysans.bmp');
y{5}=imread('ytahoma.bmp');
y{6}=imread('ytimes.bmp');
for i25=1:6,
   ubahukuran{25,i25}=imresize(y{i25},[20 20]);

ubahwarna{25,i25}=im2bw(ubahukuran{25,i25}
);
   ubahbentuk{25,i25}=ubahwarna{25,i25}';
   ubahbentuk{25,i25}=ubahbentuk{25,i25}(:);
   ubahbentuk{25,i25}=ubahbentuk{25,i25}';

end

z{1}=imread('zarial.bmp');
z{2}=imread('zbatang.bmp');
z{3}=imread('zcalibri.bmp');
z{4}=imread('zsans.bmp');
z{5}=imread('ztahoma.bmp');
z{6}=imread('ztimes.bmp');
for i26=1:6,
   ubahukuran{26,i26}=imresize(z{i26},[20 20]);

ubahwarna{26,i26}=im2bw(ubahukuran{26,i26}
);
   ubahbentuk{26,i26}=ubahwarna{26,i26}';
   ubahbentuk{26,i26}=ubahbentuk{26,i26}(:);
   ubahbentuk{26,i26}=ubahbentuk{26,i26}';

end

ubahbentuk=ubahbentuk';
ubahbentuk=ubahbentuk(:);
inputkecil=ubahbentuk
save input inputkecil;
```

Program Pelatihan Huruf Kapital

```
% TAbesar

clc;
clear all;

vp =0.5;
m=26;
L=2;
n= 400;
epn=1000;
b=zeros(n,m)+L/(L-1+n);
t=zeros(m,n)+1;
load input inputbesar;
input_final=[];
input3=[];
for jj=1:156,
   input1=[];
   input1=inputbesar{jj};
   input4=[];
   input3=[input3 ;input1];

end
data=input3;
s=data;
c=length(s);
con=1;
epoch=0;

while con
   for I=1:156;
      x=s(I,:);
      y=zeros(1,m);
      ns=sum(x);
      for j=1:m;
         if y(j)~=-1;
            for i=1:400;
               y(j)=b(i,j)*x(i);

            end
         end
      end
      con1=1;
      while con1;
         for j=1:m;
            if y(j)==max(y);
               J=j;
               break
            end
         end
         if y(J)==-1;
            con1=0;
         else
            for i=1:n;
               x(i)=s(I,i)*t(J,i);
            end
            nx=sum(x);
            if nx/ns < vp;
               y(J)=-1;
               con1=1;
            else
               con1=0;
            end
         end
      end
cl(I)=J;
for i = 1:n;
   b(i,J)=L*x(i)/(L-1+nx);
   t(J,i)=x(i);
end
   end
   epoch=epoch+1;
   if epoch==epn;
      con=0;
   end
end
```

```
for i=1:n;
   for j=1:m;
      if b(i,j)>0;
         pb(i,j)=1;
      else
         pb(i,j)=-1;
      end
   end
end
pb=pb';
save bb
save tb
```

Program Pelatihan Huruf Kecil

```
% TAbesar

clc;
clear all;

vp =0.5;
m=26;
L=2;
n= 400;
epn=100;
b=zeros(n,m)+L/(L-1+n);
t=zeros(m,n)+1;
load input inputkecil;
input_final=[];
input31=[];
for jj1=1:156,
   input11=[];
   input11=inputkecil{jj1};
   input41=[];
   input31=[input31 ;input11];

end
data=input31;
s=data;
c=length(s);
con=100;
epoch=0;

while con
   for I=1:156;
      x=s(I,:);
      y=zeros(1,m);
      ns=sum(x);
      for j=1:m;
         if y(j)~=-1;
            for i=1:400;
               y(j)=b(i,j)*x(i);

            end
         end
      end
      con1=1;
      while con1;
         for j=1:m;
            if y(j)==max(y);
               J=j;
               break
            end
         end
         if y(J)==-1;
            con1=0;
         else
            for i=1:n;
               x(i)=s(I,i)*t(J,i);
            end
            nx=sum(x);
            if nx/ns < vp;
               y(J)=-1;
               con1=1;
            else
               con1=0;
            end
         end
      end
cl(I)=J;
for i = 1:n;
   b(i,J)=L*x(i)/(L-1+nx);
   t(J,i)=x(i);
   t1=t(1,:);
end
   end

   epoch=epoch+1;
   if epoch==epn;
      con=0;
   end
end
for i=1:n;
   for j=1:m;
      if b(i,j)>0;
         pb(i,j)=1;
      else
         pb(i,j)=-1;
      end
   end
end
pb=pb';

save bk
save tk
```

Program GUI untuk Pelatihan

```
gui_Singleton = 1;
gui_State = struct('gui_Name',       mfilename, ...
                   'gui_Singleton',  gui_Singleton, ...
                   'gui_OpeningFcn',
@latihbesar1_OpeningFcn, ...
                   'gui_OutputFcn',
@latihbesar1_OutputFcn, ...
                   'gui_LayoutFcn',  [] , ...
                   'gui_Callback',   []);
if nargin && ischar(varargin{1})
    gui_State.gui_Callback =
str2func(varargin{1});
end

if nargout
    [varargout{1:nargout}] =
gui_mainfcn(gui_State, varargin{:});
else
    gui_mainfcn(gui_State, varargin{:});
end
% End initialization code - DO NOT EDIT


% --- Executes on button press in pushbutton1.
function pushbutton1_Callback(hObject,
eventdata, handles)
% hObject    handle to pushbutton1 (see GCBO)
% eventdata  reserved - to be defined in a future
version of MATLAB
% handles    structure with handles and user data
(see GUIDATA)

% TAbesar

clc;
clear all;

 vp3=0.3;
m=26;
L=2;
n= 400;
epn=100;
b=zeros(n,m)+L/(L-1+n);
t=zeros(m,n)+1;
load input inputbesar;
input_final=[];
input3=[];
for jj=1:156,
    input1=[];
    input1=inputbesar{jj};
    input4=[];
    input3=[input3 ;input1];

end
data=input3;
s=data;
c=length(s);
con=1;
epoch=0;

while con
  for I=1:156;
    x=s(I,:);
    y=zeros(1,m);
    ns=sum(x);
    for j=1:m;
      if y(j)~=-1;
        for i=1:400;
          y(j)=b(i,j)*x(i);

        end
      end
    end
    con1=1;
    while con1;
      for j=1:m;
        if y(j)==max(y);
          J=j;
          break
        end
      end
      if y(J)==-1;
        con1=0;
      else
        for i=1:n;
          x(i)=s(I,i)*t(J,i);
        end
        nx=sum(x);
        if nx/ns < vp3;
          y(J)=-1;
          con1=1;
        else
          con1=0;
        end
      end
    end
cl(I)=J;
for i = 1:n;
  b(i,J)=L*x(i)/(L-1+nx);
  t(J,i)=x(i);
end
  end
  epoch=epoch+1;
  if epoch==epn;
    con=0;
  end
end
for i=1:n;
  for j=1:m;
    if b(i,j)>0;
      pb(i,j)=1;
    else
      pb(i,j)=-1;
    end
  end
end
pb=pb';
save bb3
save tb3
```

```
myform=guidata(gcbo);
set(myform.edit2,'string',vp3);
set(myform.edit1,'string',epn);
set(myform.listbox2,'string',yall3);

% --- Executes on button press in pushbutton2.
function pushbutton2_Callback(hObject,
eventdata, handles)
% hObject    handle to pushbutton2 (see GCBO)
% eventdata  reserved - to be defined in a future
version of MATLAB
% handles    structure with handles and user data
(see GUIDATA)

close

function edit1_Callback(hObject, eventdata,
handles)
% hObject    handle to edit1 (see GCBO)
% eventdata  reserved - to be defined in a future
version of MATLAB
% handles    structure with handles and user data
(see GUIDATA)

% Hints: get(hObject,'String') returns contents of
edit1 as text
%        str2double(get(hObject,'String')) returns
contents of edit1 as a double


% --- Executes during object creation, after
setting all properties.
function edit1_CreateFcn(hObject, eventdata,
handles)
% hObject    handle to edit1 (see GCBO)
% eventdata  reserved - to be defined in a future
version of MATLAB
% handles    empty - handles not created until
after all CreateFcns called

% Hint: edit controls usually have a white
background on Windows.
%       See ISPC and COMPUTER.
if ispc &&
isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end


function edit2_Callback(hObject, eventdata,
handles)
% hObject    handle to edit2 (see GCBO)
% eventdata  reserved - to be defined in a future
version of MATLAB
% handles    structure with handles and user data
(see GUIDATA)

% Hints: get(hObject,'String') returns contents of
edit2 as text
%        str2double(get(hObject,'String')) returns
contents of edit2 as a double
vp=str2num(get(edit2,'string'))


% --- Executes during object creation, after
setting all properties.
function edit2_CreateFcn(hObject, eventdata,
handles)
% hObject    handle to edit2 (see GCBO)
% eventdata  reserved - to be defined in a future
version of MATLAB
% handles    empty - handles not created until
after all CreateFcns called

% Hint: edit controls usually have a white
background on Windows.
%       See ISPC and COMPUTER.
if ispc &&
isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end


% --- Executes when entered data in editable
cell(s) in uitable1.
function uitable1_CellEditCallback(hObject,
eventdata, handles)
% hObject    handle to uitable1 (see GCBO)
% eventdata  structure with the following fields
(see UITABLE)
%   Indices: row and column indices of the cell(s)
edited
%   PreviousData: previous data for the cell(s)
edited
%   EditData: string(s) entered by the user
%   NewData: EditData or its converted form set
on the Data property. Empty if Data was not
changed
%   Error: error string when failed to convert
EditData to appropriate value for Data
% handles    structure with handles and user data
(see GUIDATA)


% Hints: contents = cellstr(get(hObject,'String'))
returns listbox1 contents as cell array
%        contents{get(hObject,'Value')} returns
selected item from listbox1


% --- Executes on button press in pushbutton3.
function pushbutton3_Callback(hObject,
eventdata, handles)
% hObject    handle to pushbutton3 (see GCBO)
% eventdata  reserved - to be defined in a future
version of MATLAB
% handles    structure with handles and user data
(see GUIDATA)
% TAbesar
```

```
 function edit3_Callback(hObject, eventdata,
handles)
% hObject    handle to edit3 (see GCBO)
% eventdata  reserved - to be defined in a future
version of MATLAB
% handles    structure with handles and user data
(see GUIDATA)

% Hints: get(hObject,'String') returns contents of
edit3 as text
%        str2double(get(hObject,'String')) returns
contents of edit3 as a double


% --- Executes during object creation, after
setting all properties.
function edit3_CreateFcn(hObject, eventdata,
handles)
% hObject    handle to edit3 (see GCBO)
% eventdata  reserved - to be defined in a future
version of MATLAB
% handles    empty - handles not created until
after all CreateFcns called

% Hint: edit controls usually have a white
background on Windows.
%       See ISPC and COMPUTER.
if ispc &&
isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end


% --- Executes when entered data in editable
cell(s) in uitable3.
function uitable3_CellEditCallback(hObject,
eventdata, handles)
% hObject    handle to uitable3 (see GCBO)
% eventdata  structure with the following fields
(see UITABLE)
%   Indices: row and column indices of the cell(s)
edited
%   PreviousData: previous data for the cell(s)
edited
%   EditData: string(s) entered by the user
%   NewData: EditData or its converted form set
on the Data property. Empty if Data was not
changed
%   Error: error string when failed to convert
EditData to appropriate value for Data
% handles    structure with handles and user data
(see GUIDATA)


% --- Executes during object creation, after
setting all properties.
function uitable3_CreateFcn(hObject, eventdata,
handles)
% hObject    handle to uitable3 (see GCBO)
% eventdata  reserved - to be defined in a future
version of MATLAB
% handles    empty - handles not created until
after all CreateFcns called


% --- Executes when selected cell(s) is changed
in uitable6.
function uitable6_CellSelectionCallback(hObject,
eventdata, handles)
% hObject    handle to uitable6 (see GCBO)
% eventdata  structure with the following fields
(see UITABLE)
%   Indices: row and column indices of the cell(s)
currently selecteds
% handles    structure with handles and user data
(see GUIDATA)


% --- Executes when entered data in editable
cell(s) in uitable6.
function uitable6_CellEditCallback(hObject,
eventdata, handles)
% hObject    handle to uitable6 (see GCBO)
% eventdata  structure with the following fields
(see UITABLE)
%   Indices: row and column indices of the cell(s)
edited
%   PreviousData: previous data for the cell(s)
edited
%   EditData: string(s) entered by the user
%   NewData: EditData or its converted form set
on the Data property. Empty if Data was not
changed
%   Error: error string when failed to convert
EditData to appropriate value for Data
% handles    structure with handles and user data
(see GUIDATA)

% Hint: slider controls usually have a light gray
background.
if isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor',[.9 .9 .9]);
end


% --- Executes during object creation, after
setting all properties.
function uitable6_CreateFcn(hObject, eventdata,
handles)
% hObject    handle to uitable6 (see GCBO)
% eventdata  reserved - to be defined in a future
version of MATLAB
% handles    empty - handles not created until
after all CreateFcns called
```

Program GUI Untuk Pengujian

```
gui_Singleton = 1;
gui_State = struct('gui_Name',       mfilename, ...
                   'gui_Singleton',  gui_Singleton, ...
                   'gui_OpeningFcn',
@latihbesar1_OpeningFcn, ...
                   'gui_OutputFcn',
@latihbesar1_OutputFcn, ...
                   'gui_LayoutFcn',  [] , ...
                   'gui_Callback',   []);
if nargin && ischar(varargin{1})
    gui_State.gui_Callback =
str2func(varargin{1});
end

if nargout
    [varargout{1:nargout}] =
gui_mainfcn(gui_State, varargin{:});
else
    gui_mainfcn(gui_State, varargin{:});
end
% End initialization code - DO NOT EDIT


% --- Executes on button press in pushbutton1.
function pushbutton1_Callback(hObject,
eventdata, handles)
% hObject    handle to pushbutton1 (see GCBO)
% eventdata  reserved - to be defined in a future
version of MATLAB
% handles    structure with handles and user data
(see GUIDATA)

% TAbesar

clc;
clear all;

vp =0.3;
m=26;
L=2;
n= 400;
epn=1;
load bb3
load tb3

A{1}=imread('Aarial.bmp');
for i1=1,
    ubahukuran{1,i1}=imresize(A{i1},[20 20]);
    ubahwarna{1,i1}=im2bw(ubahukuran{1,i1});
    ubahbentuk{1,i1}=ubahwarna{1,i1}';
    ubahbentuk{1,i1}=ubahbentuk{1,i1}(:);
    ubahbentuk{1,i1}=ubahbentuk{1,i1}';

end
ubahbentuk=ubahbentuk';
ubahbentuk=ubahbentuk(:);
inputA1=ubahbentuk;

save input inputA1
load input inputA1;
input_final=[];
input3=[];
for jj=1
    input1=[];
    input1=inputA1{jj};
    input4=[];
    input3=[input3 ;input1];

end
data=input3;
s=data;
c=length(s);
con=1;
epoch=0;

while con
    for I=1;
        x=s(I,:);
        y=zeros(1,m);
        ns=sum(x);
        for j=1:m;
            if y(j)~=-1;
                for i=1:400;
                    y(j)=b(i,j)*x(i);

                end
            end
        end
        con1=1;
        while con1;
            for j=1:m;
                if y(j)==max(y);
                    J=j;
                    break
                end
            end
            if y(J)==-1;
                con1=0;
            else
                for i=1:n;
                    x(i)=s(I,i)*t(J,i);
                end
                nx=sum(x);
                if nx/ns < vp;
                    y(J)=-1;
                    con1=1;
                else
                    con1=0;
                end
            end
        end
cl(I)=J;
    end
    epoch=epoch+1;
    if epoch==epn;
        con=0;
    end
end
yA1=y;
save yA1

myform=guidata(gcbo);
set(myform.edit2,'string',vp);
```

```
set(myform.edit1,'string',epn);
set(myform.listbox2,'string',yall3);

% --- Executes on button press in pushbutton2.
function pushbutton2_Callback(hObject,
eventdata, handles)
% hObject    handle to pushbutton2 (see GCBO)
% eventdata  reserved - to be defined in a future
version of MATLAB
% handles    structure with handles and user data
(see GUIDATA)

close

function edit1_Callback(hObject, eventdata,
handles)
% hObject    handle to edit1 (see GCBO)
% eventdata  reserved - to be defined in a future
version of MATLAB
% handles    structure with handles and user data
(see GUIDATA)

% Hints: get(hObject,'String') returns contents of
edit1 as text
%        str2double(get(hObject,'String')) returns
contents of edit1 as a double


% --- Executes during object creation, after
setting all properties.
function edit1_CreateFcn(hObject, eventdata,
handles)
% hObject    handle to edit1 (see GCBO)
% eventdata  reserved - to be defined in a future
version of MATLAB
% handles    empty - handles not created until
after all CreateFcns called

% Hint: edit controls usually have a white
background on Windows.
%       See ISPC and COMPUTER.
if ispc &&
isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end



function edit2_Callback(hObject, eventdata,
handles)
% hObject    handle to edit2 (see GCBO)
% eventdata  reserved - to be defined in a future
version of MATLAB
% handles    structure with handles and user data
(see GUIDATA)

% Hints: get(hObject,'String') returns contents of
edit2 as text
%        str2double(get(hObject,'String')) returns
contents of edit2 as a double
vp=str2num(get(edit2,'string'))


 % --- Executes during object creation, after
setting all properties.
function edit2_CreateFcn(hObject, eventdata,
handles)
% hObject    handle to edit2 (see GCBO)
% eventdata  reserved - to be defined in a future
version of MATLAB
% handles    empty - handles not created until
after all CreateFcns called

% Hint: edit controls usually have a white
background on Windows.
%       See ISPC and COMPUTER.
if ispc &&
isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end


% --- Executes when entered data in editable
cell(s) in uitable1.
function uitable1_CellEditCallback(hObject,
eventdata, handles)
% hObject    handle to uitable1 (see GCBO)
% eventdata  structure with the following fields
(see UITABLE)
%   Indices: row and column indices of the cell(s)
edited
%   PreviousData: previous data for the cell(s)
edited
%   EditData: string(s) entered by the user
%   NewData: EditData or its converted form set
on the Data property. Empty if Data was not
changed
%   Error: error string when failed to convert
EditData to appropriate value for Data
% handles    structure with handles and user data
(see GUIDATA)


% Hints: contents = cellstr(get(hObject,'String'))
returns listbox1 contents as cell array
%        contents{get(hObject,'Value')} returns
selected item from listbox1


% --- Executes on button press in pushbutton3.
function pushbutton3_Callback(hObject,
eventdata, handles)
% hObject    handle to pushbutton3 (see GCBO)
% eventdata  reserved - to be defined in a future
version of MATLAB
% handles    structure with handles and user data
(see GUIDATA)
% TAbesar
```

```
function edit3_Callback(hObject, eventdata,
handles)
% hObject    handle to edit3 (see GCBO)
% eventdata  reserved - to be defined in a future
version of MATLAB
% handles    structure with handles and user data
(see GUIDATA)

% Hints: get(hObject,'String') returns contents of
edit3 as text
%        str2double(get(hObject,'String')) returns
contents of edit3 as a double


% --- Executes during object creation, after
setting all properties.
function edit3_CreateFcn(hObject, eventdata,
handles)
% hObject    handle to edit3 (see GCBO)
% eventdata  reserved - to be defined in a future
version of MATLAB
% handles    empty - handles not created until
after all CreateFcns called

% Hint: edit controls usually have a white
background on Windows.
%       See ISPC and COMPUTER.
if ispc &&
isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end


% --- Executes when entered data in editable
cell(s) in uitable3.
function uitable3_CellEditCallback(hObject,
eventdata, handles)
% hObject    handle to uitable3 (see GCBO)
% eventdata  structure with the following fields
(see UITABLE)
%   Indices: row and column indices of the cell(s)
edited
%   PreviousData: previous data for the cell(s)
edited
%   EditData: string(s) entered by the user
%   NewData: EditData or its converted form set
on the Data property. Empty if Data was not
changed
%   Error: error string when failed to convert
EditData to appropriate value for Data
% handles    structure with handles and user data
(see GUIDATA)


% --- Executes during object creation, after
setting all properties.
function uitable3_CreateFcn(hObject, eventdata,
handles)
% hObject    handle to uitable3 (see GCBO)
% eventdata  reserved - to be defined in a future
version of MATLAB
% handles    empty - handles not created until
after all CreateFcns called


% --- Executes when selected cell(s) is changed
in uitable6.
function uitable6_CellSelectionCallback(hObject,
eventdata, handles)
% hObject    handle to uitable6 (see GCBO)
% eventdata  structure with the following fields
(see UITABLE)
%   Indices: row and column indices of the cell(s)
currently selecteds
% handles    structure with handles and user data
(see GUIDATA)


% --- Executes when entered data in editable
cell(s) in uitable6.
function uitable6_CellEditCallback(hObject,
eventdata, handles)
% hObject    handle to uitable6 (see GCBO)
% eventdata  structure with the following fields
(see UITABLE)
%   Indices: row and column indices of the cell(s)
edited
%   PreviousData: previous data for the cell(s)
edited
%   EditData: string(s) entered by the user
%   NewData: EditData or its converted form set
on the Data property. Empty if Data was not
changed
%   Error: error string when failed to convert
EditData to appropriate value for Data
% handles    structure with handles and user data
(see GUIDATA)

% Hint: slider controls usually have a light gray
background.
if isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor',[.9 .9 .9]);
end


% --- Executes during object creation, after
setting all properties.
function uitable6_CreateFcn(hObject, eventdata,
handles)
% hObject    handle to uitable6 (see GCBO)
% eventdata  reserved - to be defined in a future
version of MATLAB
% handles    empty - handles not created until
after all CreateFcns called
```

LAMPIRAN B
PENGELOMPOKAN HURUF

PengelompokanHurufKapital Arial Vp 0.3

Kelompok	Data Pelatihan
Kelompok 1	A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z

PengelompokanHurufKapitalBatangVp 0.3

Kelompok	Data Pelatihan
Kelompok 1	A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z

PengelompokanHurufKapital Calibri Vp 0.3

Kelompok	Data Pelatihan
Kelompok 1	A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z

PengelompokanHurufKapital Microsoft SansSherifVp 0.3

Kelompok	Data Pelatihan
Kelompok 1	A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z

PengelompokanHurufKapital Tahoma Vp 0.3

Kelompok	Data Pelatihan
Kelompok 1	A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z

PengelompokanHurufKapital Times New Roman Vp 0.3

Kelompok	Data Pelatihan
Kelompok 1	A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z