Appendix

```
############################
#########################
Program to Locate  Boundaries of Edges (extra ## %
## (features
%
#################################
#######################

clc;
clear;
conn = database('jazan', 'system', 'lionlion');
curs=exec(conn, 'select * from customer');
setdbprefs('DataReturnFormat','cellarray');
curs = fetch(curs);
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%
no = inputdlg('Enter The emploee No ');
no= cell2mat(no);
where ='where cus_no =';
whereclause=strcat(where,no);
%*********************************************
pathname1 = inputdlg('Enter The Path name Image 1 ');
pathname1= cell2mat(pathname1);
%
f=imread(pathname1);
f1=imresize(f, [80, 280]);
imshow(f1);
a1=edge(f1);
figure; imshow(a1);

[m n] = size(a1);

tcount1=0;lcount1=0;
rcount1=0;bcount1=0;

topcount1=0;leftcount1=0;
rightcount1=0;botcount1=0;
%------------ Locating TOP Edge -------------
for (i=1:m
```

```
                                        (for (j=1:n

                    ((if (a1(i,j)>0 && (topcount1==0
              ;toprow1=i; topcol1=j; topcount1=1
                          ;tcount1=tcount1+1
                                              end

                                            end
                                              end

          -------------- Locating LEFT Edge ------------%
                                        (for (j=1:n

                                        (for (i=1:m

                ((if (a1(i,j)>0 && (leftcount1==0
              ;leftrow1=i; leftcol1=j; leftcount1=1
                          ;lcount1=lcount1+1
                                            end

                                            end
                                              end

          -------------- Locating RIGHT Edge ------------%
                                        (for (j=1:n
                                          ;k=n+1-j
                                        (for (i=1:m
                                          ;l=m+1-i
                ((if (a1(l,k)>0 && (rightcount1==0
          ;rightrow1=l; rightcol1=k; rightcount1=1
                          ;rcount1=rcount1+1
                                            end

                                            end
                                              end

          -------------- Locating BOTTOM Edge ------------%
                                        (for (i=1:m
                                          ;l=m+1-i
```

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```
(for (j=1:n
;k=n+1-j
((if (a1(l,k)>0 && (botcount1==0
;botrow1=l; botcol1=k; botcount1=1
;bcount1=bcount1+1
end

end
end

toprow1, topcol1
leftrow1, leftcol1
rightrow1, rightcol1
botrow1, botcol1

H_Len1 = sqrt((rightrow1-leftrow1)^2 + (rightcol1-
(leftcol1)^2
(V_Len1 = sqrt((botrow1-toprow1)^2 + (botcol1-topcol1)^2
{'colnames = {'v_len1
{exdata = {V_Len1
(update(conn, 'customer', colnames, exdata , whereclause
%
{'colnames = {'h_len1
{exdata = {H_Len1
(update(conn, 'customer', colnames, exdata, whereclause
%
{'colnames = {'rightrow1
{exdata = {rightrow1
(update(conn, 'customer', colnames, exdata, whereclause
%
{'colnames = {'rightcol1
{exdata = {rightcol1
(update(conn, 'customer', colnames, exdata, whereclause
%
{'colnames = {'leftrow1
{exdata = {leftrow1
(update(conn, 'customer', colnames, exdata, whereclause
%
{'colnames = {'leftcol1
```

{exdata = {leftcol1
(update(conn, 'customer', colnames, exdata, whereclause
%
{'colnames = {'botrow1
{exdata = {botrow1
(update(conn, 'customer', colnames, exdata, whereclause
%
{'colnames = {'botcol1
{exdata = {botcol1
(update(conn, 'customer', colnames, exdata, whereclause
%
{'colnames = {'toprow1
{exdata = {toprow1
(update(conn, 'customer', colnames, exdata, whereclause
%
{'colnames = {'topcol1
{exdata = {topcol1
(update(conn, 'customer', colnames, exdata, whereclause
+ + + + + + + + + + + + + + + + + + + %
;(' pathname2 = inputdlg('Enter The Path name Image 2
;(pathname2= cell2mat(pathname2
;(f=imread(pathname2
;([f1=imresize(f, [80, 280
;(imshow(f1
;(a2=edge(f1
;(figure; imshow(a2

;(m n] = size(a2]

;tcount2=0;lcount2=0
;rcount2=0;bcount2=0

;topcount2=0;leftcount2=0
;rightcount2=0;botcount2=0
-------------- Locating TOP Edge ------------%
(for (i=1:m
(for (j=1:n

((if (a2(i,j)>0 && (topcount2==0

5

```
;toprow2=i; topcol2=j; topcount2=1
;tcount2=tcount2+1
end

end
end

-------------- Locating LEFT Edge ------------%
(for (j=1:n

(for (i=1:m

((if (a2(i,j)>0 && (leftcount2==0
;leftrow2=i; leftcol2=j; leftcount2=1
;lcount2=lcount2+1
end

end
end

-------------- Locating RIGHT Edge ------------%
(for (j=1:n
;k=n+1-j
(for (i=1:m
;l=m+1-i
((if (a2(l,k)>0 && (rightcount2==0
;rightrow2=l; rightcol2=k; rightcount2=1
;rcount2=rcount2+1
end

end
end

-------------- Locating BOTTOM Edge ------------%
(for (i=1:m
;l=m+1-i
(for (j=1:n
;k=n+1-j
((if (a2(l,k)>0 && (botcount2==0
```

```
                    ;botrow2=l; botcol2=k; botcount2=1
                              ;bcount2=bcount2+1
                                        end


                                      end
                                       end



                              toprow2,  topcol2
                              leftrow2, leftcol2
                              rightrow2, rightcol2
                              botrow2, botcol2

        H_Len2 = sqrt((rightrow2-leftrow2)^2 + (rightcol2-
                                (leftcol2)^2
    (V_Len2 = sqrt((botrow2-toprow2)^2 + (botcol2-topcol2)^2
                              {'colnames = {'v_len2
                              {exdata = {V_Len2
      (update(conn, 'customer', colnames, exdata , whereclause
                                        %
                              {'colnames = {'h_len2
                              {exdata = {H_Len2
      (update(conn, 'customer', colnames, exdata, whereclause
                                        %
                              {'colnames = {'rightrow2
                              {exdata = {rightrow2
      (update(conn, 'customer', colnames, exdata, whereclause
                                        %
                              {'colnames = {'rightcol2
                              {exdata = {rightcol2
      (update(conn, 'customer', colnames, exdata, whereclause
                                        %
                              {'colnames = {'leftrow2
                              {exdata = {leftrow2
      (update(conn, 'customer', colnames, exdata, whereclause
                                        %
                              {'colnames = {'leftcol2
                              {exdata = {leftcol2
      (update(conn, 'customer', colnames, exdata, whereclause
```

```
%
{'colnames = {'botrow2
{exdata = {botrow2
(update(conn, 'customer', colnames, exdata, whereclause
%
{'colnames = {'botcol2
{exdata = {botcol2
(update(conn, 'customer', colnames, exdata, whereclause
%
{'colnames = {'toprow2
{exdata = {toprow2
(update(conn, 'customer', colnames, exdata, whereclause
%
{'colnames = {'topcol2
{exdata = {topcol2
(update(conn, 'customer', colnames, exdata, whereclause
% +++++++++++++++++++
;(' pathname3 = inputdlg('Enter The Path name Image 3
;(pathname3= cell2mat(pathname3
;(f=imread(pathname3
;([f1=imresize(f, [80, 280
;(imshow(f1
;(a3=edge(f1
;(figure; imshow(a3

;(m n] = size(a3]

;tcount3=0;lcount3=0
;rcount3=0;bcount3=0

;topcount3=0;leftcount3=0
;rightcount3=0;botcount3=0
% ------------- Locating TOP Edge ------------
(for (i=1:m
(for (j=1:n

((if (a3(i,j)>0 && (topcount3==0
;toprow3=i; topcol3=j; topcount3=1
;tcount3=tcount3+1
```

```
                                              end

                                              end
                                                 end


          -------------- Locating LEFT Edge ------------%
                                              (for (j=1:n

                                           (for (i=1:m

                 ((if (a3(i,j)>0 && (leftcount3==0
               ;leftrow3=i; leftcol3=j; leftcount3=1
                           ;lcount3=lcount3+1
                                              end


                                              end
                                                 end


          -------------- Locating RIGHT Edge ------------%
                                              (for (j=1:n
                                              ;k=n+1-j
                                           (for (i=1:m
                                              ;l=m+1-i
                 ((if (a3(l,k)>0 && (rightcount3==0
             ;rightrow3=l; rightcol3=k; rightcount3=1
                           ;rcount3=rcount3+1
                                              end


                                              end
                                                 end


          -------------- Locating BOTTOM Edge ------------%
                                           (for (i=1:m
                                              ;l=m+1-i
                                           (for (j=1:n
                                              ;k=n+1-j
                 ((if (a3(l,k)>0 && (botcount3==0
               ;botrow3=l; botcol3=k; botcount3=1
                           ;bcount3=bcount3+1


                     9
```

end

end
end

toprow3, topcol3
leftrow3, leftcol3
rightrow3, rightcol3
botrow3, botcol3

H_Len3 = sqrt((rightrow3-leftrow3)^2 + (rightcol3-(leftcol3)^2

(V_Len3 = sqrt((botrow3-toprow3)^2 + (botcol3-topcol3)^2
{'colnames = {'v_len3
{exdata = {V_Len3
(update(conn, 'customer', colnames, exdata , whereclause %
{'colnames = {'h_len3
{exdata = {H_Len3
(update(conn, 'customer', colnames, exdata, whereclause %
{'colnames = {'rightrow3
{exdata = {rightrow3
(update(conn, 'customer', colnames, exdata, whereclause %
{'colnames = {'rightcol3
{exdata = {rightcol3
(update(conn, 'customer', colnames, exdata, whereclause %
{'colnames = {'leftrow3
{exdata = {leftrow3
(update(conn, 'customer', colnames, exdata, whereclause %
{'colnames = {'leftcol3
{exdata = {leftcol3
(update(conn, 'customer', colnames, exdata, whereclause %
{'colnames = {'botrow3

```
{exdata = {botrow3
(update(conn, 'customer', colnames, exdata, whereclause
%
{'colnames = {'botcol3
{exdata = {botcol3
(update(conn, 'customer', colnames, exdata, whereclause
%
{'colnames = {'toprow3
{exdata = {toprow3
(update(conn, 'customer', colnames, exdata, whereclause
%
{'colnames = {'topcol3
{exdata = {topcol3
(update(conn, 'customer', colnames, exdata, whereclause
###################### %
;(' pathname4 = inputdlg('Enter The Path name Image 4
;(pathname4= cell2mat(pathname4
;(f=imread(pathname4
;([f1=imresize(f, [80, 280
;(imshow(f1
;(a3=edge(f1
;(figure; imshow(a3

;(m n] = size(a3]

;tcount4=0;lcount4=0
;rcount4=0;bcount4=0

;topcount4=0;leftcount4=0
;rightcount4=0;botcount4=0
-------------- Locating TOP Edge ------------%
(for (i=1:m
(for (j=1:n

((if (a3(i,j)>0 && (topcount4==0
;toprow4=i; topcol4=j; topcount4=1
;tcount4=tcount4+1
end
```

```
                                              end
                                                end


         -------------- Locating LEFT Edge ------------%
                                         (for (j=1:n

                                       (for (i=1:m

           ((if (a3(i,j)>0 && (leftcount4==0
         ;leftrow4=i; leftcol4=j; leftcount4=1
                       ;lcount4=lcount4+1
                                            end


                                               end
                                                 end


         -------------- Locating RIGHT Edge ------------%
                                           (for (j=1:n
                                           ;k=n+1-j
                                         (for (i=1:m
                                         ;l=m+1-i
           ((if (a3(l,k)>0 && (rightcount4==0
         ;rightrow4=l; rightcol4=k; rightcount4=1
                       ;rcount4=rcount4+1
                                            end


                                               end
                                                 end


         -------------- Locating BOTTOM Edge ------------%
                                           (for (i=1:m
                                           ;l=m+1-i
                                         (for (j=1:n
                                         ;k=n+1-j
           ((if (a3(l,k)>0 && (botcount4==0
         ;botrow4=l; botcol4=k; botcount4=1
                       ;bcount4=bcount4+1
                                            end
```

```
                                          end
                                        end


                            toprow4,  topcol4
                            leftrow4, leftcol4
                          rightrow4, rightcol4
                            botrow4, botcol4

        H_Len4 = sqrt((rightrow4-leftrow4)^2 + (rightcol4-
                                        (leftcol4)^2
(V_Len4 = sqrt((botrow4-toprow4)^2 + (botcol4-topcol4)^2
                          {'colnames = {'v_len4
                            {exdata = {V_Len4
   (update(conn, 'customer', colnames, exdata , whereclause
                                            %
                          {'colnames = {'h_len4
                            {exdata = {H_Len4
   (update(conn, 'customer', colnames, exdata, whereclause
                                            %
                          {'colnames = {'rightrow4
                            {exdata = {rightrow4
   (update(conn, 'customer', colnames, exdata, whereclause
                                            %
                          {'colnames = {'rightcol4
                            {exdata = {rightcol4
   (update(conn, 'customer', colnames, exdata, whereclause
                                            %
                          {'colnames = {'leftrow4
                            {exdata = {leftrow4
   (update(conn, 'customer', colnames, exdata, whereclause
                                            %
                          {'colnames = {'leftcol4
                            {exdata = {leftcol4
   (update(conn, 'customer', colnames, exdata, whereclause
                                            %
                          {'colnames = {'botrow4
                            {exdata = {botrow4
   (update(conn, 'customer', colnames, exdata, whereclause
```

```
%
{'colnames = {'botcol4
{exdata = {botcol4
(update(conn, 'customer', colnames, exdata, whereclause
%
{'colnames = {'toprow
{exdata = {toprow4
(update(conn, 'customer', colnames, exdata, whereclause
%
{'colnames = {'topcol4
{exdata = {topcol4
(update(conn, 'customer', colnames, exdata, whereclause
%
##################################
###############
;(' pathname5 = inputdlg('Enter The Path name Image 5
;(pathname5= cell2mat(pathname5
;(f=imread(pathname5
;([f1=imresize(f, [80, 280
;(imshow(f1
;(a3=edge(f1
;(figure; imshow(a3

;(m n] = size(a3]

;tcount5=0;lcount5=0
;rcount5=0;bcount5=0

;topcount5=0;leftcount5=0
;rightcount5=0;botcount5=0
-------------- Locating TOP Edge ------------%
(for (i=1:m
(for (j=1:n

((if (a3(i,j)>0 && (topcount5==0
;toprow5=i; topcol5=j; topcount5=1
;tcount5=tcount5+1
end
```

```
                                                      end
                                                         end


            -------------- Locating LEFT Edge ------------%
                                              (for (j=1:n

                                           (for (i=1:m

                ((if (a3(i,j)>0 && (leftcount5==0
           ;leftrow5=i; leftcol5=j; leftcount5=1
                             ;lcount5=lcount5+1
                                                   end


                                                   end
                                                      end


            -------------- Locating RIGHT Edge ------------%
                                              (for (j=1:n
                                              ;k=n+1-j
                                           (for (i=1:m
                                              ;l=m+1-i
                ((if (a3(l,k)>0 && (rightcount5==0
        ;rightrow5=l; rightcol5=k; rightcount5=1
                             ;rcount5=rcount5+1
                                                   end


                                                   end
                                                      end


            -------------- Locating BOTTOM Edge ------------%
                                              (for (i=1:m
                                              ;l=m+1-i
                                           (for (j=1:n
                                              ;k=n+1-j
                ((if (a3(l,k)>0 && (botcount5==0
           ;botrow5=l; botcol5=k; botcount5=1
                             ;bcount5=bcount5+1
                                                   end



                            15
```

```
                                          end
                                            end


                             toprow5,  topcol5
                             leftrow5, leftcol5
                             rightrow5, rightcol5
                             botrow5, botcol5

       H_Len5 = sqrt((rightrow5-leftrow5)^2 + (rightcol5-
                                        (leftcol5)^2
(V_Len5 = sqrt((botrow5-toprow5)^2 + (botcol5-topcol5)^2
                             {'colnames = {'v_len5
                             {exdata = {V_Len5
   (update(conn, 'customer', colnames, exdata , whereclause
                                              %
                             {'colnames = {'h_len5
                             {exdata = {H_Len5
    (update(conn, 'customer', colnames, exdata, whereclause
                                              %
                             {'colnames = {'rightrow5
                             {exdata = {rightrow5
    (update(conn, 'customer', colnames, exdata, whereclause
                                              %
                             {'colnames = {'rightcol5
                             {exdata = {rightcol5
    (update(conn, 'customer', colnames, exdata, whereclause
                                              %
                             {'colnames = {'leftrow5
                             {exdata = {leftrow5
    (update(conn, 'customer', colnames, exdata, whereclause
                                              %
                             {'colnames = {'leftcol5
                             {exdata = {leftcol5
    (update(conn, 'customer', colnames, exdata, whereclause
                                              %
                             {'colnames = {'botrow5
                             {exdata = {botrow3
    (update(conn, 'customer', colnames, exdata, whereclause
```

```
%
{'colnames = {'botcol5
{exdata = {botcol3
(update(conn, 'customer', colnames, exdata, whereclause
%
{'colnames = {'toprow5
{exdata = {toprow3
(update(conn, 'customer', colnames, exdata, whereclause
%
{'colnames = {'topcol5
{exdata = {topcol5
(update(conn, 'customer', colnames, exdata, whereclause

;(commit(conn
```

== The Center Section Test No 2 %%
================= %%

```
;clc
;clear
;(' no = inputdlg('Enter The emploee No
;(no= cell2mat(no
;(' imagename = inputdlg('Enter The Path name Image
;(pathname1= cell2mat(imagename
(for (q=1:5
if q==1
;('pathname1=strcat('c:\last\',pathname1,'1.gif
;end
if q==2
;('pathname1=strcat('c:\last\',pathname1,'2.gif
;end
if q==3
;('pathname1=strcat('c:\last\',pathname1,'3.gif
;end
if q==4
;('pathname1=strcat('c:\last\',pathname1,'4.gif
;end
if q==5
;('pathname1=strcat('c:\last\',pathname1,'5.gif
;end
pathname1
```

```
%
;(f=imread(pathname1
;([f1=imresize(f, [80 , 280
;(imshow(f1
;(a=edge(f1%
;a=~f1  %

;([a=imadjust(f1, [.2 .7], [1 0
;(figure; imshow(a

;(m n] = size(a]
m
n
;tcount=0;lcount=0
;rcount=0;bcount=0

;topcount=0;leftcount=0
;rightcount=0;botcount=0
-------------- Locating TOP Edge ------------%
(for (i=1:m
(for (j=1:n

((if (a(i,j)>0 && (topcount==0
;TR=i; TC=j; topcount=1; tcount=tcount+1
end

end
end
TR
-------------- Locating LEFT Edge ------------%
(for (j=1:n

(for (i=1:m

((if (a(i,j)>0 && (leftcount==0
;LR=i; LC=j; leftcount=1
;lcount=lcount+1
end
```

```
                            end
                              end
                              LC
------------- Locating RIGHT Edge -----------%
                        (for (j=1:n
                        ;k=n+1-j
                        (for (i=1:m
                        ;l=m+1-i
        ((if (a(l,k)>0 && (rightcount==0
            ;RR=l; RC=k; rightcount=1
                    ;rcount=rcount+1
                            end


                            end
                              end
                              RC
------------- Locating BOTTOM Edge ------------%
                        (for (i=1:m
                        ;l=m+1-i
                        (for (j=1:n
                        ;k=n+1-j
        ((if (a(l,k)>0 && (botcount==0
            ;BR=l; BC=k; botcount=1
                    ;bcount=bcount+1
                            end


                            end
                              end
                              BR
    (HLen = sqrt((RR-LR)^2 + (RC-LC)^2    %
    (VLen = sqrt((BR-TR)^2 + (BC-TC)^2    %
                        HLen=RC-LC
                        VLen=BR-TR
                    ,Dotpos1= RR
                    ,Dotpos2= RC
                    ,Dotpos3= BR
                    Dotpos4= BC

                    ,CR=m/2
```

```matlab
CC=n/2,
toplen=CR-TR;
if (toplen<0)
toplen=(toplen*-1)+CC
end
leftlen=CC-LC,
if (leftlen<0)
leftlen=(leftlen*-1)+CC
end
rightlen=RC-CC,
if (rightlen<0)
rightlen=(rightlen*-1)+CC
end
botlen=BR-CR,
if (botlen<0)
botlen=(botlen*-1)+CC
end
%--------------------- Move  Top to Down
dist=(VLen/2)+TR
c=round(CR-dist)
a1=circshift(a, [c 0]);
figure; imshow(a1);
%--------------------- Move   Left to Right
dist=(HLen/2)+LC
c=round(CC-dist)

a2=circshift(a1, [0 c]);
figure; imshow(a2);
% --------------------- convert the sign to binary bits
a15=im2bw(a2);
%تحويل الصورة الي ارقام ثنائية
for i=1:280
for j=1:80
temp=a15(j,i);
if temp==1
P2(j,i)=bin2dec('1');
else
P2(j,i)=bin2dec('0');
end;
```

```matlab
        end;
      end;
%قطع المنطقة الوسط المقترحة
j=1;
for i=91:190
    temp = P2(:,i);
    c_section(:,j) = temp;
    j = j+1;
end;
j
%filename1= inputdlg('Enter The Database File Name ');
%filename1= cell2mat(filename1);
if q==1
    filename1=strcat('c:\last2\',no,'5.mat');
    save (filename1,'c_section');
end;
if q==2
    filename1=strcat('c:\last2\',no,'55.mat');
    save (filename1,'c_section');
end;
if q==3
    filename1=strcat('c:\last2\',no,'555.mat');
    save (filename1,'c_section');
end;
if q==4
    filename1=strcat('c:\last2\',no,'5555.mat');
    save (filename1,'c_section');
end;
if q==5
    filename1=strcat('c:\last2\',no,'55555.mat');
    save (filename1,'c_section');
end;
filename1
pathname1= cell2mat(imagename);
clear filename1;
end;
==============================
```

```
%###########################################################
%## Program to move the signature to Centre of the
%## Window
%###########################################################
clc;
clear;
% pathname = inputdlg('Enter The Path name Image ')
% pathname= cell2mat(pathname);
% pathname=strcat('c:\last\',pathname,'6.gif');
pathname
% f=imread(pathname);
f1=imresize(f, [80 , 280]);
imshow(f1);
%a=edge(f1);
% a=~f1;

a=imadjust(f1, [.2 .7], [1 0]);
figure; imshow(a);

[m n] = size(a);
m
n
tcount=0;lcount=0;
rcount=0;bcount=0;

topcount=0;leftcount=0;
rightcount=0;botcount=0;
%------------- Locating TOP Edge ------------
for (i=1:m)
for (j=1:n)

if (a(i,j)>0 && (topcount==0))
TR=i; TC=j; topcount=1; tcount=tcount+1;
```

```
                                    end

                                    end
                                        end
                                        TR
        -------------- Locating LEFT Edge ------------%
                                        (for (j=1:n

                                    (for (i=1:m

            ((if (a(i,j)>0 && (leftcount==0
                    ;LR=i; LC=j; leftcount=1
                            ;lcount=lcount+1
                                        end


                                        end
                                        end
                                        LC
        -------------- Locating RIGHT Edge ------------%
                                        (for (j=1:n
                                        ;k=n+1-j
                                        (for (i=1:m
                                        ;l=m+1-i
            ((if (a(l,k)>0 && (rightcount==0
                    ;RR=l; RC=k; rightcount=1
                            ;rcount=rcount+1
                                        end


                                        end
                                        end
                                        RC
        -------------- Locating BOTTOM Edge ------------%
                                        (for (i=1:m
                                        ;l=m+1-i
                                        (for (j=1:n
                                        ;k=n+1-j
            ((if (a(l,k)>0 && (botcount==0
                    ;BR=l; BC=k; botcount=1
                            ;bcount=bcount+1


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```

```
                              end

                                      end
                                        end
                                        BR
(HLen = sqrt((RR-LR)^2 + (RC-LC)^2    %
(VLen = sqrt((BR-TR)^2 + (BC-TC)^2    %
                              HLen=RC-LC
                              VLen=BR-TR
                            ,Dotpos1= RR
                            ,Dotpos2= RC
                            ,Dotpos3= BR
                            Dotpos4= BC

                              ,CR=m/2
                              ,CC=n/2
                            ;toplen=CR-TR
                             (if (toplen<0
               toplen=(toplen*-1)+CC
                                      end
                            ,leftlen=CC-LC
                             (if (leftlen<0
               leftlen=(leftlen*-1)+CC
                                      end
                            ,rightlen=RC-CC
                             (if (rightlen<0
              rightlen=(rightlen*-1)+CC
                                      end
                            ,botlen=BR-CR
                             (if (botlen<0
               botlen=(botlen*-1)+CC
                                      end
    Move  Top to Down --------------------%
                        dist=(VLen/2)+TR
                        (c=round(CR-dist
                     ;([a1=circshift(a, [c 0
                       ;(figure; imshow(a1
    Move   Left to Right ---------------------%
                        dist=(HLen/2)+LC
```

```matlab
c=round(CC-dist)
a2=circshift(a1, [0 c]);
figure; imshow(a2);
% --------------------- convert the sign to binary bits
a15=im2bw(a2);

no = inputdlg('Enter The emploee No : ');
no= cell2mat(no);
stat='c:\last2\';

% Test Genuine No 1          pathname1=strcat(stat,no);
pathname1=strcat(pathname1,'5.mat');
pathname1
load (pathname1);
% =====================================
count_one = 0;
for i=1:80
for j=1:100
if c_section(i,j)==1
count_one = count_one+1;
end
end
end
% =====================================
%تحويل الصورة الي ارقام ثنائية
for i=1:280
for j=1:80
temp=a15(j,i);
if temp==1
P2(j,i)=bin2dec('1');
else
P2(j,i)=bin2dec('0');
end
end
end
%قطع المنطقة الوسط المقترحة
j=1;
for i=91:190
```

```matlab
        temp = P2(:,i);
        section(:,j) = temp;
        j = j+1;
    end
%
=====================================
counter=0;
for i=1:80
    for j=1:100
        if ((c_section(i,j)==section(i,j))&&(section(i,j)==1))
            counter=counter+1;
        end
    end
end
per1 = (counter/count_one)*100;
if per1>=10
    flag1=1;
else
    flag1=0;
end
i , j
clear c_section;
counter=0;
counter_one=0;
% #############################
pathname2=strcat(stat,no);          % Test Genuine No 2
pathname2=strcat(pathname2,'55.mat');
pathname2
load (pathname2);
% =====================================
count_one = 0;
for i=1:80
    for j=1:100
        if c_section(i,j)==1
            count_one = count_one+1;
        end
    end
end
% =====================================
```

```matlab
%تحويل الصورة الي ارقام ثنائية
for i=1:280
    for j=1:80
        temp=a15(j,i);
        if temp==1
            P2(j,i)=bin2dec('1');
        else
            P2(j,i)=bin2dec('0');
        end
    end
end
%قطع المنطقة الوسط المقترحة
j=1;
for i=91:190
    temp = P2(:,i);
    section(:,j) = temp;
    j = j+1;
end
%
=====================================
counter=0;
for i=1:80
    for j=1:100
        if ((c_section(i,j)==section(i,j))&&(section(i,j)==1))
            counter=counter+1;
        end

    end
end
per2 = (counter/count_one)*100;
if per2>=10
    flag2=1;
else
    flag2=0;
end
% %####################
% Test Genuine No 3                pathname3=strcat(stat,no);
pathname3=strcat(pathname3,'555.mat');
pathname3
```

```matlab
load (pathname3);
% ===================================
count_one = 0;
for i=1:80
for j=1:100
if c_section(i,j)==1
count_one = count_one+1;
end
end
end
% ===================================
%تحويل الصورة الي ارقام ثنائية
for i=1:280
for j=1:80
temp=a15(j,i);
if temp==1
P2(j,i)=bin2dec('1');
else
P2(j,i)=bin2dec('0');
end
end
end
%قطع المنطقة الوسط المقترحة
j=1;
for i=91:190
temp = P2(:,i);
section(:,j) = temp;
j = j+1;
end
%
===================================
counter=0;
for i=1:80
for j=1:100
if ((c_section(i,j)==section(i,j))&&(section(i,j)==1))
counter=counter+1;
end
end
end
```

```matlab
per3 = (counter/count_one)*100;
if per3>=10
flag3=1;
else
flag3=0;
end
i , j
clear c_section;
counter=0;
counter_one=0;
%###########################
###
% Test Genuine No 4                pathname4=strcat(stat,no);
pathname4=strcat(pathname4,'5555.mat');
pathname4
load (pathname4);
% ==================================
count_one = 0;
for i=1:80
for j=1:100
if c_section(i,j)==1
count_one = count_one+1;
end
end
end
% ==================================
%تحويل الصورة الي ارقام ثنائية
for i=1:280
for j=1:80
temp=a15(j,i);
if temp==1
P2(j,i)=bin2dec('1');
else
P2(j,i)=bin2dec('0');
end
end
end
%قطع المنطقة الوسط المقترحة
j=1;
```

```
                                for i=91:190
                             ;(temp = P2(:,i
                          ;section(:,j) = temp
                                    ;j = j+1
                                        ;end
                                          %
   =====================================
                                 ;counter=0
                                  for i=1:80
                                 for j=1:100
((if ((c_section(i,j)==section(i,j))&&(section(i,j)==1
                          ;counter=counter+1
                                       ;end
                                       ;end
                                       ;end
                   ;per4 = (counter/count_one)*100
                                 if per4>=10
                                   ;flag4=1
                                       else
                                   ;flag4=0
                                       ;end
                                        i , j
                           ;clear c_section
                                 ;counter=0
                             ;counter_one=0
   ##############################%
                                          #
  pathname5=strcat(stat,no);        %  % Test Genuine No 5
          ;('pathname5=strcat(pathname5,'55555.mat
                                  pathname5
                           ;(load (pathname5
   ===================================== %
                             ;count_one = 0
                                  for i=1:80
                                 for j=1:100
                           if c_section(i,j)==1
                       ;count_one = count_one+1
                                       ;end
```

```matlab
end;
end;
% ================================
%تحويل الصورة الي ارقام ثنائية
for i=1:280
for j=1:80
temp=a15(j,i);
if temp==1
P2(j,i)=bin2dec('1');
else
P2(j,i)=bin2dec('0');
end;
end;
end;
%قطع المنطقة الوسط المقترحة
j=1;
for i=91:190
temp = P2(:,i);
section(:,j) = temp;
j = j+1;
end;
%
================================
counter=0;
for i=1:80
for j=1:100
if ((c_section(i,j)==section(i,j))&&(section(i,j)==1))
counter=counter+1;
end;
end;
end;
per5 = (counter/count_one)*100;
if per5>=10
flag5=1;
else
flag5=0;
end;
i , j
clear c_section;
```

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```
counter=0;
counter_one=0;
%##############################%
#####
per1
per2
per3
per4
per5
sumofflag=flag1+flag2+flag3+flag4+flag5
%&&&&&&&&&&&&&&&&&&&&&&&&&&&&&

if sumofflag>=2
text='Acceptance !!'
msgbox(text,'The Result ')
else
text2 = 'Rejected !!!'
msgbox(text2,'The Result ')
end;


==========================================
=======
%% Fours Points Plus 2 Lenghts %%
% ##########################%
clc;
clear;
conn = database('jazan.lion', 'system', 'lionlion');

pathname1 = inputdlg('Enter The Path name Image 1 ');
pathname1= cell2mat(pathname1);
pathname1=strcat('c:\last\',pathname1,'6.gif');
no = inputdlg('Enter The emploee No ');
no= cell2mat(no);
stat='select *  from customer where cus_no=';
sqlstat=strcat(stat,no);
curs=exec(conn, sqlstat);

setdbprefs('DataReturnFormat','cellarray');
curs = fetch(curs);
```

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```matlab
cust = curs.data
%التوقيع المراد اختباره

%
f=imread(pathname1);
f1=imresize(f, [80, 280]);
imshow(f1);
a1=edge(f1);
figure; imshow(a1);

[m n] = size(a1);

tcount1=0;lcount1=0;
rcount1=0;bcount1=0;

topcount1=0;leftcount1=0;
rightcount1=0;botcount1=0;
% ------------ Locating TOP Edge -------------
for (i=1:m)
for (j=1:n)

if (a1(i,j)>0 && (topcount1==0))
toprow1=i; topcol1=j; topcount1=1;
tcount1=tcount1+1;
end

end
end

% ------------ Locating LEFT Edge ------------
for (j=1:n)

for (i=1:m)

if (a1(i,j)>0 && (leftcount1==0))
leftrow1=i; leftcol1=j; leftcount1=1;
lcount1=lcount1+1;
end;
end
```

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```
                                        end

          -------------- Locating RIGHT Edge ------------%
                                        (for (j=1:n
                                        ;k=n+1-j
                                        (for (i=1:m
                                        ;l=m+1-i
                    ((if (a1(l,k)>0 && (rightcount1==0
          ;rightrow1=l; rightcol1=k; rightcount1=1
                            ;rcount1=rcount1+1
                                        end

                                        end
                                        end


          -------------- Locating BOTTOM Edge ------------%
                                        (for (i=1:m
                                        ;l=m+1-i
                                        (for (j=1:n
                                        ;k=n+1-j
                    ((if (a1(l,k)>0 && (botcount1==0
          ;botrow1=l; botcol1=k; botcount1=1
                            ;bcount1=bcount1+1
                                        end

                                        end
                                        end


                            toprow1,  topcol1
                            leftrow1, leftcol1
                            rightrow1, rightcol1
                            botrow1, botcol1

        H_Len1 = sqrt((rightrow1-leftrow1)^2 + (rightcol1-
                                        (leftcol1)^2
        (V_Len1 = sqrt((botrow1-toprow1)^2 + (botcol1-topcol1)^2
```
%المقارنة بين الصورة المدخلة و الوسط الحسابي للنقاط الاربعة والطولين
```
                                        ;counter =0
```

```
;({x=abs(H_Len1-cust{1,4
                (if (x<7
;counter=counter+1
                  ;end
;({x=abs(V_Len1-cust{1,5
                (if (x<7
  ;counter=counter+1
                  ;end
;({x=abs(toprow1-cust{1,6
                (if (x<=7
;counter=counter+1
                  ;end
;({x=abs(topcol1-cust{1,7
                (if (x<=7
;counter=counter+1
                  ;end
;({x=abs(botrow1-cust{1,8
                (if (x<=7
  ;counter=counter+1
                  ;end
;({x=abs(botcol1-cust{1,9
                (if (x<=7
;counter=counter+1
                  ;end
;({x=abs(leftrow1-cust{1,10
                 (if (x<=7
;counter=counter+1
                  ;end
;({x=abs(leftcol1-cust{1,11
                 (if (x<=7
;counter=counter+1
                  ;end
;({x=abs(rightrow1-cust{1,12
                 (if (x<=7
 ;counter=counter+1
                  ;end
;({x=abs(rightcol1-cust{1,13
                 (if (x<=7
;counter=counter+1
```

```
                              ;end
          res1 = (counter/10)*100
                      if res1>=50
                         ;flag1=1
                            else
                         ;flag1=0
                            ;end
######################## %
                      ;counter =0
      ;({x=abs(H_Len1-cust{1,14
                         (if (x<7
          ;counter=counter+1
                            ;end
      ;({x=abs(V_Len1-cust{1,15
                         (if (x<7
          ;counter=counter+1
                            ;end
      ;({x=abs(toprow1-cust{1,16
                        (if (x<=7
          ;counter=counter+1
                            ;end
      ;({x=abs(topcol1-cust{1,17
                        (if (x<=7
          ;counter=counter+1
                            ;end
      ;({x=abs(botrow1-cust{1,18
                        (if (x<=7
          ;counter=counter+1
                            ;end
      ;({x=abs(botcol1-cust{1,19
                        (if (x<=7
          ;counter=counter+1
                            ;end
      ;({x=abs(leftrow1-cust{1,20
                        (if (x<=7
          ;counter=counter+1
                            ;end
      ;({x=abs(leftcol1-cust{1,21
                        (if (x<=7
```

```
                          ;counter=counter+1
                                          ;end
       ;({x=abs(rightrow1-cust{1,22
                          (if (x<=7
                 ;counter=counter+1
                                 ;end
       ;({x=abs(rightcol1-cust{1,23
                          (if (x<=7
                 ;counter=counter+1
                                 ;end
          res2 = (counter/10)*100
                       if res2>=50
                          ;flag2=1
                             else
                          ;flag2=0
                             ;end
                                %
  ###############################
                               ##
                      ;counter =0
         ;({x=abs(H_Len1-cust{1,24
                           (if (x<7
                 ;counter=counter+1
                                 ;end
         ;({x=abs(V_Len1-cust{1,25
                           (if (x<7
                 ;counter=counter+1
                                 ;end
       ;({x=abs(toprow1-cust{1,26
                          (if (x<=7
                 ;counter=counter+1
                                 ;end
        ;({x=abs(topcol1-cust{1,27
                          (if (x<=7
                 ;counter=counter+1
                                 ;end
        ;({x=abs(botrow1-cust{1,28
                          (if (x<=7
                 ;counter=counter+1
```

```
                                        ;end
            ;({x=abs(botcol1-cust{1,29
                                (if (x<=7
        ;counter=counter+1
                                        ;end
            ;({x=abs(leftrow1-cust{1,30
                                (if (x<=7
        ;counter=counter+1
                                        ;end
            ;({x=abs(leftcol1-cust{1,31
                                (if (x<=7
        ;counter=counter+1
                                        ;end
          ;({x=abs(rightrow1-cust{1,32
                                (if (x<=7
        ;counter=counter+1
                                        ;end
          ;({x=abs(rightcol1-cust{1,33
                                (if (x<=7
        ;counter=counter+1
                                        ;end
            res3 = (counter/10)*100
                            if res3>=50
                              ;flag3=1
                                    else
                              ;flag3=0
                                    ;end
    ####################### %
                          ;counter =0
            ;({x=abs(H_Len1-cust{1,34
                                (if (x<=7
        ;counter=counter+1
                                        ;end
            ;({x=abs(V_Len1-cust{1,35
                                (if (x<=7
        ;counter=counter+1
                                        ;end
          ;({x=abs(toprow1-cust{1,36
                                (if (x<=7
```

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```
;counter=counter+1
;end
;({x=abs(topcol1-cust{1,37
(if (x<=7
;counter=counter+1
;end
;({x=abs(botrow1-cust{1,38
(if (x<=7
;counter=counter+1
;end
;({x=abs(botcol1-cust{1,39
(if (x<=7
;counter=counter+1
;end
;({x=abs(leftrow1-cust{1,40
(if (x<=7
;counter=counter+1
;end
;({x=abs(leftcol1-cust{1,41
(if (x<=7
;counter=counter+1
;end
;({x=abs(rightrow1-cust{1,42
(if (x<=7
;counter=counter+1
;end
;({x=abs(rightcol1-cust{1,43
(if (x<=7
;counter=counter+1
;end
res4 = (counter/10)*100
if res4>=50
;flag4=1
else
;flag4=0
;end
######################### %
;counter =0
;({x=abs(H_Len1-cust{1,44
```

```
                              (if (x<=7
            ;counter=counter+1
                             ;end
     ;({x=abs(V_Len1-cust{1,45
                      (if (x<=7
          ;counter=counter+1
                       ;end
    ;({x=abs(toprow1-cust{1,46
                    (if (x<=7
         ;counter=counter+1
                      ;end
    ;({x=abs(topcol1-cust{1,47
                    (if (x<=7
         ;counter=counter+1
                      ;end
    ;({x=abs(botrow1-cust{1,48
                    (if (x<=7
         ;counter=counter+1
                      ;end
    ;({x=abs(botcol1-cust{1,49
                    (if (x<=7
         ;counter=counter+1
                      ;end
    ;({x=abs(leftrow1-cust{1,50
                    (if (x<=7
         ;counter=counter+1
                      ;end
    ;({x=abs(leftcol1-cust{1,51
                    (if (x<=7
         ;counter=counter+1
                      ;end
  ;({x=abs(rightrow1-cust{1,52
                    (if (x<=7
         ;counter=counter+1
                      ;end
  ;({x=abs(rightcol1-cust{1,53
                    (if (x<=7
         ;counter=counter+1
                      ;end
```

```matlab
res5 = (counter/10)*100
if res5>=50
    flag5=1;
else
    flag5=0;
end;
% $$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
sumofflag=flag1+flag2+flag3+flag4+flag5
if sumofflag>=2
    text='Acceptance !!'
    msgbox(text,'The Result ')
else
    text2 = 'Rejected !!!'
    msgbox(text2,'The Result ')
end;
% &&&&&&&&&&&&&&&&



% Thinning, Centering and Hidden Markov
clc;
clear;
no = inputdlg('Enter The emploee No ');
no= cell2mat(no);
imagename = inputdlg('Enter The Path name Image ');
pathname1= cell2mat(imagename);
%
for (loop=1:5)
    if loop==1
        pathname1=strcat('c:\last\',pathname1,'1.gif');
    end;
    if loop==2
        pathname1=strcat('c:\last\',pathname1,'2.gif');
    end;
    if loop==3
        pathname1=strcat('c:\last\',pathname1,'3.gif');
    end;
    if loop==4
```

```
;('pathname1=strcat('c:\last\',pathname1,'4.gif
                                          ;end
                                    if loop==5
;('pathname1=strcat('c:\last\',pathname1,'5.gif
                                          ;end
                                    pathname1

                          ;(f=imread(pathname1

------------ Thinning starts here ---------%
                        ;('I = imread('saad3.gif  %

                                          ;I=f
                        ;([I=imresize(I, [81, 282
                              ;(J = imadjust(I
                        ;(figure, imshow(I

                  ;([j1 = imadjust(J,[0 1],[1 0
                            ;(figure, imshow(j1
            ;([],[K = imadjust(j1,[0.3 0.4
                        ;(figure, imshow(K

                                ;(f=edge(I
                        ;(figure, imshow(f

                    ;('f1 = bwmorph(K,'thin
                          ;(figure, imshow(f1
                                    ;f2=f1-f
                  ;((figure; imshow(edge(f2
                        ;(f3=f2-edge(f2
                        ;(figure, imshow(f3
                            ;(f4=f3-edge(f3
                        ;(figure, imshow(f4

                        ;(f5=f4-edge(f4
                        ;(figure, imshow(f5
                            ;(f6=f5-edge(f5
                        ;(figure, imshow(f6
------------ OLD Thinning----------------------%
```

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```
% f=imread('saad3.gif');
% imshow(f);
% f1=f>100;
% f1=1-f1;
%
% f2=edge(f1);
%
% f3=f1-f2;
% f3=f3>.5;
% figure;imshow(f3);
%----------------------------------------------

f6=number
number=a;
[m n] = size(a);

%========= Centering ==========

tcount=0;lcount=0;
rcount=0;bcount=0;

topcount=0;leftcount=0;
rightcount=0;botcount=0;
%-------------- Locating TOP Edge ------------
for (i=1:m)
for (j=1:n)

if (a(i,j)>0 && (topcount==0))
TR=i; TC=j; topcount=1; tcount=tcount+1;
end

end
end
TR
%-------------- Locating LEFT Edge ------------
for (j=1:n)

for (i=1:m)
```

```
                  ((if (a(i,j)>0 && (leftcount==0
                       ;LR=i; LC=j; leftcount=1
                            ;lcount=lcount+1
                                    end


                                          end
                                            end
                                            LC
    ------------- Locating RIGHT Edge -----------%
                                    (for (j=1:n
                                     ;k=n+1-j
                                    (for (i=1:m
                                     ;l=m+1-i
                  ((if (a(l,k)>0 && (rightcount==0
                      ;RR=l; RC=k; rightcount=1
                            ;rcount=rcount+1
                                    end


                                          end
                                            end
                                            RC
    ------------- Locating BOTTOM Edge ------------%
                                    (for (i=1:m
                                     ;l=m+1-i
                                    (for (j=1:n
                                     ;k=n+1-j
                  ((if (a(l,k)>0 && (botcount==0
                      ;BR=l; BC=k; botcount=1
                            ;bcount=bcount+1
                                    end


                                          end
                                            end
                                            BR
      (HLen = sqrt((RR-LR)^2 + (RC-LC)^2    %
      (VLen = sqrt((BR-TR)^2 + (BC-TC)^2    %
                             ;HLen = RC-LC
                             VLen = BR-TR
```

```
CR=m/2,
CC=n/2,
toplen=CR-TR;
(if (toplen<0
toplen=(toplen*-1)+CC
end
leftlen=CC-LC,
(if (leftlen<0
leftlen=(leftlen*-1)+CC
end
rightlen=RC-CC,
(if (rightlen<0
rightlen=(rightlen*-1)+CC
end
botlen=BR-CR,
(if (botlen<0
botlen=(botlen*-1)+CC
end
% ---------------------Move  Top to Down
dist=(VLen/2)+TR
(c=round(CR-dist
a1=circshift(a, [c 0]);

figure; imshow(a1);
% ---------------------Move   Left to Right
dist=(HLen/2)+LC
(c=round(CC-dist

a2=circshift(a1, [0 c]);
figure; imshow(a2);


%===================HMM Processing
=======
b=1; hmmno=0;

cell(3,3)=0;

hmm(round((m/3)*(n/3)))=0;
```

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```matlab
% number
                    for i=3:3:m
                    for j=3:3:n
%-----------------------------------------------------
hmmno=hmmno+1;
rowno=1;
for k=i-2:i
colno=1;
for z=j-2:j
cell(rowno,colno)=number(k,z);
colno=colno+1;
end
rowno=rowno+1;
end
% cell
%...........................................
for h=1:3
for q=1:3
if ((cell(2,1)==1) && (cell(1,2)==1))
hmm(hmmno)=1;
else if((cell(1,2)==1) && (cell(2,3)==1))
hmm(hmmno)=2;
else if((cell(3,2)==1) && (cell(2,3)==1))
hmm(hmmno)=3;
else if((cell(2,1)==1) && (cell(3,2)==1))
hmm(hmmno)=4;
else
hmm(hmmno)=0;
end
end
end
end

end
end
%...........................................
end
```

```matlab
end

' Printing the HMM Array '

hmm%;
x=0;
for i=1:round((m/3)*(n/3));))
if (hmm(i)>0)
x=x+1;
a3(x,1)=i;
a3(x,2)=hmm(i);)
end
end
%-----Display HMM values with positions
if loop==1
filename1=strcat('c:\hidden\',no,'5.mat');)
save (filename1,'hmm');)
end;
if loop==2
filename1=strcat('c:\hidden\',no,'55.mat');)
save (filename1,'hmm');)
end;
if loop==3
filename1=strcat('c:\hidden\',no,'555.mat');)
save (filename1,'hmm');)
end;
if loop==4
filename1=strcat('c:\hidden\',no,'5555.mat');)
save (filename1,'hmm');)
end;
if loop==5
filename1=strcat('c:\hidden\',no,'55555.mat');)
save (filename1,'hmm');)
end;
filename1
pathname1= cell2mat(imagename);)
clear filename1;
end;
```

--------------   END   ---------------%

the Hidden Markov Model test %
;clc
;clear
%
;(' pathname1 = inputdlg('Enter The Path name Image
;(pathname1= cell2mat(pathname1
;('pathname1=strcat('c:\last\',pathname1,'6.gif
pathname1
%%

pathname1

;(f=imread(pathname1

```
%-------- Thinning starts here ------------
% I = imread('saad3.gif')'(;

f=I;
282 ,81] ,I=imresize(I[(;
I)imadjust = J(;
I)figure, imshow(;

0 1],[1 0]imadjust(J,[ = j1[(;
j1)figure, imshow(;
0.4 0.3],[imadjust(j1,[ = K],[],([;
K)figure, imshow(;

I)f=edge(;
f)figure, imshow(;

thin')'f1 = bwmorph(K,'(;
f1)figure, imshow(;
f2=f1-f;
f2)figure; imshow(edge((;
f2)f3=f2-edge(;
f3)figure, imshow(;
f3)f4=f3-edge(;
f4)figure, imshow(;

f4)f5=f4-edge(;
f5)figure, imshow(;
f5)f6=f5-edge(;
f6)figure, imshow(;
%----------------------OLD Thinning ------------
% f=imread('saad3.gif')'(;
% f)imshow((;
% f1=f>100;
% f1=1-f1;
%
% f1)f2=edge((;
%
% f3=f1-f2;
```

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```
;f3=f3>.5 %
;(figure;imshow(f3   %
------------------------------------------------%

number=f6
;a=number
;(m n] = size(a]


======== Centering ==========%


;tcount=0;lcount=0
;rcount=0;bcount=0


;topcount=0;leftcount=0
;rightcount=0;botcount=0
-------------- Locating TOP Edge ------------%
(for (i=1:m
(for (j=1:n


((if (a(i,j)>0 && (topcount==0
;TR=i; TC=j; topcount=1; tcount=tcount+1
end


end
end
TR
-------------- Locating LEFT Edge ------------%
(for (j=1:n


(for (i=1:m


((if (a(i,j)>0 && (leftcount==0
;LR=i; LC=j; leftcount=1
;lcount=lcount+1
end


end
end
LC
```

-------------- Locating RIGHT Edge -----------%

(for (j=1:n

;k=n+1-j

(for (i=1:m

;l=m+1-i

((if (a(l,k)>0 && (rightcount==0

;RR=l; RC=k; rightcount=1

;rcount=rcount+1

end

end

end

RC

-------------- Locating BOTTOM Edge -----------%

(for (i=1:m

;l=m+1-i

(for (j=1:n

;k=n+1-j

((if (a(l,k)>0 && (botcount==0

;BR=l; BC=k; botcount=1

;bcount=bcount+1

end

end

end

BR

(HLen = sqrt((RR-LR)^2 + (RC-LC)^2   %

(VLen = sqrt((BR-TR)^2 + (BC-TC)^2   %

;HLen = RC-LC

VLen = BR-TR

,CR=m/2

,CC=n/2

;toplen=CR-TR

(if (toplen<0

toplen=(toplen*-1)+CC

end

,leftlen=CC-LC

(if (leftlen<0

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```
leftlen=(leftlen*-1)+CC
                      end
             ,rightlen=RC-CC
              (if (rightlen<0
     rightlen=(rightlen*-1)+CC
                      end
              ,botlen=BR-CR
                (if (botlen<0
       botlen=(botlen*-1)+CC
                      end
Move  Top to Down ---------------------%
               dist=(VLen/2)+TR
               (c=round(CR-dist
             ;([a1=circshift(a, [c 0


               ;(figure; imshow(a1
Move   Left to Right ---------------------%
               dist=(HLen/2)+LC
               (c=round(CC-dist

             ;([a2=circshift(a1, [0 c
               ;(figure; imshow(a2


HMM Processing  =================%
                      =======
                  ;b=1; hmmno=0

                    ;cell(3,3)=0

       ;hmm(round((m/3)*(n/3)))=0

                      number %

                    for i=3:3:m
                     for j=3:3:n
-------------------------------------------------------%
              ;hmmno=hmmno+1
                     ;rowno=1
```

```
                    for k=i-2:i
                        colno=1;
                    for z=j-2:j
        cell(rowno,colno)=number(k,z);
                    colno=colno+1;
                        end
                    rowno=rowno+1;
                        end
                    cell          %
...............................................%
                    for h=1:3
                    for q=1:3
        if ((cell(2,1)==1) && (cell(1,2)==1))
                    hmm(hmmno)=1;
        else if((cell(1,2)==1) && (cell(2,3)==1))
                    hmm(hmmno)=2;
        else if((cell(3,2)==1) && (cell(2,3)==1))
                    hmm(hmmno)=3;
        else if((cell(2,1)==1) && (cell(3,2)==1))
                    hmm(hmmno)=4;
                        else
                    hmm(hmmno)=0;
                        end
                        end
                        end
                        end

                        end
                        end
...........................................%
                        end
                        end

                    ' Printing the HMM Array '

                    hmm;%
                    x=0;
        for i=1:round((m/3)*(n/3))
                    if (hmm(i)>0)
```

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```matlab
            x=x+1;
            a3(x,1)=i;
            a3(x,2)=hmm(i);
        end
    end
%-----Display HMM values with positions
hmmtest=hmm;
no = inputdlg('Enter The emploee No : ');
no= cell2mat(no);
stat='c:\hidden\';
% ***************************test no 1*************
% Test Genuine No 1          pathname1=strcat(stat,no);
pathname1=strcat(pathname1,'5.mat');
pathname1
load (pathname1);
%
counter=0;
for i=1:2538
    if (hmm(i)==hmmtest(i))
        counter=counter+1;
    end;
end;
counter
%
per1 = (counter/2538)*100
if per1>=10
    flag1=1;
else
    flag1=0;
end;

%
clear hmm;
counter=0;
% Test Genuine No 2         pathname1=strcat(stat,no);
pathname1=strcat(pathname1,'55.mat');
pathname1
load (pathname1);
%
```

```matlab
for i=1:2538
if (hmm(i)==hmmtest(i))
counter=counter+1;
end
end
counter
%
per2 = (counter/2538)*100
if per2>=10
flag2=1;
else
flag2=0;
end

%
clear hmm;
counter=0;
pathname1=strcat(stat,no);          % Test Genuine No 3
pathname1=strcat(pathname1,'555.mat');
pathname1
load (pathname1);
%
for i=1:2538
if (hmm(i)==hmmtest(i))
counter=counter+1;
end
end
counter
%
per3 = (counter/2538)*100
if per3>=10
flag3=1;
else
flag3=0;
end
%
clear hmm;
counter=0;
```

```matlab
pathname1=strcat(stat,no);          % Test Genuine No 4
pathname1=strcat(pathname1,'5555.mat');
pathname1
load (pathname1);
%
for i=1:2538
if (hmm(i)==hmmtest(i))
counter=counter+1;
end
end
counter
%
per4 = (counter/2538)*100
if per4>=10
flag4=1;
else
flag4=0;
end
%
clear hmm;
counter=0;
pathname1=strcat(stat,no);          % Test Genuine No 5
pathname1=strcat(pathname1,'55555.mat');
pathname1
load (pathname1);
%
for i=1:2538
if (hmm(i)==hmmtest(i))
counter=counter+1;
end
end
counter
%
per5 = (counter/2538)*100
if per5>=10
flag5=1;
else
flag5=0;
end
```

%
per1
per2
per3
per4
per5
sumofflag=flag1+flag2+flag3+flag4+flag5

Papers Exacted from the Thesis