CAR NUMBER PLATE DETECTION USING MATLAB CODE

1. Plate_detection.m

```
close all;
clear all;

im = imread('Number Plate Images/image1.png');
imgray = rgb2gray(im);
imbin = imbinarize(imgray);
im = edge(imgray, 'prewitt');

%Below steps are to find location of number plate
Iprops=regionprops(im,'BoundingBox','Area', 'Image');
area = Iprops.Area;
count = numel(Iprops);
maxa= area;
boundingBox = Iprops.BoundingBox;
for i=1:count
  if maxa<Iprops(i).Area
     maxa=Iprops(i).Area;
     boundingBox=Iprops(i).BoundingBox;
  end
end

im = imcrop(imbin, boundingBox);%crop the number plate area
im = bwareaopen(~im, 500); %remove some object if it width is too long or
too small than 500

 [h, w] = size(im);%get width

imshow(im);

Iprops=regionprops(im,'BoundingBox','Area', 'Image'); %read letter
```

```
count = numel(Iprops);
noPlate=[]; % Initializing the variable of number plate string.

for i=1:count
  ow = length(Iprops(i).Image(1,:));
  oh = length(Iprops(i).Image(:,1));
  if ow<(h/2) & oh>(h/3)
     letter=Letter_detection(Iprops(i).Image); % Reading the letter
corresponding the binary image 'N'.
     noPlate=[noPlate letter] % Appending every subsequent character in
noPlate variable.
  end
end
```

2.letter_detection.m

```
function letter=readLetter(snap)


load NewTemplates
snap=imresize(snap,[42 24]);
rec=[ ];

for n=1:length(NewTemplates)
   cor=corr2(NewTemplates{1,n},snap);
   rec=[rec cor];
end

ind=find(rec==max(rec));
display(ind);

% Alphabets listings.
if ind==1 || ind==2
   letter='A';
elseif ind==3 || ind==4
```

```
    letter='B';
elseif ind==5
    letter='C';
elseif ind==6 || ind==7
    letter='D';
elseif ind==8
    letter='E';
elseif ind==9
    letter='F';
elseif ind==10
    letter='G';
elseif ind==11
    letter='H';
elseif ind==12
    letter='I';
elseif ind==13
    letter='J';
elseif ind==14
    letter='K';
elseif ind==15
    letter='L';
elseif ind==16
    letter='M';
elseif ind==17
    letter='N';
elseif ind==18 || ind==19
    letter='O';
elseif ind==20 || ind==21
    letter='P';
elseif ind==22 || ind==23
    letter='Q';
elseif ind==24 || ind==25
    letter='R';
elseif ind==26
    letter='S';
```

```
elseif ind==27
   letter='T';
elseif ind==28
   letter='U';
elseif ind==29
   letter='V';
elseif ind==30
   letter='W';
elseif ind==31
   letter='X';
elseif ind==32
   letter='Y';
elseif ind==33
   letter='Z';
   %*-*-*-*-*
% Numerals listings.
elseif ind==34
   letter='1';
elseif ind==35
   letter='2';
elseif ind==36
   letter='3';
elseif ind==37 || ind==38
   letter='4';
elseif ind==39
   letter='5';
elseif ind==40 || ind==41 || ind==42
   letter='6';
elseif ind==43
   letter='7';
elseif ind==44 || ind==45
   letter='8';
elseif ind==46 || ind==47 || ind==48
   letter='9';
else
```

```
   letter='0';
end
end
```

3.template_creation.m

```
%CREATE TEMPLATES
%Alphabets
A=imread('alpha/A.bmp');B=imread('alpha/B.bmp');C=imread('alpha/C.bmp'
);
D=imread('alpha/D.bmp');E=imread('alpha/E.bmp');F=imread('alpha/F.bmp')
;
G=imread('alpha/G.bmp');H=imread('alpha/H.bmp');I=imread('alpha/I.bmp')
;
J=imread('alpha/J.bmp');K=imread('alpha/K.bmp');L=imread('alpha/L.bmp');
M=imread('alpha/M.bmp');N=imread('alpha/N.bmp');O=imread('alpha/O.b
mp');
P=imread('alpha/P.bmp');Q=imread('alpha/Q.bmp');R=imread('alpha/R.bmp'
);
S=imread('alpha/S.bmp');T=imread('alpha/T.bmp');U=imread('alpha/U.bmp')
;
V=imread('alpha/V.bmp');W=imread('alpha/W.bmp');X=imread('alpha/X.bm
p');
Y=imread('alpha/Y.bmp');Z=imread('alpha/Z.bmp');

%Natural Numbers
one=imread('alpha/1.bmp');two=imread('alpha/2.bmp');
three=imread('alpha/3.bmp');four=imread('alpha/4.bmp');
five=imread('alpha/5.bmp'); six=imread('alpha/6.bmp');
seven=imread('alpha/7.bmp');eight=imread('alpha/8.bmp');
nine=imread('alpha/9.bmp'); zero=imread('alpha/0.bmp');

%Creating Array for Alphabets
letter=[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];
```

```
%Creating Array for Numbers
number=[one two three four five six seven eight nine zero];

NewTemplates=[letter number];
save ('NewTemplates','NewTemplates')
clear all
```