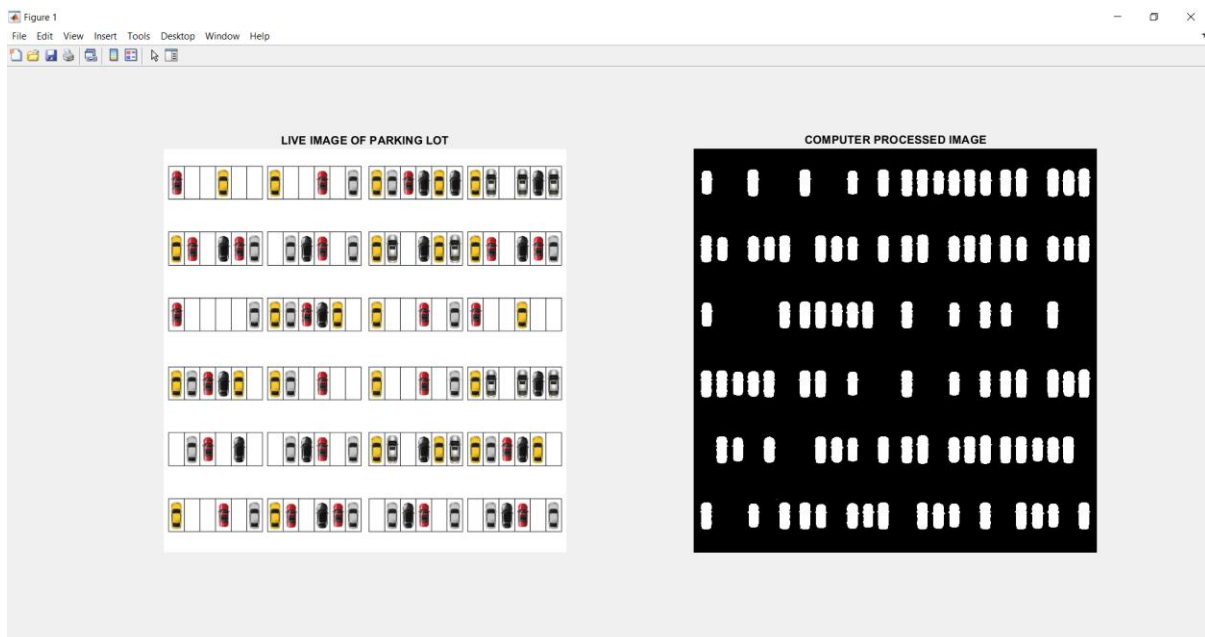


AUTOMATED INDICATOR SYSTEM FOR CAR PARKING

MATLAB CODE

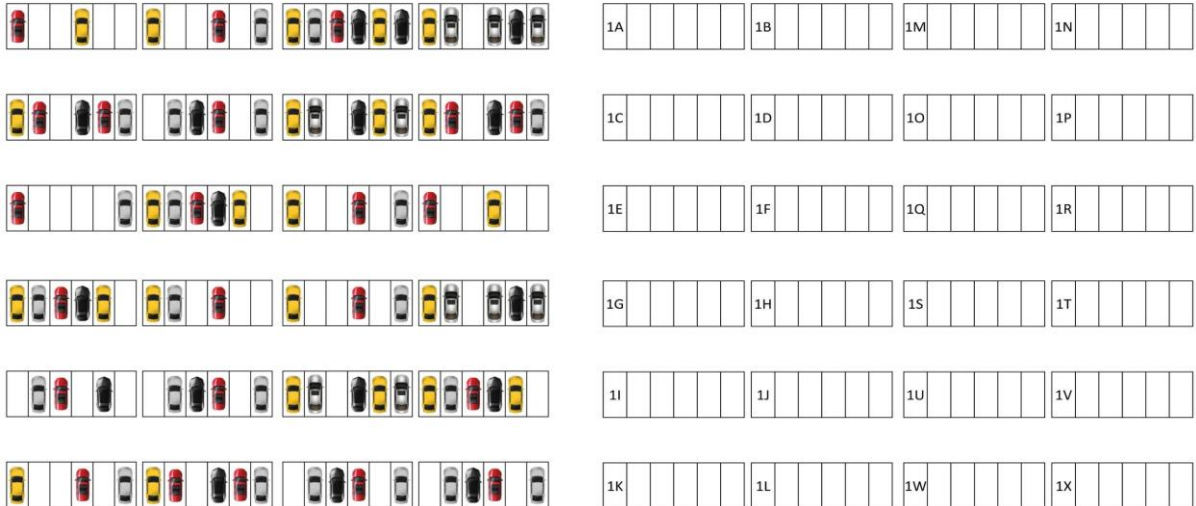
```
a=imread('C:\Users\Vijet Nigam\Desktop\RG IPT -  
CSE\SEMESTER\sem ii\CSEP\PROJECT\cp32_1.jpg');  
                                     % Live Parking Lot Image  
b=imread('C:\Users\Vijet Nigam\Desktop\RG IPT -  
CSE\SEMESTER\sem ii\CSEP\PROJECT\cp32_blank.jpg');  
                                     % BG Parking Lot Image  
m=imresize(b, [size(a,1) size(a,2)]);  
d= imsubtract(m, a);                 % Image Subtraction  
f=im2bw(d, 0.1);  
bw3 = imfill(f, 'holes');  
bw4 = bwareaopen(bw3, 10);  
cars = bwconncomp(bw4);  
d1 = cars.NumObjects;                % Counting No. of Objects  
total = 144 - d1;  
subplot(121); imshow(a); title('LIVE IMAGE OF PARKING  
LOT');  
subplot(122); imshow(bw3); title('COMPUTER PROCESSED  
IMAGE');
```

OUTPUT



NOTE

According to the **LIVE IMAGE OF PARKING LOT** and the **BACKGROUND IMAGE (Fig. below)**, the first position to fill the lane is **LANE N** which matches with **OUTPUT**.



```
[ r c l ] = size(bw4);                                % for calculation
img1 = bw4(1:r/2, 1:c/2, :);                          % Dividing Image
img2 = bw4(1:r/2, c/2:c, :);
img3 = bw4(r/2:r, 1:c/2, :);
img4 = bw4(r/2:r, c/2:c, :);
cars1 = bwconncomp(img1);
n1 = cars1.NumObjects;
cars2 = bwconncomp(img2);
n2 = cars2.NumObjects;
cars3 = bwconncomp(img3);
n3 = cars3.NumObjects;
cars4 = bwconncomp(img4);
n4 = cars4.NumObjects;

[ rr cc ll ] = size(a);                                % for display
imgg1 = a(1:rr/2, 1:cc/2, :);
imgg2 = a(1:rr/2, cc/2:cc, :);
imgg3 = a(rr/2:rr, 1:cc/2, :);
imgg4 = a(rr/2:rr, cc/2:cc, :);
subplot(221); imshow(imgg1); title('REGION 1');
subplot(222); imshow(imgg2); title('REGION 2');
subplot(223); imshow(imgg3); title('REGION 3');
```

```

subplot(224); imshow(imgg4); title('REGION 4');

REGION = [ n1 n2 n3 n4 ];           %Position Filled
for i=1:4
    if max(REGION) == 36             % When Parking Region Full
        REGION(i)=0;
    end
end
maxregion = max(REGION);
t6 = 36 - maxregion;                 % Available Region Space

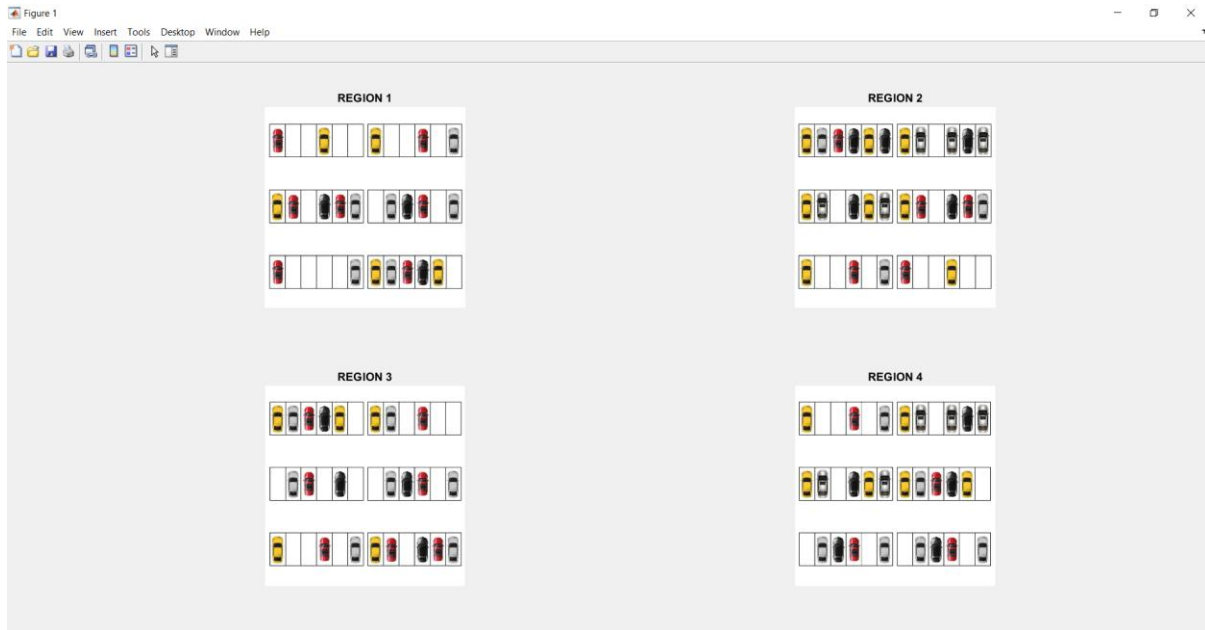
for i=1:4
    if REGION(i)== maxregion
z = i;
break
    end
end

fprintf('Check Available space in parking lot REGION %d
', z);

switch z
    case 1
        imgp = img1;
        imgppp = imgg1;
    case 2
        imgp = img2;
        imgppp = imgg2;
    case 3
        imgp = img3;
        imgppp = imgg3;
    case 4
        imgp = img4;
        imgppp = imgg4;
end

```

OUTPUT



```
[ r1 c1 l1 ] = size(imgp); % for calculation
imgp1 = imgp(1:r1/3, 1:c1/2, :);
imgp2 = imgp(1:r1/3, c1/2:c1, :);
imgp3 = imgp((r1/3)+1:2*(r1/3), 1:c1/2, :);
imgp4 = imgp((r1/3)+1:2*(r1/3), c1/2:c1, :);
imgp5 = imgp((2*(r1/3))+1:r1, 1:c1/2, :);
imgp6 = imgp((2*(r1/3))+1:r1, c1/2:c1, :);
car1 = bwconncomp(imgp1);
nm1 = car1.NumObjects;
car2 = bwconncomp(imgp2);
nm2 = car2.NumObjects;
car3 = bwconncomp(imgp3);
nm3 = car3.NumObjects;
car4 = bwconncomp(imgp4);
nm4 = car4.NumObjects;
car5 = bwconncomp(imgp5);
nm5 = car5.NumObjects;
car6 = bwconncomp(imgp6);
nm6 = car6.NumObjects;

REGIONP = [ nm1 nm2 nm3 nm4 nm5 nm6 ]; %Filled Position
for i=1:4
    if max(REGIONP) == 6 % When Parking Lane Full
        REGIONP(i)=0;
    end
end
```

```

maxregionp = max(REGIONP);
t1 = 6 - maxregionp;

for i=1:4
    if REGIONP(i)== maxregionp
        z2 = i;
        break
    end
end

if z == 1                                % Region 1
    switch z2
        case 1
            lane = 'A';
        case 2
            lane = 'B';
        case 3
            lane = 'C';
        case 4
            lane = 'D';
        case 5
            lane = 'E';
        case 6
            lane = 'F';
    end
else if z==3                             % Region 3
    switch z2
        case 1
            lane = 'G';
        case 2
            lane = 'H';
        case 3
            lane = 'I';
        case 4
            lane = 'J';
        case 5
            lane = 'K';
        case 6
            lane = 'L';
    end
else if z==2                             % Region 2
    switch z2
        case 1
            lane = 'M';
        case 2
            lane = 'N';
        case 3

```

```

        lane = 'O';
    case 4
        lane = 'P';
    case 5
        lane = 'Q';
    case 6
        lane = 'R';
    end
else if z==4                                %Region 4
    switch z2
        case 1
            lane = 'S';
        case 2
            lane = 'T';
        case 3
            lane = 'U';
        case 4
            lane = 'V';
        case 5
            lane = 'W';
        case 6
            lane = 'X';
    end
end
end
end

[ r1 c1 l1 ] = size(imgppp)                % for display
imgp1 = imgppp(1:r1/3, 1:c1/2, :);
imgp2 = imgppp(1:r1/3, c1/2:c1, :);
imgp3 = imgppp((r1/3)+1:2*(r1/3), 1:c1/2, :);
imgp4 = imgppp((r1/3)+1:2*(r1/3), c1/2:c1, :);
imgp5 = imgppp((2*(r1/3))+1:r1, 1:c1/2, :);
imgp6 = imgppp((2*(r1/3))+1:r1, c1/2:c1, :);
if z==1                                    % Region 1
    subplot(321); imshow(imgp1); title('Lane A');
    subplot(322); imshow(imgp2); title('Lane B');
    subplot(323); imshow(imgp3); title('Lane C');
    subplot(324); imshow(imgp4); title('Lane D');
    subplot(325); imshow(imgp5); title('Lane E');
    subplot(326); imshow(imgp6); title('Lane F');
    else if z==3                            % Region 3
        subplot(321); imshow(imgp1); title('Lane G');
        subplot(322); imshow(imgp2); title('Lane H');
        subplot(323); imshow(imgp3); title('Lane I');
        subplot(324); imshow(imgp4); title('Lane J');
    end
end

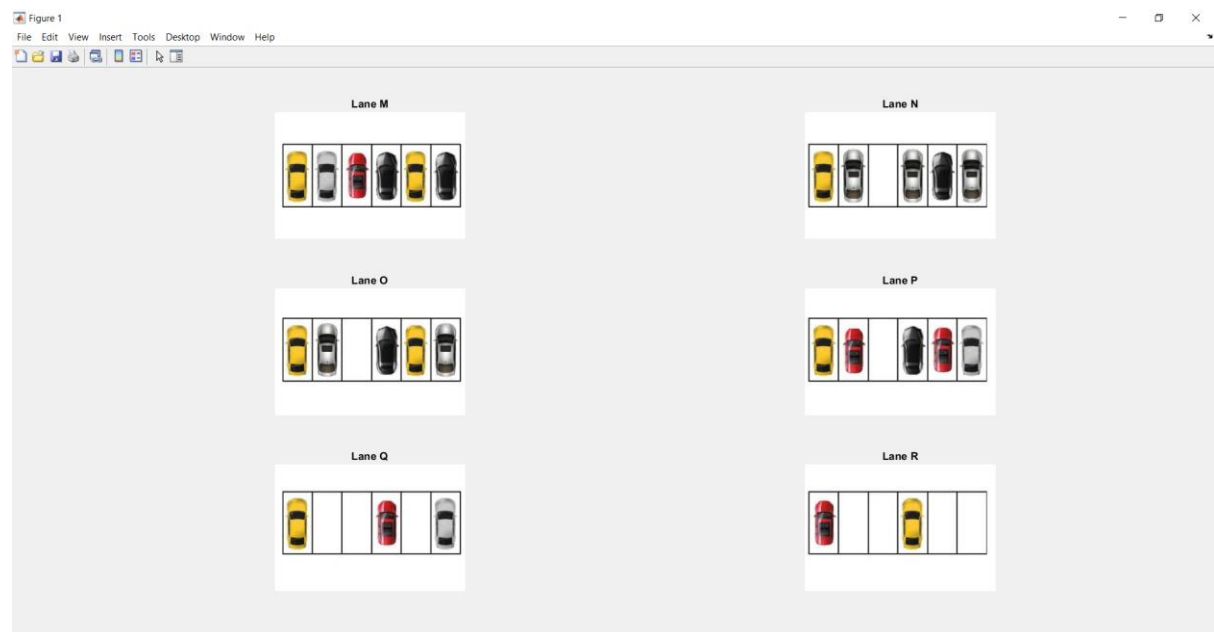
```

```

subplot(325); imshow(imgp5); title('Lane K');
subplot(326); imshow(imgp6); title('Lane L');
    else if z==2                                % Region 2
subplot(321); imshow(imgp1); title('Lane M');
subplot(322); imshow(imgp2); title('Lane N');
subplot(323); imshow(imgp3); title('Lane O');
subplot(324); imshow(imgp4); title('Lane P');
subplot(325); imshow(imgp5); title('Lane Q');
subplot(326); imshow(imgp6); title('Lane R');
    else if z==4                                % Region 4
subplot(321); imshow(imgp1); title('Lane S');
subplot(322); imshow(imgp2); title('Lane T');
subplot(323); imshow(imgp3); title('Lane U');
subplot(324); imshow(imgp4); title('Lane V');
subplot(325); imshow(imgp5); title('Lane W');
subplot(326); imshow(imgp6); title('Lane X');
    end
    end
end
end
end

```

OUTPUT

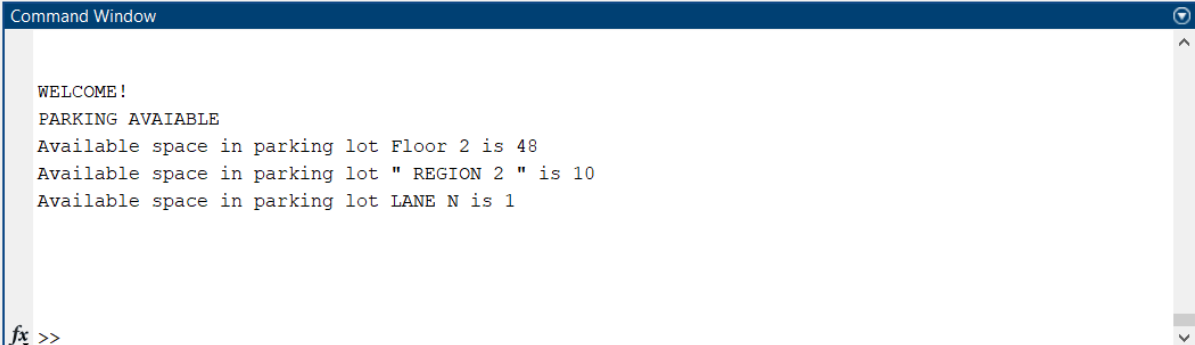


```
if(total>0)
fprintf('WELCOME! \nPARKING AVAIABLE\n');
fprintf('Available space in parking lot Floor 2 is %d
\n', total);
fprintf('Available space in parking lot " REGION %d " is
%d \n',z,t6);
fprintf('Available space in parking lot LANE %s is %d
\n\n\n\n\n',lane, t1);

else
    disp('Sorry for the Inconvenience - PARKING FULL')

end
```

FINAL OUTPUT



```
Command Window

WELCOME!
PARKING AVAIABLE
Available space in parking lot Floor 2 is 48
Available space in parking lot " REGION 2 " is 10
Available space in parking lot LANE N is 1

fx >>
```