TASK

Detection of Screen Flickering: In this task we are providing you a video which contains screen flickering and your responsibility is to identify the flicker of the video, frame by frame and show the region of flicker with proper title to inform of flickering detected or not in adjacent subplots.

CODE

```
clc
clear all
close all
v = VideoReader('flicker.mp4');
h=v.Height;
w=v.Width;
n=30;
s=zeros(n,w);
% Part-1
% Calulating luminance between neighboring pixels and summing it for each
% columns in a frame
for q=1:n
    f=v.read(q);
    f=0.299 * f(:,:,1) + 0.587 * f(:,:,2) + 0.114 * f(:,:,3);
    for a=1:w
        for k=2:h
            d=difference(f,a,k);
            s(q,a)=s(q,a)+d;
        end
    end
end
% Part-2
% Performing Motion Estimation
t=zeros(n,w,5);
for q=2:n
    for u=3:w-2
        for c=-2:2
        t(q,u,c+3)=t(q,u,c+3)+abs(s(q,u)-s(q-1,u+c));
        end
    end
end
t(1,:,:)=t(2,:,:);
% Part-3
% performing a motion compensation to a current frame data
p=zeros(n,w);
v = VideoReader('flicker.mp4');
for q=1:n
    f=v.read(q);
    f=0.299 * f(:,:,1) + 0.587 * f(:,:,2) + 0.114 * f(:,:,3);
    for a=1:w
        for k=1:h
            p(q,a)=p(q,a)+double(f(k,a));
        end
    end
end
```

```
% Part-4
% difference between a previous frame data and the compensated current frame
% data
e=zeros(n,w);
for q=2:n
    for u=3:w
        [a,b]=min(t(q,u,:));
        e(q,u)=p(q,u)-p(q-1,u+b-3);
    end
end
e(1,:,:)=e(2,:,:);
% Part-5
% Displaying Output
for i=1:n
    subplot(1,2,1);
    f=v.read(i);
    image(f);
    k=strcat('Frame',num2str(i));
    title(k);
    axis off;
    axis image;
    subplot(1,2,2);
    image(f);
    y=e(i,:)<0;
    if sum(y)>100
        title('Flickering Detected');
    else
        title('No Flickering Detected');
    end
    axis off;
    axis image;
    drawnow
end
```

Difference Function

```
function d = difference( f,a,k )
%Calulating luminance between neighboring pixels
d=f(k,a)-f(k-1,a);
d=abs(d);
if d<40
    d=0;
end
end
```

EXPLANATION

VideoReader() function is used to read video data. It makes the object v for this class.
v.height() and v.width() finds the height and width of video frame respectively.
To add the luminance difference of each columns of each frames of the video I make matrix s containing n columns signifying frames and w columns signifying columns of the frame.

PART-1

In part 1 of the program we find the luminance value of each pixel by using the equation

```
f=0.299 * f(:,:,1) + 0.587 * f(:,:,2) + 0.114 * f(:,:,3)
Then I find the difference between neighboring pixels and
summing it for each columns in the frame.
```

PART-2

In part 2 of the program, to find motion estimation, I pick the column of current frame then sum the values obtained from difference between the current frame column and previous frame 5 neighboring columns.

PART-3

For motion compensation I add the luminance value of every pixels for respective columns.

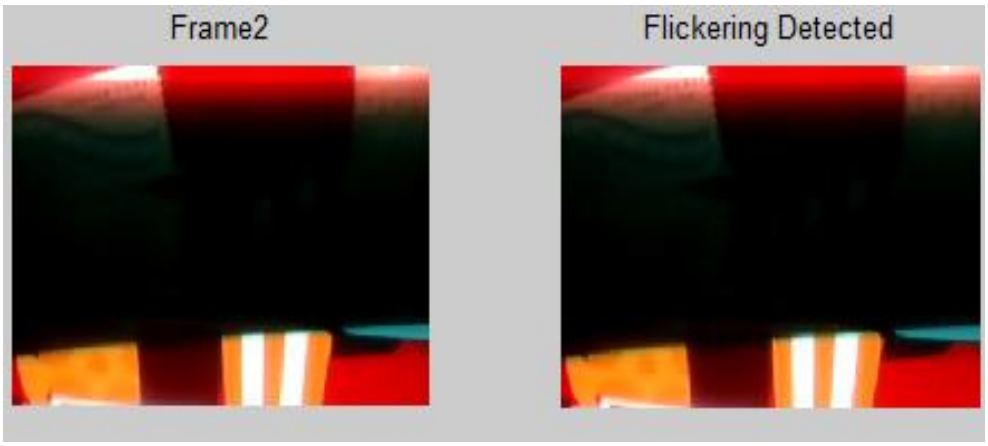
PART-4

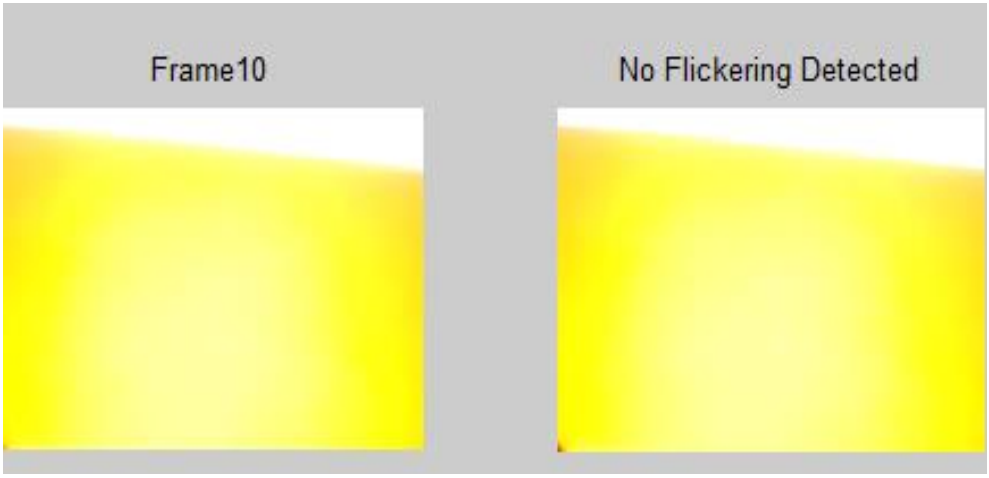
In this I calculate the difference between the current frame data for each column and the column of previous frame for which value obtained in part 2 is minimum.

PART-5

I make the 2 subplot to display the output.
I display the flickering condition of the frame in the title of second plot in subplot.

OUTPUT


Frame2
Flickering Detected


Frame10
No Flickering Detected


Frame30
No Flickering Detected