EEE-391
Section 1
MATLAB Assignment 2
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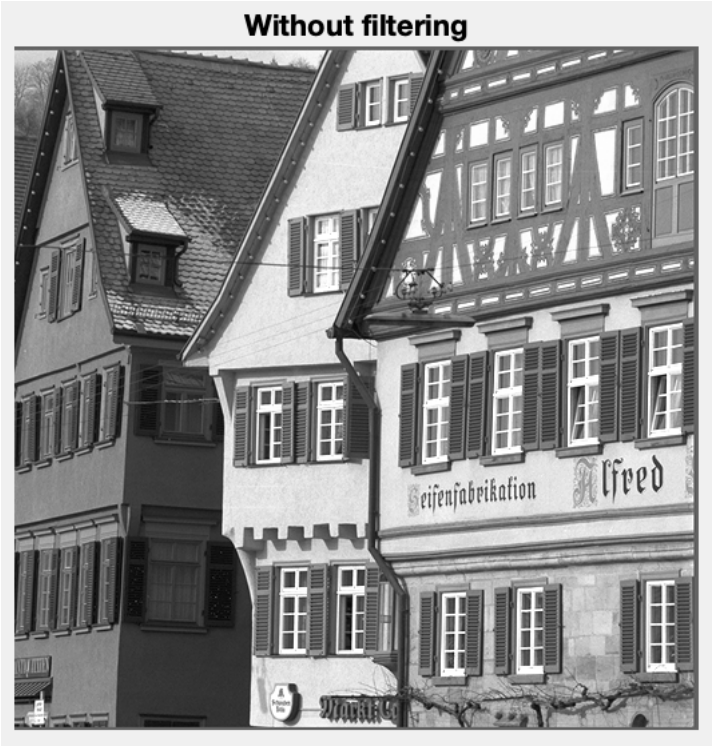
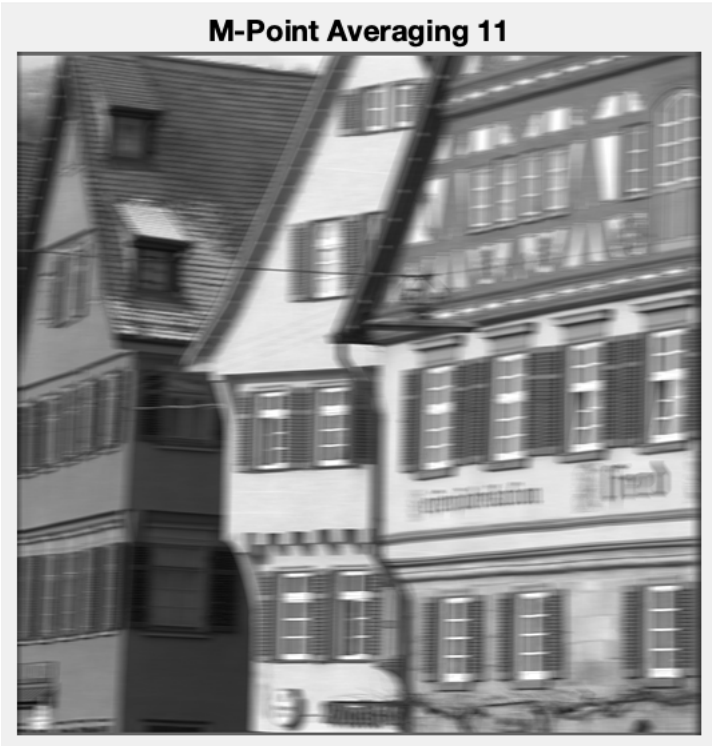
Q1)





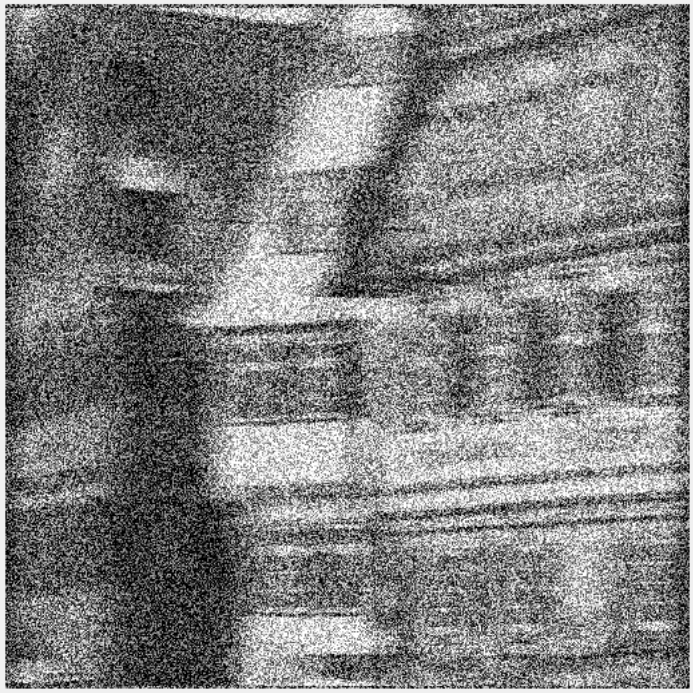
M-Point Averaging 31

M-Point Averaging 61

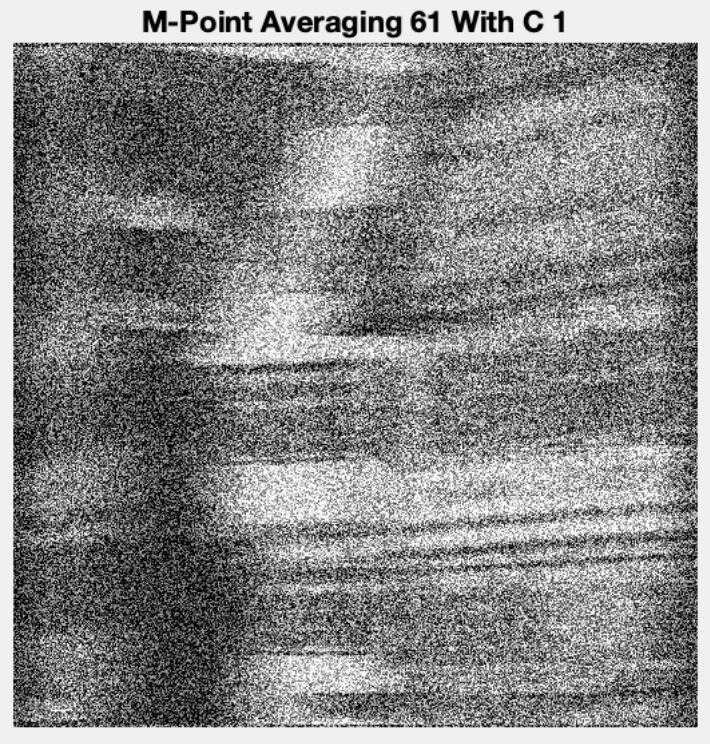
M-Point Averaging 11 With C 1

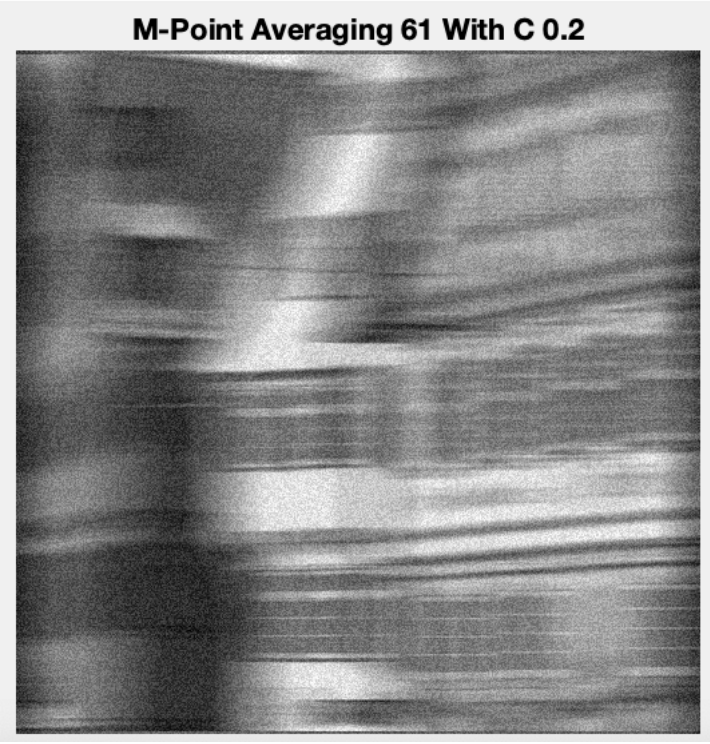
M-Point Averaging 11 With C 0.2

M-Point Averaging 31 With C 1



M-Point Averaging 31 With C 0.2





i) It caused the sharp transitions in the image to become smoother. It shifted points in horizontal directions.

ii) As M value increased, image more corrupted. Sharp details lost as M increase.

iii) Because we filtered only horizontal direction, points shifted horizontally. So horizontal corruption occured more than the vertical.

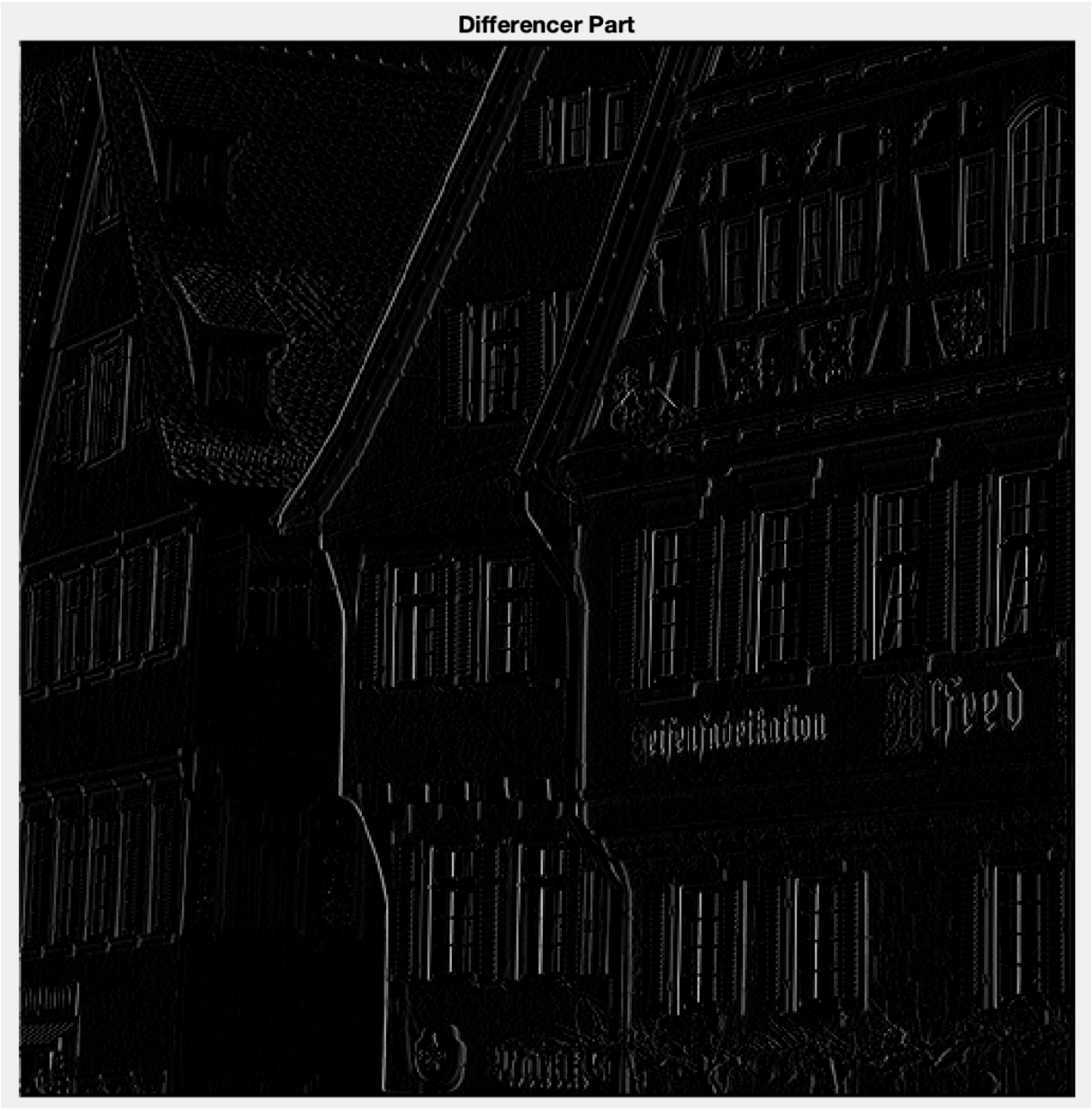
iv) ?

v) As we closed to edges of the image it become darker because we regarded outside of the image as 0 (black points).

vi) Averaging I think didn't help to reduce noise in our examples. Because our first image was in full detail but it could may be help for corrupted images. For example details in M = 61 is worse than M = 11.

vii) M = 11;

PART 2



i) We get black image with differences (White points).

ii) I theoretically expected the same thing. Formula also assures that result.

iii) There are no vertical differences showed in image because we only retrieved horizontal difference.

iv) ?

Code :

```
A = imread('houses.bmp');
J = mat2gray(A, [0 255]);
filteredImg = [];
filteredImgTwo = [];
filteredImgThree = [];
hold on;
figure;
imshow(A);
title('No filter');
%% M is 11 Filtering
for m = 1:length(J)
    total = 0;
    if m < 6
        i = -6;
        %%EDGE CASE OF 0-5
        while i < 6
            i = i + 1;
            temp = 0;
            if (m+i) < 1
                temp = 0;
            else
                temp = J(:,m+i);
            end
            total = total + temp;
        end
    else
         %%EDGE CASE OF 508-512
    if m > 507
        i = -5;
        while i < 6
            temp = 0;
             if (m+i) > 512
                temp = 0;
             else
                 temp = J(:,m+i);
             end
             total = total + temp;
             i = i + 1;
        end
    else
        %% NOT EDGE CASE LEFT AND RIGHT AVAILABLE
    if(m < 508) && ( m > 5)
        i = -5;
        while i < 6
            total = total + J(:,m+i);
            i = i + 1;
        end
    end
    end
    end
    filteredImg(:,m) = total * (1/11);
end
hold on;
figure;
```

```
imshow(filteredImg);
title('M-Point Averaging 11');
hold on;


%% M is 31 Filtering
for m = 1:length(J)
    total = 0;
    if m < 16
        i = -16;
        %%EDGE CASE OF 0-15
        while i < 16
            i = i + 1;
            temp = 0;
            if (m+i) < 1
                temp = 0;
            else
                temp = J(:,m+i);
            end
            total = total + temp;
        end
    else
         %%EDGE CASE OF 497-512
    if m > 497
        i = -15;
        while i < 16
            temp = 0;
             if (m+i) > 512
                temp = 0;
             else
                 temp = J(:,m+i);
             end
             total = total + temp;
             i = i + 1;
        end
    else
        %% NOT EDGE CASE LEFT AND RIGHT AVAILABLE
    if(m < 498) && ( m > 15)
        i = -15;
        while i < 16
            total = total + J(:,m+i);
            i = i + 1;
        end
    end
    end
    end
    filteredImgTwo(:,m) = total * (1/31);
end
hold on;
figure;
imshow(filteredImgTwo);
title('M-Point Averaging 31');
hold on;


%% M is 61 Filtering
for m = 1:length(J)
    total = 0;
    if m < 31
        i = -31;
        %%EDGE CASE OF 0-30
        while i < 31
```

```
            i = i + 1;
            temp = 0;
            if (m+i) < 1
                temp = 0;
            else
                temp = J(:,m+i);
            end
            total = total + temp;
        end
    else
         %%EDGE CASE OF 497-512
    if m > 482
        i = -30;
        while i < 31
            temp = 0;
             if (m+i) > 512
                temp = 0;
             else
                 temp = J(:,m+i);
             end
             total = total + temp;
             i = i + 1;
        end
    else
        %% NOT EDGE CASE LEFT AND RIGHT AVAILABLE
    if(m < 483) && ( m > 30)
        i = -30;
        while i < 31
            total = total + J(:,m+i);
            i = i + 1;
        end
    end
    end
    end
    filteredImgThree(:,m) = total * (1/61);
end
hold on;
figure;
imshow(filteredImgThree);
title('M-Point Averaging 61');
hold on;
filteredImgThreeC = filteredImgThree;
filteredImgTwoC = filteredImgTwo;
filteredImgC = filteredImg;
filteredImgThreeCO = filteredImgThree;
filteredImgTwoCO = filteredImgTwo;
filteredImgCO = filteredImg;
%% c = 0.2
i = 1;
while i < 513
   j = 1;
   while j < 513
    random = rand;
    random = random - 0.5;
    randomO = random;
    randomO = randomO * 1;
    random = random * 0.2;
    filteredImgThreeC(i,j) = filteredImgThreeC(i,j) + random;
    filteredImgTwoC(i,j) = filteredImgTwoC(i,j) + random;
    filteredImgC(i,j) = filteredImgC(i,j) + random;
    filteredImgThreeCO(i,j) = filteredImgThreeCO(i,j) + randomO;
    filteredImgTwoCO(i,j) = filteredImgTwoCO(i,j) + randomO;
    filteredImgCO(i,j) = filteredImgCO(i,j) + randomO;
```

```
    j = j+1;
   end
    i = i + 1;
end
hold on;
figure;
imshow(filteredImgC);
title('M-Point Averaging 11 With C 0.2');
hold on;

figure;
imshow(filteredImgTwoC);
title('M-Point Averaging 31 With C 0.2');
hold on;

figure;
imshow(filteredImgThreeC);
title('M-Point Averaging 61 With C 0.2');
hold on;

figure;
imshow(filteredImgCO);
title('M-Point Averaging 11 With C 1');
hold on;

figure;
imshow(filteredImgTwoCO);
title('M-Point Averaging 31 With C 1');
hold on;

figure;
imshow(filteredImgThreeCO);
title('M-Point Averaging 61 With C 1');
hold on;

diffJ = J;
m = 1;
while m < 513
    n = 1;
    while n < 513
        if m-1 == 0
           diffJ(n,m) = J(n,m);

        else
           diffJ(n,m) = J(n,m) - J(n,m-1);
        end
        n = n + 1;
    end
    m = m + 1;
end
figure;
imshow(diffJ);
title('Differencer Part');
hold on;
```