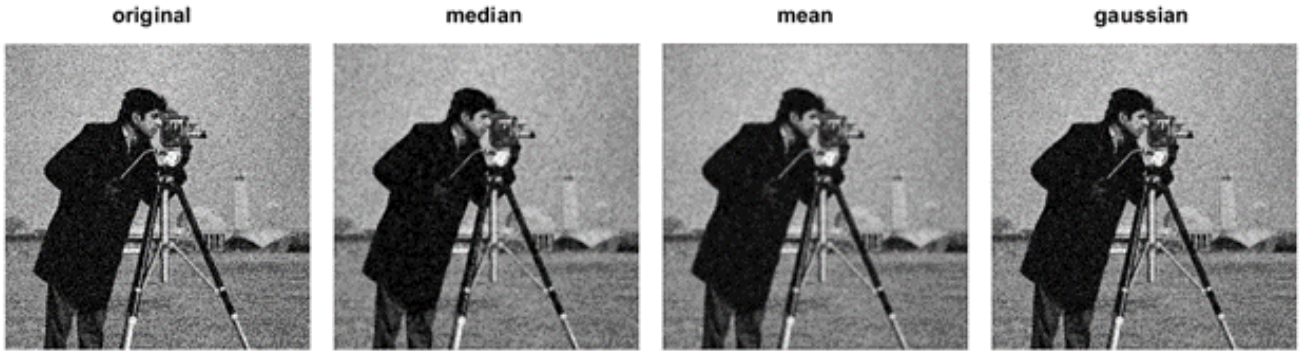
Lab 4 Report

Name: Grant Beatty SID: 862037946

EE146 Section (022)

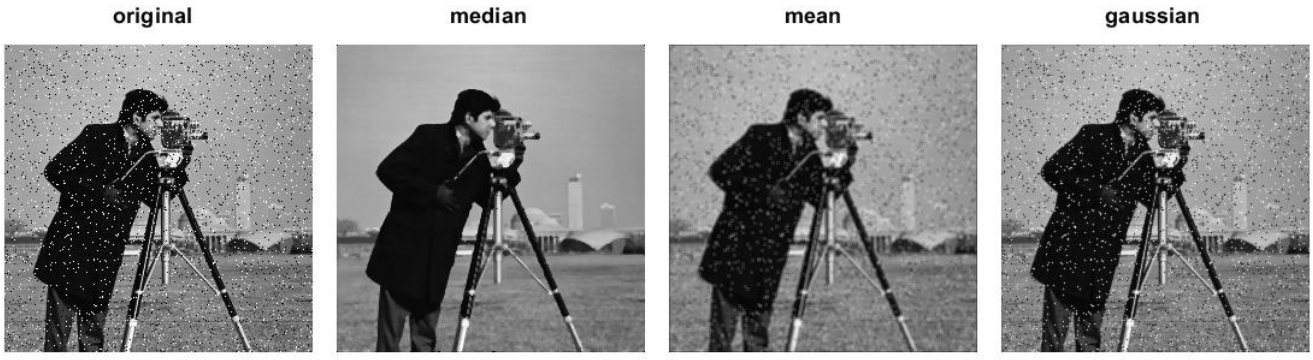
Problem 1

1)



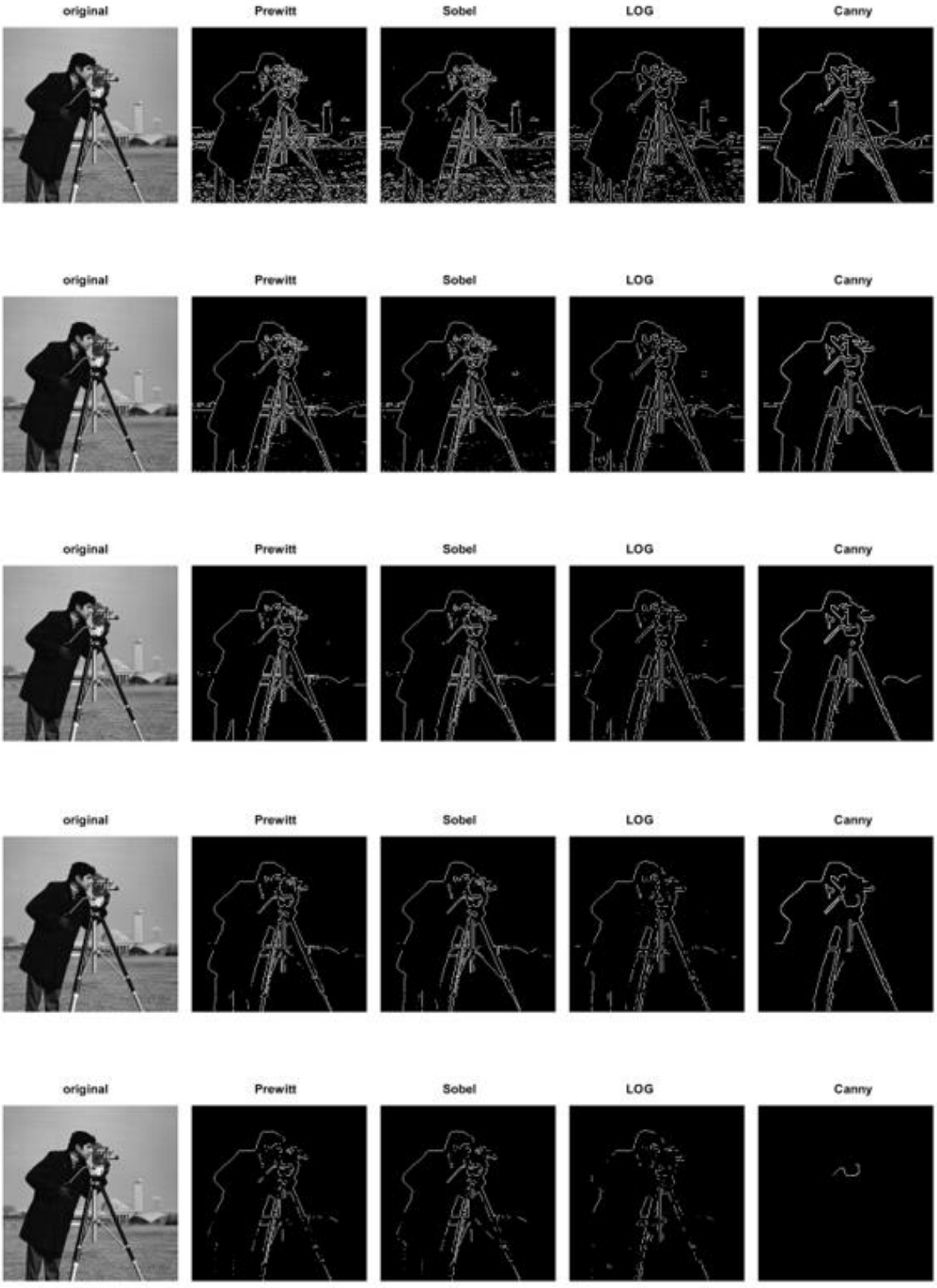
For this image, the gaussian filter works best. It blurs out the noise and retains the images details. The gaussian filter is a weighted average where the most significant bits are located towards the center pixel. This makes it so that the fine details are retained better than with a pure average filter.

2)



The median filter works best here. The other filters are based on either weighted or unweighted averages so all they do is blur the salt and pepper dots which makes them bigger. The median filter takes the median value of a set to determine values for the new image. The outlier dots are factored out with this way.

Problem 2


original
Prewitt
Sobel
LOG
Canny
original
Prewitt
Sobel
LOG
Canny
original
Prewitt
Sobel
LOG
Canny
original
Prewitt
Sobel
LOG
Canny
original
Prewitt
Sobel
LOG
Canny

Problem 3

Laplacian

Imsharpen

Every time the C value is increased in either method the sharpening is increased until a certain point then the sharpening becomes counterproductive. I notice that the contrast is increased with the sharpening.

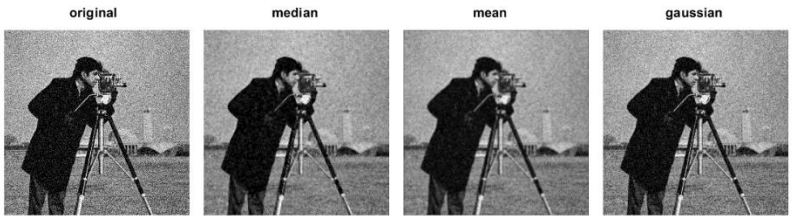
Lab 4 Code

```
clear all;
close all;
```

Problem 1

1)

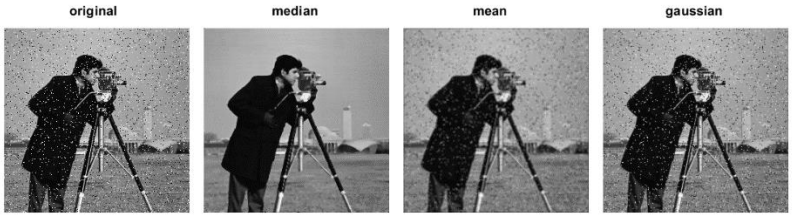
```
I=imread("cameramanGN.tif");
meanfilt=fspecial('average',3);
gaussianfilt1=fspecial('gaussian',5);

pic1=medfilt2(I);         %medfilter
pic2=imfilter(I,meanfilt);     %mean filter
pic3=imfilter(I,gaussianfilt1);     %gaussian filter
imshow(imtile({I pic1 pic2 pic3},'gridsize',[1
4],"BorderSize",10,"BackgroundColor",'w'))
title('original                                    median
mean                                    gaussian');
```



For this image, the gaussian filter works best. It blurs out the noise and retains the images details. The gaussian filter is a weighted average where the most significant bits are located towards the center pixel. This makes it so that the fine details are retained better than with a pure average filter.

2)

```
I=imread("cameramanSPN.tif");
pic1=medfilt2(I);         %medfilter
pic2=imfilter(I,meanfilt);     %mean filter
pic3=imfilter(I,gaussianfilt1);     %gaussian filter
imshow(imtile({I pic1 pic2 pic3},'gridsize',[1
4],"BorderSize",10,"BackgroundColor",'w'))
title('original                                    median
mean                                    gaussian');
```

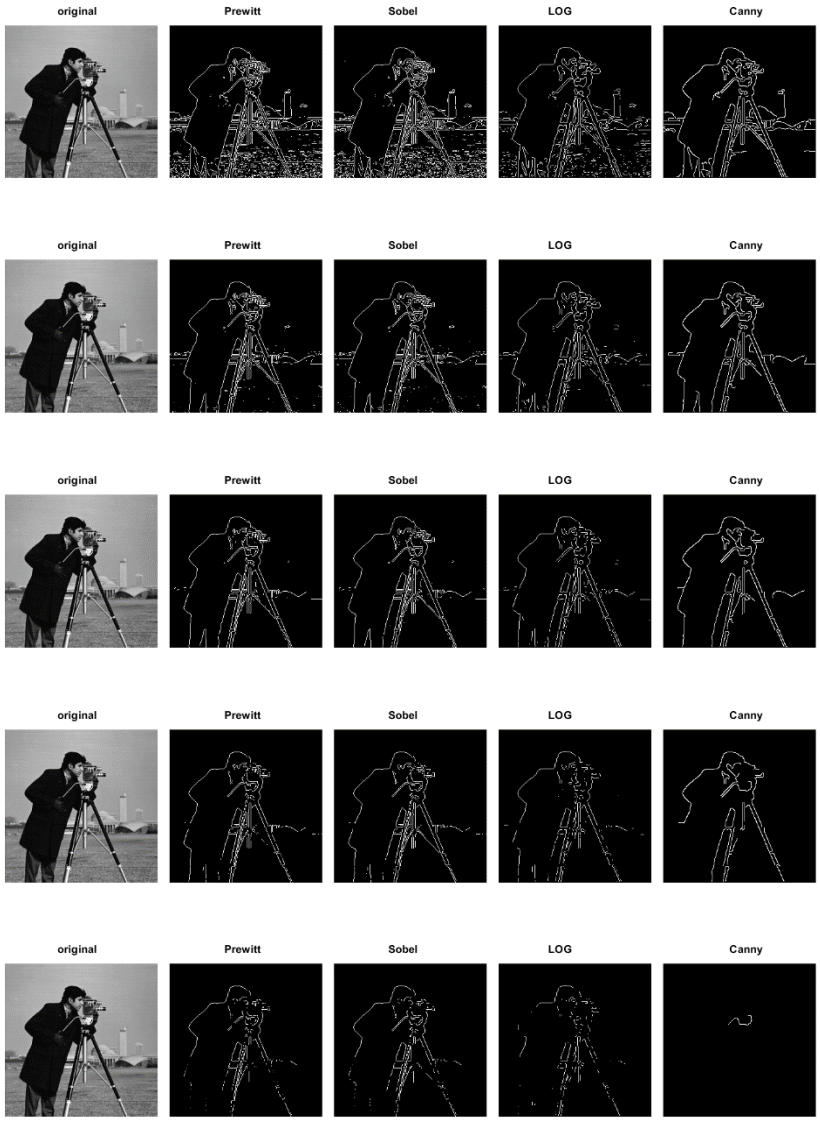


The median filter works best here. The other filters are based on either weighted or unweighted averages so all they do is blur the salt and pepper dots which makes them bigger. The median filter takes the median value of a set to determine values for the new image. The outlier dots are factored out with this way.

problem 2

```
 I=imread("cameraman.tif");
 P=edge(I,'Prewitt');
 S=edge(I,'Sobel');
 L=edge(I,'log');
 C=edge(I,'Canny');
 imshow(imtile({I P S L C},'gridsize',[1
5],"BorderSize",10,"BackgroundColor",'w'))
 title('original                                          Prewitt
Sobel                                      LOG
Canny');
```


```
 for C=1:5

 P=edge(I,'Prewitt',0.05*C);
 S=edge(I,'Sobel',0.05*C);
 L=edge(I,'log',0.005*C);
 C=edge(I,'Canny',0.2*C-0.0001);
 figure
 imshow(imtile({I P S L C},'gridsize',[1
5],"BorderSize",10,"BackgroundColor",'w'))
 title('original                                          Prewitt
Sobel                                      LOG
Canny');
 end
```



Problem 3

```
 for C=1:10
 I=imread('cameramanBlur.tif');
 a=fspecial("laplacian");
 h=a*0.4*C;
 sharp=imfilter(I,h);
 figure
 imshow(imtile({I sharp (I-sharp)},'gridsize',[1
5],"BorderSize",10,"BackgroundColor",'w'))
 end
```







```
 for C=1:10
 sharp2=imsharpen(I,'amount',0.2*C);
 figure
 imshow(imtile({I sharp2},'gridsize',[1
2],"BorderSize",10,"BackgroundColor",'w'))
 end
```










Every time the C value is increased in either method the sharpening is increased until a certain point then the sharpening becomes counterproductive.