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%Pratap Luitel
%ENGS 111
%HW 4, Problem 2
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```
%The function returns a filtered(top hat/bottom hat) image from
%the input image. The flag argument determines the choice of filter - 0
%is bottom hat and 1 is top hat. The function assumes that the input image
%is of type double.
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```
function imOut = topBottomHat(imIn,SE,flag)
```

```
%bottom hat filtering
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```
if (flag == 0)
    %closing = dilation, and then erosion
    dilatedImage = erodeDilate(imIn,SE,1);%dilate
    closeImage = erodeDilate(dilatedImage,SE,0);%erode
    imOut = imsubtract(closeImage,imIn);%bottomHat
```

```
%top hat filtering
```

```
else
    %opening = erosion and then dilation
    erodedImage = erodeDilate(imIn,SE,0);%erode
    openImage = erodeDilate(erodedImage,SE,1);%dilate
    imOut = imsubtract(imIn,openImage);%topHat
end
```

```
end
```

```
Error using topBottomHat (line 14)
Not enough input arguments.
```

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