COMP4421 (Fall 2018)

Assignment #1

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I.   Exercises

1) Solution:
   a) The horizontal and vertical lines increase due to the appearance of the black box area, which creates a horizontal and vertical pattern in the background part of the image. This pattern is expressed in the frequency domain as the cross.
   b) Because the side border appears, this causes a large area of the image to have small changes in intensity. This information is encoded in the low frequency zones, thus they increase after the black border is shown.
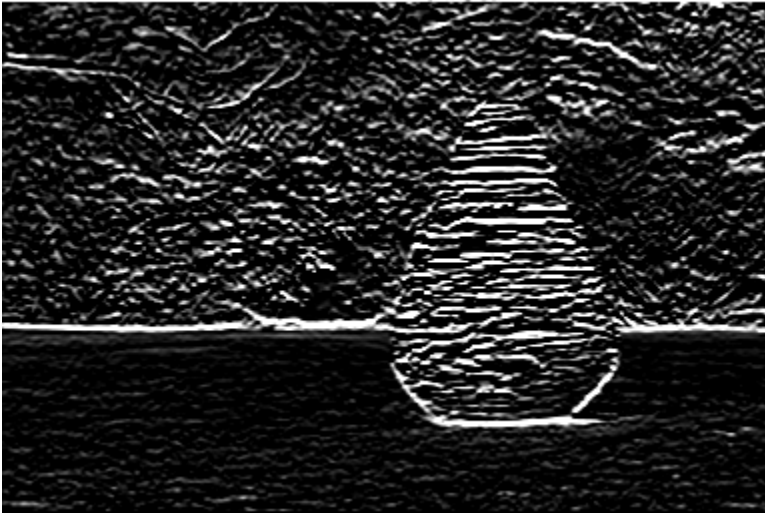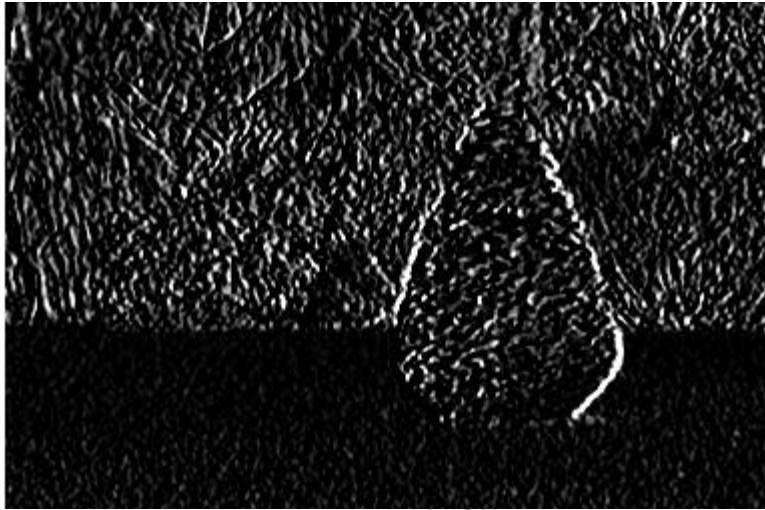
II.   Programming Tasks
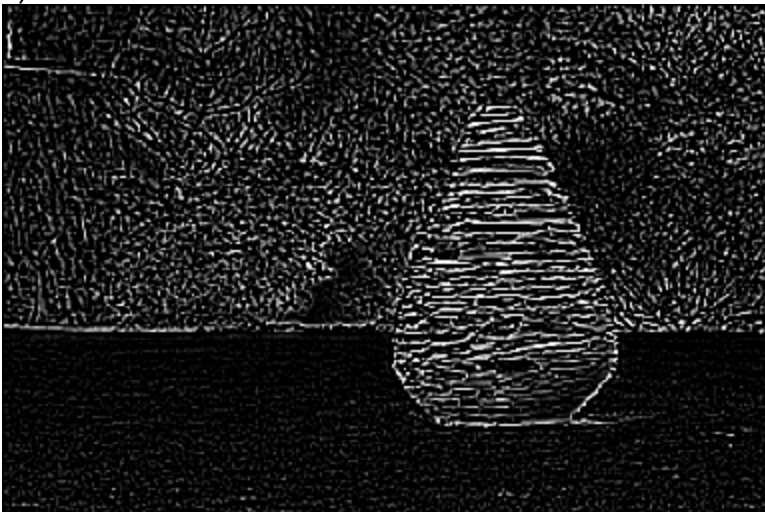
1) Task 1: Spatial Linear Filtering
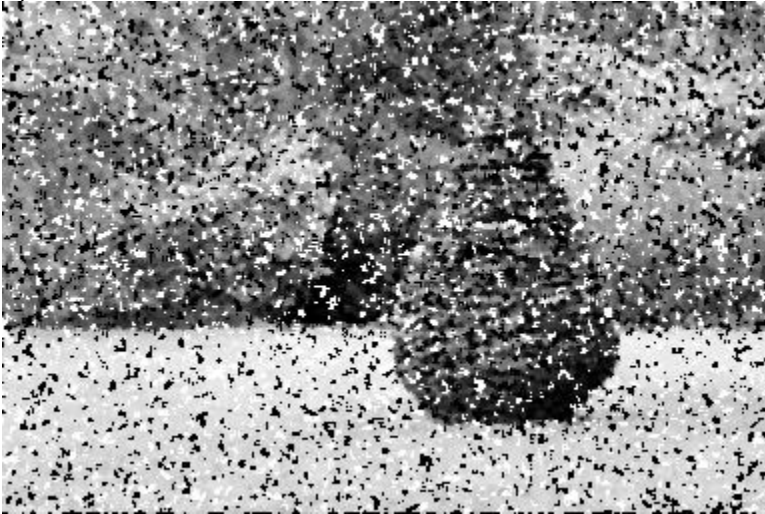a)

b)

c)

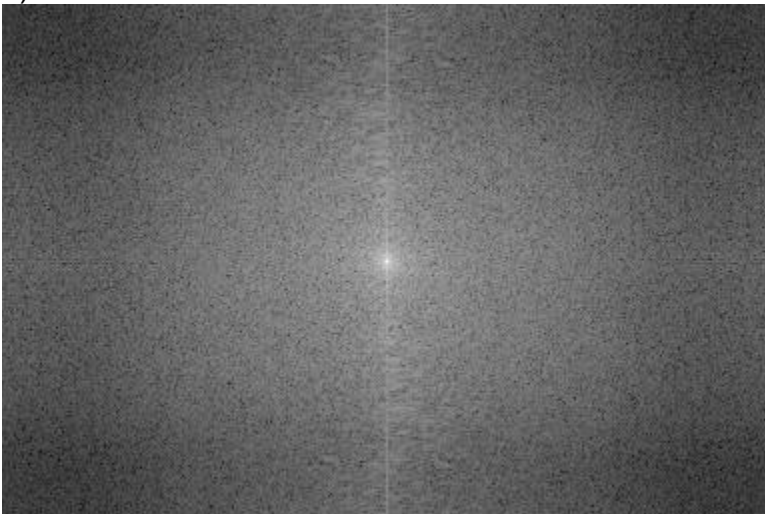2) Task 2: Spatial Non-linear Filtering
a)

b)

3) Task 3: Discrete Fourier Transform

a)

b)

4) Task 4: Filtering in the Frequency Domain
a)

b)

5) Task 5: High Frequency Emphasis
a)

b)