CS 558, Fall 2018: Quiz 2

NAME:

Problem 1. You are given the 3×3 gray-scale image below:

9	7	12
5	3	4
1	6	2

Apply the following filter to the center pixel of the image:

1	0	-1
1	0	-1
1	0	-1

Problem 2. Explain a) WHY after applying a mean filter, the maximum intensity of an image cannot increase? b) WHEN does the maximum stay the same after filtering? The filter is square ($n \times n$), all weights are equal and they sum to 1.

Problem 3. a) WHY should image gradient estimation be performed over a pre-smoothed image? b) HOW can differentiation and smoothing be performed at the same time?