CAP 4401 Digital Image Processing
Sample Quiz 1

Name: _____ **USF Number**: _____

- This is a closed book examination. No books, no notes, no calculators.
- Show all your work for possible partial credit. Credit is up to 5 points per problem (25 points total).
- After completing your exam, sign the following pledge: **"No aid given, received, nor observed"**

Signature: _____

1. Explain the concepts of variable thresholding. How is the threshold computed? Give at least one advantage and one disadvantage as comparing to fix thresholding. Explain what image conditions call for variable thresholding technique.
2. Explain the concept of position-**in**dependent brightness transformation. Does histogram stretching fits that concept? Explain histogram stretching procedure.
3. Explain the idea and describe the algorithm of the weighted median filter. Describe the difference in performance (in terms of quality of processed images) of such filter as compared to the "regular" median filter. What image content makes the weighted median filter useful?
4. ~~Explain the idea of gradient-based grey level edge detection (based on directional derivatives, df/dx and df/dy). Define edge strength and edge direction (give formulas). Show how the Sobel operator implements this approach. [Note that I am not asking about compass operators]~~
5. Explain the idea of histogram specification. Explain how histogram equalization method (and look-up tables) can be utilized to implement histogram specification.

Note: Please, give detailed explanations for full credit. Please, write legibly so I can understand your writing.