Feedback — Quiz 1

Help Center

You submitted this quiz on **Thu 4 Apr 2013 10:42 AM PDT**. You got a score of **13.00** out of **13.00**.

Question 1

Please select the one answer choice that is characteristic of a "digital" image.

Your Answer		Score	Explanation
(•) It is a discrete sampling of a continuous signal.	✔	1.00	That's right! An image uses discrete pixels to represent a continuous light intensity signal.
( ) It is a continuous sampling of a continuous signal.			
( ) It is a discrete sampling of a discrete signal.			
( ) It is a continuous sampling of a discrete signal.			
Total		1.00 / 1.00	

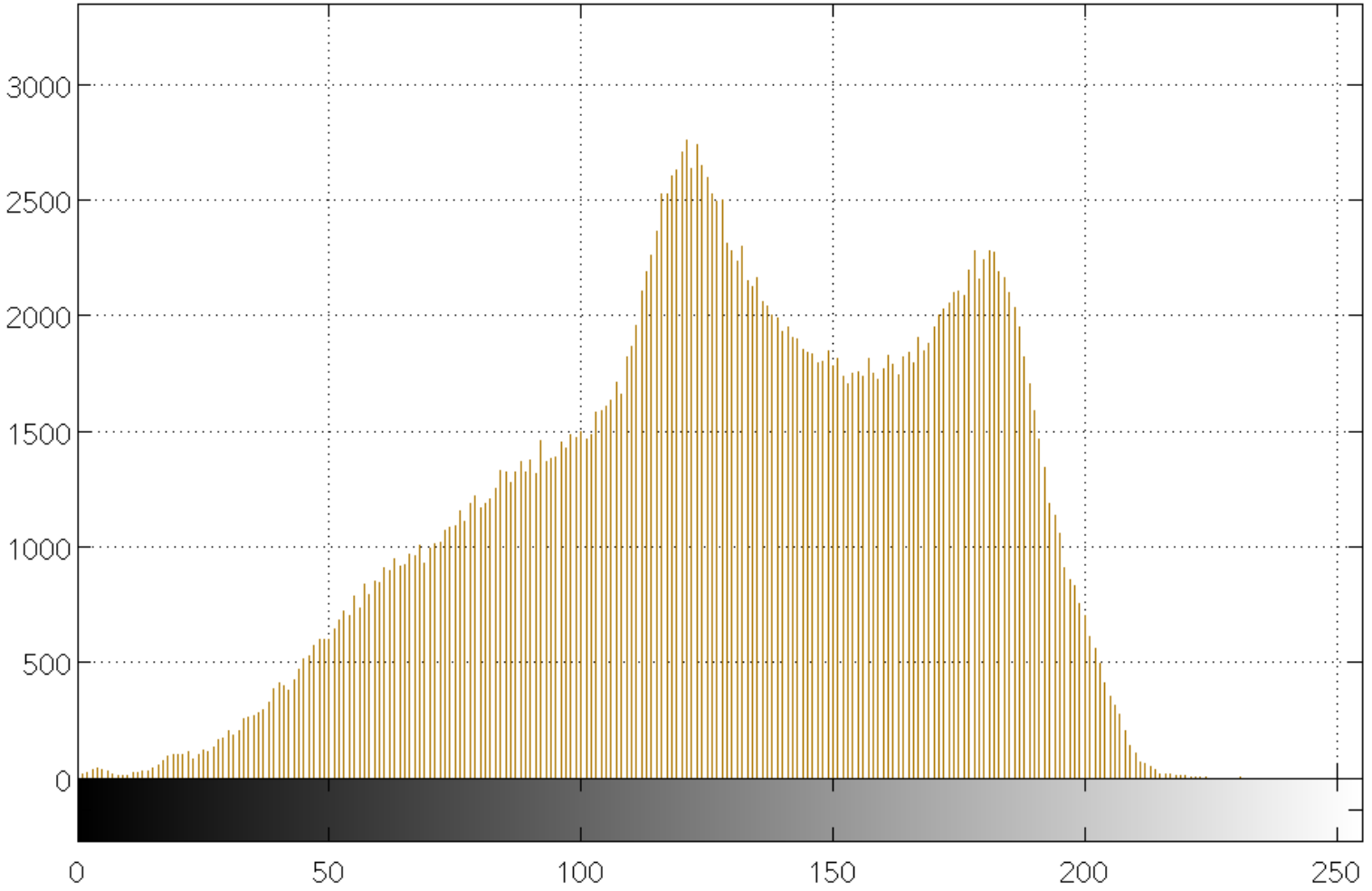
Question 2

Please select ALL possible answer choices that describe the meaning of the term 'uint8'.

Your Answer		Score	Explanation
☑ An integer between 0 and 255.	✔	0.25	Correct! The maximum value that can be stored in 8 bits is 11111111 in binary, which is 255. The lowest is 00000000 in binary, which is 0.
☐ Can represent the number 11.5.	✔	0.25	Sorry, this is not correct. uint8 is strictly an integer datatype, and so it can represent the numbers 11 and 12, but not 11.5
☑ An unsigned integer of 8 bits.	✔	0.25	Correct! This is, in fact, what uint8 stands for.
☑ A common datatype for representing light intensity in a digital image.	✔	0.25	Correct! Most images will be stored with 3 channels, with a uint8 number representing the intensity of each channel.
Total		1.00 / 1.00	

Question 3

The following is an image of a histogram:



Please select the one answer that correctly identifies the dimensions of this histogram.

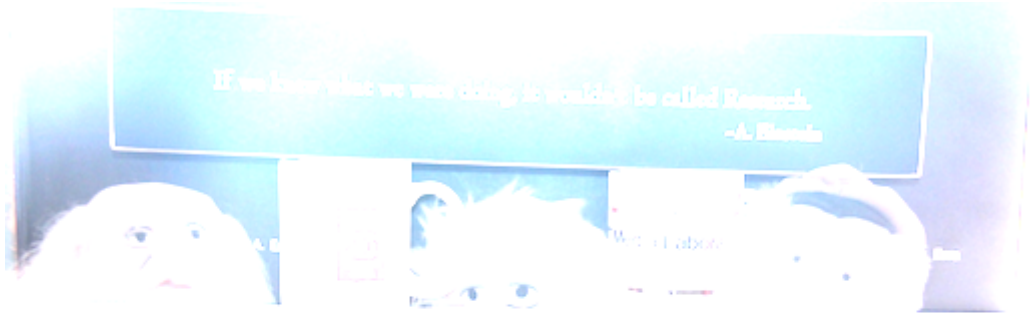
Your Answer		Score	Explanation
The horizontal axis is an intensity, and the vertical axis is the number of pixels in the image that have that intensity.	✔	1.00	Correct!

- The vertical axis identifies a pixel, and the horizontal axis shows the height of that pixel.
- The horizontal axis identifies a pixel, and the vertical axis shows the intensity of that pixel.
- The vertical axis is an intensity, and the horizontal axis is the number of pixels in the image that have that intensity.

Total 1.00 / 1.00

Question 4

Recall the following image, which we saw in lecture when we tried to add several images together using a pixel process:



Choose the one option that best describes the reason behind the washed-out brightness of the image.

Your Answer		Score	Explanation
○ For some of the pixels, addition of intensities resulted in a value that was less than 0. We should have used alpha-blending instead.			
○ For some of the pixels, addition of intensities resulted in a value that was less than 0. We should have subtracted the images instead.			
◉ For some of the pixels, addition of intensities resulted in a value that was higher than 255. We should have used alpha-blending instead.	✔	1.00	Correct!
○ For some of the pixels, addition of intensities resulted in a value that was higher than 255. We should have subtracted the images instead.			
Total		1.00 / 1.00	

Question 5

Select ALL possible answer choices that are valid strategies for dealing with representation errors when performing arithmetic on images.

Your Answer		Score	Explanation
☑ We should use alpha-blending.	✔	0.25	Correct! When adding images together, we can use alpha blending to make sure the resulting pixel values are in the 0, 255 range.
☑ We should perform the operations in floating point, and then scale the results to be in the 0, 255 range.	✔	0.25	Correct! When doing image arithmetic, it's often useful to convert the images to a higher precision. We just need to remember to put them back in the correct range before we want to view them in image format again.
☐ We don't have to worry,	✔	0.25	This option is false. Most image software will assume that the image is in this range, and

computers are capable of displaying images even when they're not in the 0, 255 range.			crop the values if that is not the case, resulting in useless images like the one above.
We should make sure that our images are darker, so the results of operations stay in the 0, 255 range.	✔	0.25	This option is false. While this might work in some cases, this is not a practical solution.
Total		1.00 / 1.00	

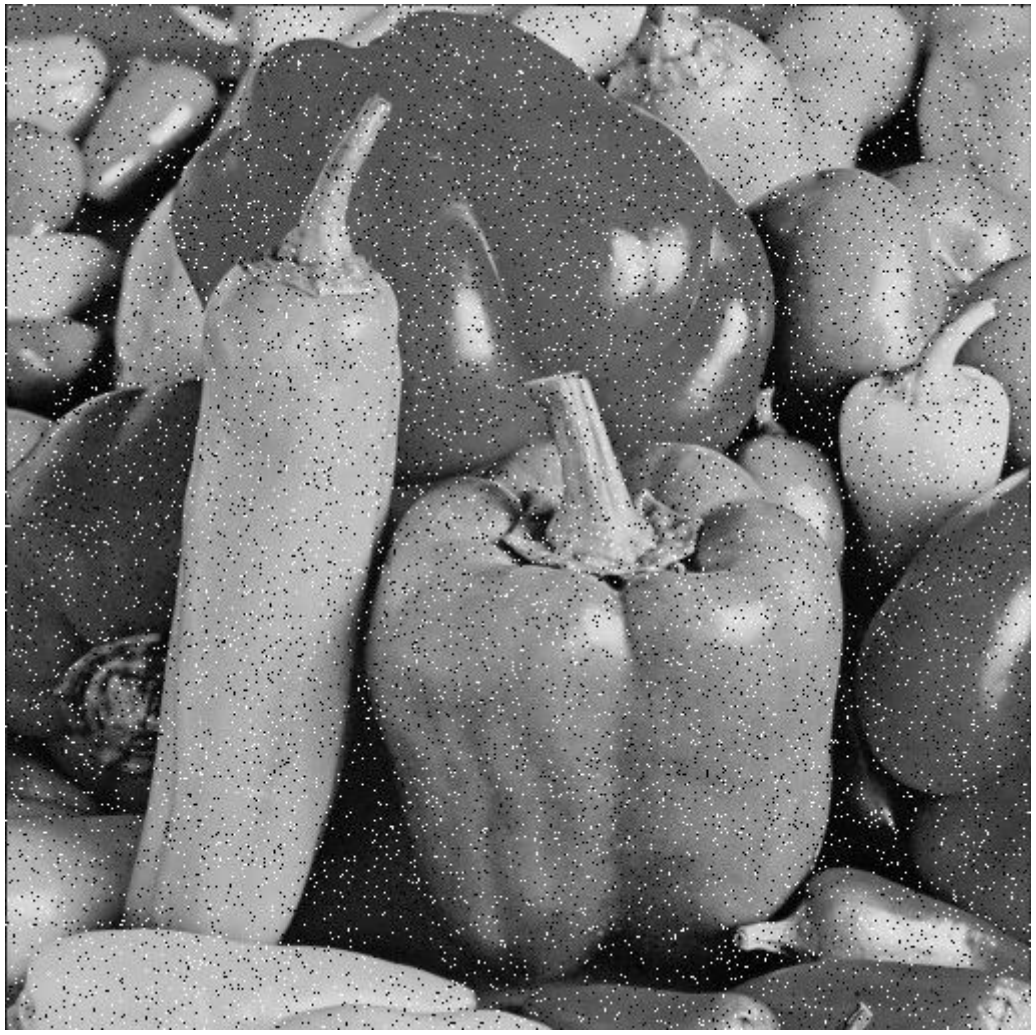
Question 6

Recall the following images from lecture:

a. 

b.

c.

d. 

Please choose the one option that correctly matches the image to the method by which it was produced.

Your Answer		Score	Explanation
a. box filter b. original image c. sharpen filter d. salt and pepper noise			
a. original image b. box filter c. median filter d. salt and pepper noise			
a. box filter b. original image c. median filter d. salt and pepper noise	✔	1.00	Correct!

a. median filter b. original image c. box filter d. sharpen filter			
Total		1.00 / 1.00	

Question 7

A neighborhood of diameter 3 contains how many pixels?

Your Answer		Score	Explanation
three (3)			
nine (9)	✔	1.00	Correct - a 3x3 patch of pixels contains 9 pixels.
six (6)			
twenty seven (27)			
Total		1.00 / 1.00	

Question 8

Select the one answer that best describes salt and pepper noise.

Your Answer		Score	Explanation
Random pixels are set to completely white or completely black, to simulate dead or broken	✔	1.00	Correct!

pixels in a sensor.			
We add a small random number to the intensity of every pixel, to simulate sensitive film, to simulate dead or broken pixels in a sensor.			
Random pixels are set to completely white or completely black, to simulate sensitive film.			
We add a small random number to the intensity of every pixel, to simulate sensitive film.			
Total		1.00 / 1.00	

Question 9

Please select the one answer that describes the main way in which correlation is different from convolution.

Your Answer		Score	Explanation
In convolution, we fill in the border elements by copying the edge of the convolved image.			
In correlation, we flip the kernel prior to rubbing it on the image.			
In convolution, we flip the kernel prior to rubbing it on the image.	✔	1.00	Correct!
In correlation, we fill in the border elements by copying the edge of the correlated image.			
Total		1.00 / 1.00	

Question 10

Please select all of the answers that accurately describe what would happen when the given operation is applied to an impulse image and a kernel.

Your Answer		Score	Explanation
☐ Performing a convolution between a kernel and an impulse image would return a flipped kernel.	✔	0.25	This is not correct.
☐ Performing a correlation between a kernel and an impulse image would return the kernel.	✔	0.25	This is not correct.
☑ Performing a convolution between a kernel and an impulse image would return the kernel.	✔	0.25	Correct, this is the purpose of flipping the kernel.
☑ Performing a correlation between a kernel and an impulse image would return a flipped kernel.	✔	0.25	Correct!
Total		1.00 / 1.00	

Question 11

Please select the one answer that best explains why we might want to use a Gaussian filter instead of a box filter for blurring an image.

Your Answer		Score	Explanation
◉ A single point of light when viewed out of focus appears to be a circular blob, and not a square.	✔	1.00	Correct!

- We want to place less weight on the points closer to the center of the kernel.
- A single point of light when viewed out of focus appears to be a square, and not a blob.
- Box filters are too simple to be useful.

Total 1.00 / 1.00

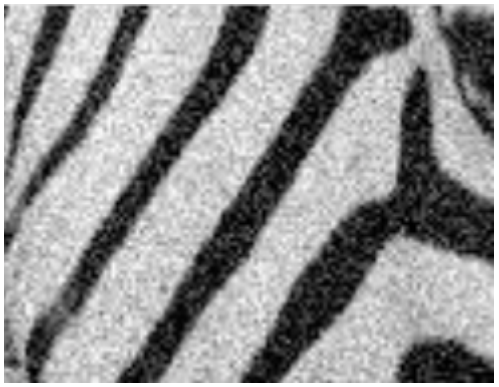
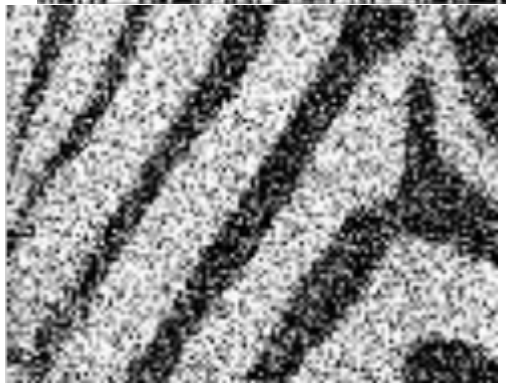
Question 12

Please select the one or more answers that describe a gradient of an image.

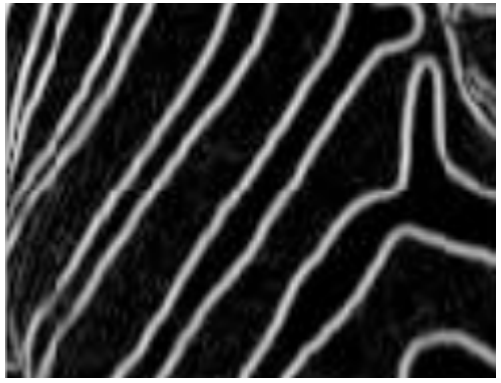
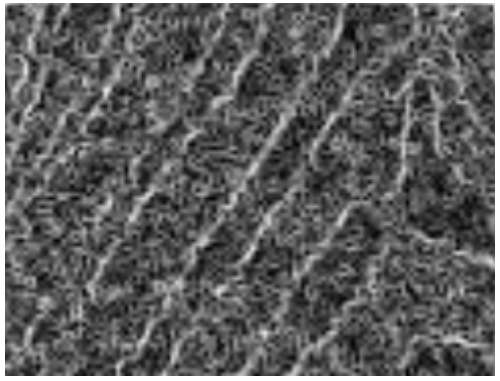
Your Answer		Score	Explanation
☑ The rate of change of the intensity of the image.	✔	0.25	Correct!
☑ Can be used to find the magnitude and orientation of edges.	✔	0.25	Correct!
☑ Is affected by noise, so it is a good idea to smooth the image prior to looking at its gradient.	✔	0.25	Correct!
☑ Can be calculated by taking the difference between adjacent pixels in the image.	✔	0.25	Correct!
Total		1.00 / 1.00	

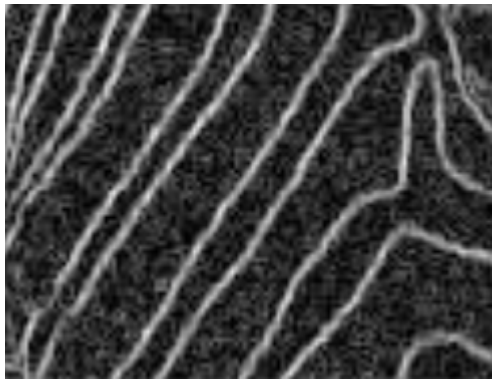
Question 13

Consider this set of source images, numbered 1 through 4.

1. 
2. 
3. 
4. 

And these four gradient images, labeled a-d:

a. 
b. 
c. 
d.



Please choose the one option that correctly matches the source images to the target images.

Your Answer		Score	Explanation
○ 1. a 2. b 3. c 4. d			
○ 1. a 2. d 3. c 4. b			
○ 1. d 2. c 3. a 4. b			
◉ 1. c 2. d 3. a 4. b	✔	1.00	Correct!
Total		1.00 / 1.00	