

## PART A

Sensor Value	1st Deriv.	2nd Deriv.
0		
	2	
2		0
	2	
4		1
	3	
7		-1
	2	
9		4
	6	
15		-9
	-3	
12		5
	2	
14		1
	3	
17		0
	3	
20		

If 1st Derivative is  $< 2$  or  $> 3$ , then noise.

Sensor Value	1st Deriv.	2nd Deriv.
1		
	2	
3		2
	4	
7		-6
	-2	
5		18
	16	
21		-6
	10	
31		2
	12	
43		2
	14	
57		2
	16	
73		2
	18	
91		

If 2nd Derivative is  $\neq 2$ , then noise.

## PART B

### 3 x 3 Filter

[illegible][illegible]

20	21	20
20	22	55
20	24	255

New Value for Row 2, Column 2

$$\begin{aligned}
 &20 * 1/9 + 21 * 1/9 + 20 * 1/9 + \\
 &20 * 1/9 + 22 * 1/9 + 55 * 1/9 + \\
 &20 * 1/9 + 24 * 1/9 + 255 * 1/9 = 51 \quad (50.78)
 \end{aligned}$$

**PS 5: Noise and Filtering: Part C, D and E**  
**For each image to be filtered:**

First place the image in Matlab's current directory. Either navigate to the directory where the image is using the browse button near the directory box or use Windows Explorer to place the image in Matlab's current directory. The image file should show in the pane to the left of the Command pane.

Read in the image: **imread**

Set the filter: Create a matrix for the filter

Apply the filter: **imfilter**

Display the filtered image: **imshow**