CS 555 Assignment-1

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Question 1:

1) Given image subsets:

					S1				S2
0	0	0	0	0	0	0	1	1	0
1	0	0	1	0	0	1	0	0	1
1	0	0	1	0	1	1	0	0	0
0	0	1	1	1	0	0	0	0	0
0	0	1	1	1	0	0	1	1	1

Answer: These subsets are m-adjacent in nature as shown in the following figure

Since the pixel in interest follows :

- q is N4(p), or
- q is Nd(p) and N4(p) ∩ N4(q) =∅

					S1		S2		
0	0	0	0	0	0	0	1	1	0
1	0	0	1	0	0	1	0	0	1
1	0	0	1	0	1	1	0	0	0
0	0	1	1	1	0	0	0	0	0
0	0	1	1	1	0	0	1	1	1

Question 2:

Given Image:

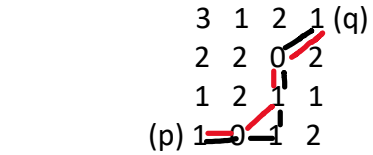
	3	1	2	1 (q)
	2	2	0	2
	1	2	1	1
(p)	1	0	1	2

Answer:

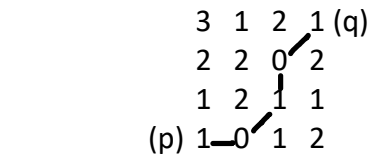
2.a)

	3	1	2	1 (q)
	2	2	0	2
	1	2	1	1
(p)	1	0	1	2

Shortest path for 4-connected V{0,1} does not exist since we cannot reach to (q) from (p) with only strong connected edges as shown above.

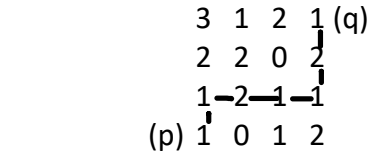


Path for 8-connected V{0,1} can have two ways to reach from (p) to (q) with varied path length as shown in the above figure. Hence the shortest path out of both will be considered. So the red path is the shortest path with length of 4.

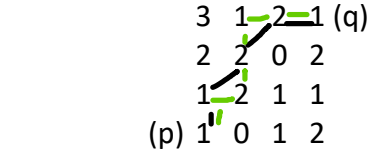


Shortest path for m-adjacent edges of V{0,1} is 4 as showed in the figure above.

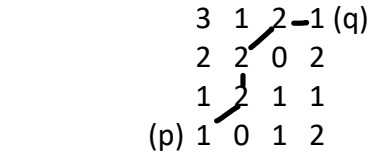
b)



Shortest path for 4-adjacent edges of V{1,2} is 6 as showed in the figure above.



Shortest path for 8-adjacent edges of V{1,2} is 4 as showed in the above figure.

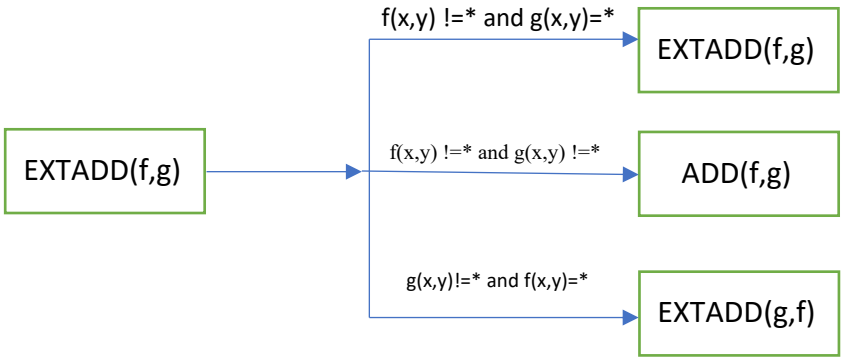


Shortest path for m-adjacent edges of V{1,2} is 4 as showed in the above figure.

Question3 :

a) Block Diagram for EXTADD(f, g) using ADD(f,g), EXTEND(f,g)

Answer:

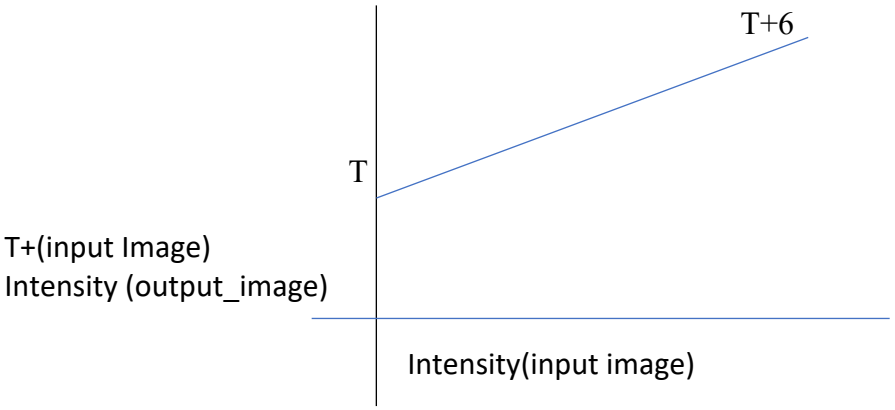


3 b) EXTADD($\begin{bmatrix} 3 & 5 & -2 \\ * & 0 & * \\ * & * & * \end{bmatrix}$, $\begin{bmatrix} 2 & 4 & * \\ 3 & 9 & * \\ -2 & * & * \end{bmatrix}$)

Answer: $\begin{bmatrix} 5 & 9 & -2 \\ 3 & 9 & * \\ -2 & * & * \end{bmatrix}$

Question 4:

Answer: intensity(output_image)= T+intensity(input_image)



Question 5:

Answer: