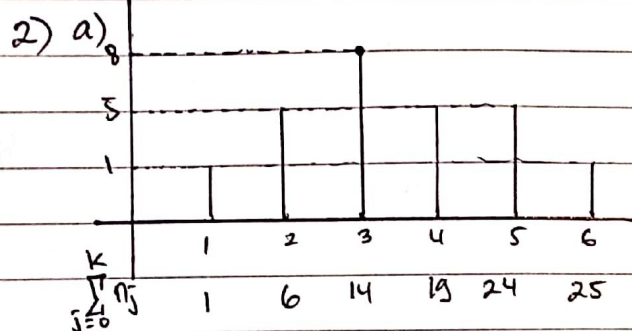1)a) Ya, S_1 dan S_2 connected

b) 8 adjacent, Karena hanya 87 dan 90 yang memenuhi Set V dan 87 dan 90 berada pada posisi diagonal / 8 adjacent

c)

S_1
86	67	90	91	S_2
86	87	95	95	
87	87	40	45	

2) a)

k						
$\sum_{j=0} n_j$	1	6	14	19	24	25

b) $S_1 = \frac{1}{25} \times 16 = 0,64 \approx 1$

$S_2 = \frac{6}{25} \times 16 = 3,84 \approx 4$

$S_3 = \frac{14}{25} \times 16 = 8,96 \approx 9$

$S_4 = \frac{19}{25} \times 16 = 12,16 \approx 12$

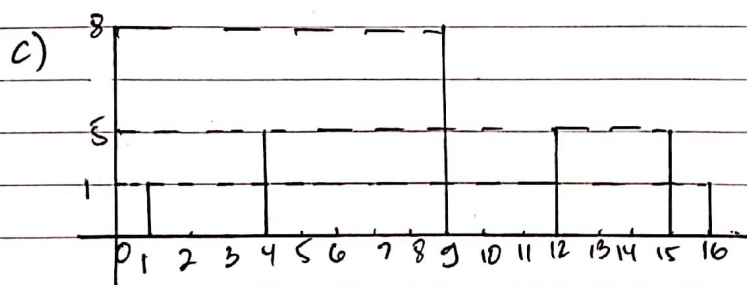$S_5 = \frac{24}{25} \times 16 = 15,36 \approx 15$

$S_6 = \frac{25}{26} \times 16 = 16$

Atau

No of pixel	1	2	3	4	5	6
$\sum_{j=0}^{k} \frac{n_j}{n}$	$\frac{1}{25}$	$\frac{6}{25}$	$\frac{14}{25}$	$\frac{19}{25}$	$\frac{24}{25}$	$\frac{25}{25}$
$S \times 16$	0,64 / 1	3,84 / 4	8,96 / 9	12,16 / 12	15,36 / 15	16

c)

3) a) Citra No 2   Konvolusi Filter Median 3×3

3	4	41	1	3
3	5	5	6	2
4	5	2	4	2
5	2	3	3	3
2	3	3	5	4

$M_{22} = [\,2\ 3\ 3\ 4\ ④\ 4\ 5\ 5\ 5\,]$
$= 4$

$M_{44} = [\,2\ 2\ 3\ 3\ ③\ 3\ 4\ 4\ 5\,]$
$= 3$

Hasil Konvolusi

3	4	4	1	3
3	4	5	3	2
4	4	4	3	2
5	3	3	3	3
2	3	3	5	4

$M_{23} = 5$ $M_{32} = 4$ $M_{42} = 3$

$M_{24} = 3$ $M_{33} = 4$ $M_{43} = 3$

$M_{34} = 3$

3b) Operator Robert

$$G[f_{(i,j)}] = |Gx| + |Gy|$$
$$= |f_{ij} - f_{(i+1)(j+1)}| + |f_{(i+1)j} - f_{i(j+1)}|$$

Filter

$$Gx = \begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix} \quad Gy = \begin{bmatrix} 0 & -1 \\ 1 & 0 \end{bmatrix}$$

Citra 2

3	4	4	1	3
3	5	5	6	2
4	5	2	4	2
5	2	3	3	3
2	3	3	5	4

$M_{11} = |3-5| + |3-4| = 3$
$M_{12} = |4-5| + |5-4| = 2$
$M_{13} = |4-6| + |5-1| = 6$
$M_{14} = |1-2| + |6-3| = 4$

$M_{21} = 3$
$M_{22} = 3$
$M_{23} = 5$
$M_{24} = 6$

$M_{31} = 2$
$M_{32} = 2$
$M_{33} = 2$
$M_{34} = 2$

$M_{41} = 2$
$M_{42} = 1$
$M_{43} = 2$
$M_{44} = 3$

Hasil Konvolusi

3	2	6	4	3
3	3	5	6	2
2	2	2	2	2
2	1	2	3	3
2	3	3	5	4

4) Operasi Opening (Erosion + Dilation)

a) Erosion

0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	1	0	0	0	0	0
0	0	0	1	1	0	0	0	0	0
0	0	0	0	1	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0

Filter SE

1	1	1
1	1	1
1	1	1

o) Dilation

0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	1	1	1	0	0	0	0
0	0	1	1	1	1	0	0	0	0
0	0	1	1	1	1	0	0	0	0
0	0	1	1	1	1	0	0	0	0
0	0	0	1	1	1	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0