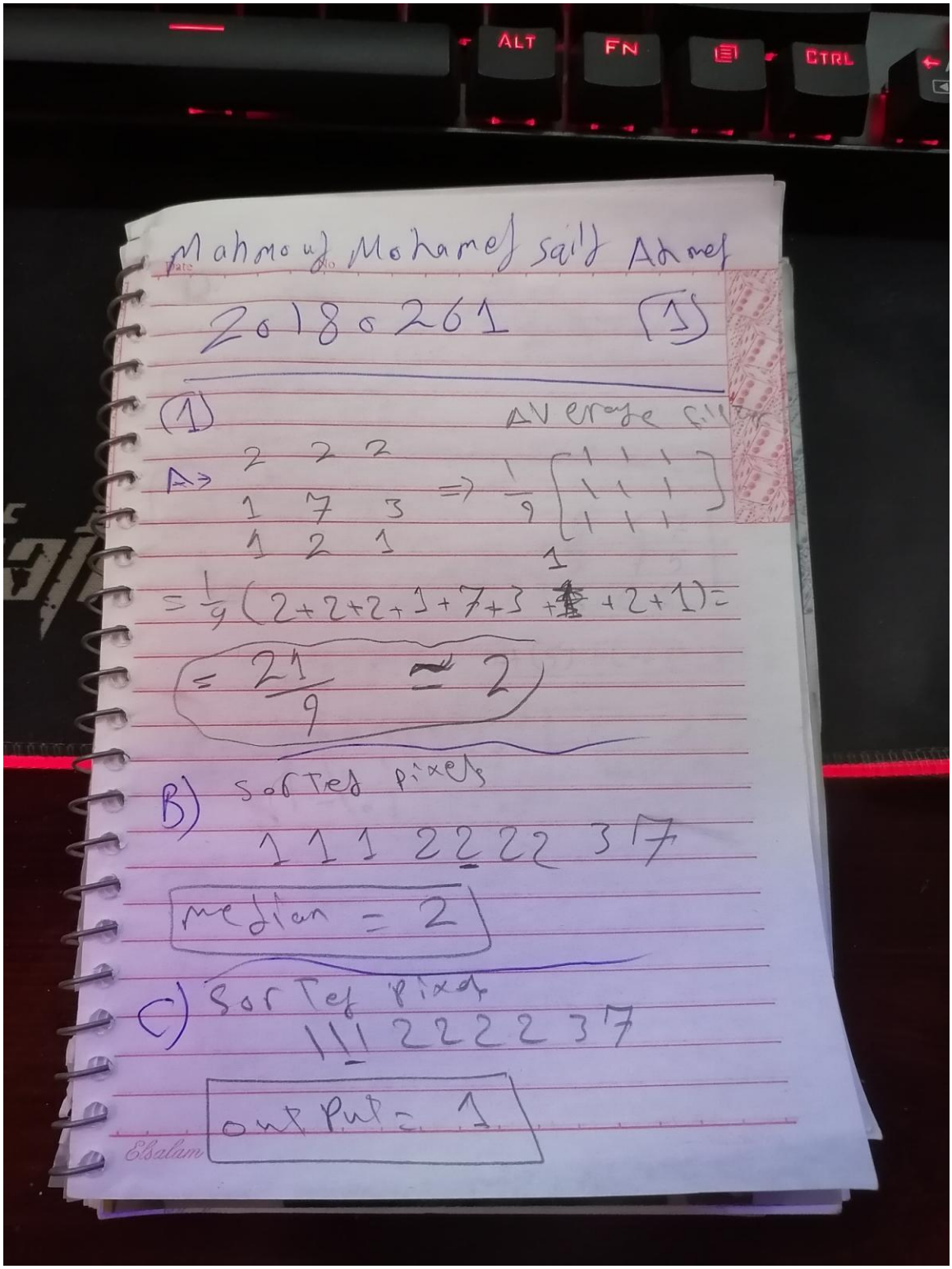
Name -: Mahmoud Mohamed Siad Ahmed
ID :- 20180261



(2)

Date No

D. sorted Array

1 1 1 2 2 2 2 3 7

output = 2

(2) perwitt

$$\frac{\partial f}{\partial x} = \begin{vmatrix} -1 & 0 & 1 \\ -1 & 0 & 1 \\ -1 & 0 & 1 \end{vmatrix} \begin{vmatrix} 6 & 6 & 7 \\ 5 & 7 & 5 \\ 6 & 6 & 6 \end{vmatrix}$$

$$= (-6) + (7) + (-5) + (5) + (-6) + (6) = 1$$

$$\frac{\partial f}{\partial y} = \begin{vmatrix} -1 & 0 & 1 \\ -1 & 0 & 1 \\ -1 & 0 & 1 \end{vmatrix} \begin{vmatrix} 6 & 6 & 7 \\ 5 & 7 & 5 \\ 6 & 6 & 6 \end{vmatrix} = 1$$

$$\text{mag} = \sqrt{\left(\frac{\partial f}{\partial x}\right)^2 + \left(\frac{\partial f}{\partial y}\right)^2} = \sqrt{2}$$

$$\tan^{-1}\frac{\frac{\partial f}{\partial y}}{\frac{\partial f}{\partial x}} = \frac{1}{1} = 45^\circ$$

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$$\frac{\partial f}{\partial x} = \begin{vmatrix} -1 & 0 & 1 \\ -2 & 0 & 2 \\ -1 & 0 & 1 \end{vmatrix} \begin{vmatrix} 6 & 6 & 7 \\ 5 & 7 & 5 \\ 6 & 6 & 6 \end{vmatrix}$$

$= (-6) + (6) + (-10) + (10) + (-6) + (6)$

$= 0$

$$\frac{\partial f}{\partial y} = \begin{vmatrix} 1 & 2 & 1 \\ 0 & 0 & 0 \\ -1 & -2 & -1 \end{vmatrix} \begin{vmatrix} 6 & 6 & 7 \\ 5 & 7 & 5 \\ 6 & 6 & 6 \end{vmatrix} = 1$$

$$\text{mag} = \sqrt{\left(\frac{\partial f}{\partial x}\right)^2 + \left(\frac{\partial f}{\partial y}\right)^2} = \sqrt{1} = 1$$

$$\text{Phase} = \tan^{-1}\frac{\frac{\partial f}{\partial y}}{\partial f/\partial x} = \frac{1}{0}$$

unknown

5

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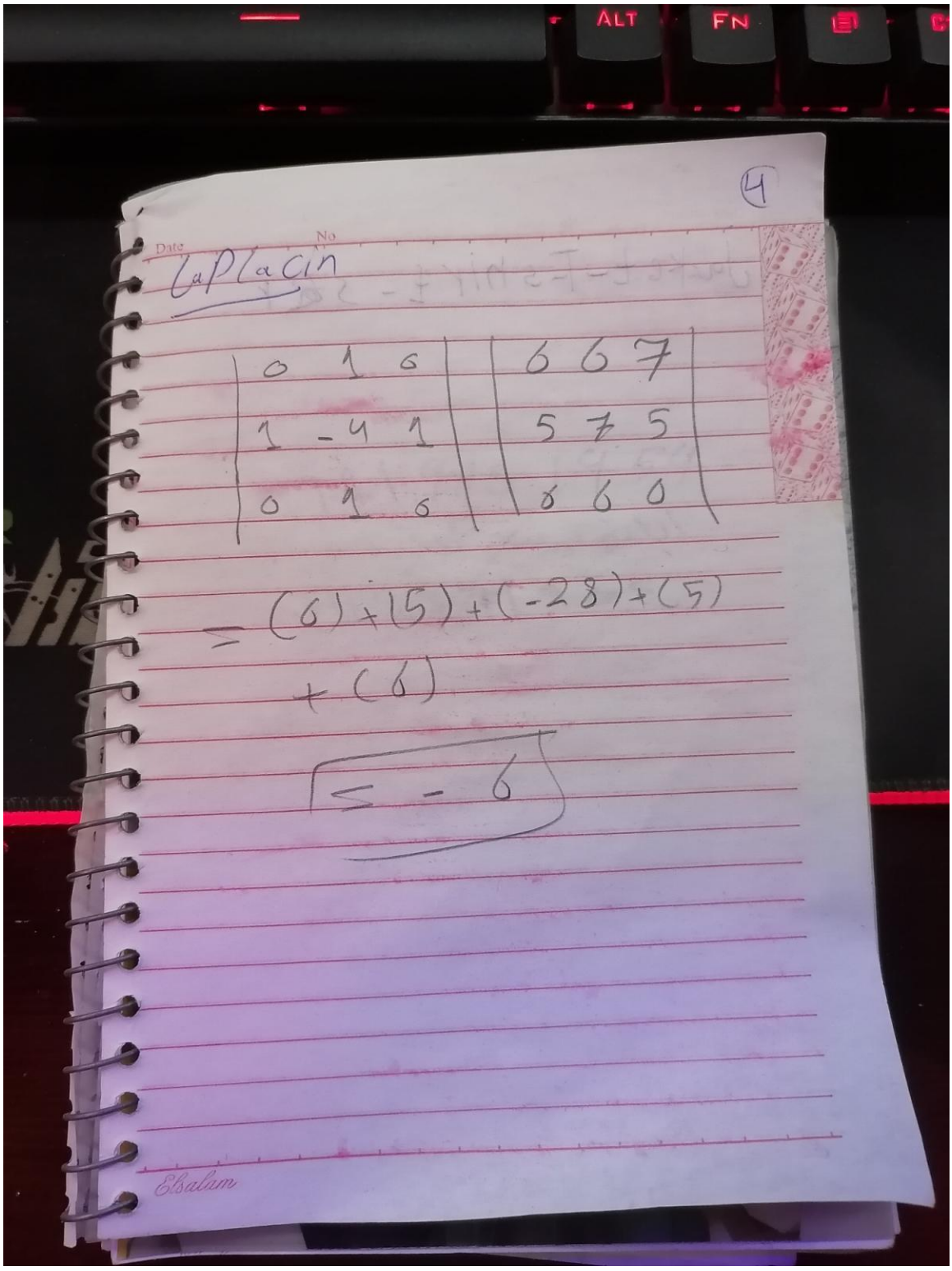
4
Date
No
Laplacin
0 1 6
1 -4 1
0 1 6
6 6 7
5 7 5
6 6 0
= (6) + (5) + (-28) + (5)
+ (6)
= -6
Elsalam