Assignment 3

Question 3

Subquestion 2

2) What is output activation map when you apply convolutional operation using filter f on input X without padding?

→ Answer

Given

$$X = \begin{bmatrix} 7 & 5 & 0 & 0 & 3 & 2 \\ 6 & 4 & 5 & 1 & 4 & 8 \\ 9 & 0 & 2 & 2 & 5 & 4 \\ 6 & 3 & 4 & 7 & 9 & 8 \\ 5 & 7 & 5 & 6 & 9 & 0 \\ 7 & 9 & 0 & 8 & 2 & 3 \end{bmatrix}$$

$$f = \begin{bmatrix} 1 & 0 & -1 \\ 2 & 0 & -2 \\ 1 & 0 & -1 \end{bmatrix}$$

Activation map can be found by the help of numpy.

```
np.sum(a*f)
```

∴ Activation map $= \begin{bmatrix} 16 & 9 & -4 & -18 \\ 17 & -5 & -10 & -12 \\ 11 & -9 & -17 & 2 \\ 9 & -18 & -15 & 16 \end{bmatrix}$

$\Rightarrow \begin{bmatrix} -17 & 2 \\ -15 & 16 \end{bmatrix}$

Subquestion 3

3) Applying max pooling on output from 2.

Apply 2X2 matrix into activation map, and then take maximum value.

$\Rightarrow \begin{bmatrix} 17 & -4 \\ 11 & 16 \end{bmatrix}$ //