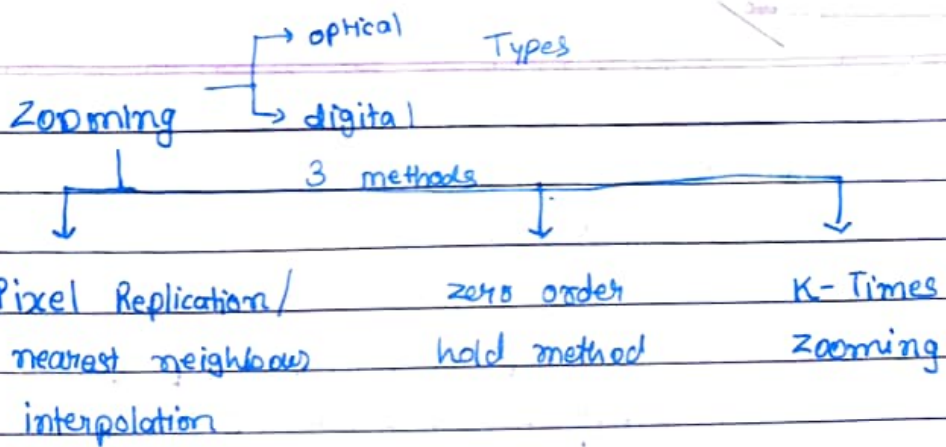


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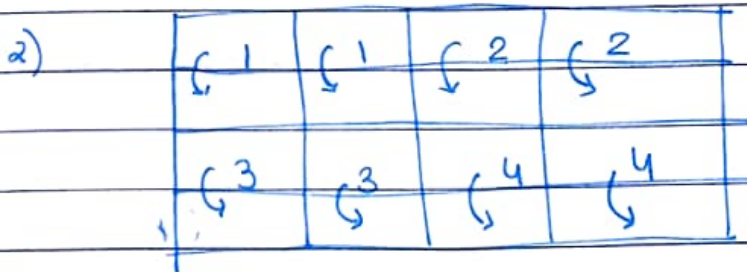
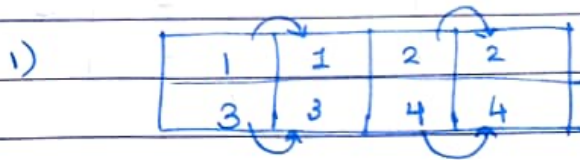
2) Pixel Replication

- Step 1) Row wise zooming
2) Column wise zooming

Eg:

1	2
3	4

 2- zooming factor



Ans →

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

eg

1	2	3
4	5	6

zooming factor = 3

①

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

②

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

②

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

6*9

Eg

1	2
3	4

Row zoom factor $\rightarrow 2$

Col " " $\rightarrow 3$

(1)

1	1	2	2
3	3	4	4

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

(2)

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

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

Note

Input $\rightarrow n * m$ zf

Output $\rightarrow (n * \overset{\text{row}}{\text{zf}}) * (m * \overset{\text{col}}{\text{zf}})$

Eg: Input $\rightarrow 2 \times 2$ R. zf $\rightarrow 2$ C. zf $\rightarrow 3$

Output $\rightarrow 4 \times 6$

② Zero Order Hold

columns $\rightarrow n$

1	2
3	4

zf $\rightarrow 2$ (not necessarily 2 twice)

Insert $(n-1)$

columns in between

① Row

existing column except ending

1	$1+2/2$	2
3	$3+4/2$	4

\rightarrow

1	2	2
3	4	4

rows $\rightarrow n$

Insert $(n-1)$

② Col

rows between

existing rows (except ending)

1	2	2
2	3	3
3	4	4

Eg

1	2	3
4	5	6

\rightarrow zf $\rightarrow 3$

① Row

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

(2) Col

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

4x7

Note $[2f * (\text{no. of rows}) - 1] * [2f * (\text{no. of col}) - 1]$

Eg $2 * 3 \xrightarrow{2f \rightarrow 2} 3 * 5 \xrightarrow{2} 5 * 9$

↓ 2

9 * 17

6 time zoom

(3) K - Times zooming

K (zooming factor) = 3

15	30	10
30	15	30

Row → add (K-1) col

Steps (1) $\frac{\text{Higher} - \text{Lower value}}{K} = x$

15	1 st	2 nd	30			10
30	3 rd	4 th	15			30

→ for 1st

$$\frac{30 - 15}{3} = 5 = x$$

$$\begin{aligned} 1^{\text{st}} \text{ value} &= \text{lower} + x \\ &= 15 + 5 \\ &= 20 \end{aligned}$$

$$2^{\text{nd}} \text{ value} = 1^{\text{st}} + x$$

$$\begin{aligned} &= 20 + 5 = 25 \\ &= 25 \end{aligned}$$

∴

15	20	25	30	17	24	10
30	20	25	15	20	25	30

2) Now ~~retr~~ reexchange values

15	20	25	30	24	17	10
30	25	20	15	20	25	30

3) (a)

add $(k-1)$ row

	15	20	25	30	24	17	10
1 st							
2 nd							
	30	25	20	15	25	20	30

→ 1st

$$\frac{30 - 15}{3} = 5 = x$$

$$1^{st} = \text{lower} + x = 15 + 5 = 20$$

$$2^{nd} = 1^{st} + x = 20 + 5 = 25$$

15	20	25	30	24	17	10
20	22	22	20	24 ²¹	16 ²⁰	17
25	24	24	25	24 ²²	23	24
30	25	20	15	20	20 ²⁵	30

(4) Sort

15	20	25	30	24	17	10
20	22	24	25	22	20	17
25	24	22	20	21	23	24
30	25	20	15	20	25	30

4x7

Eg

$K \rightarrow 4$

24	12
12	6
6	24

Not

Input $\rightarrow n \times m \times K$

Output $\rightarrow (K \times (n-1) + 1) \times (K \times (m-1) + 1)$