

VIVEK BAJPAI A20361204

(8)

(d)

$$\text{Ans} \rightarrow a(2,:) = d.$$

1	1	1	1	1
1	1	1	1	1
1	1	1	1	1
1	1	1	1	1
1	1	1	1	1

2	2	2	2	2
---	---	---	---	---

d.

1	1	1	1	1
2	2	2	2	2
1	1	1	1	1
1	1	1	1	1
1	1	1	1	1

$$\therefore a(2,:) = d.$$

a

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

1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
9	9	9	9	9
9	9	9	9	9

b)

$$\text{Ans} \rightarrow a(1:3,:) = b(2:4,:)$$

b

a

c)

$\text{Ans} \rightarrow$  Where  $(b \cdot \text{eq. } c) \cdot a = c$

b

1	1	1	1	1
i	x	1	1	1
1	1	0	1	y
Z	1	1	1	1
1	1	p	1	1

4	4	4	4	4
4	x	4	4	4
4	4	4	4	4
Z	4	4	4	4
4	4	p	4	4

a

2	2	2	2	2
2	x	2	2	2
2	2	2	2	y
Z	2	2	2	2
2	2	p	2	2

d)

$\text{Ans} \rightarrow$  for all  $(i=2:4, j=2:5)$   $a(i,j) = b(i-1, j-1) + c(i+1, j)$

Before operation  $\rightarrow$

a

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

b

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

c

3	5	7	9	11
1	2	3	4	5
2	4	8	10	12
1	2	1	2	1
3	5	4	5	3

during operation  $\rightarrow$

<i>a</i>	<i>b</i>
3 5 7 9 11	1 1 1 1 1
1 2 3 4 5	2 2 2 2 2
2 4 8 10 12	3 3 3 3 3
1 2 1 2 1	4 4 4 4 4
3 5 4 5 3	5 5 5 5 5

<i>c</i>
1 2 3 4 5
1 5 9 11 13
1 4 3 4 3
1 8 7 8 6
1 2 3 4 5

e) for all ( $i=1:5, j=1:5$ ).  $b(i,j) = i+j-1$

Before  $\rightarrow$

20	22	24	26	28
28	26	24	22	20
20	22	24	26	28
28	26	24	22	20
20	22	24	26	28

	1	2	3	4	5
1	1	2	3	4	5
2	2	3	4	5	6
3	3	4	5	6	7
4	4	5	6	7	8
5	5	6	7	8	9

Q)  $a = \text{spread}(v, \text{dim}=2, \text{n\_replics}=5)$

assume →

$$v = [1 2 3 4 5]$$

∴

$$a = \begin{bmatrix} 1 & 1 & 1 & 1 \\ 2 & 2 & 2 & 2 \\ 3 & 3 & 3 & 3 \\ 4 & 4 & 4 & 4 \\ 5 & 5 & 5 & 5 \end{bmatrix}$$

Ans → for all ( $j = 1:5$ )  $v(j) = \text{sum}(a(1:4, j), \text{dim}=1)$

$$a = \begin{bmatrix} 1 & 2 & 3 & 4 & 5 \\ 6 & 7 & 8 & 9 & 10 \\ 1 & 2 & 3 & 4 & 5 \\ 6 & 7 & 8 & 9 & 10 \\ 1 & 2 & 3 & 4 & 5 \end{bmatrix}$$

$d = [14 \quad 18 \quad 22 \quad 26 \quad 30]$

h)  
Ans →

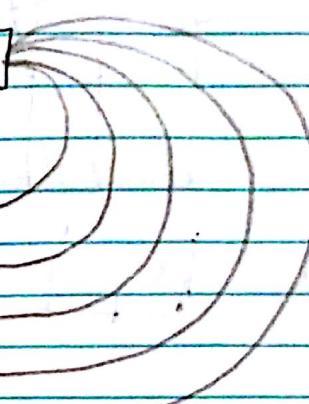
$b = \text{spread}(d, \text{dim}=1, \text{ncopies}=5)$ ,

assume →

$$d = [1 \boxed{2} 3 4 5]$$

$b =$

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



i)

$a = \text{cshift}(b, \text{dim}=1, \text{shift}=3)$

Ans →

$b =$

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

$a =$

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

i)  $d = \text{sum}(\text{spread}(d, \text{dim}=1, \text{nreps}=5), \text{dim}=2)$

$\rightarrow$

$d =$	1	2	3	4	5
	1	2	3	4	5
	1	2	3	4	5
	1	2	3	4	5
	1	2	3	4	5

$$d = [1 \ 2 \ 3 \ 4 \ 5]$$

$\downarrow \text{spread}(d, \text{dim}=1, \text{nreps}=5)$

$d' =$

$\downarrow$  temp matrix

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

$\downarrow \text{sum}(d', \text{dim}=2)$

$$d = \begin{array}{|c|} \hline 15 \\ \hline \end{array}$$

Q2]

a)

$\text{Ans} \rightarrow \text{forall } (i=1:100, j=1:100, i < j) \ a(i, j) = 0$

b)

$\text{Ans} \rightarrow \text{forall } (i=1:100, j=1:100) \ b(i, j) = a(j, i)$

c)

$\text{Ans} \rightarrow b = \text{spread}(a, \text{dim}=2, \text{ncopies}=5)$

d)

$\text{Ans} \rightarrow b = c\text{shift}(c\text{shift}(a, \text{dim}=2, \text{shift}=2), \text{dim}=1, \text{shift}=-1)$

e)

$\text{Ans} \rightarrow b = a(:, 2:8:2)$

Q3]

a)

Ans →

Distribution directive →

$\text{!HPF\$ DISTRIBUTE } a(\text{block})$

Alignment directive →

not needed, as it has only one array.

b)

Ans →

Distribution directive →

$\text{!HPF\$ DISTRIBUTE } a(\text{block})$

Alignment directive →

~~$\text{!HPF\$ ALIGN } a(:) \text{ with } b(*,:)$~~

$\text{!HPF\$ ALIGN } b(*,:) \text{ with } a(:)$

The final code will look like →

$\text{!HPF\$ ALIGN } b(*,:) \text{ with } a(:)$

~~$\text{!HPF\$ DISTRIBUTE } a(\text{block})$~~