

[1]

```

def firstFunction Min(arr, index1, index2, min):
    if (index1 == len(arr)-1):
        return min
    min = inner(arr, index1, index2, min)
    firstFunction Min(arr, index1+1, index2, min)

```

```

def inner(arr, index1, index2, min):
    if index2 == len(arr[index1])-1:
        return min
    inner(arr, index1, index2+1)
    if arr[index1][index2] < min:
        min = arr[index1][index2]
    inner(arr, index1, index2+1, min)

```

Question 2

(a)

Given Array = [CA@53, dB\$47, xH#12, ZT%89, 1K&P3]

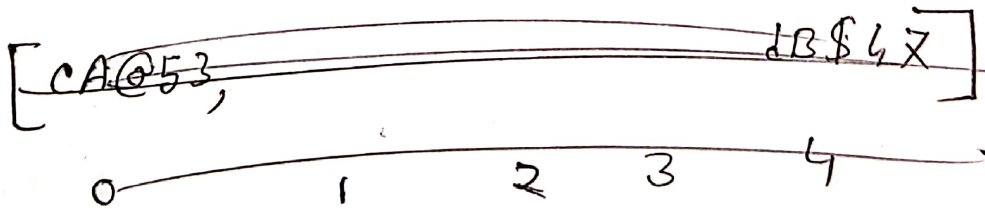
$$CA@53 \rightarrow |(67+65+64+53)-15|\%5 = 1$$

$$dB\$47 \rightarrow |(100+66+36)-28|\%5 = 4$$

$$xH\#12 \Rightarrow |(120+72+35)-2|\%5 = 0$$

$$ZT\%89 \Rightarrow |(122+84+37)-72|\%5 = 1$$

$$1K\&P3 = |(75+38+112)-31|\%5 = 2$$



[xH#12, CA@53, ZT%89, 1K&P3, dB\$47]

0 1 2 3 4

(b)

~~def~~

def makearr(arr):

arr = [0]

min = min(arr)

max = max(arr)

if (min < 0):

min = 0

arr = [0] * (-max + 1 + (min * -1))

for i in arr:

arr[i + (-min * -1)] += 1

return arr

3

a) (i)

$$P \rightarrow Q \rightarrow R \rightarrow \perp$$

$$Q \rightarrow R \rightarrow T \rightarrow \perp$$

$$S \rightarrow T \rightarrow U \rightarrow W \rightarrow \perp$$

$$T \rightarrow U \rightarrow \perp$$

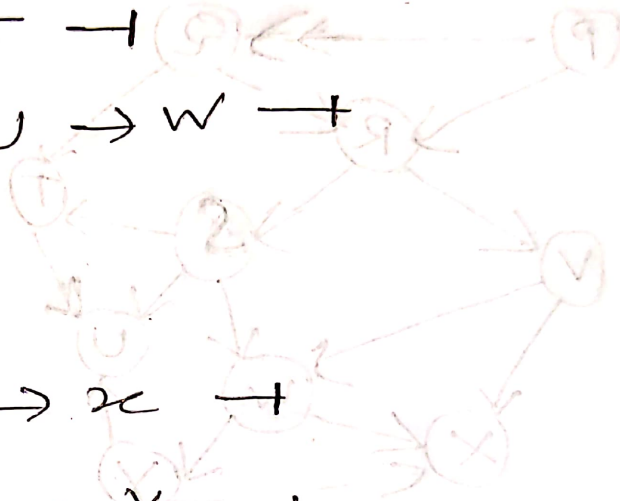
$$U \rightarrow \perp$$

$$V \rightarrow W \rightarrow X \rightarrow \perp$$

$$W \rightarrow X \rightarrow Y \rightarrow \perp$$

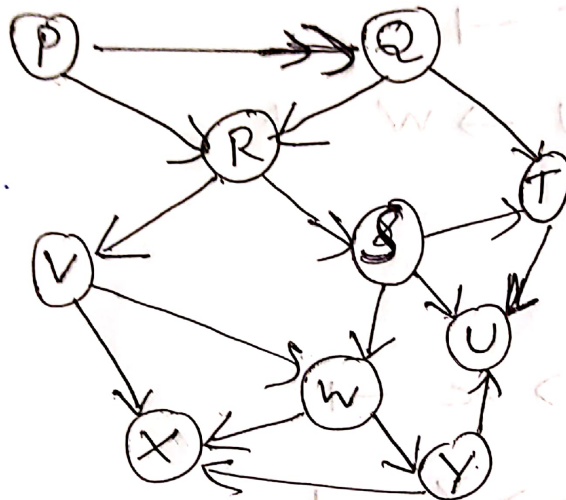
$$X \rightarrow \perp$$

$$Y \rightarrow U \rightarrow X \rightarrow \perp$$



3(ii)

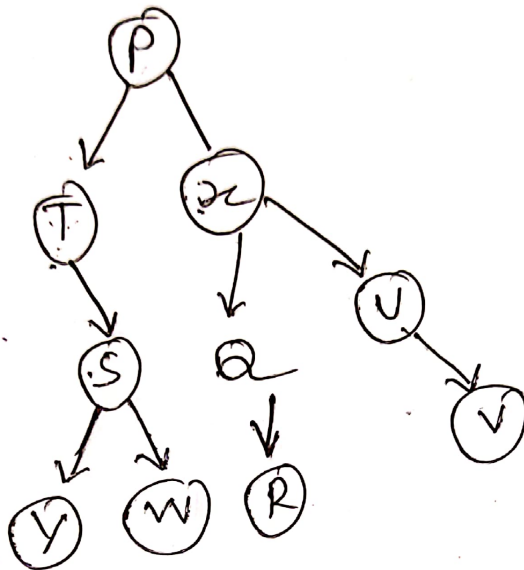
equivalent graph



(iii) indegree and out degree

	P	Q	R	S	T	U	V	W	X	Y
indegree	0	1	2	1	2	3	1	2	3	1
outdegree	2	2	2	3	1	0	2	2	0	2

3. b (i)

(ii) postorder

Y W S T R Q V U æ P

in order

T Y S W P R Q x U V

(, !, .)

