

10-11-25 : 3:15

Name: Umar ahad Uol din Ahmed Usmani

SAP: 60199

Cause: AOA

Q.No.1

$$1 + n + n - 1 \left[2 + 1 + n + n - 1 \left[2 + 2 + 1 + n + n - 1 \left[9 \right] \right] \right]$$

$$1 + n + (n - 1) \left[3 + n + n - 1 \left[5 + n + n - 1 \left[8 \right] \right] \right]$$

$$1 + n + (n - 1) \left[3 + n + (n - 1) \left[5 + n + 8n - 8 \right] \right]$$

$$1 + n + (n - 1) \left[3 + n + (n - 1) \left[9n - 3 \right] \right]$$

$$1 + n + (n - 1) \left[\overset{3+n}{\cancel{3+n}} 9n^2 + 3 - 3n - 9n \right]$$

$$1 + n + (n - 1) \left[9n^2 - 11n + 6 \right]$$

$$1 + n + 9n^3 - 11n^2 + 6n - 9n^2 + 11n - 6$$

$$9n^3 - 20n^2 + 18n - 5$$

Result:- The Time complexity is $O(n^3)$.

Q. No. 2

Brute force.

$(2, 3), (5, 7), (8, 2), (1, 9), (6, 5), (10, 4), (3, 8)$

By using Brute force.

1) $(2, 3) \times (5, 7)$ Not minimal.
 $(8, 2)$

$(1, 9)$

$(6, 5)$

$(10, 4)$

$(3, 8)$

2) $(5, 7) \checkmark (2, 3)$ minimal.

$\checkmark (8, 2)$

$\checkmark (1, 9)$

$\checkmark (6, 5)$

$\checkmark (10, 4)$

$\checkmark (3, 8)$

$$3) (8, 2) \quad \checkmark \quad (\overset{x}{2}, \overset{x}{3})$$

not minimal.

$$\checkmark \quad (\overset{x}{5}, \overset{x}{7})$$

$$\checkmark \quad (\overset{x}{1}, \overset{x}{9})$$

$$\checkmark \quad (\overset{x}{6}, \overset{x}{5})$$

$$\times \quad (\overset{x}{10}, \overset{x}{4})$$

$$4) (1, 9) \quad \checkmark \quad (\overset{x}{2}, \overset{x}{3})$$

minimal.

$$\checkmark \quad (\overset{x}{5}, \overset{x}{7})$$

$$\checkmark \quad (\overset{x}{8}, \overset{x}{2})$$

$$\checkmark \quad (\overset{x}{6}, \overset{x}{5})$$

$$\checkmark \quad (\overset{x}{10}, \overset{x}{4})$$

$$\checkmark \quad (\overset{x}{3}, \overset{x}{8})$$

$$5) (6, 5) \quad \checkmark \quad (\overset{x}{2}, \overset{x}{3})$$

minimal.

$$\checkmark \quad (\overset{x}{5}, \overset{x}{7})$$

$$\checkmark \quad (\overset{x}{8}, \overset{x}{2})$$

$$\checkmark \quad (\overset{x}{1}, \overset{x}{9})$$

$$\checkmark \quad (\overset{x}{10}, \overset{x}{4})$$

$$\checkmark \quad (\overset{x}{3}, \overset{x}{8})$$

$$(10, 4) \quad \checkmark \quad \begin{matrix} \times \\ (2, 9) \end{matrix}$$

$$\checkmark \quad \begin{matrix} \times \\ (5, 7) \end{matrix}$$

minimal.

$$\checkmark \quad \begin{matrix} \times & \times \\ (8, 2) \end{matrix}$$

$$\checkmark \quad \begin{matrix} \times & \checkmark \\ (1, 9) \end{matrix}$$

$$\checkmark \quad \begin{matrix} \times & \checkmark \\ (6, 5) \end{matrix}$$

$$\checkmark \quad \begin{matrix} \times & \checkmark \\ (3, 8) \end{matrix}$$

$$(3, 8) \quad \checkmark \quad \begin{matrix} \times & \times \\ (2, 3) \end{matrix}$$

$$\checkmark \quad \begin{matrix} \checkmark \\ (5, 7) \end{matrix}$$

minimal.

$$\checkmark \quad \begin{matrix} \checkmark & \times \\ (8, 2) \end{matrix}$$

$$\checkmark \quad \begin{matrix} \times & \checkmark \\ (1, 9) \end{matrix}$$

$$\checkmark \quad \begin{matrix} \checkmark & \times \\ (6, 5) \end{matrix}$$

$$\checkmark \quad \begin{matrix} \checkmark & \times \\ (10, 4) \end{matrix}$$

8

1.

By using Plane sweep.

$(2, 3), (5, 7), (8, 2), (1, 9), (6, 5)$

$(10, 4), (3, 8)$

arranging n in ascending order

$(1, 9), (2, 3), (3, 8), (5, 7), (6, 5)$

$(8, 2), (10, 4)$

maximal
point is

$(10, 4)$
$(6, 5)$
$(5, 7)$
$(3, 8)$
$(1, 9)$

$(10, 4)$
$(8, 2)$
$(6, 5)$
$(5, 7)$
$(3, 8)$
$(2, 3)$
$(1, 9)$

P	w	i	0	5	10	15	20	25	30	35	40	45	50
0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	10	1	0	0	60	60	60	60	60	60	60	60	60
75	15	2	0	0	60	75	75	135	135	135	135	135	135
100	20	3	0	0	60	75	100	135	160	175	175	235	235
90	25	4	0	0	60	75	100	135	160	175	175	235	235
120	30	5	0	0	60	75	100	135	160	175	175	235	235
130	35	6	0	0	60	75	100	135	160	175	175	235	235

135, 3, 25

$$2 + 6 = 35 + 15 \Rightarrow 205 \neq 235$$

$$= 50 \text{ Kg.}$$

$$3 + 5 = 30 + 20 = 50 \text{ Kg} \quad 220 \neq 235$$

$$4 + 2 + 1 = 25 + 15 + 10 = 50 \quad 135 + 90 = 225$$