

Name: Umair ahad Mol din Ahmed Umairi

SAP, 60199

Course: AOA

Q.no.1

$$1 + n + n - 1 \left[2 + 1 + n + n - 1 \left[2 + 2 + 1 + n + n - 1 [8] \right] \right]$$

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

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

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

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

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

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

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

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) $(2,3) \times (5,7)$ Nat maximal.
 $(8,2)$

$(1,9)$

$(6,5)$

$(10,4)$

$(3,8)$

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

$\checkmark (8,2)$

$\checkmark (1,9)$

$\checkmark (6,5)$

$\checkmark (10,4)$

$\checkmark (3,8)$

3) $(8, 2)$ ✓ $(\overset{x}{2}, \overset{\checkmark}{3})$ nat maximal.

✓ $(\overset{x}{5}, \overset{\checkmark}{2})$

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

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

~~✗ $(\overset{\checkmark}{10}, \overset{\checkmark}{4})$~~

4) $(1, 9)$ ✓ $(\overset{\checkmark}{2}, \overset{x}{3})$ minimal.

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

✓ $(\overset{\checkmark}{8}, \overset{\checkmark}{2})$

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

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

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

5) $(6, 5)$ ✓ $(\overset{x}{2}, \overset{x}{3})$ maximal.

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

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

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

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

✓ $(\overset{x}{3}, \overset{\checkmark}{18})$

:CJ

$\checkmark (0, 4)$ $\checkmark (2, \overset{x}{3})$ minimal.

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

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

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

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

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

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

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

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

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

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

$\checkmark (10, \overset{\checkmark}{6})$

B

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	o	5	10	15	20	25	30	35	40	45	50
60	10	-	0	0	0	0	0	0	0	0	0	0	0
60	60	60	60	60	60	60	60	60	60	60	60	60	60
25	15	2	0	0	60	75	75	135	135	135	135	135	135
100	20	3	0	0	60	75	100	135	160	175	195	215	235
90	25	4	0	0	60	75	100	135	160	175	195	215	235
120	30	5	0	0	60	75	100	135	160	175	195	215	235
135	35	6	0	0	60	75	100	135	160	175	195	215	235

135, (3, 25)

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

= 50 Kg.

$$3+5 = 30+20 = 50 \text{ kg}$$

$$4+2+1 = 25+15+10 = 50$$

$$220 + 235$$

$$135 + 90 = 225$$