

St. Mira's College for Girls, Pune
(Autonomous-Affiliated to Savitribai Phule Pune University)
Class-F.Y.M.Sc(C.S)

Subject: Design and Analysis of Algorithms

Subject Code:MS11902

Semester: I

Year: 2019-20

All Units - focusing on Skill Development, Employability and Entrepreneurship

Supplement No. _____
Roll No. [5814] 2779
St. Mira's College For Girls, Pune - 1.

10/10/19 DAA flexi 1.

Q1) Attempt (any 5)

Aa) matrix chain multiplication

$m[i, j] = \dots$

		1	2	3	4
5 X 4	$P_0 \times P_1$	0	360	52	852
4 X 18	$P_1 \times P_2$	2	0	432	672
18 X 6	$P_2 \times P_3$	3		0	1080
6 X 10	$P_3 \times P_4$	4			0

$$m[i, j] = \min \{ m[i, k] + m[k+1, j] + P_{i-1} P_k P_j \}$$

$$m[1, 2] = \min_{(k=1)} \{ m[1, 1] + m[2, 2] + P_0 P_1 P_2 \}$$

$$= \min \{ 0 + 0 + 5 \times 4 \times 18 \}$$

$$= 360$$

$$m[2, 3] = \min_{(k=2)} \{ m[2, 2] + m[3, 3] + P_1 P_2 P_3 \}$$

$$= \min \{ 0 + 0 + 4 \times 18 \times 6 \}$$

$$= 432$$

$$m[3, 4] = \min_{(k=3)} \{ m[3, 3] + m[4, 4] + P_2 P_3 P_4 \}$$

$$= \min \{ 0 + 0 + 18 \times 10 \times 6 \}$$

$$m[1, 4] = \min_{(k=1, 2, 3)} \{ m[1, 1] + m[2, 4] + P_0 P_1 P_4, m[1, 2] + m[3, 4] + P_0 P_2 P_4, m[1, 3] + m[4, 4] + P_0 P_3 P_4 \}$$

$$= \min \{ 0 + 672 + 5 \times 4 \times 10, 360 + 1080 + 5 \times 52 + 0 + 5 \times 6 \times 10 \}$$

$$= \min \{ 872, 2340, 852 \}$$

$$= 852$$

Ab) 0/1 knapsack.
n=4, m=16.
p = { 10, 20, 15, 8 }
w = { 8, 4, 4, 8 }

$$f_n(w) = \max \{ f_{n-1}(w), f_{n-1}(w - w_n) + P_n \}$$

$$f_4(16) = \max \{ f_3(16), f_3(16-8) + 8 \}$$

$$= \max \{ f_3(16), f_3(8) + 8 \}$$

$$= \max \{ 45, 35 + 8 \} = 43$$

$$f_3(16) = \max \{ f_2(16), f_2(16-4) + 15 \}$$

$$= \max \{ f_2(16), f_2(12) + 15 \}$$

$$= \max \{ 30, 30 + 15 \} = 45$$

$$f_2(8) = \max \{ f_1(8), f_1(8-4) + 15 \}$$

$$= \max \{ f_1(8), f_1(4) + 15 \}$$

$$= \max \{ 20, 20 + 15 \} = 35$$

Asst. Prof. Atka B. Kalhapure
subject Teacher



Principal Incharge
St. Mira's College for Girls