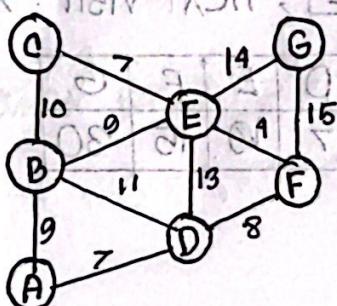


ASSIGNMENT -12

ID: 2130110

a) To minimize the electricity consumption, the shortest path to every city from the root A will be considered as the solution; Therefore Dijkstra is the suitable algorithm.

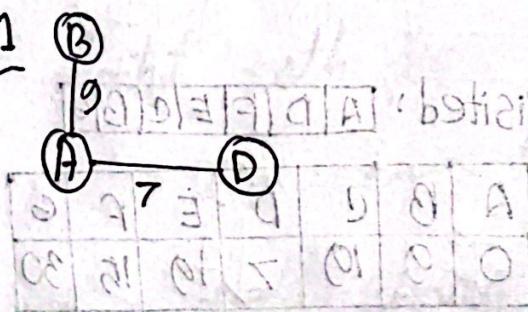
Main Graph



Visited: ; to be visited: A

A	B	C	D	E	F	G
0	∞	∞	∞	∞	∞	∞

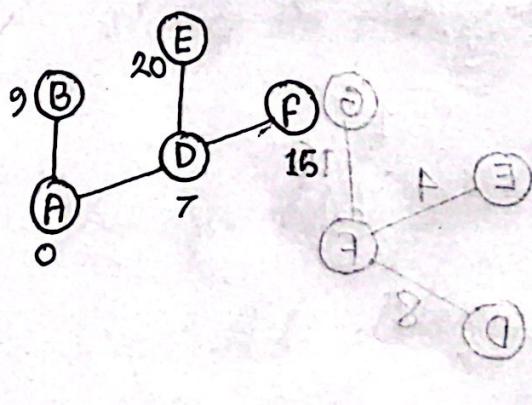
S-1



Visited: ; to be visited : D

A	B	C	D	E	F	G
0	9	∞	7	∞	∞	∞

S-2



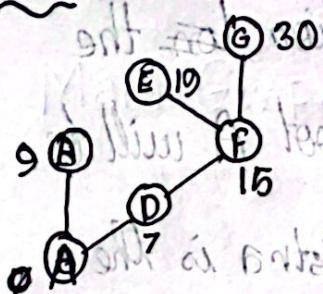
visited: ; to be visited : F

A	B	C	D	E	F	G
0	9	∞	7	20	15	∞

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Updated distance of E

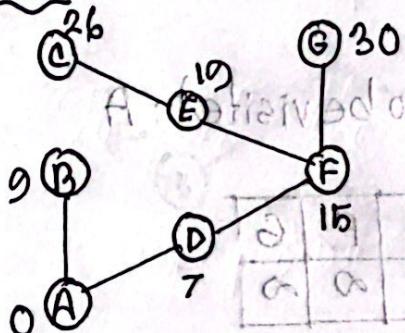
S-3



Visited: [A D F] ; to next visit → E

A	B	C	D	E	F	G
0	9	∞	7	10	15	30

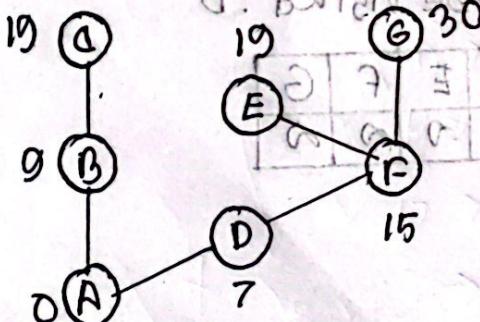
S-4



Visited: [A D F E] ; next visit → C

A	B	C	D	E	F	G
0	9	26	7	10	15	30

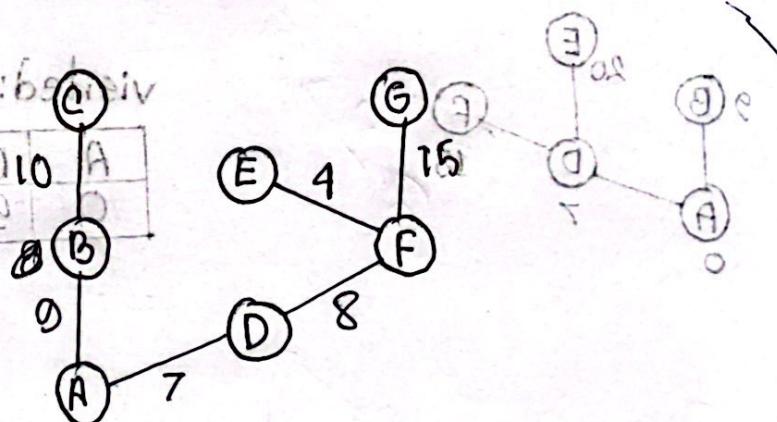
S-5



Visited: [A D F E C B G]

A	B	C	D	E	F	G
0	9	19	7	19	15	30

The resultant graph:



2130 W18

(b) Previous energy consumption = $(10 + 9 + 7 + 11 + 7 + 13 + 14 + 4 + 8 + 15)$
= 98

Energy consumption after implementing Dijkstra

~~Mark Energy~~
 $= (10 + 9 + 7 + 8 + 4 + 15)$
 $= 53$

Saved energy = $(98 - 53) = 45$

(Ans)

(c) If Dijkstra is a greedy algorithm, it takes the shortest path from the root vertex to destination vertex. To implement the idea of Dubai Authority we a slight change needs to be done.

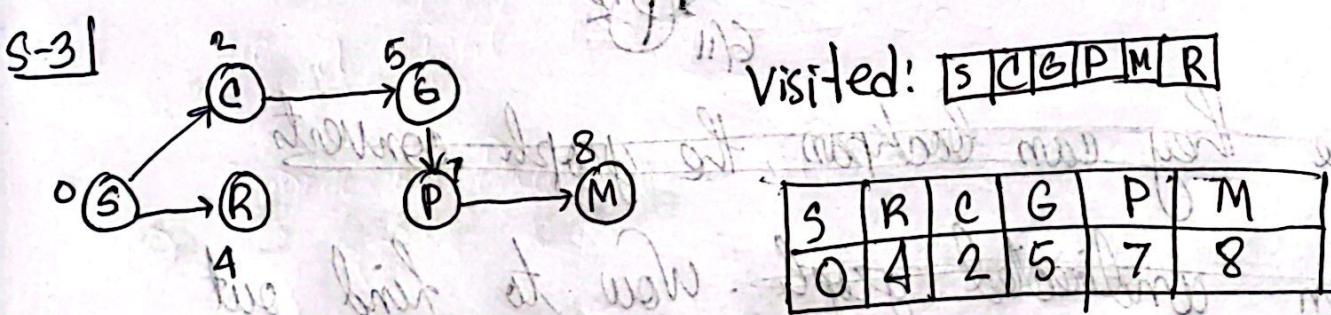
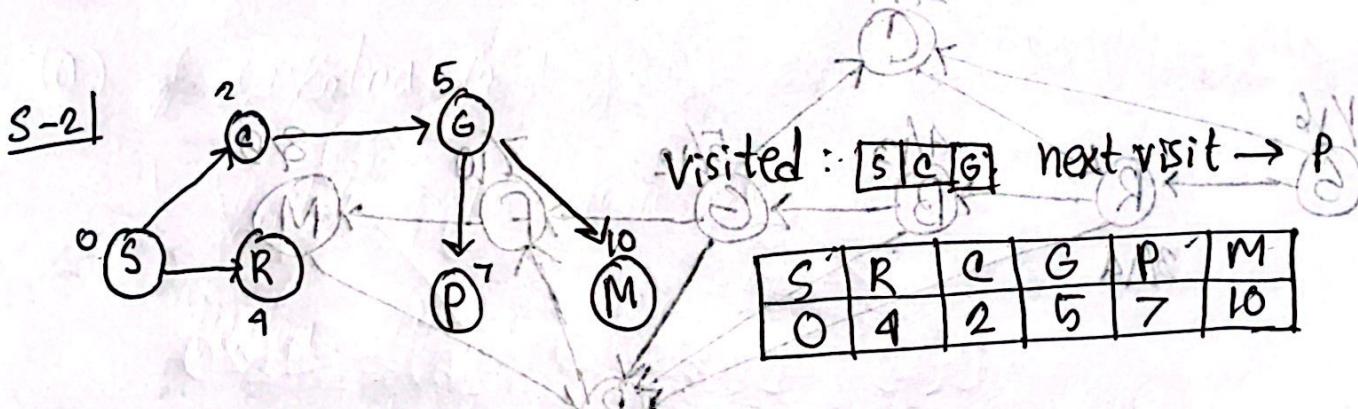
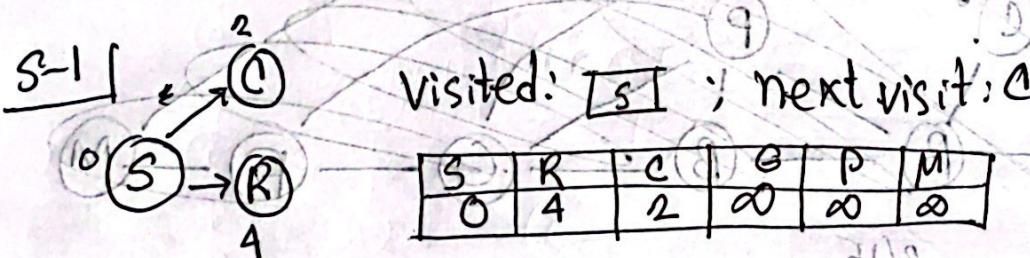
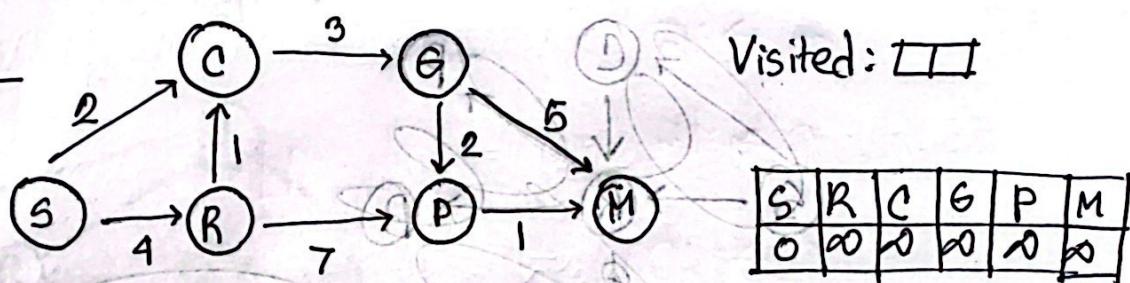
change in Pseudocode: if temporary dist \geq dist[v]:

$$\text{dist}[v] = \text{temporary_dist}$$

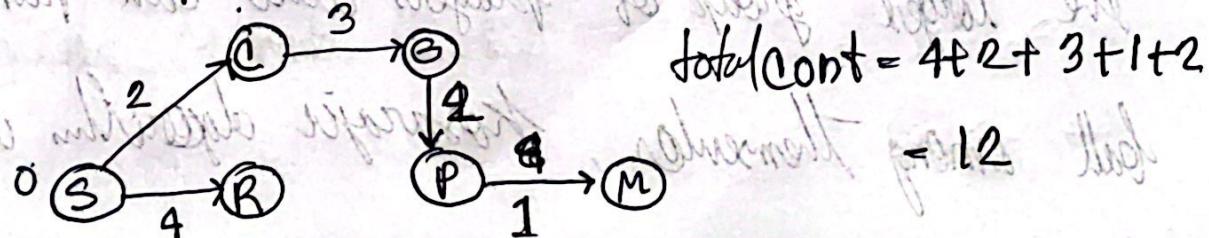
changes have been ~~to~~ underlined, instead of taking the shortest distance, we will take longest distance will be taken and updated.

① To find the lowest cost for the ball to reach every player, Dijkstra is a suitable graph.

Main Graph



Resultant Graph:

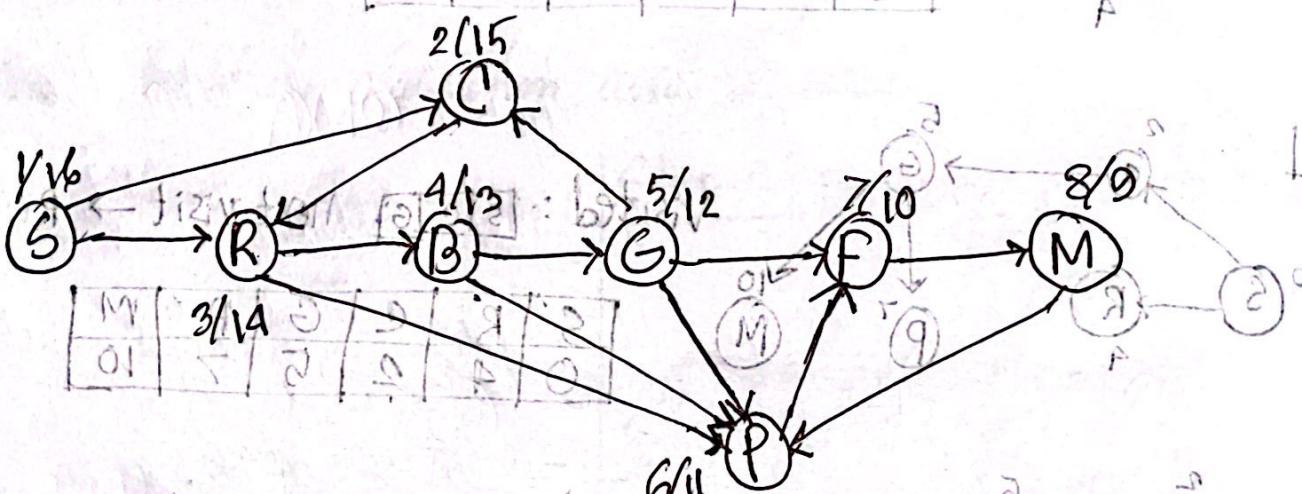
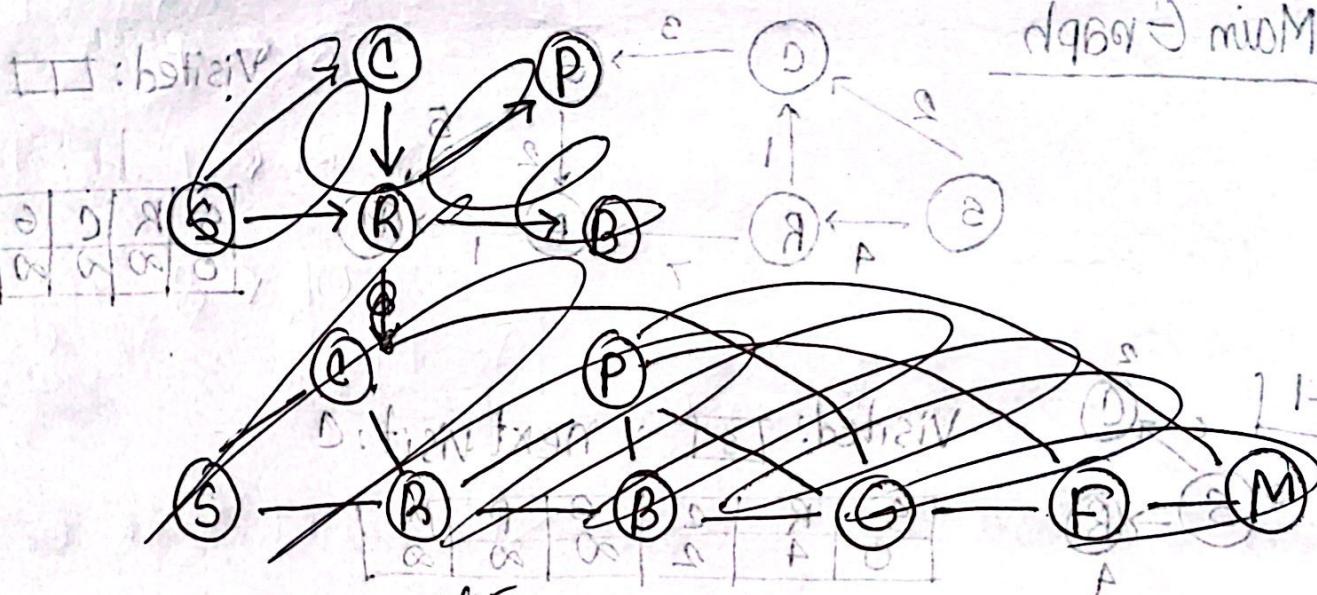


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(b)

Graph

Answer of this will not be found until part 1
 A group selection is a whole. requires good communication



Since they can backpass, the graph converts to an undirected graph. Now to find out the largest group of players who can pass the ball among themselves, Kosaraju algorithm will be used.

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1-B
L-B
C-B

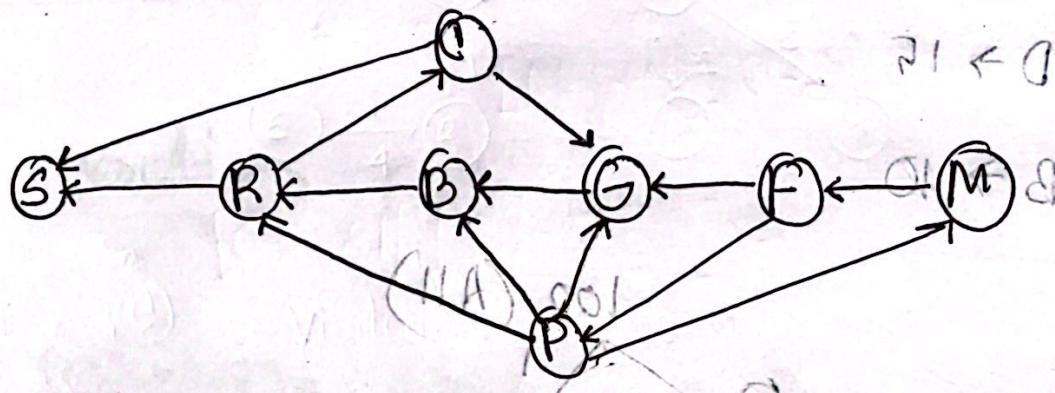
① DFS Applied on the graph

0A ← A

0B ← D

0I ← +

0I ← D



② Start DFS on the reverse graph from the highest ending time of the main graph

1. S
2. C G B R I +
3. P M F

③ 3 group found

(Simon), (Corar, Gami, Busquets, Rodri)

0 ← A

001 ← B

111 ← D

101 ← I

011 ← +

(Pedri, Morata, Fati)

2130 WZ8

Greedy - I

$$A \rightarrow 40$$

$$C \rightarrow 20$$

$$+ \rightarrow 15$$

$$D \rightarrow 15$$

$$B \rightarrow 10$$

$$A(40)$$

$$0$$

$$B(10)$$

$$D(15)$$

$$+ (15) \quad C(20)$$

$$60 \quad 270$$

$$100 \quad (AN)$$

Reverses with scores

Leaves with scores

Leaves with scores

$$A \rightarrow 0$$

$$B \rightarrow 100$$

$$C \rightarrow 111$$

$$D \rightarrow 101$$

$$+ \rightarrow 110$$

LMG 185610818

21301078 year

a) 11

given code 1000 0 101110 0, 1010
 [OS-8] [8-5] [5-3] [3-1] - max length

$$\begin{array}{r} 100 \\ \times 10 \\ \hline 0 \\ A \end{array} \quad \begin{array}{r} 101 \\ \times 10 \\ \hline 110 \\ + \quad 0 \\ A \end{array} \quad \begin{array}{r} 101 \\ \times 10 \\ \hline 101 \\ D \end{array} \quad \begin{array}{r} 0 \\ A \end{array}$$

[N-11][C-2] & max length

result

\rightarrow BAP + ADA [F-1] [P - max length]

(b) (i) sorting according to their end time

Start time	end time
1	7 ✓
2	7 ✗
6	9 ✗
7	13 ✓
8	13 ✗
11	14 ✗
12	20 ✗
13	20 ✓

only three trains can use platform

2130W18

Platform - 1 $\rightarrow [1-7] [2-13] [13-20]$

Platform - 2 $\rightarrow [2-7] [8-13] \frac{0}{A} \frac{001}{d}$

Platform - 3 $[6-9] [11-14]$

Platform - 4 $[1-7] [7-13] [13-20]$

So minimum ~~no~~ platform is required

	Arrival									Completion	
	0	1	2	3	4	5	6	7	8	9	10
B(1)	0	4	4	4	4	4	4	4	4	5	1
J(3)	0	4	4	5	9	9	9	9	9	5	3
P(4)	0	4	4	5	9	9	9	10	A	8	4
S(5)	0	4	4	5	9	9	13	13	14	1	11
M(12)	0	4	4	5	9	9	13	13	14	2	12

J \rightarrow Jewellery, P \rightarrow Painting and Book will be taken

Waiting time and wait with filing

2130118

⑪ <u>Items</u>	<u>Price/weight</u>	<u>Weight</u>	<u>Price</u>
Sculpture	5	5	5
Book	4	1	4
Sculpture	1.25	5	6.25
Jewellery	1.67	3	5
Painting	1.25	4	5
Mummy	0.5	12	6

In greedy approach Nairobi will choose the highest value for weight which is book. then Sculpture and then she will not have enough space.

$$\therefore \text{total} = (6+4) = 10$$

which is less than DP method

so Nairobi's belief is not valid.

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③ 99/19

$$M[3][4] = 2$$

Topic: LCM

Date: 11

It means the LCM between
 L A B

abey and any in '2' as 3×4

matrix covers till abey and any

⑥

	\varnothing	a	b	y	x	\varnothing	M
\varnothing	0	0	0	0	0	0	
a	0	↑ 1	↑ 1	↑ 1	↑ 1	↑ 1	
x	0	↑ 1	↑ 1	↑ 1	↑ 2	↑ 2	
y	0	↑ 1	↑ 1	↑ 2	↑ 2	↑ 2	
b	0	↑ 1	↑ 2	↑ 2	↑ 2	↑ 3	

$LCM = a \times b$ square root for min & max

$$E_1 = (A + \varnothing) = 10 + 0 \therefore$$

bottom row with min & max

below for a mixed division or

21301178 (6)

(c)

	0	1	2	3	4	5	6	7	8
0	0	0	0	0	0	0	0	0	0
iv (3)	0	0	0	9	9	9	9	9	9
ii (4)	0	0	0	9	10	10	10	10	10
i (5)	0	0	0	9	10	11	11	10	10
iii (6)	0	0	0	9	10	11	12	10	10

so the maximum profit will be 20.

Mohammed Abdul Ali
Ana fat tan zin

ID: 21301178

Section, 03

CS±221