Saathi

Date ___ /___ /___

	Date//
	Assignment - OR
,	AANA Anis C2 Garber
*	Problem statement: Transportation Problem: - milk in Milk whed
	area is collected on three routes A, B and C. There are
	four chilling centers P, Q, R and S where milk is kept
	before transporting it to a milk plant. Each route is able to
11. YT 1	supply on an average one thousand litres of Milk por day.
· ·	The supply of milk on soutes A, B and C are 150, 160 and
- 42 A	190 thousand littles respectively. Daily capacity in thousand littles
ी ग्रह्मची	of chilling tenters is 140, 120, 90 and 50 respectively.
	The cost of transportation of local of milk from each route
	to each chilling renter differ acrordingly to the distance.
	There costs (in 2) are shown in following table:
	Routes reach has chilling centered: handed.
niciani	property and household por all of how R making
~	A 16 18 21 12
Yı	Branch Branch 17 h mr. 19 Jan 14 and 13 jan 14
-107	of Colored with the man 32 with His mile 15 to 10
A#10 - 10 - 1	word in whom to come a country that you will the country and the
T a	The problem is to determine how many thousand litres of milk is to
	at warper that from each route on a daily back in oxider to
	maximize the total cost of transportation.
	the state of the s
*	Objective!
Yast	understanding the transportation problem and using different
	millar basic leady wouting
	granter colution using 3 methods
	respondent collicell, your subjection
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	method (VAM).
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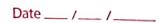
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#	H/W & S/W Requirements:
	Fedora 20, 8GB RAM.
	Google Colab, Rython.
et.	Throxy1-
	Transportation problem is a special kind of linear proparaming problem (LPP) in which goods are transported from a set of sources to a set of destinations subject to the supply and demand of sources and destination respectively such that total cost of transportation is minimized.
	Types of transportation Problem:
7	Bolonced: When both supplies and demands are equal then the problem is said to be a balanced transportation problem.
-)	unbalanced: When supply and demand are not equal then it is said to be unbalanced transportation problem. In this type of problem, either a dummy rous or dummy column
- h- , , ,	is added according to the requirement to make it a balance problem.
4)	methods to solve'-
ع	To find the initial basic feasible solution, there are 3 methods! Noothhest comex cell method least call cell method
7	Vogel's Affisoximation method (VAM).
	n Page No. 1



CS RALL	Basic structure of transportation Problem:
	postination supply (si).
	01 02 03 04
	0 C1 (13 (14 51 -
	02 (21 (22 (23 (24 (23 (24
	03 (31 (32 (33 (34)3
ha	04 (41 (42 C43 C44 S4
	Demand (di) de de de dy a sur la constante
1/10/2004	In the above table D1, D2, D3 and D4 are the destinations
	where the products goods are to be delivered from different
4 14	courses s1,52, 13 and s4. s1 is the supply course oi. cij
1 (4) /	is the cost when the product is delivered from source si to
ant i	destination of pieces as the last section of the se
,	- rathering as our mathematica arrandorm arrains than
1	North West comes cell Method:
That	the up, hours is a series of a state would trained to the
	Algorithm:
	step-1: select the upper left coonex cell of the transportation
4	modsix and allocate min (SI, D1).
Well.	Control of a special of the state of the property of a state of the
of the	step-2: a) subtract this value from supply and domand of respective
	Tous and column
	b) Al the sulling is O thou exact that you and myle do
A	by If the supply is 0, then cross that row and move down to next cell.
- va *,	to next cell.
3700	2) If the demand is 0, then cross the column and move
	right-to next rell, min to ment have
i dini	a) If supply and demand both are o, then cross both row
1	and column and move diagonally to next call.
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	step-3: Repeat these steps until all the supply and demand values are o.
	WANTS SIDE O
-t kz	reast cost method:
	TISE MANOR!
	Algorithm 1-
	WILCO WITE
	Step-11 select the cell having minimum unit cost cij and
	allocate as much as possible in min (si, dj)
- (Y.)	step-2:- a) subtract this min value from supply si and deman
No. No. of the State of the Sta	b) If this supply si is 0, then cross that row and if
• , , †*	the demand di is o then cross that column.
	of min unit cost cell is not unique, then celect the
	rell where maximum allocation can be possible.
	step-31- Repeat these steps for uncrossed row and alumns until
*	Logel's Approximation Method:
	This method is preferred over the NWCM and LCM because the
mitaker	initial basic feasible solution obtained by this method is either
	optimal solution or very neases to optimal solution.
10 mm 21	my tree from those and a south it as the first the second the seco
9 . S	Algorithm'
	has be done in the made of a hororow with the
	step-1: Find the cells having smallest and next to smallest
1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	nost in each sour with write the difference called
	penalty along the side of the table in row benalty
The state of the s	Page No.





	Step-2: find the cells having smallest and next to smallest cost
	in each column and write the difference (called penalty).
	along the side of the table in each column benefty.
	, 4
	step-3: select row or column with maximum penalty and find
, 1	cell that has least cost in selected sow or column.
	Allocate as much as possible in this cell.
-	
	step-4: Adjust the supply and demand the cooss at the satisfied
÷	sow or column.
	ARY I W
	Step-51. Repeat these steps until all sufply & demand values
	are 0.
*	Example & Test Case:
	•
,	Input: 16 18 21 12 150
	17 19 14 16 160
	22 11 15 10 90 Demand 140 120 90 50, 400
	averance 10 120 to 100
	I) Northwest Exnex Method.
	Outbut: 140 10 0 0
	0 110 50 0 Final (ast = 6310.
	0 10 50 C Mad (ast : 23/0.
	I) least Gomes Cell Method:
	0 40 0 50
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1000	TIT Vagel's Approximation Method:	1
(gren a	outpute 100 0 0 00 00000000000000000000000000	1
- H	40 30 90 0 Final tost = 5700.	
-	0 90 0 0	P
Ann .	re-colored normanic who model is one here	
e zasa t	Hence, Here the VAM gives the least cost of fox transportation	lon.
	and hence the optimal solution.	
Las factor	conclusion: we successfully undexstood and implemented , NWR,	rails
6	LCM and VAM method for transportation problem and	
	found that VAM gave the minimum cost.	
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