Transshipment problem [Bronson, 1982, Pr. 9.3, p 89]ROUTINE								
<i>Sources</i> (they only send): 1, 2	Give as positive quantities (supply)							
Destinations (they only receive): 5, 6	Give as negative quantities (demand)							
		Destin. ^s	Capacity					
	5	6						
Sources 1	8	М	95					
2	М	М	70					
Capacity	30	45	75 \ 165					

A) Insert junctions — *Transshipment points* or *depots* or *junctions* (remaining):
3, 4. Each becomes *source* and *destination*. Transform to *transportation problem*.
Insert junctions appropriately with their capacities *M* is infinity, to mean "no path".

			Destin. ^s		
	3	4	5	6	
Sources 1	3	М	8	М	95
2	2	7	М	М	70
3	0	3	4	4	15
4	М	0	М	2	0
	0	30	30	45	$105 \setminus 180$

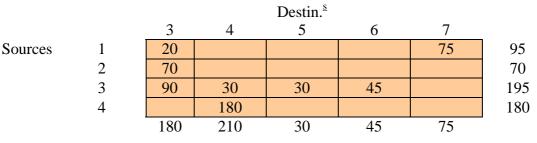
B) Balance — If the transportation problem is not balanced, insert one fictitious *source* or *destination* with the capacity difference (and 0 transportation costs).

					-		
		Destin. ^s					
		3	4	5	6	7	
Sources	1	3	М	8	М	0	95
	2	2	7	М	М	0	70
	3	0	3	4	4	0	15
	4	М	0	М	2	0	0
		0	30	30	45	75	180 \ 180

C) Convert — Let T be the total capacities. (Here, T = 180.) To convert to aTP *equivalent* to the *transshipment problem*, add T to every junction's capacity.

	Destin. ^s						
		3	4	5	6	7	
Sources	1	3	М	8	М	0	95
	2	2	7	М	М	0	70
	3	0	3	4	4	0	195
	4	М	0	М	2	0	180
		180	210	30	45	75	$540 \setminus 540$

Solve as an ordinary TP. Solution:



(This solution is non-degenerate: 4 + 5 - 1 = 8 full cells, as expected) At junctions —points (*i*, *i*)—, interpret the quantity as **complement to** *T*. (So, here: 90 units pass by 3; and 4 is not used.)

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