

Brain Teaser

Round-the-World Race

Your team has entered a round-the-world speedboat race. You have three identical speedboats, each of which can carry enough fuel to go exactly half-way around the world. All three of your boats must be at the home port for both the start and the finish of the race and the race is won when at least one of the boats circumnavigates the globe. The only source of fuel is at the home port.

Assuming that you can transfer any amount of fuel between boats instantly, how can you get one of your boats around the world in the shortest time? How much fuel does it take?

Solution

	Boat A		Boat B		Boat C	
	Position	Fuel (tanks)	Position	Fuel (tanks)	Position	Fuel (tanks)
	Home port	1.00	Home port	1.00	Home port	1.00
Step 1	Point 1	0.75 -> 1.00	Point 1	0.75 -> 1.00	Point 1	0.75 -> 0.25
Step 2	Point 2	0.75 -> 1.00	Point 2	0.75 -> 0.50	Home port	0.00 -> 1.00
Step 3	Point 3	0.75	Point 1	0.25	Home port	1.00
Step 4	Point 4	0.50	Home port	0.00 -> 1.00	Home port	1.00
Step 5	Point 5	0.25	Home port	1.00	Point 7	0.75
Step 6	Point 6	0.00 -> 0.25	Home port	1.00	Point 6	0.50 -> 0.25
Step 7	Point 7	0.00 -> 0.25	Point 7	0.75 -> 0.25	Point 7	0.00 -> 0.25
Step 8	Home port	0.00	Home port	0.00	Home port	0.00

	Position	
	Home port	
Step 1	Point 1	Boat C transfers 0.25 tank to each of Boat A and Boat B
Step 2	Point 2	Boat B transfers 0.25 tank to Boat A, Boat C fills tank
Step 3	Point 3	
Step 4	Point 4	Boat B fills tank
Step 5	Point 5	
Step 6	Point 6	Boat C transfers 0.25 tank to Boat A
Step 7	Point 7	Boat B transfers 0.25 tank to each of Boat A and Boat C
Step 8	Home port	