A hospital ER needs to keep doctors on call, so that a qualified individual is available to perform every medical operation that might be required (there is an official list of such procedures). For each of several doctors available for on-call duty, the additional salary they need to be paid, and which operations they can perform, is known. The goal to choose doctors so that each operation is covered, at a minimum cost.

	Doc 1	Doc 2	Doc 3	Doc 3	Doc 4	Doc 5
Op 1	✓			✓		
Op 2	✓				✓	
Op 3		✓	✓			
Op 4	✓					✓
Op 5		✓	✓			✓
Op 6		✓				

Letting c_j be the cost of placing doctor j on duty, formulate the above problem as an integer programming model.

Does this integer programming model include set-covering, set-packing, or set-partitioning constraints?

Reconsider the problem to now assigning each doctor to perform each operation.

Change the costs to c_{ij} for all doctors i and operations j. **Write out the set-partitioning constraints.**