

Shapley Sneakers

The Shapley Sneaker Company is opening a new factory in Simplexville. One of its major purchases will be a leather cutting machine. The cost of maintaining a machine depends on its age as follows:

Age at beginning of year (years)	0	1	2	3	4
Maintenance cost for next year (\$)	38,000	50,000	97,000	182,000	304,000

The cost of purchasing a machine at the beginning of each year is:

Year	1	2	3	4	5
Purchase cost (\$)	170,000	190,000	210,000	250,000	300,000

There is no trade-in value when a machine is replaced. The company's goal is to minimize the total cost (purchase plus maintenance) of having a machine for five years. Formulate this problem as a shortest path problem.