

Normal Form Game Against Nature

A business needs a production facility. Four scenarios in the table below capture demand possibilities.

Scenario	A	B	C	D
Probability	0.05	0.5	0.35	0.1
Quantity	0	100	150	250

Assume product price is \$5 and assume all sales will take place immediately. (This is too simplistic, but ignore choosing price and the flow of sales over time to let us focus on the other important parts of the problem).

The business can choose from three types of production facilities with different up front cost, per unit costs, and capacities, as shown in the table below.

Type	Low	High	Flex
Up Front Cost	300	500	600
Capacity	125	200	Unlimited
Cost per unit	2	1	1 up to 125, 2 above 125

a) With no further information, what facility should be chosen?

Net Benefits

Probability Quantity		A 0.05 0	B 0.5 100	C 0.35 150	D 0.1 250	Exp Value
Facility	Low	-300	0	75	75	18.75
	High	-500	-100	100	300	-10
	Flex	-600	-200	-25	275	-111.25

b) Suppose they can contract for a study that will tell them with certainty whether demand will be over 100 or not before the facility is chosen, but sheds no more information on other states. What is it worth?