

Probability of an event

Suppose a local manufacturing company is evaluating the probability of completion of a project that has two stages (design and construction), each with three different alternative dates for completion. This project is similar to other projects in the past. The company has information available concerning the number of months for carrying out the first and second stages, and the number of months that took the company to complete similar projects in the past.

The information is presented in the following table

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Design	Construction	Sample point	Months for completion	Number of projects	Probability of sample point
1	4	(1,4)	5	6	0.15
1	5	(1,5)	6	6	0.15
1	6	(1,6)	7	2	0.05
2	4	(2,4)	6	4	0.10
2	5	(2,5)	7	8	0.20
2	6	(2,6)	8	2	0.05
3	4	(3,4)	7	2	0.05
3	5	(3,5)	8	4	0.10
3	6	(3,6)	9	6	0.15

Based on this information we can compute the probability of completion in 6 months or less (let us call this event C), where C is the event:

$$C = (1, 4), (1, 5), (2, 4)$$

That probability is calculated as:

$$P(C) = P(1, 4) + P(1, 5) + P(2, 4) = 0.15 + 0.15 + 0.10 = 0.40$$

where 0.40 is the probability on completing the project in 6 months or less. This method can become tedious if the number of sample points is large.

Reference: Anderson, D.R., D.J. Sweeny, and T.A. Williams (1999): *Statistics for Business and Economics*. South-Western.