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PROBABILITY BEST CHANCES FOR SUCCESSFUL JOBS.

•Name of the Author:

*Bewar Sulaiman Abdi Hajani

*Department of mathematics, university of zaxo, Kurdistan region iraq .

*E-mai: bewar.sulaiman88@gmail.com

∗∗ Shwan Omer Abdalrahman

**Department of mathematics,Sulaimani university of sulaimani, Kurdistan region Iraq.

**E-mail: Shwan.abdalrahman@uok.ac.ir

***Sarwar.Ahmed.Hamad

***Department of mathematics, university of zaxo, Kurdistan region iraq .

ABSTRACT

for hundreds of times, the study of probability has formerly been bandied in 1600, French mathematicians utilised probability rules to place and succeed bets. in consequence, probability proposition as sense expanded well beyond the as similar's cross uentist academy systems of probability proposition and it's innovated on further abecedarian hypotheticals (desiderata) and is mainly further adaptable in its operations, as revealed in this job. liability proposition, in verity, is good judgement converted in to the accurate fine pronouncements in order to get introductory and extremely clear responded through the process of reduction to simulation. rather than ignoring any excellent data, difficulty is lowered to simplicity.' probability proposition as sense' simply a means for reaching constant findings in the face of inadequate moxie that extends well beyond conventional sense or deducible logic. As a result, it truly represents a sense in and itself.The fashion has a wide range of operations in a variety of scientific disciplines, including mathematics, drugs, biology, drug, economics, psychology, social lores, and numerous further. It's useful, for illustration, when logic with bitsy samples, which is typical in remedial or cerebral evaluation exploration. At the end of this paper, an illustration of such a circumstance is addressed to give a concrete case of the introductory frame. Probability knowledge has advanced extensively and is now an essential tool in statistics. The introductory theoretical generalities of probability will be addressed in this study in order to ameliorate understanding of statistical conclusion

I.   INTRODUCTION

When it comes to planning and running water resource systems, uncertainty is unavoidable. It occurs because many aspects influencing the performance of water resource systems are unknown and cannot be predicted when a system is planned, developed, built, and managed. Each component of a system's success and performance is frequently dependent on future climatic, demographic, social, technological, and political factors, all of which may influence future benefits, costs, environmental consequences, and societal acceptability. Uncertainty emerges as a result of the stochastic (random over time) character of meteorological and hydrological phenomena like evaporation and rainfall(Zahir 2018)(Brown and Wong 2015).

Similarly, future population of towns and cities, per capita water use rates, irrigation patterns, and water use priorities, all of which influence water demand, are unknowns. This chapter presents strategies for characterizing and coping with uncertainty, as well as some basic applications in water resource planning. These approaches are developed further in the next two chapters. There are several approaches of dealing with uncertainty(Zahir 2018)(Brown and Wong 2015).

The most basic technique is to replace each uncertain number with its anticipated or average value, or with some important (e.g., "worst-case") value, and then proceed with a deterministic strategy. The use of predicted values or, alternatively, median values of unknown quantities can be appropriate provided the uncertainty or fluctuation in a variable is fairly minor and does not have a significant impact on the system's performance. If the predicted values of unknown parameters or variables are employed in a deterministic model, the planner can assess the significance of uncertainty using sensitivity and uncertainty assessments, which are addressed further in this and following chapters(Viti, Terzi, and Bertolaccini 2013)(Batanero et al. 2016).

Table 1.1 Data Determining reservoir recreation potential

Possible Pool Levels	Probability of each level	Recreational potential in terms of visitor days per day for reservoirs with varying pool levels
10	0.10	25
20	0.25	75
30	0.30	100
40	0.25	80
50	0.10	70

When crucial parameters are extremely variable, replacing unknown quantities with either expected or worst-case values might have a negative impact on project performance evaluation. Consider the appraisal of a reservoir's recreational potential as an example of these difficulties. Table 1.1. demonstrates that the level of the water surface fluctuates from year to year based on water inflow and demand. The table shows the pool levels and the probability associated with them, as well as the predicted utilization of the leisure facility with different pool levels(Viti et al. 2013)(Batanero et al. 2016)

The average pool level $\bar{L}$ is just the sum of all potential pool levels multiplied by a factor of two, or $\bar{L} = 10(0.10) + 20(0.25) + 30(0.30) + 40(0.25) + 50(0.10) = 30$ This pool level corresponds to 100 visitor-days per day

$$VD(\bar{L}) = 100 \; visitor - days \; per \; day$$

In the worst-case scenario, a pool level of 10 would be chosen as a critical value, producing an estimate of system performance equivalent to 25 visitor-days each day(Viti et al. 2013).

$$VD(L_{low}) = VD(10) = 25 \; visitor - days \; per \; day$$

Neither of these figures is a decent approximation of the typical visiting rate., which is

$$\overline{VD} = 0.10VD(10) + 0.25VD(20) + 0.10VD(30) + 0.25VD(40) + 0.10VD(50) =$$

$$0.10(25) + 0.25(75) + 0.30(100) + 0.25(80) + 0.10(70) =$$

$$78.25\ Visitor - days\ Per\ day$$

Clearly the average of visitation rate, $\overline{VD} = 78.25$, the visitation rate corresponding to the average pool level $VD(\overline{L}) = 100$, and the worst-case assessment $VD(L_{low}) = 25$, are very different(Viti et al. 2013).

Other measurements that describe a data collection include the median and the most likely. They benefit from being less impacted by extreme outliers. The median, most probable, and mean for the symmetric data set provided in Table 1.1 are all the same, namely 30. However, if the various pool level probabilities were 0.30, 0.25, 0.20, 0.15, and 0.10 (rather than 0.10, 0.25, 0.30, 0.25, 0.10), the anticipated value or mean is 25, and the value with the highest likelihood of happening (the most probable) is 10, and the median or value in the data set that is larger than or equal to half of the other values but less than or equal to the other half of the values is 20(Viti et al. 2013)(Alpen and Ramesh 2010).

Probability Terms and Definition

Term	Definition
Sample Space	The collection of all conceivable outcomes in any study
Sample Point	It is one of the probable outcomes
Experiment or Trial	A succession of activities with unpredictability in the result
Event	It is the result of a single experiment
Outcome	The outcome of a trial/experiment
Complimentary event	The occurrences that do not occur. An event's complement the event is A, not A (or A')
Impossible Event	The occurrence is not possible

II. TYPES

with theoretical probability (i.e., roll a die or conduct a survey). Instead, you utilize your understanding of a scenario, some logical reasoning, and/or a known formula to determine the

likelihood of an event occurring. It can be written as the ratio of the number of favorable events divided by the number of possible events. For instance, suppose you had two raffle tickets and 100 tickets were sold(Sjetne et al. 2019):

- **Number of favorable outcomes: 2**

- **Number of possible outcomes: 100**

- **Ratio = number of favorable outcomes / numbers of possible outcomes = 2/100 = .5.**

A theoretical probability distribution is a well-known distribution, such as the normal or gamma distributions, or one of hundreds of other theoretical distributions(Seidenfeld 2015).

Experimental Probability

. It is founded on the results Probability is a measure of how likely an event is to occur. Many occurrences are impossible to forecast with absolute accuracy. We can only anticipate the possibility of an event occurring, i.e. how probable it is to occur, by utilizing it. Probability can vary from 0 to 1, with 0 indicating an impossible event and 1 indicating a certain event. Probability for Class 10 is an essential topic for students since it discusses all of the fundamental elements of this discipline. The probability of all occurrences in a sample space equals one. For example, when we toss a coin, we can obtain either Head OR Tail; there are only two potential outcomes (H, T). However, if we toss two coins into the air, there are three possible outcomes: both coins show heads, both show tails, or one shows heads and one tail, i.e. (H, H), (H, T) (T, T)(Sjetne et al. 2019)(Alpen and Ramesh 2010)There are three major types of probabilities:

- ## Theoretical Probability

- ## Experimental Probability

- ## Axiomatic Probability

Theoretical Probability

It is predicated on the likelihood of something occurring. The rationale underlying probability is the foundation of theoretical probability. If a coin is tossed, the theoretical probability of obtaining a head is 12(Sjetne et al. 2019).

You don't truly run an experiment of an experiment. The experimental probability may be estimated by dividing the total number of trials by the number of potential outcomes. For example, if a coin is tossed ten times and heads is recorded six times, the experimental probability of heads is 6/10, or 3/5(Seidenfeld 2015).

Experimental probability, also known as Empirical probability, is based on real experiments and proper documentation of occurrences as they occur. A set of real tests are carried out to determine the presence of any event. Random experiments are those that do not have a predetermined outcome. The results of such tests are unpredictable. To estimate the likelihood of a random experiment, it is performed several times. An experiment is performed a set number of times, with each repetition referred to as a trial. The experimental probability formula is expressed mathematically as(Seidenfeld 2015).

Probability of an Event P(E) = Number of times an event occurs / Total number of trials.

Axiomatic Probability

A collection of principles or axioms that apply to all kinds is established in axiomatic probability. Kolmogorov established these axioms, which are known as Kolmogorov's three axioms. The axiomatic approach to probability quantifies the possibilities of events occurring or not occurring. This topic is covered in full in the axiomatic probability lesson, which includes Kolmogorov's three rules (axioms) as well as several examples. The possibility of an event or outcome occurring dependent on the occurrence of a preceding event or outcome is known as conditional probability(Savage, Scholtes, and Zweidler 2009)(Batanero, Henry, and Parzysz 2005).

III.   Basic Solutions

1) There are 6 pillows in a bed, 3 are red, 2 are yellow and 1 is blue. What is the probability of picking a yellow pillow?

Ans: The likelihood is equal to the number of yellow pillows in the bed divided by the total number of pillows, i.e., 2/6 = 1/3(Savage et al. 2009).

2) There is a container full of coloured bottles, red, blue, green and orange. Some of the bottles are picked out and displaced. Sumit did this 1000 times and got the following results:

- **No. of blue bottles picked out: 300**

- **No. of red bottles: 200**

- **No. of green bottles: 450**

- **No. of orange bottles: 50**

**a) What is the probability that Sumit will pick a green bottle?**

Ans: For every 1000 bottles picked out, 450 are green.Therefore, P(green) = 450/1000 = 0.45

b) If there are 100 bottles in the container, how many of them are likely to be green?

Ans: The experiment implies that 450 out of 1000 bottles are green.Therefore, out of 100 bottles, 45 are green(Savage et al. 2009).

IV. Probability Tree

The tree diagram aids in organizing and visualizing the various alternative outcomes. The branches and the tree's ends are the two most important places. Each branch's probability is written on the branch, and the ends contain the ultimate conclusion. When determining when to multiply and when to add, tree diagrams are employed. A tree diagram for the coin is shown below(Prasanna 2015):
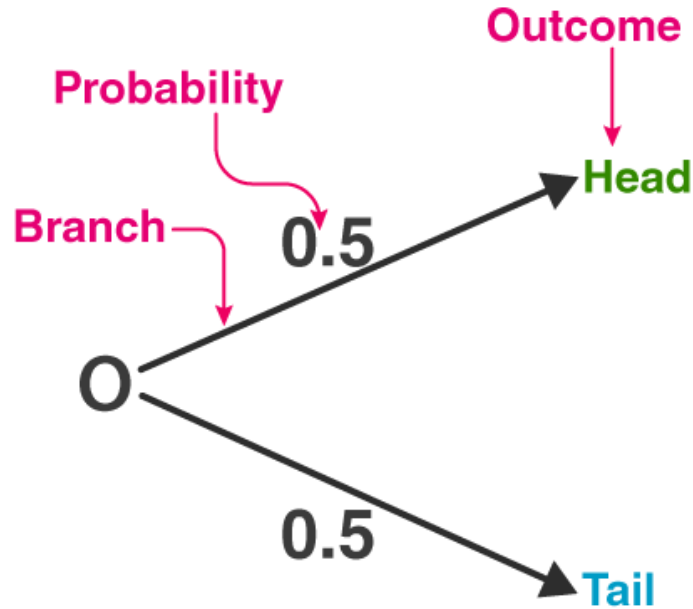
V. Probability of an Event

Assume that an event E can occur in r of n probable or feasible equally likely ways. The event's likelihood of occurring or success is then represented as**(Prasanna 2015)**;

P(E) = r/n

The likelihood that an event will not occur, often known as its failure, is stated as:

P(E') = (n-r)/n = 1-(r/n)

E' represents that the event will not occur.

Therefore, now we can say**(Prasanna 2015)**;

P(E) + P(E') = 1

This suggests that the sum of all probability in every random test or experiment equals 1.When two occurrences have the same theoretical likelihood of occurring, they are referred to be equally probable occurrences. The outcomes in a sample space are said to be equally likely if they all have the same chance of happening. **For example, if you roll a dice, the chance of receiving 1 is 1/6. Similarly, the likelihood of receiving all of the numbers from 2,3,4,5, and 6 at the same time is 1/6. As a result, the following are some instances of equally likely outcomes when rolling a die(Palaniammal 2006):**

- **Getting 3 and 5 on throwing a die**

- **Getting an even number and an odd number on a die**

- **Getting 1, 2 or 3 on rolling a die**

Ar equally likely events, since the probabilities of each event are equal?

Complementary Events

The potential that there will be just two outcomes, stating whether or not an event will occur. Examples of complementing occurrences include a person coming or not coming to your house, receiving a job or not obtaining a job, and so forth. Essentially, the counterpart of an event occurring in the exact opposite likelihood that it will not occur. Here are some more examples(Palaniammal 2006):

- **It will rain or not rain today**

- **The student will pass the exam or not pass.**

- **You win the lottery or you don't.**

VI.   Examples

Example 1: Theoretical Probability.

Question 1: What is the theoretical chance of rolling a 4 or a 7 with a pair of dice?

You could do an experiment if this question asked you to estimate the empirical likelihood. You could, for example, roll the dice 100 times, record the outcomes, and state the likelihood. However, because this question asks for theoretical probability, you must apply a formula or create a sample space. Set up a sample space because there is no one formula for estimating die rolling probabilities(Palaniammal 2006).

Solution(Palaniammal 2006):

Step 1: Create a test environment. In other words, list all of the conceivable "events" that may occur. The events in this situation are the numbers that appear after the dice are rolled. The probability for two dice are:

[1][1], [1][2], [1][3], [1][4], [1][5], [1][6],

[2][1], [2][2], [2][3], [2][4],[2][5], [2][6],

[3][1], [3][2], [3][3], [3][4], [3][5], [3][6],

[4][1], [4][2], [4][3], [4][4], [4][5], [4][6],

[5][1], [5][2], [5][3], [5][4], [5][5], [5][6],

[6][1], [6][2], [6][3], [6][4], [6][5], [6][6].

I've bolded the rolls that result in a total of 7.

Step 2: Determine the likelihood. There are 36 potential rolls in the total sample space. Because there are nine rolls that end in a 7, the solution is:

9/36 = .25.

Example 2: Experimental Probability.

Question: What is the flaw in the following statement?(Palaniammal 2006)

When I toss a die, the likelihood of getting a 6 is 16, thus if I throw the die six times, I should expect to get precisely one 6.

In principle, this statement is correct, but in practice, it may not be. Try throwing a dice six times - you won't always get a six.

Question: Kate and Josh each roll the dice 30 times(Palaniammal 2006).

a) How many times do you think Kate will get a 6?

b) How many times do you think Josh will get a 6?

c) What is the total number of sixes you would expect Kate and Josh to get?

Solution

a) Kate should get a 6 on 16 of her throws, in principle. As a result, in principle, Kate should throw a 6 on 5 of her 30 throws.

b) Josh should get a 6 on 5 of his 30 throws.

c) Kate and Josh have tossed the dice 60 times in total. On 10 of those throws, you'd expect them to get a 6. It is quite implausible that either Kate or Josh would have thrown exactly five 6s, or that they would have thrown 10 6s together. However, their combined scores are more likely to have been closer to the projected outcome (ten 6s) than their individual outcomes(Palaniammal 2006).

Example 3:

Question: There are four candidates in a presidential election. A, B, C, and D are their initials. According to our polling data, A has a 2020 percent probability of winning the election, whereas B has a 4040 percent probability of winning. What is the likelihood that A or B will win the election?(Maity 2018)

Solution:

In summary, if A1A1 and A2A2 are disjoint events, then P(A1A2) =P(A1) +P(A2) P(A1A2) =P(A1) +P(A2) P(A1A2) =P(A1) +P(A2) P(A1A2) =P(A1) +P(A2) (A2). The same logic applies when there are n discontinuous events A1, A2, AnA1, A2, An:

P(A1A2A3An) =P(A1) +P(A2) ++P(An), if A1, A2, and An are disjoint(A1A2A3An) =P(A1) +P(A2) ++P(An), if A1, A2, and An are disjoint(A1A2A3An) =P(A1) +P(A2) ++P(An)(Maity 2018).

The third axiom goes even farther, stating that the same is true even for a countably infinite number of disconnected occurrences. Soon, we'll see additional instances of how to apply the third axiom(Maity 2018).

Example 4

Question: Determine the likelihood of 'getting 3 on a dice roll(Maity 2018).

Solution:

Sample Space = {1, 2, 3, 4, 5, 6}

Number of favourable event = 1

i.e. {3}

Total number of outcomes = 6

Thus, Probability, P = 1/6

Example 5

Question: Draw a card at random from a deck of cards. What is the likelihood that the card drawn will be a face card?(Maity 2018)

Solution:

A standard deck has 52 cards.

The total number of possible outcomes is 52.

The number of favorable events is equal to 4 x 3 = 12. (Considered Jack, Queen and King only)

P = Number of Favourable Outcomes/Total Number of Outcomes = 12/52= 3/13.

Example 6

Question: A jar includes four blue balls, five red balls, and eleven white balls. What is the likelihood that the first ball pulled from the vessel is red, the second ball is blue, and the third ball is white?(Maity 2018)

Solution: The chance of getting the first red ball or the first event is 5/20.

Given that we have drawn a ball for the first event, the number of choices for the second event is 20 – 1 = 19.

As a result, the chances of receiving the second ball as blue or the second event are 4/19.

With the first and second events occurring, the number of possible outcomes for the third event is 19 – 1 = 18.

And the likelihood of the third ball being white or the third event occurring is 11/18.

As a result, the chance is calculated as 5/20 x 4/19 x 11/18 = 44/1368 = 0.032.

P = 3.2 percent is another way to say it(Maity 2018).

Example 7

Question: If two dice are thrown, what is the likelihood that the total will be(Galavotti 2015):

1. **equal to 1**

2. **equal to 4**

3. **less than 13**

Solution:

1) To calculate the probability that the total is equal to one, we must first compute the sample space S of two dice, as illustrated below.

S = { (1,1),(1,2),(1,3),(1,4),(1,5),(1,6)

(2,1),(2,2),(2,3),(2,4),(2,5),(2,6)

(3,1),(3,2),(3,3),(3,4),(3,5),(3,6)

(4,1),(4,2),(4,3),(4,4),(4,5),(4,6)

(5,1),(5,2),(5,3),(5,4),(5,5),(5,6)

(6,1),(6,2),(6,3),(6,4),(6,5),(6,6) }

1) Let E represent the event "sum equal to 1." Because there are no outcomes where the total is equal to one, P(E) = n(E) / n(S) = 0 / 36 = 0.

2) Three alternative results result in a total of four, and they are as follows:

E = (1,3), (2,2), and (3,1) As a result, P(E) = n(E) / n(S) = 3 / 36 = 1 / 12

3) We can observe all potential outcomes for the event E from the sample space, which result in a total smaller than 13. For example, (1,1) or (1,6) or (2,6) or (6,6).

As you can see, the maximum probability of an event occurring is when both dies have the number 6, i.e. (6,6).

As a result, P(E) = n(E) / n(S) = 36 / 36 = 1(Galavotti 2015)

VII.   Conclusion

VIII.   In conclusion I would say that Probability and chances are used in a variety of scenarios, including deciding what sort of weather to prepare for, whether or not to buy a stock, and how much to risk while gambling. Probability enables individuals to determine which options are safe and which are dangerous. Of course, having a solid understanding of probability makes this process much easier. We may learn about the possibility of future events and plan accordingly by knowing about probability. Probability theory is defined as a bridge between qualitative reasoning and quantitative computations. formalized and included other early research from the domains of mathematics, information theory, and physics, such that probability theory became a framework that permits consistent conclusions to be reached in conditions of insufficient information and reasonable decisions to be made in uncertain situations. The method makes use of the ability to directly convert qualitative information into accurate quantitative values, allowing for additional computations. The concepts of 'probability theory as logic' encourage one to analyze all relevant information in a certain decision-making process methodically and consistently. Furthermore, upgrading data by incorporating new information into an existing framework allows for much latitude to reflect on potential changes and diverse perspectives–both qualitative and quantitative.

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