Learning Objectives

Is normal distribution a probability distribution?

Probability

Normal curve

Probability distribution types

Discrete probability distribution

Continuous probability distribution

Example

To conclude

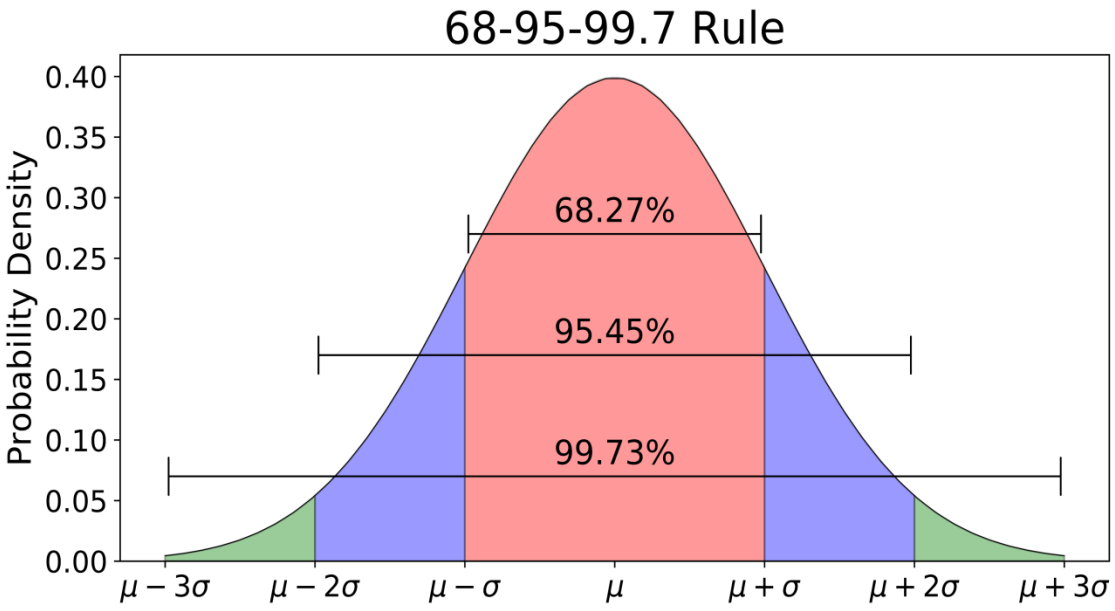
Is normal distribution a probability distribution?

Probability

- Represents the chance the event will occur.
- It's a number from 0.00 to 1.00. (Sum of all probability value is 1)
- Probability=1.00 (event always occurs) & Probability=0.00 (event will never occurs),
- Represented in percentage.

Normal curve

- Area under the normal curve is 1.00.
- Empirical rule
  1. The area between -1 to +1 standard deviation is 0.68 or 68%
  2. The area between -2 to +2 standard deviation is 0.95 or 95%
  3. The area between -3 to +3 standard deviation is 0.99 or 99%



Probability distribution types

- List of all possible outcomes of a random variable along with their corresponding probability value.
- Discrete probability distribution for discrete variables.
- Probability density function for continuous variables.

Discrete probability distribution

- There are discrete number of values.
- Each possible value has a non-zero probability.

Continuous probability distribution

- Continuous range of values.
- Specific value in continuous probability distribution have a zero probability.

Example

Bacteria contaminated in a city water supply of mean 500ppm, standard deviation of 100ppm. Find the probability of bacteria in a randomly selected water sample X.

1. X<600

2. X>600
3. 400 <= X >= 600

1. X<600

=NORMDIST(600,500,100,TRUE) is 0.8413

2. X>600

=1-0.8 = 0.1587

3. 400 <= X >= 600 which is 1 SD

=0.682 = 68%

To conclude

Normal distribution is the continuous probability distribution.