**DAILY ASSESSMENT FORMAT**

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| **Date:** | **27/July/2020** | **Name:** | **Prashantha naik** |
| **Course:** | **Basic statistics** | **USN:** | **4al17ec074** |
| **Topic:** | **Week4** | **Semester & Section:** | **6th b** |
| **GitHub Repository:** | **prashanth\_course** |  |  |

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| **SESSION DETAILS** |
| **Image of session** |
| **Report – Report can be typed or hand written for up to two pages.**  **Probability distributions**  **probability distribution specifies the probabilities for each of the values that a random variable may take. It also illustrates how a probability distribution can take the form of a table, graph or equation. Finally, it explains how for a discrete random variable the probability distribution is called a probability mass function, giving probabilities, while for a continuous random variable the probability distribution is called a probability density function, giving probabilities per unit of the random variable. To obtain probabilities for a continuous random variable the sum (or integral) of all probabilities over an interval have to be considered.**  **cumulative probability distribution can be obtained from a probability distribution by summing the probabilities in the latter from the smallest up to the largest value of the random variable. Also cumulative probability distributions can exist in the form of a table, graph or an equation. Interestingly, the difference between discrete and continuous variables disappears for cumulative probability distributions: for both variables the cumulative distribution gives cumulative probabilities: the probability of an event lower than or equal to the specified value of the random variable. The second video ends by illustrating how the cumulative probability distribution is useful to find a cumulative probability relating to a specified value of the random variable, but also the reverse: to find the threshold value of the random variable at a given probability level.**  **When making observations on individuals or objects, you can observe several attributes per individual. These are called variables. Now imagine you've collected a dataset and you decide to repeat your study**  **There are two types of random variables, discrete and continuous. A discrete random variable is one which may take on only a countable number of distinct values, such as 0/1/2/3. In fact, if a random variable can take on only a finite number of distinct values then it must be discrete.**  **Examples of discrete random variables include the number of children in a family or whether you had to wait in front of a traffic light today.**  **A continuous random variable is one which takes an infinite number of possible values.**  **Continuous random variables are usually measurements.**  **To illustrate the aspect of infinity, lets assume a height that has been measured as 3.1 meters, but with a more accurate measuring tape, a value of 3.14 is measured. With an even more accurate tape, 3.145 meters. In other words, by making more accurate measurements, or zooming in, an infinite number of outcomes is possible.**  **A probability distribution specifies the probabilities for each of the values that the random variable may take. A probability distribution of a discrete random variable is called a probability mass function and gives probabilities on the y-axis. A probability distribution for a continuous random variable is called a probability density function and it gives probability densities on the y-axis.**  **the mean, variance and standard deviation when two random variables are added or subtracted and when a random variable is manipulated by adding or multiplying with a constant. Such operations occur frequently when dealing with real data. Examples of adding random variables are cases where the output of one model (e.g. a weather or an econometric model) is input for another (e.g. for hydrologic or macro-economic projections) or where different observations are combined to calculate a variable of interest (e.g. weight and height in a body-mass index). An examples of addition or multiplication with a constant could be applying a unit conversion to an observed variable (e.g. when converting a temperature in Celcius to Farenheit).**  **normal distribution and and the role of the two parameters in determining location (the mean) and the spread (the standard deviation) of the distribution. In addition it shows how the normal distribution not only exists as a statistical equation but is also a function that describes the outcome of many processes where some form of diffusion is important.**  **normally distributed random variable falls within a given range can be expressed in units of standard deviations (sigma) around the mean: the probability values of 0.68, 0.95 and almost 1 correspond with intervals of 1, 2 and 3 sigma around the mean respectively. z-transformation to a normally distributed variable. Probability statements can then be made for any value of the random variable (not just 1, 2 or 3 sigma around the mean) on the basis of the resulting z-scores, by using a table that lists cumulative probabilities with the corresponding z-values. It is shown how a cumulative probability can be found and interpreted for a given value of the random variable, and (reversely) how a threshold value of the random variable is found and interpreted for a given cumulative probability**  **binomial probability distribution is introduced. It starts by explaining the type of elementary random variable to which the distribution relates: a variable with only two mutually exclusive outcomes and a fixed probability p to obtain one of the two outcomes (a Bernoulli trial). Next it shows how the distribution gives the probability of observing x successes in n Bernoulli trials. The assumptions of independence among each outcome and a constant probability of success are specified, and the equation that describes this distribution is given with its two parameters p and n. The use of this equation is demonstrated with an example. Finally the equations for the mean and standard deviation of a binomial probability distribution are given and it is shown how the standard deviation of this distribution varies for different values of the parameters.** |