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Statistics: Statistics is the science of collecting, organizing, presenting analyzing ~~data~~ the to assist in making more effective decisions.

According to R.A Fisher (Sir Ronald Aylmer Fisher) the science of statistics is essentially a branch of applied mathematics and may be regarded as mathematics applied to observational data.

The role of statistics in ~~eg~~engineering: H.T

Population: Population is the collection of all objects, items or individual on which observations are taken on the basis of some characteristics of the objects in any field of enquiry.

i. All students of ICT department.
ii. All workers of a factory

Sample: A sample is a representative part of a population.

i. Some students of ICT department.
ii. Some workers of a factory.

Variable:

Variable is a characteristic whose values varies object to object or person to person.

Types of variable: It can be classified in to two categories.

(1) **Qualitative variable:** A variable that can not assume a numerical value but can be classified into two or more non-numerical categories

Example: i. Religion of a student.

Religion can be categorised Muslim and Non-muslim.

(ii) Gender of a patient.

Gender can be ~~classified~~ categorized male-female.

(iii) Economic status of a person. (rich, middle, poor)

(2) **Quantitative variable:** A variable that can be measured numerically is called a quantitative variable.

i. Blood pressure of a patient
ii. ~~Monthly income of~~
ii. Daily Income of a worker
iii. Height of ~~of~~ a student.

Quantative Variable may be classified in to two types: i) Discrete variable
ii) continous "

i) Discrete variable: A variable, which can take, only isolated value is called Discrete variable.

Example: Family size, class size, number of children in a family.

ii) Continous variable: A variable is said to be continous if it assumes any value within certain range.

i. Age of a worker
ii. Height of a person
iii. Montly salary of a worker ete.

Scales of measurement:

~~Scales of~~ Measurement: It is a process of assigning numbers to some characteristics or events according to scientific rules.

→ In response to a question on wheather he or she is using the ATM provided by a particular bank branch, the respondents may say yes, or no

You may wish assign the number

* 1 for the response yes
* 2 for " " No

→ In response to a question on wheather some people ~~were~~ are asked their economic status, the respondent may say poor, middle, rich.

You may wish assign the number.

→ 1 for the response, poor
→ 2 " " " , middle
→ 3 " " " , Rich.

There are four scales of measurement:

i. Nominal Scale } Qualitative scale
ii. Ordinal Scale }
iii. Interval scale } ~~Quantative~~, Quantitative scale
iv. Ratio scale. }

Nominal Scale: The scale of measurement by which we can classify and identify a qualitative variable according to different categories is called nominal scale.

Examples: i. Gender of a worker (male, female)

ii. Colour of eyes of a worker (black, green, brown)

iii) Religion of a worker (Muslim, Hindu, Buddhist, christian).

iv) Marital status: of a worker (Single, married, widowed, divorced or separate)

Ordinal scale: The scale of measurement by which we can classify, identify and rank a qualitative variable according to different categories is called ordinal scale.

Example: i) Economic status of a citizen (Higher class, middle class, poor)

ii) Health status of a worker. (Excellent, good, poor)

iii) level of education: (Illiterate, primary/ secondary).

Interval scale: The scale of measurement by which we can measure a quantitative variable numerically is called Interval scale. It has arbitrary zero (0) but not absulate / true zero ('0').

'+', '−' operation are possible but 'x', '÷' operation are not possible.

Example: i) Body temperature of a patient.
ii) Calendar time.

Ratio Scale: The scale of measurement ~~is called ratio scale when a quantitati~~ by which we can measure a quantitative variable numerically with absulate zero is called Ratio scalled. '+', '−', 'x', '÷' operation are possible.

i. Age of a worker.
ii. Height of " " "
iii. weight " " "
iv. Number of children per family.