Name: Sher Muhammad Khan

ID # 16402

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Instructor: Sir, Raza Ahmed Khan Sb

Final Term Assignment

Q1. Fill the following statements with appropriate words and options:

Solutions.

1. Scale data is the word which use to measure **variables/numbers**
2. Number belongs with **Quantitative** Data.
3. Qualitative study of the data belongs with **nominal and ordinal**
4. **Classification** is the process which separate data from heterogeneous to homogeneous groups.
5. The field which depends upon the utilization of human resource in data management is called as **HRM data**
6. The Grading score of the ILETS exams belongs with **Nominal** measurement scale.
7. Peshawar temperature was recorded at 32° F, lies in the category of **Interval** measurement scale.
8. Quantitative study has very unlimited number of usage in advance research studies. **(T)**
9. Number of dots in a single line is very good example of uncountable data. **(F)**
10. Qualitative data do not belong with the field of Statistics. **(F)**

Question No: 02

a) **Describe the relevant fields and branches of Data type.**

Solution.

Data Type: A data type, in programming, is a classification that specifies which type of value a variable has and what type of mathematical, relational or logical operations can be applied to it without causing an error. A string, for example, is a data type that is used to classify text and an integer is a data type used to classify whole numbers.

Fields and branches of data types

- Machine data types.
- Boolean type.
- Numeric types.
- Enumerations.

- String and text types.
- Pointers and references.
- Function types.

  Machine data types Machine data is data that is generated by machines without human involvement. It is an important category of data as machines

- **Boolean type** the Boolean data type is a data type that has one of two possible values (usually denoted true and false) which is intended to represent the two truth values of logic and Boolean algebra.
- **Numeric types.** Numeric data types are numbers stored in database columns. These data types are typically grouped by: ... The exact numeric types are INTEGER, BIGINT, DECIMAL, NUMERIC, NUMBER, and MONEY

- **Enumerations** factor in the R programming language, and a categorical variable in statistics) is a **data** type consisting of a set of named values called elements, members, enumeral, or enumerators of the type
- **String and text type** Both a string and text field will hold information that you can freely write in. The major difference between the two fields is how many characters you can put in these fields. A string field has a limit of 255 characters, whereas a text field has a character limit of 30,000 characters.
- **Pointers and references. References** are used to refer an existing variable in another name whereas **pointers** are used to store address of variable. **References** cannot have a null value assigned but **pointer** can. A **reference** variable can be referenced by pass by value whereas a **pointer** can be referenced but pass by **reference.**
- **Function type.** a **function type** (or arrow **type** or exponential) is the **type** of a variable or parameter to which a **function** has or can be assigned, or an argument or result **type** of a higher-order **function** taking or returning a **function**.

(b). How could you elaborate the "Probability" in business life.?

Solution

In our day to day life the "probability" or "chance" is very commonly used term. Sometimes, we use to say "Probably it may rain tomorrow", "Probably Mr. X may come for taking his class today", "Probably you are right". All these terms, possibility and probability convey the same meaning. But in statistics probability has certain special connotation unlike in Layman's view.

The theory of probability has been developed in 17th century. It has got its origin from games, tossing coins, throwing a dice, drawing a card from a pack. In 1954 Antoine Gornband had taken an initiation and an interest for this area.

After him many authors in statistics had tried to remodel the idea given by the former. The "probability" has become one of the basic tools of statistics. Sometimes statistical analysis becomes paralyzed without the theorem of probability. **"Probability of a given event is defined as the expected frequency of occurrence of the event among events of a like sort."** (Garrett)

The probability theory provides a means of getting an idea of the likelihood of occurrence of different events resulting from a random experiment in terms of quantitative measures ranging between zero and one. The probability is zero for an impossible event and one for an event which is certain to occur.

An individual now living will someday die is 1.00.

Let us clarify the meaning of probability with an example of drawing a playing card. There are 4 varieties of cards in a pack and if these cards will be shuffled randomly the probability of drawing a spade is 13/52=1/4. If an unbiased coin is tossed, the probability of occurrence of Head (H) is 1/2 .

Probability as Ratio:

The probability of an event stated or expressed mathematically called as a ratio. The probability of an unbiased coin, falling head is 1/2, and the probability of a dice showing a two-spot is 1/6. These ratios, called probability ratios, are defined by that fraction, the numerator of which equals the desired outcome or outcomes, and the denominator of which equals the total possible outcomes.

More simply put, the probability of the appearance of any face on a 6-faced (e.g. 4 spots) is 1/6 or the

Probability = desired outcome/total number of outcomes

Thus, a probability is a number or a ratio which ranges from 0 to 1. Zero for an event which cannot occur and 1 for an event, certain to occur.

Example:

The probability that the sky will fall is .00.

Question No: 03

a) **Find the number of outcomes during the following experiments:**

i. **5 – Dice and 3- Coins**

Solution:

The outcomes of one dice is equal to 6 then

1^{st} Dice = 6 outcomes

2^{nd} Dice = 6 outcomes

3^{rd} Dice = 6 outcomes

4^{th} Dice = 6 outcomes

5^{th} Dice = 6 outcomes

Thus 6 × 6 × 6 × 6 × 6 = 7,776 outcomes of dice

→ one Coin contains two outcomes i.e. Head and Tail.

1^{st} Coin = 2 outcomes

2^{nd} Coin = 2 outcomes

3^{rd} Coin = 2 outcomes

Thus $2^3 = 2 \times 2 \times 2 = 8$ outcomes

Now total outcomes of 5 Dice and 3 Coins are 7,776 × 8 = 62,208 outcomes

ii. **5- Shirts, 2- Ties and 4- Pants**

Solution:

$5p_1 \times 2p_1 \times 4p_1$

$$\rightarrow 5p_1 = np_r = \frac{n!}{(n-r)!} = \frac{5!}{(5-1)!} = \frac{5!}{4!} = \frac{5 \times \cancel{5!}}{\cancel{5!}} = 5$$

$$\rightarrow 2p_1 = np_r = \frac{n!}{(n-r)!} = \frac{2!}{(2-1)!} = \frac{2!}{1!} = \frac{2 \times \cancel{2!}}{\cancel{2!}} = 2$$

$$\rightarrow 4p_1 = np_r = \frac{n!}{(n-r)!} = \frac{4!}{(4-1)!} = \frac{4!}{3!} = \frac{4 \times \cancel{3!}}{\cancel{3!}} = 4$$

Outcomes 5 × 2 × 4 = 40 answer

b)

i. Three and 8 people standing in a line. How many ways to construct a line with 8 people?

n = 8 r = 3

Solution

$$n_{cr} = \frac{n!}{r!(n-r)!} = \frac{8!}{3!(8-3)!} = \frac{8!}{3!\ 5!} = \frac{8 \times 7 \times \cancel{6} \times \cancel{5} \times \cancel{4!}}{\cancel{3} \times \cancel{2} \times \cancel{5} \times 4!} = 56 \text{ ways}$$

ii. There are 4 members (Principal, Headmaster Clerk & Peon). How many arrangements could be possible for these members during selections.

Solution

Now arrangements $n! = \times (n - 1) \times (n - 2) \times (n - 3) \times (n - 4)$

$4! = \times (4 - 1) \times (4 - 2) \times (4 - 3) \times (4 - 4)$

$4! = \times 3 \times 2 \times 1$

$4! = \times 6$

Thus $4 \times 6 = 24$

iii. How many arrangements could be possible for the word "Probability" and "Statistics "?

Solution

$\longrightarrow$ **Probability** $\dfrac{n!}{p!q!}$

b = 2 time **i = 2 time**

$$= \frac{11!}{2!2!} = \frac{11!}{2 \times 1!2 \times 1!} = \frac{11 \times 10 \times 9 \times 8 \times 7 \times 6 \times 5 \times \cancel{4} \times 3 \times \cancel{2!}}{\cancel{2!}\ \cancel{2!}}$$

$$= 11 \times 10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 2 \times 3$$

Thus = **9,979,200**

$\longrightarrow$ **Statistics** **here are n = 10**

$\longrightarrow$ **S = 3** **T = 3** **i = 2**

$$= \frac{10!}{3!3!2!} = \frac{10 \times 9 \times 8 \times 7 \times \cancel{6} \times 5 \times \cancel{4} \times \cancel{3!}}{\cancel{3!}\ \cancel{3} \times \cancel{2} \times \cancel{2} \times 1}$$

Thus $= 10 \times 9 \times 8 \times 7 \times 5 \times 2 = 50400$