STATISTICS AND ANALYTICS

Unit-1, Session-1

STATISTICAL DATA COLLECTION AND TYPES

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- Types of Data

- Data Collection Tools

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BASIC CONCEPTS

DATA:

➢ Data is a collection of facts, such as numbers, words, measurements, observations or just descriptions of things.
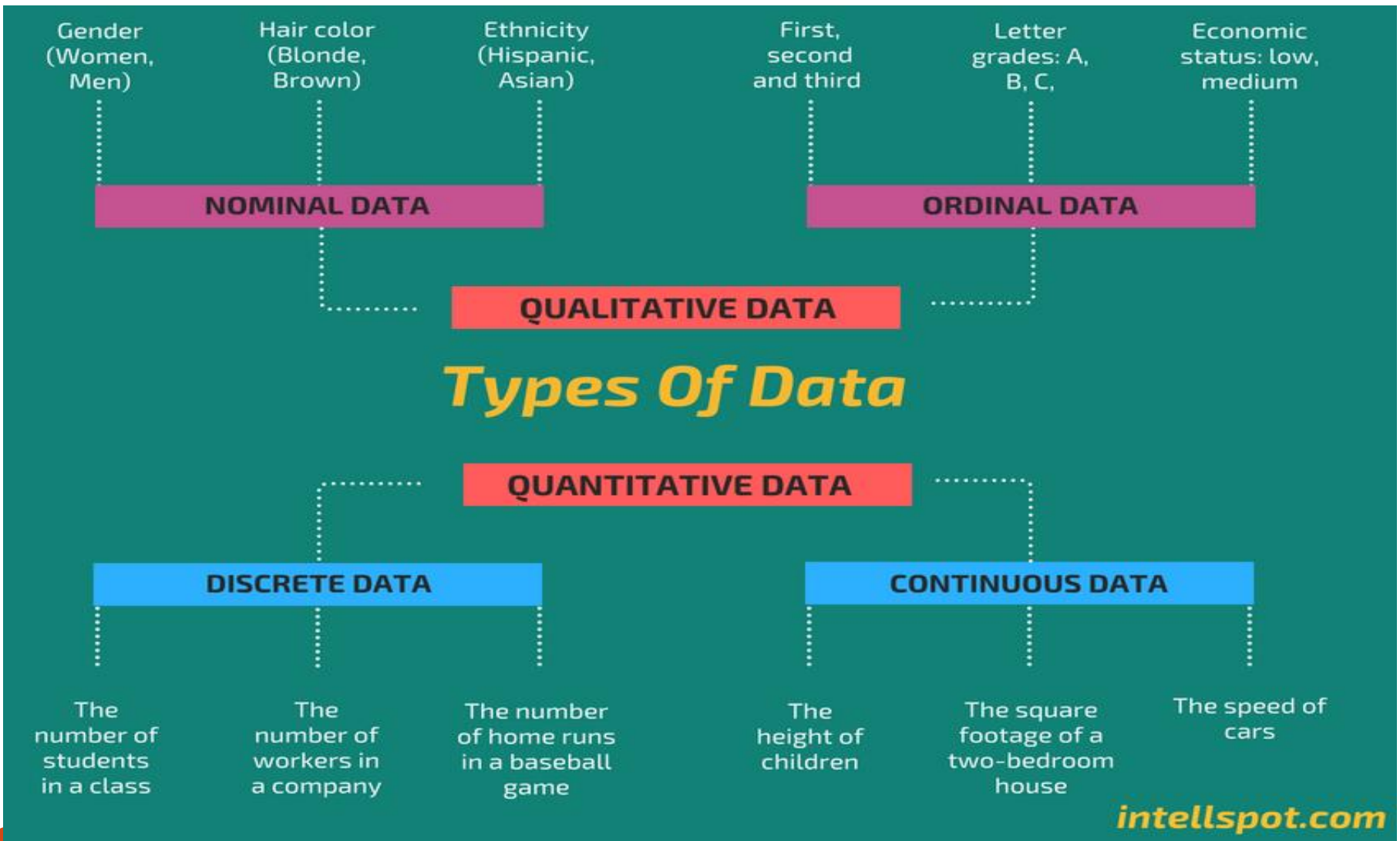
STATISTICAL DATA :

➢ Collection refers to the process of gathering, organizing, and analyzing data in order to extract meaningful insights and draw conclusions.

Sales and New Clients by Month

TYPES OF DATA

1. **Qualitative data:** Qualitative data refers to non-numerical or descriptive information that is observed, recorded, or collected.

2. **Quantitative data :** Quantitative data refers to numerical or measurable information that is collected.

3. **Mixed data :**qualitative and quantitative data are mixed for analysis then the data is mixed data

TYPES OF DATA

Gender (Women, Men) | Hair color (Blonde, Brown) | Ethnicity (Hispanic, Asian) | First, second and third | Letter grades: A, B, C, | Economic status: low, medium

NOMINAL DATA

ORDINAL DATA

QUALITATIVE DATA

Types Of Data

QUANTITATIVE DATA

DISCRETE DATA

CONTINUOUS DATA

The number of students in a class | The number of workers in a company | The number of home runs in a baseball game | The height of children | The square footage of a two-bedroom house | The speed of cars
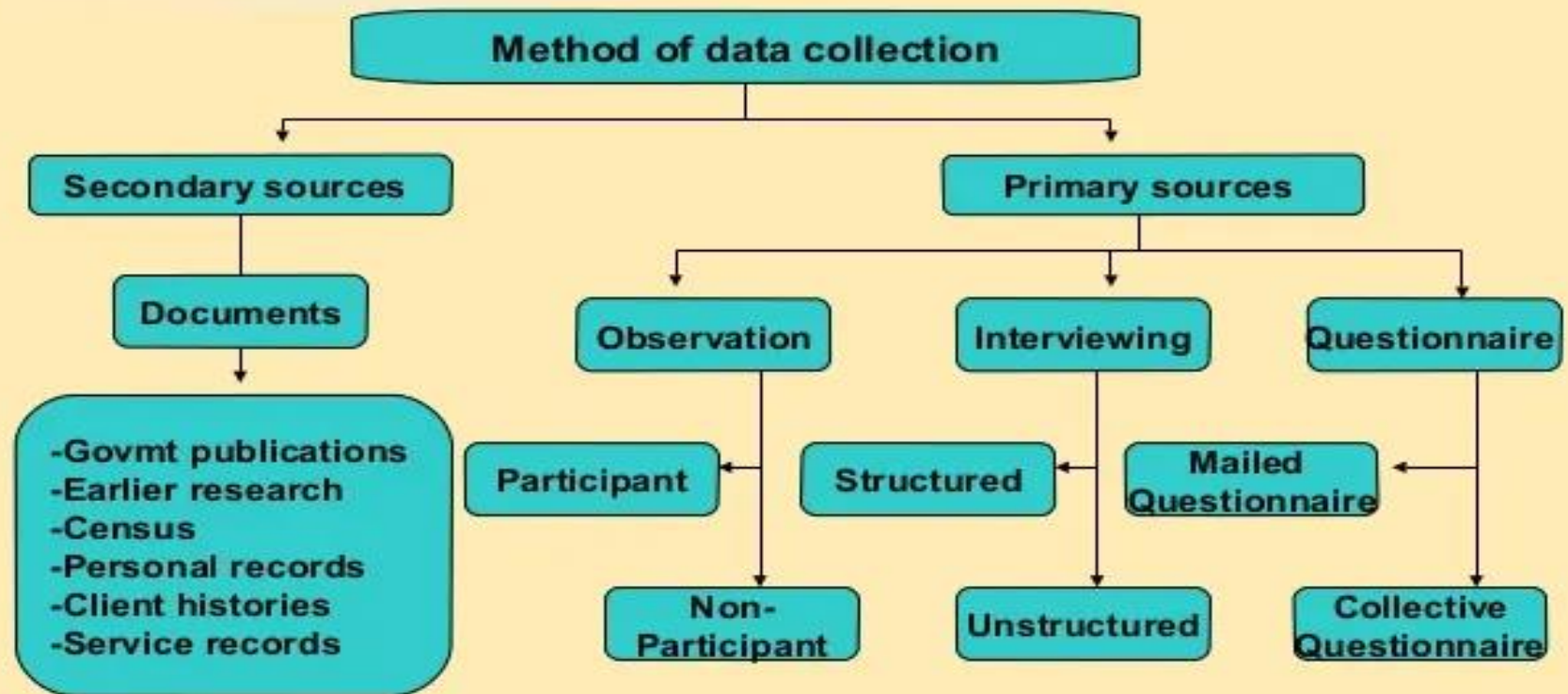
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DATA COLLECTION

❖ Data collection is the systematic approach to gathering and measuring information from a variety of sources to get a completed and accurate picture of an area of interest.

Purpose of data collection:

❖ To obtain information

❖ To keep on record

❖ To make decisions about important issues

DATA COLLECTION

Method of data collection

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                        ┌─────────────────────────────┐
                        │  Method of data collection  │
                        └─────────────────────────────┘
                          │                        │
        ┌──────────────────────┐        ┌──────────────────────┐
        │  Secondary sources   │        │    Primary sources   │
        └──────────────────────┘        └──────────────────────┘
                 │                    │           │            │
        ┌──────────────┐      ┌─────────────┐ ┌─────────────┐ ┌────────────────┐
        │  Documents   │      │ Observation │ │ Interviewing│ │ Questionnaire  │
        └──────────────┘      └─────────────┘ └─────────────┘ └────────────────┘
```

- Govmt publications
- Earlier research
- Census
- Personal records
- Client histories
- Service records

Participant

Non-Participant

Structured

Unstructured

Mailed Questionnaire

Collective Questionnaire

DATA COLLECTION TOOLS:

Some of the data collection tools are:

❖ Questionnaires.

❖ Survey.

❖ Interviews.

❖ Focus group discussion.

QUESTIONNAIRES.

❖ A questionnaire is a data collection method, in which you present a pattern of questions to a selected group of people.

Type of Questions :

- Closed-Ended Questions: Multiple-Choice Questions, Ranking Questions

- Open-Ended Questions: Paragraph , free-text responses.

- Dichotomous Questions: "yes" or "no" or "true" or "false."

SURVEY:

❖ Survey is a method of gathering information from a sample of people, traditionally with the intention of generalising the results to a larger population.

❖ Surveys provide a critical source of data and insights for nearly everyone engaged in the information economy, from businesses and the media to government and academics.

❖ An example of the survey :   Customer satisfaction survey (online, email, or paper) that a business uses to get actionable feedback from their clients so they can provide better service.

INTERVIEW:

An interview is a face-to-face conversation between two individuals with the sole purpose of collecting relevant information to satisfy a research purpose

Types of Interview:

➢ Structured Interviews

➢ Unstructured Interviews

FOCUS GROUPS

➤ Focus groups are a qualitative data collection method that involves gathering insights and opinions from a small group of individuals.

➤ This research involves asking open-ended questions to a group of individuals usually ranging from 6- 10 people, to provide feedback.

Qualitative Data Collection Methods

<u>Qualitative Data:</u>

- **Interviews:** For example, conducting interviews with customers to understand their perception of a product or service.

- **Observations:** For instance, observing and recording the behavior of children in a classroom to understand their learning patterns.

- **Focus Groups:** For example, conducting a focus group to gather insights on consumer preferences for a new product.

Quantitative Data Collection Methods

- **Surveys/Questionnaires:** For example, using a Likert scale to measure customer satisfaction with different aspects of a product.

- **Experimental Data:** For instance, conducting an experiment to measure the effect of different fertilizers on plant growth.

- **Test Scores:** For example, collecting data on students' performance on a math test to analyze their proficiency levels.

- **Sensor Data:** For instance, using temperature sensors to collect data on temperature variations in a climate study.

DATA CLEANING

➢ The process of maintaining a high data quality is called Data cleaning.

➢ Data cleaning is the process of detecting and correcting corrupt or inaccurate data.

➢ For example, let's say a survey questionnaire was put online and data was collected via a website.

What are the different types of data issues?

➢ Duplicate data:

➢ Conflicting Data:

➢ Incomplete Data:

➢ Invalid Data:

Unit-2, Session-1
Assessment-MCQ

THANK YOU

Assessment-MCQ

1) Which of the following best defines statistical data collection?

A) The process of gathering subjective opinions and qualitative descriptions.

B) The systematic collection, analysis, and interpretation of data for statistical purposes.

C) The collection of numerical information through interviews and observations.

D) The process of gathering data for descriptive purposes only.

2) What type of data does statistical data collection typically focus on?

A) Qualitative data.   B) Categorical data.

C) Discrete data.   D) **Numerical data.**

Assessment-MCQ

3) Which data collection method allows for the collection of in-depth narratives and opinions?

A) Surveys with closed-ended questions.   B) Observational studies.

C) Focus groups.   D) Experiments.

4) Which of the following best describes quantitative data collection?

A) Gathering subjective opinions and qualitative descriptions.

B) Collecting numerical measurements and conducting statistical analysis.

C) Observing behaviors and recording events without numerical measurements.

D) Conducting interviews to explore experiences and perspectives.

5) What type of data is generated from surveys with Likert scale questions?

A) Qualitative data. **B) Continuous data.** C) Categorical data.   D) Discrete data.

6) Which of the following is an example of primary data collection?

A) Analyzing data from a published research article.

B) Collecting data from government reports.

C) Conducting surveys to gather fresh data.

D) Obtaining data from an existing database.

7) What is the purpose of sampling in statistical data collection?

A) To collect data from the entire population.

B) To ensure random selection of participants.

C) To make data collection faster and more efficient.

D) To minimize errors and represent the population.

8)What is the purpose of data cleaning in statistical data collection?

A) To summarize and visualize the data.

B) To ensure the accuracy and consistency of the data.

C) To interpret the data and draw conclusions.

D) To select the appropriate statistical analysis technique.

9)Which of the following is an example of secondary data collection?

A) Conducting interviews to gather fresh data.

B) Analyzing data from government reports.

C) Observing behaviors and recording qualitative descriptions.

D) Collecting numerical measurements in a controlled experiment.

10) Which type of questions have only two options for the answer.

a) Open ended   b) closed ended   **c) Dichotomous**   d) None of the above

11) What are the different types of data issues?

a) Duplicate data   b) Conflicting Data   c) Incomplete Data   **d) All of the Above**

12) Quantitative Data can be collected by using which of the se method

a) Interviews   b) Focus group   **c) Experiments**   d)   None of the above

13) Qualitative Data can be collected by using which of the se method

a) Interviews   b) Focus group   c) observation   **d) All of the above**

14) What is the primary goal of statistical data collection?

A) To gather subjective opinions and qualitative descriptions.

B) To analyze and interpret numerical data.

C) To collect data for exploratory research.

D) To study social behaviours and interactions.

15) Which data collection method involves observing and recording behaviors in their natural setting?

A) Surveys   B) Experiments   **C) Observational studies**   D) Focus groups