# HINDUSTHAN INSTITUTE OF TECHNOLOGY

**(An Autonomous Institution)**

**(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai, Accredited with "A" Grade by NAAC and Accredited by NBA (Aero, CSE, ECE & Mech.)**

Valley Campus, Pollachi Main Road, Coimbatore 641 032.

## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

## Innovations in Teaching Learning Process

| Name | A. NISHA NANDHINI |
|---|---|
| Subject code & Title | 20CS510 - Data Warehouse and Mining |
| Academic year & Semester | 2023-2024 & V |

## Puzzle Based Learning

## "Data Warehousing Illumination: Unravelingthe 3 Bulbs and 3 Switches Puzzle"

### Objectives:

➢ Challenge and enhance participants' understanding of data warehousing concepts, data modeling.

➢ Empower Analytical reasoning skills in a fun and interactive manner.

➢ Through solving puzzles, participants will strengthen their ability to identify data anomalies,

➢ Optimize data flows, and troubleshoot issues commonly encountered in real-world data warehouse environments.

➢ By fostering teamwork, critical thinking, and problem-solving abilities.

➢ Empower participants to become proficient in navigating complex data landscapes, ultimately contributing to their professional growth and expertise in the field of data warehousing."

## Description:

➢ Start by understanding the different entities or attributes you're working with in the data warehouse. These could represent tables, columns, or data elements.

➢ Begin with an initial exploration of the data. This could involve running queries, examining sample data, or using data profiling tools to understand the characteristics of the data.

➢ Turn on Switch 1 (Data Transformation): Start by focusing on one attribute or entity and analyze its relationship with others. This could involve performing data transformations, joins, or aggregations to see how the data behaves.

➢ Observe Results (Bulbs): After applying transformations or operations, observe the impact on related attributes or entities. This could involve examining the output data, running validation checks, or comparing results with expected outcomes.

➢ Iterative Testing (Switch 2 and Switch 3): Repeat the process for other attributes or entities, gradually expanding your analysis to cover more areas of the data warehouse.

➢ Verify Relationships: As you identify relationships between entities or attributes, document your findings and verify them through further analysis or validation.

➢ Finalize Mappings (Switch Correspondence): Once you've identified and verified the relationships between different entities or attributes, finalize the mappings or associations..

## Outcomes:

➢ Entity-Attribute Mapping: The puzzle helps in identifying and establishing mappings between different entities and attributes within the data warehouse. Each bulbcorresponds to a specific entity or attribute, while each switch represents a different operation or transformation applied to the data.

➢ Optimized Data Flows: By understanding the relationships between different entities and attributes, the puzzle-solving process can lead to optimized data flows within the data warehouse. This involves streamlining data transformations, reducing unnecessary processing, and improving overall efficiency.

➢ Improved Data Quality: As relationships between entities and attributes are clarified, it becomes easier to identify and address data quality issues within the data warehouse. By mapping each switch to its corresponding bulb, data quality checks and transformations can be applied more effectively to ensure the accuracy and consistency of the data.

➢ Informed Decision-Making: The outcomes of solving the puzzle provide valuable insights into the structure and behavior of the data warehouse. This enables stakeholders to make more informed decisions regarding data management, resource allocation, and strategic planning.

➢ Documentation and Knowledge Sharing: Documenting the mappings and outcomes of the puzzle-solving process facilitates knowledge sharing and collaboration among data warehouse stakeholders. Clear documentation helps in communicating insights, best practices, and lessons learned, ensuring that valuable knowledge is retained and disseminated within the organization.

## Puzzle:

**Bulbs and Switches**

Let's say three light bulbs work in a room with a closed door. These bulbs outside the room have three connected switches. You can manipulate the switches until you open the door using this puzzle, but once the door is open, you cannot manipulate the switches anymore. You must determine which switch is connected to each bulb.
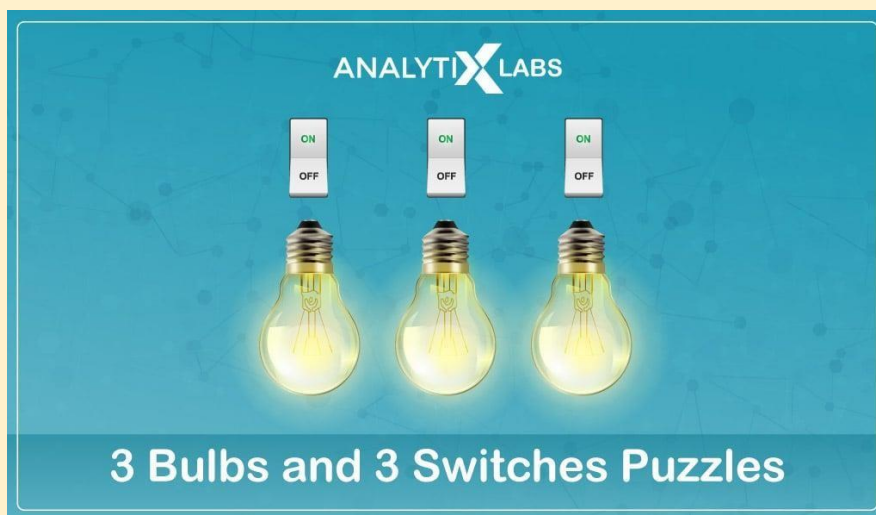


**Solution:**

The way you did in the previous puzzle, the common step is to label the subjects in your puzzle. You label three bulbs here as A, B, and C and the three switches as X, Y, and Z.

First, you will switch on X for 10 minutes so that the bulb connected to this switch gets hot. You then switch on Y and open the door to check the light bulb that is on and then check the other two bulbs to know which one is hot and which one is cold.

Let's say the hot bulb was A, the cold bulb was B, and the bulb light up when you opened the door was C. This would mean then-

X connects A
Y connects C
Z connects B