Earlier known as
B. V. B. College of Engineering & Technology
School of Computer Science and Engineering

Design Phase Report

Title: Database of Monuments In India

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Team Leader: Sagar Kanamadi

Responsibilities:

Sagar : Relational Schema, ER diagram &writing queries

Rohit : Data collection, data insertion & writing queries.

Pallavi : Table creation, data Insertion and writing queries.

Harshita. : Data insertion, report writing & writing queries.

Requirements Specification:

In our database, we have all the real-time data inserted in it so that if we execute it, we will get to know anything about the details of monuments according to our wishes.

It emphasizes about the region, ruler, architecture, & many other information regarding it as mentioned above.

We have covered all the variety of information that can be gathered regarding the monument such as nearby landmark, architecture styles, carving styles, time taken to build, unesco_id, visitors & special features.

Our database also acknowledges about the attacks on the monument if there are any & also the year in which it was attacked.

Design Questions to be answered

[Note: *Complete a logical design of a database. This section of the course project involves designing a database schema based on problem specification stated during proposal phase. Here, you need to submit a report summarizing your design which includes Entity-Relationship Model, ER to Relational mapping, data dictionary, data flow diagram, Normalization.* ***]***

Question 1: From the problem description, identify the entities that need to be represented in the database, the attributes of each entity, the relationships between the entities, and the cardinality ratios of each relationship.

Problem Description: As we all know, India is a country of rich & diverse cultural heritage. The monument plays a very important role in preserving the rich cultural heritage & history of India. They symbolise different periods in India's long history. Our database helps people to get to know the various information regarding the monument (It's ruler, region, architecture, critiques, attacks, traits, etc…) easily according to their wishes.

Identification of Entities and the attributes of each entity:

ruler(k_id, dynasty, ruling_years, no_of_monuments_built)

critique(unseco_id, visitors, ratings)

monuments(m_id,name,location,k_id,built_by,built_year,time_taken, unesco_id)

architecture(m_id,architecture_style, type, carvings_style, material,height)

region(m_id, location, area, landmark)

attack(m_id, attack_by, year)

trait(unesco_id, features)

Relationships:

A relationship "construct" exists between the entities ruler and monuments since one ruler can construct more than one monument. (Cardinality Ratio-1:N)

A relationship "in" exists between monument and region as many monuments can exist in a given region. (Cardinality Ratio-1:N)

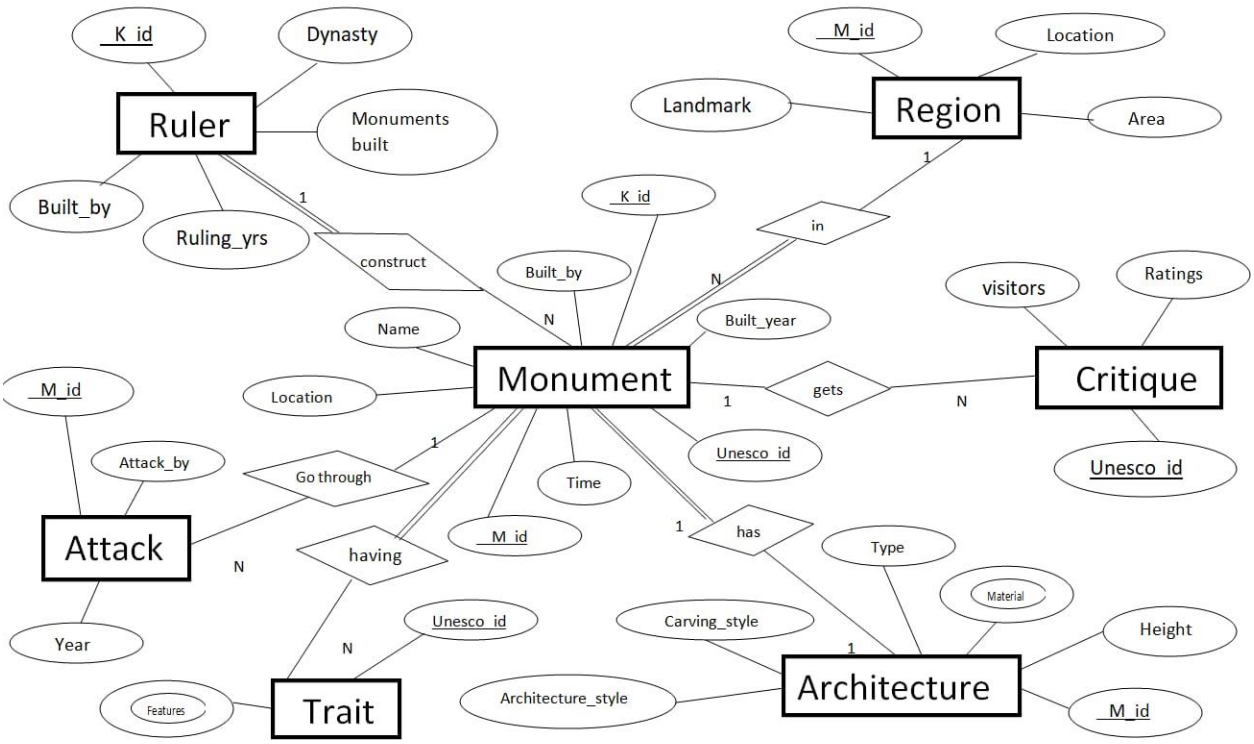
A relationship "Go through" exists between attack and monument as one monument can undergo more than one attack (Cardinality Ratio-1:N)

A relationship "having" exists between monument and trait as one monument can have many characteristic traits(Cardinality Ratio-1:N)

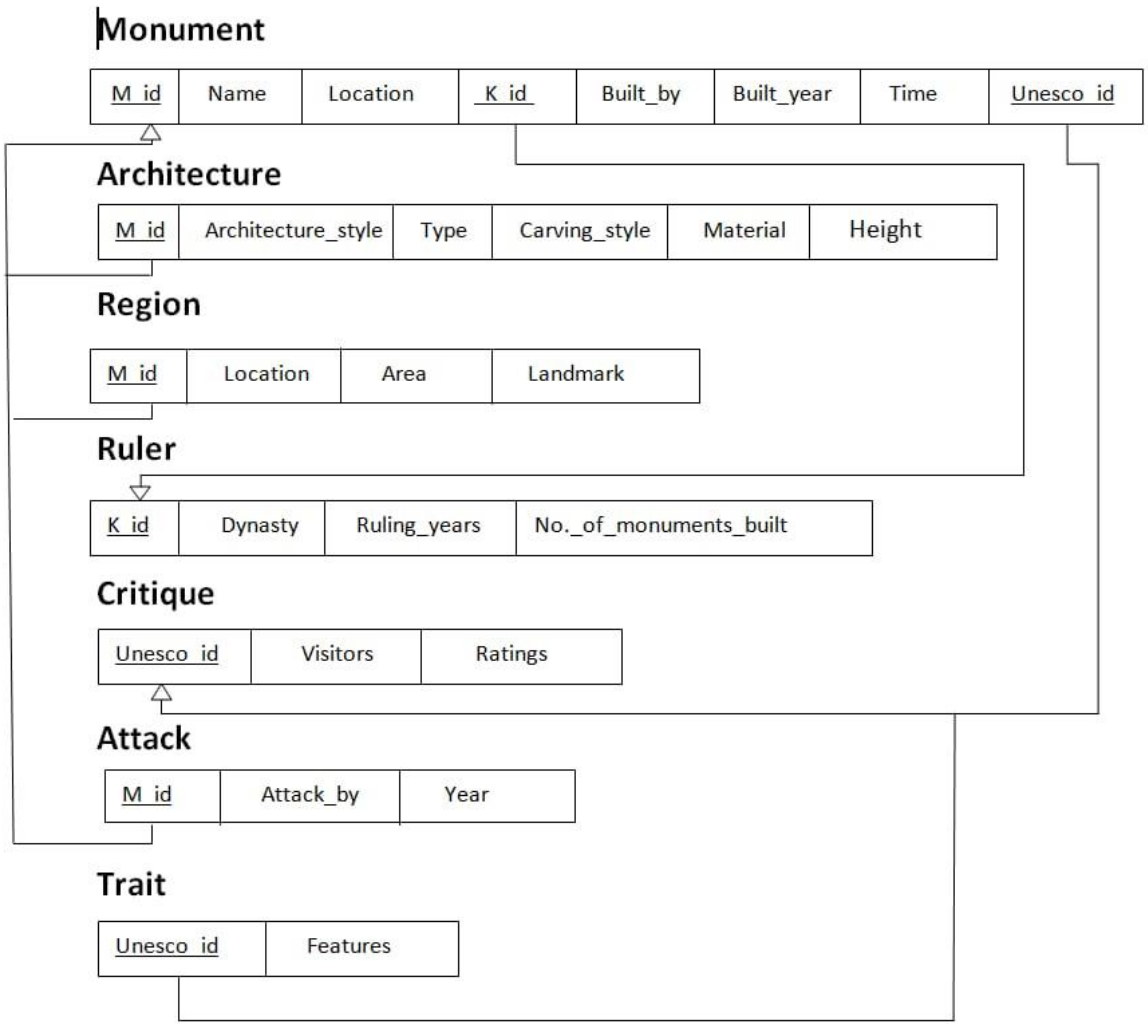
A relationship "has" exists between monument and architecture as one monument will have only one architecture style(Cardinality Ratio-1:1)

A relationship "gets" exists between monument and critique as one monument can receive more than one critiques(Cardinality Ratio-1:N)

Question 2: Draw an Entity-Relationship Diagram illustrating the information you have identified.



Question 3: Draw an ER to Relation Mapping illustrating the information you have identified.



Question 4: Draw **alternate** Entity-Relationship Diagram illustrating the information you have identified in Question 1 that you think are most likely to occur.

The above drawn ER diagram itself is the optimal ER diagram as the ER diagram contains all the required attributes, entities and also avoiding redundant values which all together compile and form an Optimal Database System. Cardinality ratios are shown properly and the ER diagram is drawn by referring the rules.

Question 5: Draw a Data Dictionary illustrating the information you have identified in Question 6.

Object (Entity)	**Name (Attribute)**	**Type (Data type)**	**Description**	**Primary Key**	**Foreign Key**
Monuments	Name	String	The first name of the customer	No	No
Monuments	Built_by	Integer	Unique Identification number for the customer	Yes	No
Monuments	Built_year	Integer	Monument built year	No	No
Monuments	Time_taken	Integer	Time taken to build the monument	No	No
Monuments	Location	Varchar	Location of the Monument	No	No
Monuments	unesco_id	Integer	Identification of monument	No	No
Monuments	M_id	Integer	Unique Identification of Monument	Yes	No

Monuments	k_id	Integer	Unique identification of King	No	Yes
Architecture	m_id	Integer	Unique Identification of Monument	No	Yes
Architecture	architecture_style	Varchar	Architecture Style	No	No
Architecture	Type	Varchar	Type of Architecture	No	No
Architecture	Carving_style	Varchar	Type of Carving	No	No
Architecture	Material	Varchar	Material used	No	No
Architecture	Height	Float	Height	No	No
Ruler	k_id	Integer	Unique identification of King	Yes	No
Ruler	Dynasty	Varchar	King's dynasty	No	No
Ruler	ruling_years	Integer	Ruling years	No	No
Ruler	no_of_monuments_built	Integer	No_of_monuments_built	No	No

Question 6: Normalization: Are all the relations in your chosen schema in 3NF? Are they in BCNF? Explain your answers. If any of your relations are not in BCNF, normalize them to BCNF. If you choose to normalize your relations only till 2NF or 3NF, explain your reasons (e.g., the amount of redundancy introduced is limited or some other valid reason).

Normalised Solution 1:

Consider the attributes in our relation schema, the primary key of an entity functionally determines the other attributes as the values in LHS have to be unique and distinct

Normalizing 1: The relation ruler to monument

1NF: It obeys 1NF since all the attributes are not multivalued in nature

2NF: All the values are fully dependent, hence it obeys 2NF

Normalizing 2:

The relation region to Monument

1NF: It obeys 1NF since all the attributes are not multivalued in nature

2NF: All attributes which were partially dependent are eradicated and hence it obeys 2NF

Normalizing: 3:

The relation Monument to critique

1NF: It obeys 1NF since all the attributes are not multivalued in nature

2NF:All the values are fully dependent, hence it obeys 2NF

Normalizing 4:

The relation Monument to Trait

1NF: It does not obey 1NF since the attribute "features" is multivalued hence, the care w.r.t primary key being distinct is taken into consideration

2NF: All the values are fully dependent, hence it obeys 2NF

Normalising 5:

The relation Monument to attack

1NF: It obeys 1NF since all the attributes are not multivalued in nature

2NF: All attributes which were partially dependent are eradicated and hence it obeys 2NF

Justification: Since it is a real time database, few of the unavoidable multiple values present in the database for example: attribute "features" in trait is present and hence it does not have many NULL values. That is why we have concluded the normalisation till 2NF only.

Question 7: Choose the **optimal** normalized schema from Question 9 and justify why you think this is an optimal solution.

1. The solution mentioned in question number 9 is our optimal design because

*There is no presence of many NULL values

*There exist no partial dependency

*No transitive dependency and no non prime attribute is determining the other non prime attributes

References:

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