Assignment 2

Database Design

Group 10

EMERALD

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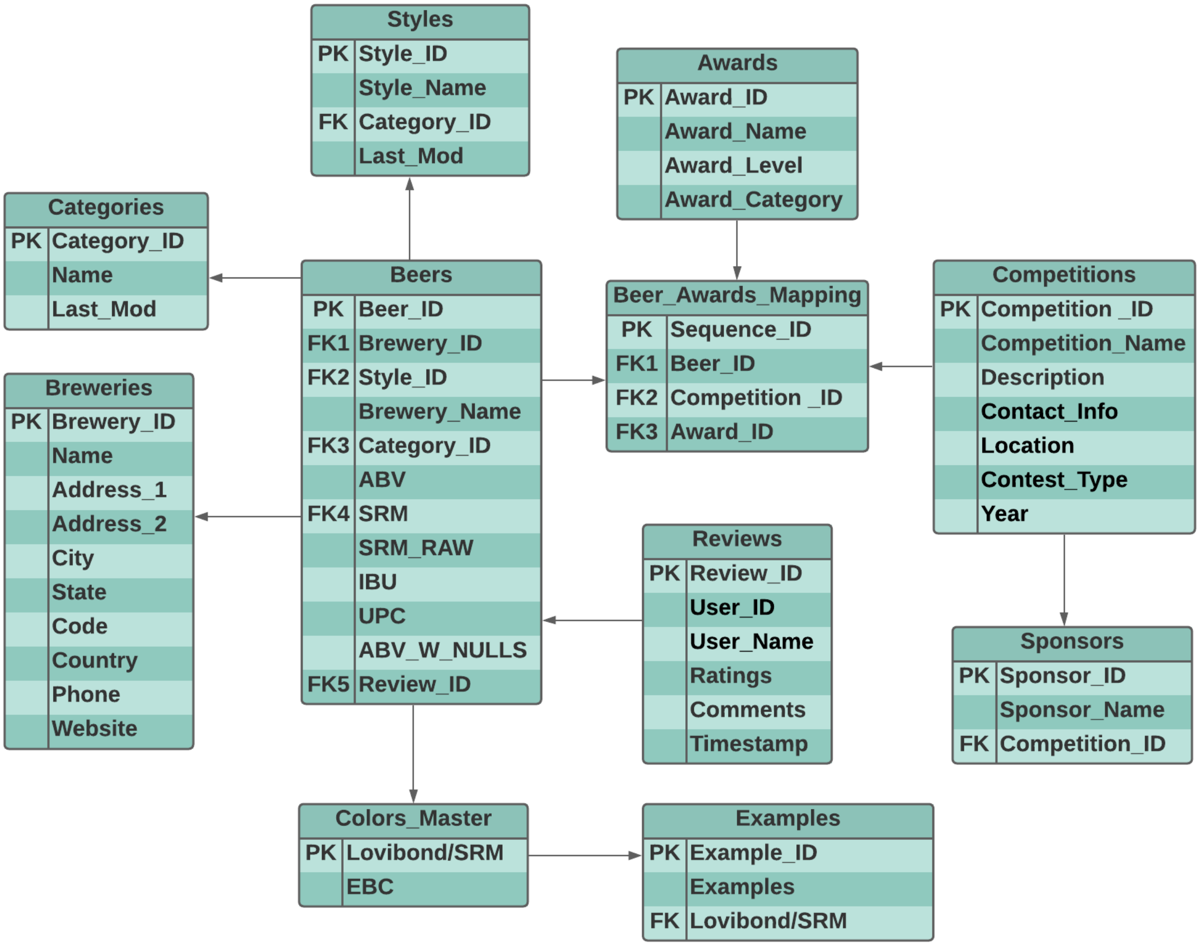
1. **Update the design to fulfill the requirements specified in the Beers scenario below. This should include developing an extended ERD.**



Styles	
PK	Style_ID
	Style_Name
FK	Category_ID
	Last_Mod

Awards	
PK	Award_ID
	Award_Name
	Award_Level
	Award_Category

Categories	
PK	Category_ID
	Name
	Last_Mod

Beers	
PK	Beer_ID
FK1	Brewery_ID
FK2	Style_ID
	Brewery_Name
FK3	Category_ID
	ABV
FK4	SRM
	SRM_RAW
	IBU
	UPC
	ABV_W_NULLS
FK5	Review_ID

Beer_Awards_Mapping	
PK	Sequence_ID
FK1	Beer_ID
FK2	Competition _ID
FK3	Award_ID

Competitions	
PK	Competition _ID
	Competition_Name
	Description
	Contact_Info
	Location
	Contest_Type
	Year

Breweries	
PK	Brewery_ID
	Name
	Address_1
	Address_2
	City
	State
	Code
	Country
	Phone
	Website

Reviews	
PK	Review_ID
	User_ID
	User_Name
	Ratings
	Comments
	Timestamp

Sponsors	
PK	Sponsor_ID
	Sponsor_Name
FK	Competition_ID

Colors_Master	
PK	Lovibond/SRM
	EBC

Examples	
PK	Example_ID
	Examples
FK	Lovibond/SRM

2. **Correct any errors / deficiencies in the existing design. That is, reduce data redundancy.**

   - As evident from the existing DB design, the **Colors** table has multiple values(in form of comma separated values) for the "**examples**" attribute in each row. So, this redundancy has been eliminated by normalizing the Colors table.
   - Apart from that, there are no data redundancies present in the existing and extended database design.

3. **Normalize the entire design to 3rd normal form.**

   - After eliminating the data redundancy for Colors table, we can say that the data satisfies the 1 NF. The details are shown in the ER Diagram. Apart from this, the entire design already satisfies 1 NF.
   - Secondly, there is no partial dependency due to the absence of composite key, in the overall database, it also satisfies 2NF.
   - Lastly, there is no transitive dependency on the non-key attributes, hence the entire design is in 3 NF.

4. **For each synthetic primary key created either: 1) list a candidate key or, 2) explicitly state no viable candidate key exists.**

   - Since we have not created any synthetic primary key, we can say that no viable candidate key exists.

5. **List all critical assumptions made.**

The five critical assumptions are listed below:

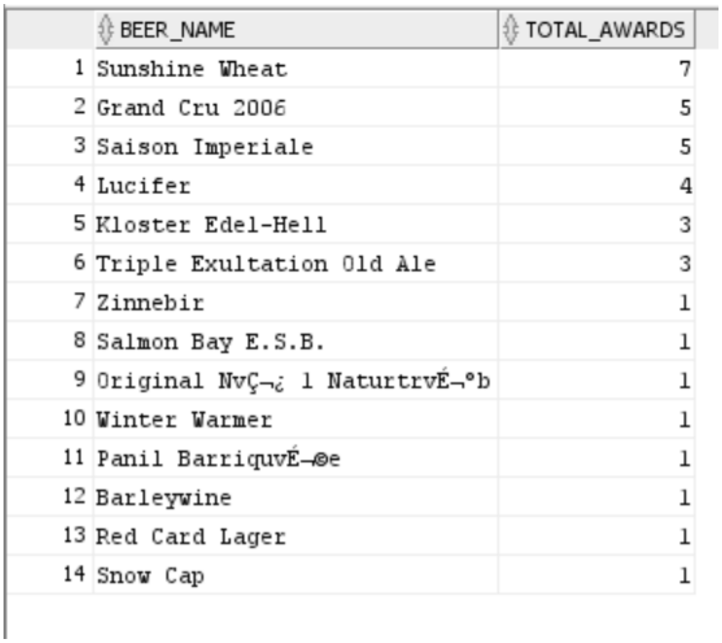
- One beer can get multiple awards.
- One beer can participate in multiple competitions.
- Review Ratings would range from 1 to 5.
- New comments in reviews table are appended by means of pipe (|) operator. Anything other than pipe operator is one review comment.
- All the sponsors are investing equal amounts of sponsorship for all the competitions.
- For the “**Reviews**” table, the requirement is to have reviews appending the existing reviews, thereby having multiple values per record which violates the 1 NF. Hence in this case, the assumption is to have the redundant version of the table data because of the requirement stated.

6. **Assume you implemented your complete design. Write two interesting queries that can now be run using your design. Include the SQL statement for each query, along with a description.**

1) Display the top 10 beers that won maximum awards in the year 2014 for different award categories. (Gold, Silver, Bronze)

```
SELECT
        b.beer_name,
        COUNT(bm.award_id) as TOTAL_AWARDS
FROM
        beer_award_mapping bm
        INNER JOIN  beers b
                ON (bm.beer_id=b.beer_id)
        INNER JOIN  awards a
                ON (bm.award_id=a.award_id)
        INNER JOIN competitons c
                ON (bm.competition_id=c.competition_id)
WHERE c.year = '2014'
AND award_level IN ('Gold','Silver','Bronze')
GROUP BY
        b.beer_name
ORDER BY
        TOTAL_AWARDS desc;
```

<u>Output:</u>



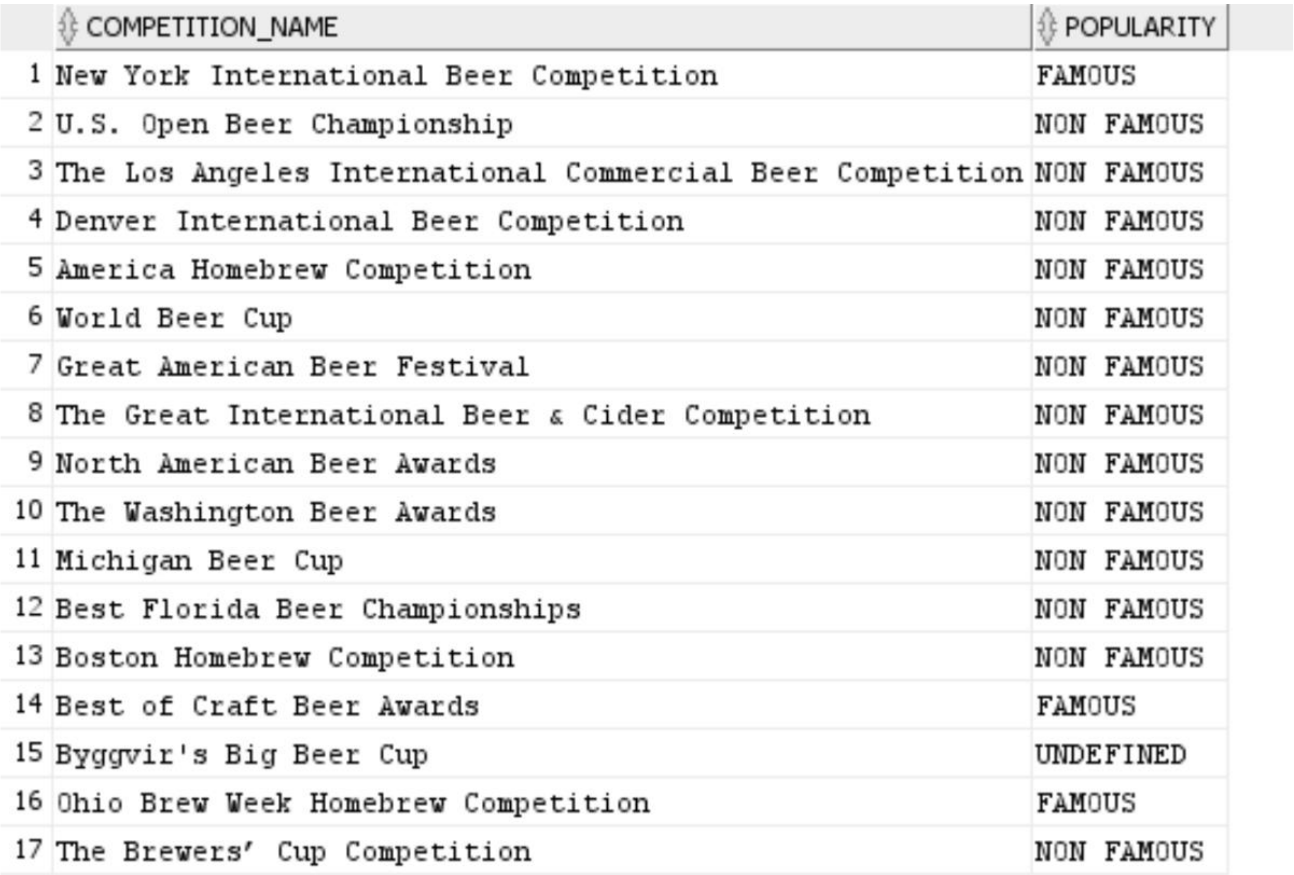
	BEER_NAME	TOTAL_AWARDS
1	Sunshine Wheat	7
2	Grand Cru 2006	5
3	Saison Imperiale	5
4	Lucifer	4
5	Kloster Edel-Hell	3
6	Triple Exultation Old Ale	3
7	Zinnebir	1
8	Salmon Bay E.S.B.	1
9	Original NvÇ¬¿ 1 NaturtrvÉ¬°b	1
10	Winter Warmer	1
11	Panil BarriquvÉ¬®e	1
12	Barleywine	1
13	Red Card Lager	1
14	Snow Cap	1

2) Display popularity of competition (Famous, Non-Famous, Undefined) based on count of beers and no of sponsors.

Famous - beers count > 5 and sponsor count >7
Non-Famous - beers count <=5 and sponsor count <= 7

```
SELECT
        qry2.competition_name,
        (CASE WHEN count_spons<=5 AND count_beer<=7 THEN 'NON FAMOUS'
                WHEN count_spons>5 AND count_beer>7 THEN 'FAMOUS'
                ELSE 'UNDEFINED'
        END) "POPULARITY"
FROM
        (SELECT
                qry1.competition_id,
                qry1.competition_name,
                MAX (qry1.spcnt) count_spons,
                MAX (qry1.beercnt) count_beer
        FROM
                (SELECT
                        cn.competition_id,
                        cn.competition_name,
                        COUNT (sn.sponsor_id) AS spcnt,
                        0 beercnt
                FROM
                        Competitons cn
                        INNER JOIN sponsors sn
                                ON (cn.competition_id = sn.competition_id)
                GROUP BY
                        cn.competition_id ,
                        cn.competition_name
                UNION ALL
                SELECT
                        cn.competition_id,
                        cn.competition_name,
                        0 spcnt,
                        COUNT (ba.beer_id) beercnt
                FROM
                        Competitons cn
                        INNER JOIN beer_award_mapping ba
                                ON (cn.competition_id = ba.competition_id)
                GROUP BY
                        cn.competition_id,
                        cn.competition_name
                ) qry1
        GROUP BY
                qry1.competition_id,
                qry1.competition_name
        ORDER BY
                qry1.competition_id ASC
) qry2;
```

Output:



	COMPETITION_NAME	POPULARITY
1	New York International Beer Competition	FAMOUS
2	U.S. Open Beer Championship	NON FAMOUS
3	The Los Angeles International Commercial Beer Competition	NON FAMOUS
4	Denver International Beer Competition	NON FAMOUS
5	America Homebrew Competition	NON FAMOUS
6	World Beer Cup	NON FAMOUS
7	Great American Beer Festival	NON FAMOUS
8	The Great International Beer & Cider Competition	NON FAMOUS
9	North American Beer Awards	NON FAMOUS
10	The Washington Beer Awards	NON FAMOUS
11	Michigan Beer Cup	NON FAMOUS
12	Best Florida Beer Championships	NON FAMOUS
13	Boston Homebrew Competition	NON FAMOUS
14	Best of Craft Beer Awards	FAMOUS
15	Byggvir's Big Beer Cup	UNDEFINED
16	Ohio Brew Week Homebrew Competition	FAMOUS
17	The Brewers’ Cup Competition	NON FAMOUS