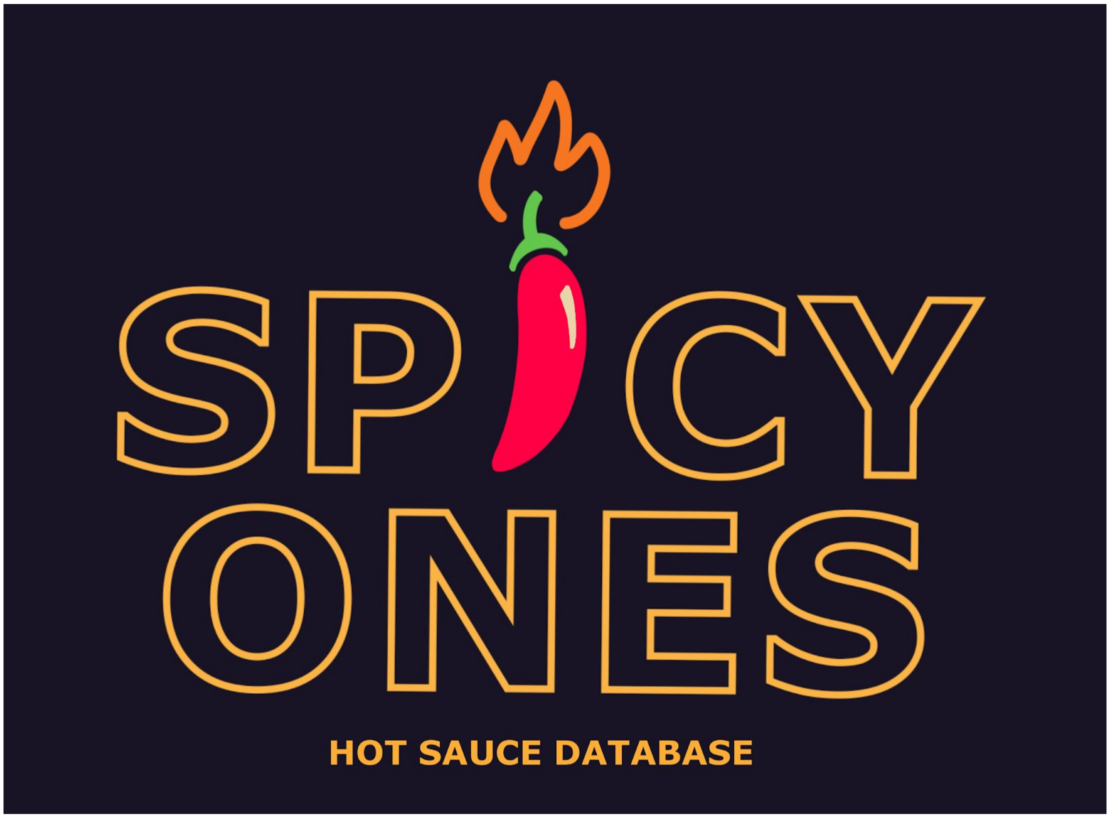
Spicy Ones



Created by Ilya Bokov, Mariko Briggs, Mercedes Chea, Korey Pecha

Abstract

Based on the YouTube series *Hot Ones*, Spicy Ones is a database and website that displays the hot sauces and celebrities featured on the YouTube show. Our corresponding website allows fans to interact with our database via seeing the results of interesting queries and seeing information about hot sauces that they search for. We aim to allow users of our database to easily find and filter information about these sauces at ease. To achieve this, we used MySQL and Microsoft Azure to create and host our database. Our work can be seen at www.spicyones.com.

Introduction

Hot Ones, "the show with hot questions, and even hotter wings."

First We Feast's *Hot Ones* is, at this point, a cultural phenomena responsible for bringing smaller hot sauces into the mainstream. *Hot Ones* is a YouTube show where the host, Sean Evans, is accompanied by a guest celebrity as they eat ten wings of increasingly hot constitution. Each video garners millions of views as hot sauce fans around the world rally around the celebration of spicy sauces.

As fans of the series, we wanted to make a database that would allow hot sauce enthusiasts, as well as *Hot Ones* viewers, to easily be able to search and filter information about their favorite celebrities and spicy hot sauces from the show. Our database includes the sauces from each corresponding season with their scoville units and primary pepper, celebrities and their professions, and seasons and their list of episodes. Also included is a Hall of Shame that features celebrities who have failed the challenge and did not finish all of the wings.

Objective and scope

Our objective is to create an extensive and detailed database containing various hot sauce attributes to document the wide range of sauces available to the modern consumer. Such attributes include the name and producer of the sauce, the Scoville/heat rating (SHU), the main ingredients and flavor profile of the sauce, whether or not it was on the show Hot Ones and which celebrity tried it, the origin of the sauce, and the release date of the sauce. Additionally, as a database heavily inspired by the show Hot Ones, additional information such as the list of celebrities who passed/failed the challenge may be listed. There is a lot of interesting information available regarding hot sauces, but it does not exist in a single consolidated place.

Currently, there is no existing resource for fans of the show Hot Ones. We are motivated by the idea of a comprehensive, detailed, and functional database for all hot sauce fans. Hot sauce is persistent across many regions and cultures, manifests in mainstream forms or by small-batch independent producers, and transforms bland food into an adventure of the senses. However, it can be hard for individuals (both amateurs and spicy connoisseurs alike) to find any consolidated information about hot sauces beyond the field's biggest players (names that we've all heard of, such as McIlhenny Co.'s Tabasco and Huy Fong's Sriracha). As such, there is a need for SPICY ONES.

The project's scope covers information about the hot sauces on the show and the featured guests. It is aimed specifically at fans of the show, but does contain information that would be valuable to any hot sauce fan.

Relation to other existing work

There are a few existing hot sauce database solutions such as "HotSauceFever" and "TheChilliHunter" but these databases are limited in terms of functionality and overall completeness. Additionally, these databases target hot sauces in general; there is no existing site that is aimed specifically at fans of the show *Hot Ones*.

Our first example, "HotSauceFever", is heavily focused on reviews; however, it's only ability to search is limited by hot sauce name. Since the information about the hot sauces is mostly gathered by the user input, many hot sauces are missing specific details such as the pepper used, or scoville heat units (SHU).

"TheChilliHunter" database in contrast has better search options; however, it consists of a much smaller collection of various hot sauces and no SHU. SHU is a very important variable to consider, as there is no other way to quantify the heat of hot sauces.

Our hot sauce database has extensive information about the hot sauces featured on the show *Hot Ones*. We are targeting a more specific audience in this way, but also ensuring that this audience has access to a wide suite of information and data points about the featured sauces. For those who are interested in more than just the sauces, we also have extensive information about the guests of the show and how well they did on their episode.

Main body of work and overview of architecture

Initially, we created the basic outline of our database schema using MySQL and LucidChart. To develop the front end portion of the project, we used Visual Studio and asp.net to visually display the outcome of our queries.

Our normalized database contains nine tables. We have a company table, which describes various aspects of a hot sauce company - its name, where the headquarters are, etc. This table is referenced by our hot sauce table. We also have a primary pepper table, which describes the main pepper used in a hot sauce. It has attributes such as the name of the pepper and its Scoville heat level. It has a pepper ID value which is referenced by the hot sauce table. The hot sauce table is arguably one of our more important tables -- it describes individual hot sauces, the main pepper in the hot sauce, the company that produced it, its scoville level, and more. There is also a "featured in" table which accounts for hot sauces that have been featured across multiple episodes or seasons. This references the hot sauce table and the season table. The season table is a reference to each season of the show as well as the year that season started. This is relevant in our next table, the episodes table, which has basic data such as the name of the episode, its airdate, and of course, the season it is in. Our "appears in" table connects which guests have been on the show and what episodes they've appeared in. The guest table associates a guest and their profession, and finally the "Hall of Shame" table associates a guest and the hot sauce they couldn't get past during their Hot Ones run.

We wrote several queries that refer to data across multiple tables and return interesting and meaningful datasets. These queries are written with a fan of the show in mind -- what information might they want to see? These queries attempt to capture and respond to a wide range of unique questions a fan of the show might have.

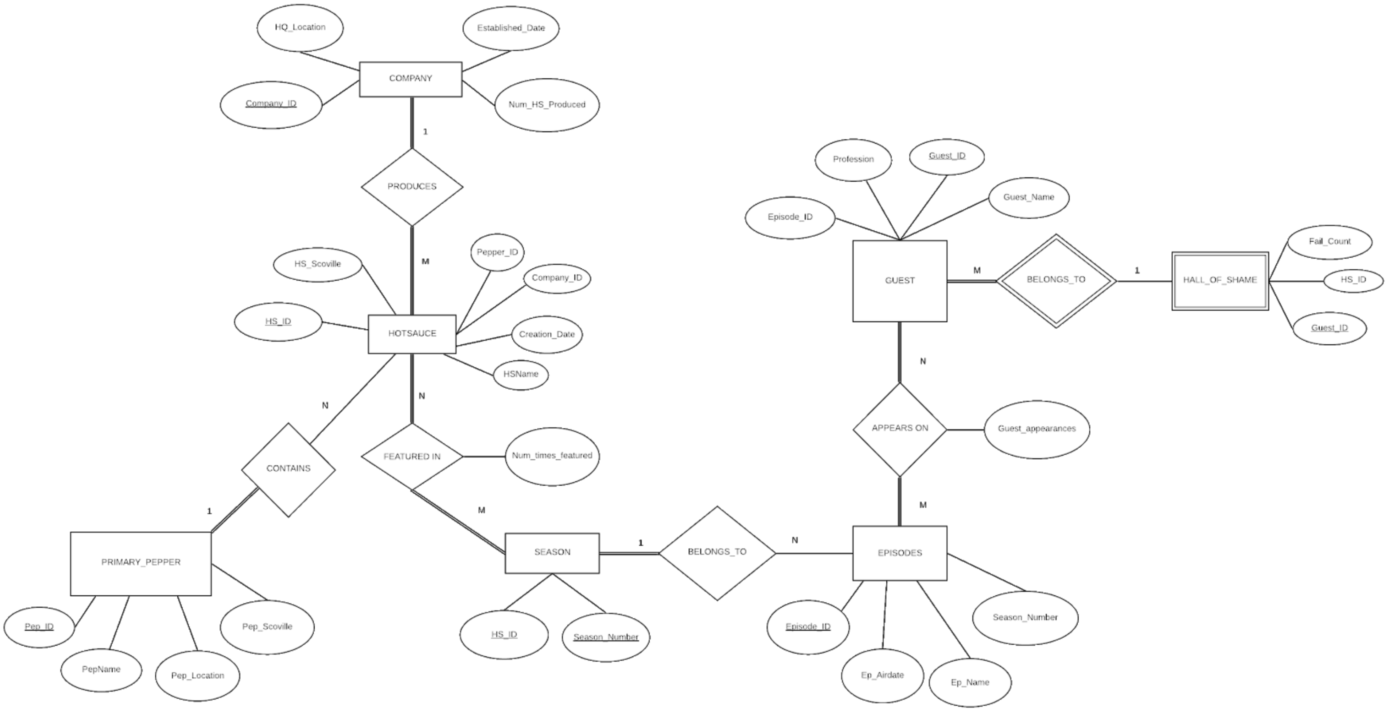
Our first query returns basic information about a Hot Ones guest - their name, the episode they were on, and the season. The second query summarizes all hot sauce ID values from a given season if they have a Scoville level higher than 200,000. This query could be modified to take a user input as the (currently arbitrary) Scoville unit threshold. The third query shows all of the hot sauces that are above average in heat, for those who are looking for particularly spicy sauces from the show. The fourth query displays extensive information about the hot sauces and their corresponding peppers - this includes the scoville level of the hot sauce and their main pepper, the creation date of the sauce, and where the pepper comes from. The fifth query displays all of the musicians and comedians that have been on the show, along with their episode and season number. Like our second query, this could be modified to display information about any profession. The sixth query pays homage to the hot sauces that have had repeat appearances - it returns a list of the most frequent hot sauces. The seventh query attempts to correlate a guest's profession and their fail rate. If you've ever wondered, "are musicians weaker to spice than comedians?", then this query would be a great way to explore that. The eighth query shows the relationship between the fail rate and head of a hot sauce (and the hot sauce's main pepper). The ninth query focuses on the guests that have failed the Hot Ones challenge, and shows you what episode you can watch to witness it. The final query that we wrote shows the hot sauce that was created the longest time before its appearance on an episode.

Conclusions with contribution

Databases are complex tools that have the ability to add great functionality in how we interact with large data sets. Our coursework has introduced us to tools that have facilitated the creation of Spicy Ones. Spicy Ones uses data about the show Hot Ones to help hot sauce fans get access to interesting and meaningful information. This data and corresponding schema have been manipulated in a number of ways; for example, normalization helped isolate certain aspects of the data and allow it to be independent.

Design diagrams

Below, we have our entity-relationship diagram, our Boyce-Codd normalized database schema, and the database schema that we had before normalization. The proof for normalization is also included.



Appendix A. ER Diagram

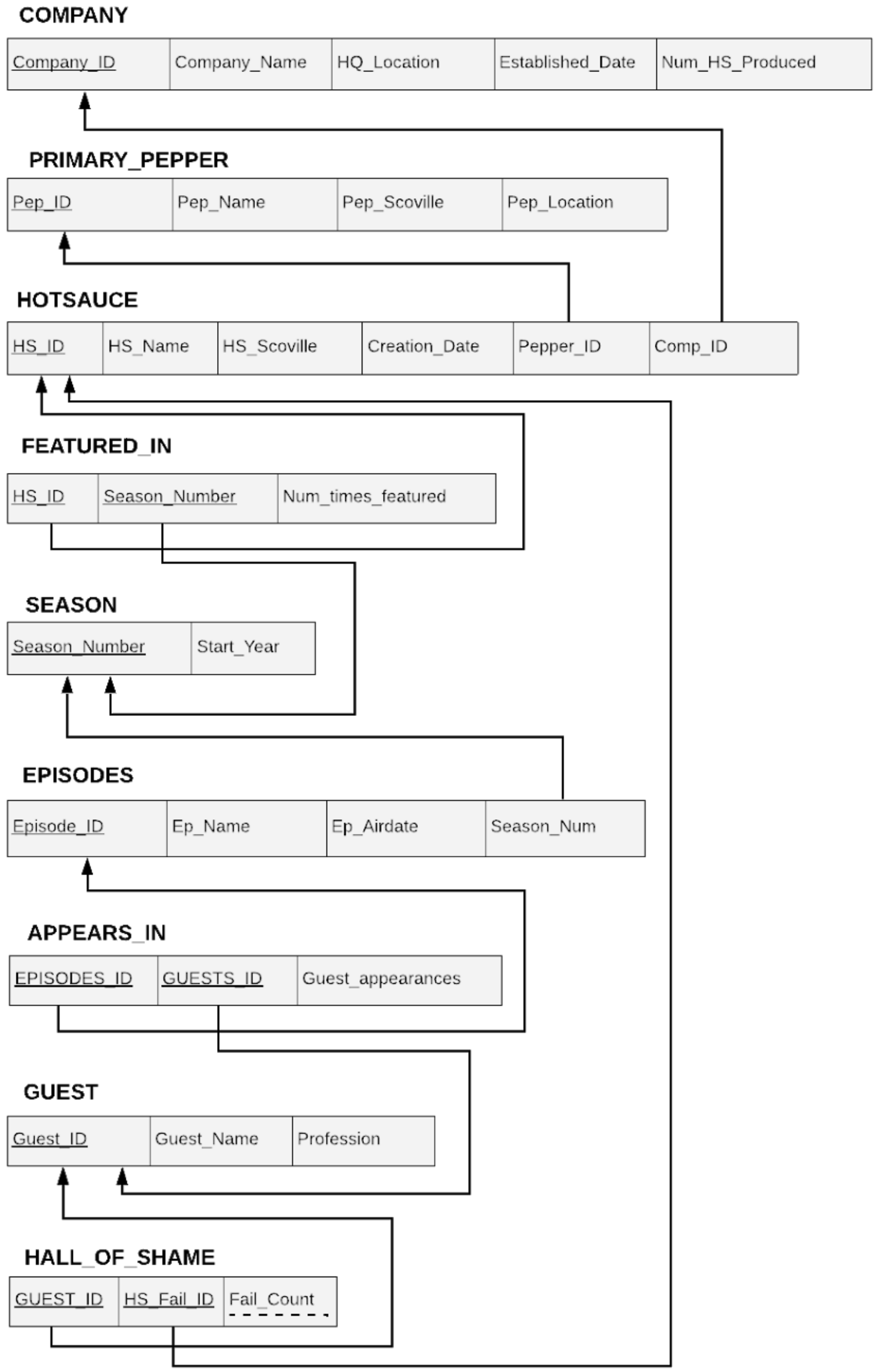
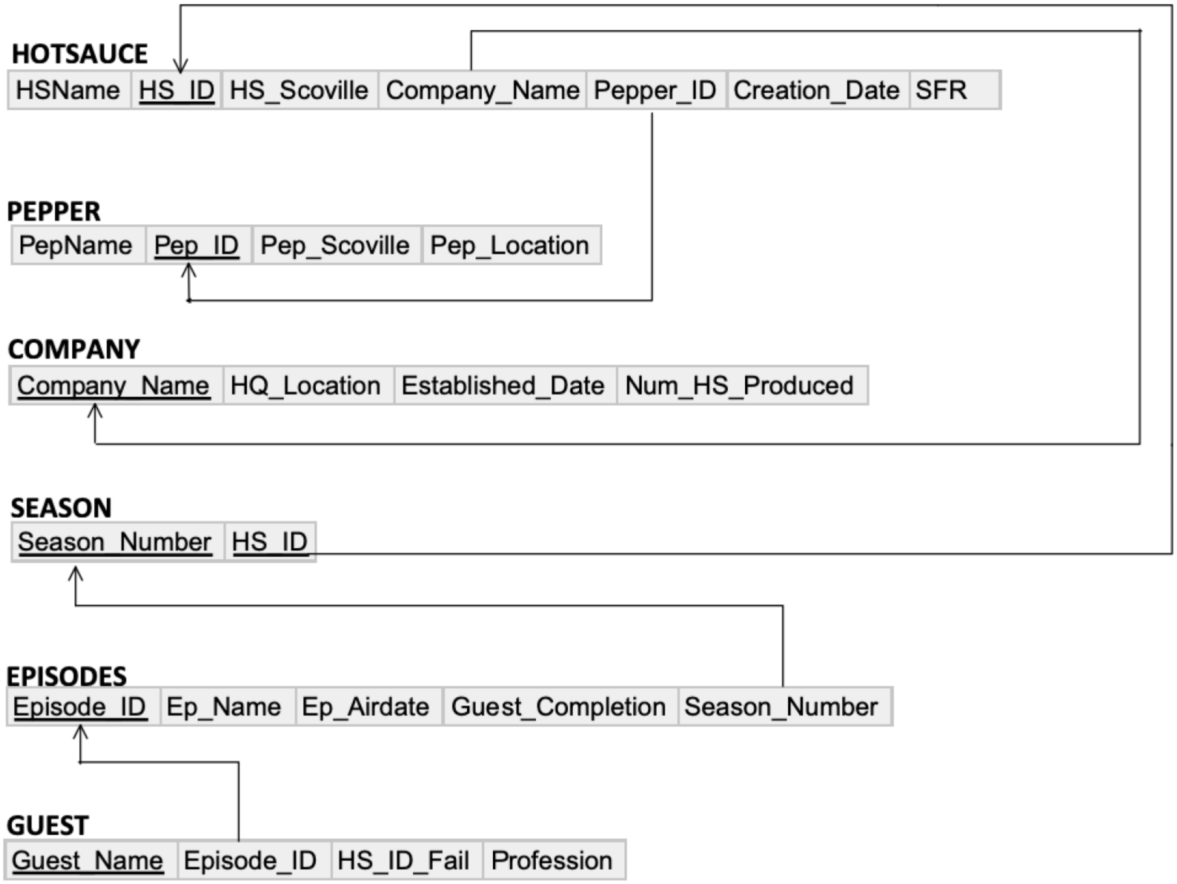

COMPANY
Company_ID | Company_Name | HQ_Location | Established_Date | Num_HS_Produced
PRIMARY_PEPPER
Pep_ID | Pep_Name | Pep_Scoville | Pep_Location
HOTSAUCE
HS_ID | HS_Name | HS_Scoville | Creation_Date | Pepper_ID | Comp_ID
FEATURED_IN
HS_ID | Season_Number | Num_times_featured
SEASON
Season_Number | Start_Year
EPISODES
Episode_ID | Ep_Name | Ep_Airdate | Season_Num
APPEARS_IN
EPISODES_ID | GUESTS_ID | Guest_appearances
GUEST
Guest_ID | Guest_Name | Profession
HALL_OF_SHAME
GUEST_ID | HS_Fail_ID | Fail_Count

Figure C1. Boyce-Codd normalized schema


HOTSAUCE
HSName | HS_ID | HS_Scoville | Company_Name | Pepper_ID | Creation_Date | SFR
PEPPER
PepName | Pep_ID | Pep_Scoville | Pep_Location
COMPANY
Company_Name | HQ_Location | Established_Date | Num_HS_Produced
SEASON
Season_Number | HS_ID
EPISODES
Episode_ID | Ep_Name | Ep_Airdate | Guest_Completion | Season_Number
GUEST
Guest_Name | Episode_ID | HS_ID_Fail | Profession

Appendix C2. Schema prior to Boyce-Codd normalization.

Identifying Function Dependencies:

1. **HOTSAUCE**
   HS_ID -> { HS_Scoville, Comp_ID, Pepper_ID, Creation_Date}
2. **PEPPER**
   Pep_ID -> {PepName, Pep_Scoville, Pep_Location}
3. **COMPANY**
   Company_ID -> {Company_Name, HQ_Location, Established_Date, Num_HS_Produced]
4. **SEASON**
   {Season_Number, Start_Year}
5. **EPISODES**
   Episode_ID -> {Ep_Name, Ep_Airdate, Season_Num}
6. **GUEST**
   Guest_ID -> {Guest_Name, Profession}
7. **APPEARS_IN**
   {Episodes_ID, Guests_ID} -> Guest_appearances
8. **FEATURED_IN**
   {HS_ID, Season_Number} -> Num_times_featured
9. **HALL_OF_SHAME**
   {Guest_ID, HS_Fail_ID} -> Fail_Count

I. Identifying Candidate Keys:

1. **HOTSAUCE**
   HS_ID
2. **PEPPER**
   Pep_ID
3. **COMPANY**
   Company_ID
4. **SEASON**
   {Season_Number, HS_ID}
5. **EPISODES**
   Episode_ID
6. **GUEST**
   Guest_ID
7. **APPEARS_IN**
   {Episodes_ID, Guests_ID}
8. **FEATURED_IN**
   {HS_ID, Season_Number}
9. **HALL_OF_SHAME**
   {Guest_ID, HS_Fail_ID}

II. Handling Functional Dependencies That Have Determinants Which Are Not Candidate Keys.

We have no cases like this.

Appendix B. Normalization Proof

Thoughts about future work and references

Currently, the data that powers our database and queries is hardcoded and was collected by hand. As such, the website and database does not contain all of the information possible about *Hot Ones*. In the future, to ensure that the database is always up-to-date, it may benefit from external tooling that pulls requisite information from online automatically and regularly. This could exist in the form of web scrapers that regularly pull up-to-date hot sauce info, or update the database as new YouTube videos of the series are uploaded.

The website, though well-featured, also has room to grow. Some features that we could implement include a more robust search option that would allow for users to search with their own queries.

Overall goals

We are motivated by the idea of a comprehensive, detailed, and functional database for all hot sauce fans. Hot sauce is persistent across many regions and cultures, manifests in mainstream forms or by small-batch independent producers, and transforms bland food into an adventure of the senses. However, it can be hard for individuals (both amateurs and spicy connoisseurs alike) to find any consolidated information about hot sauces beyond the field's biggest players and the celebrities that try them on the show.

On a smaller scale, our group was motivated by the opportunity to learn and apply the skills from our class. We were interested in learning about how to make a proper database schema, normalize it, produce ER diagrams, write interesting queries, and create a cloud-hosted website that takes advantage of our database knowledge - all of this was accomplished with this project. It helped tie together our course learnings and allowed us to apply the skills we gained in our in-class activities.

Relationship to course

This course has taught us the fundamentals of creating databases and appropriate, relevant queries. These topics were essential in the creation of Spicy Ones.

With our knowledge of relational models and more specifically schema-based constraints, we were able to properly create a schema that relates our tables using primary and foreign keys. Via our understanding of Boyce-Codd normalization, we were able to ensure that our table is optimized and as modular as possible. We were also able to resolve constraint violations by including more complex keywords in our queries such as ON UPDATE CASCADE. Using attribute constraints, we were able to set conditions for the data being inserted into the table. Additional keywords used in our queries include aggregate functions (MIN, MAX), JOIN statements, and data manipulation commands. Completing activity 7 and 8 helped us learn the functions of Visual Studio and asp to create the front end interface portion of our project.

Design and implementation

The database is created using MySQL and is hosted on a webpage through Microsoft Azure. We used sources such as the Hot Ones series, Heatonist, and Pepper Explosion to retrieve data about the hot sauces and guests that were featured on the show. Using the schema and LucidChart, we were able to create an Entity Relationship Diagram to show the relationship of entities stored in the database.

We chose to use MySQL, as it is a popular DBMS system in the tech industry. According to Stack Overflow's 2019 developer survey, a survey of over 90,000 developers from across the world, 54% of databases were MySQL (Stack Overflow Developer Survey 2019). For the most part, MySQL was easy to work with; however, it is missing certain functionalities such as FULL JOIN which needed to be worked around.

We used Azure as our cloud service provider for a number of reasons. Azure is one of the most popular cloud services and experience with it is highly sought-after. It easily integrates with MySQL, which allowed us to build a full-featured site.

Using Visual Studio and ASP.NET, we were able to visually show the results of our queries.

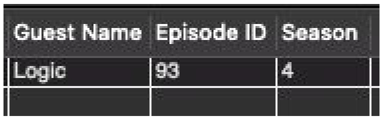
Results and analysis

The ideation and development process of the project was not without difficulty. Some of the challenges that we faced revolved around compatibility issues with MySQL. Our team encountered issues when trying to connect MySQL to Visual Studio -- ultimately, we needed to revert to an older version of MySQL. Additionally, we had difficulty connecting the cloud Azure server to MySQL. This delayed our ability to work simultaneously on the hosted server.

The process of normalizing our schema significantly changed its structure. We had to add three additional tables to the schema, and as a result, our ER diagram needed to be altered to match. The queries that we had previously written needed to be redone in order to achieve the same task they did prior to normalization. This was a fairly time-consuming process and proved, at times, difficult - especially with the more complex and layered queries. Especially after normalization, queries that required information from several tables often grew more complex and needed additional JOINs to ensure that all the data was being accessed.

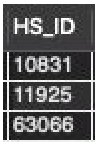
Proofs of working queries

Query 1: Displays a Hot Ones Guest with their appropriate Season and Episode.



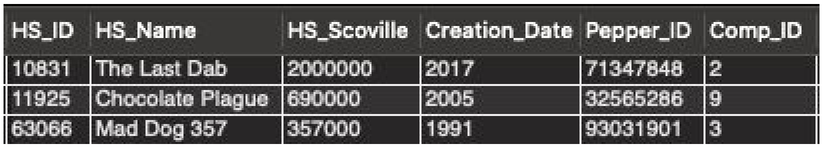
Guest Name	Episode ID	Season
Logic	93	4

Query 2: A table that summarizes all the hotsauce id from season table that have a scoville level higher than 200000.



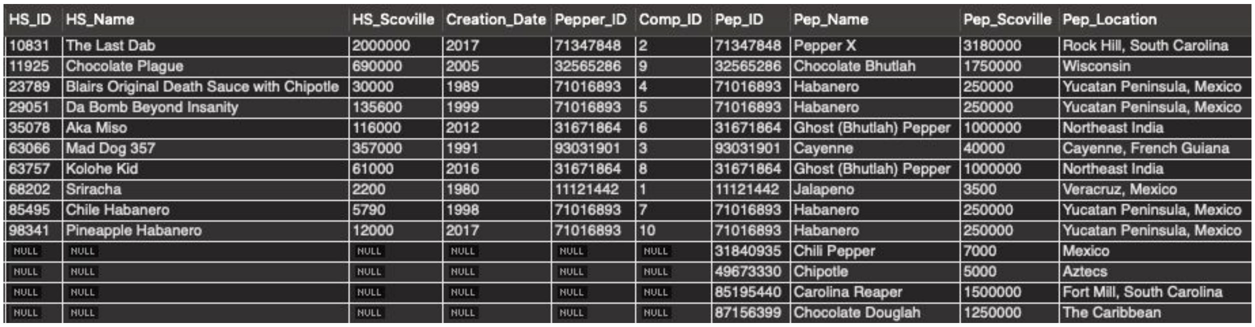
HS_ID
10831
11925
63066

Query 3: A table summarizing all of the hot sauces from a brand that are hotter than average hot sauces from the Hot Sauce table.



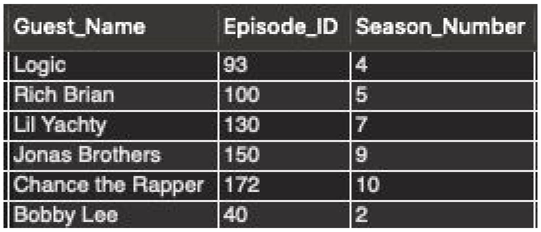
HS_ID	HS_Name	HS_Scoville	Creation_Date	Pepper_ID	Comp_ID
10831	The Last Dab	2000000	2017	71347848	2
11925	Chocolate Plague	690000	2005	32565286	9
63066	Mad Dog 357	357000	1991	93031901	3

Query 4: Displays all the information about Hot Sauces and Peppers that were featured on the show.



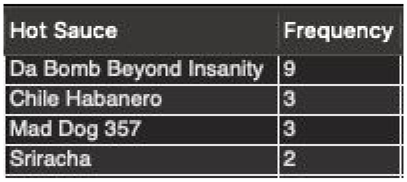
HS_ID	HS_Name	HS_Scoville	Creation_Date	Pepper_ID	Comp_ID	Pep_ID	Pep_Name	Pep_Scoville	Pep_Location
10831	The Last Dab	2000000	2017	71347848	2	71347848	Pepper X	3180000	Rock Hill, South Carolina
11925	Chocolate Plague	690000	2005	32565286	9	32565286	Chocolate Bhutlah	1750000	Wisconsin
23789	Blairs Original Death Sauce with Chipotle	30000	1989	71016893	4	71016893	Habanero	250000	Yucatan Peninsula, Mexico
29051	Da Bomb Beyond Insanity	135600	1999	71016893	5	71016893	Habanero	250000	Yucatan Peninsula, Mexico
35078	Aka Miso	116000	2012	31671864	6	31671864	Ghost (Bhutlah) Pepper	1000000	Northeast India
63066	Mad Dog 357	357000	1991	93031901	3	93031901	Cayenne	40000	Cayenne, French Guiana
63757	Kolohe Kid	61000	2016	31671864	8	31671864	Ghost (Bhutlah) Pepper	1000000	Northeast India
68202	Sriracha	2200	1980	11121442	1	11121442	Jalapeno	3500	Veracruz, Mexico
85495	Chile Habanero	5790	1998	71016893	7	71016893	Habanero	250000	Yucatan Peninsula, Mexico
98341	Pineapple Habanero	12000	2017	71016893	10	71016893	Habanero	250000	Yucatan Peninsula, Mexico
NULL	NULL	NULL	NULL	NULL	NULL	31840935	Chili Pepper	7000	Mexico
NULL	NULL	NULL	NULL	NULL	NULL	49673330	Chipotle	5000	Aztecs
NULL	NULL	NULL	NULL	NULL	NULL	85195440	Carolina Reaper	1500000	Fort Mill, South Carolina
NULL	NULL	NULL	NULL	NULL	NULL	87156399	Chocolate Douglah	1250000	The Caribbean

Query 5: Display all of the Musicians and Comedians featured on the show.



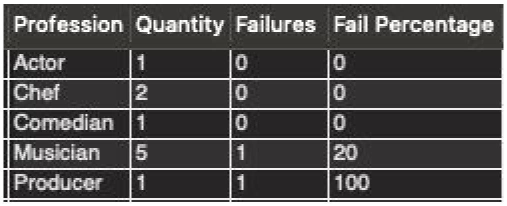
Guest_Name	Episode_ID	Season_Number
Logic	93	4
Rich Brian	100	5
Lil Yachty	130	7
Jonas Brothers	150	9
Chance the Rapper	172	10
Bobby Lee	40	2

Query 6: Return a list of the most frequent hot sauces to be featured on the show.



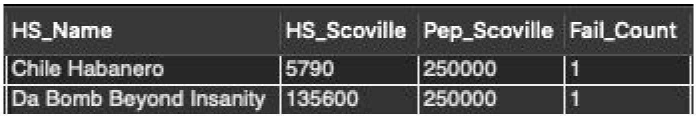
Hot Sauce	Frequency
Da Bomb Beyond Insanity	9
Chile Habanero	3
Mad Dog 357	3
Sriracha	2

Query 7: Return percentage of failures per profession.



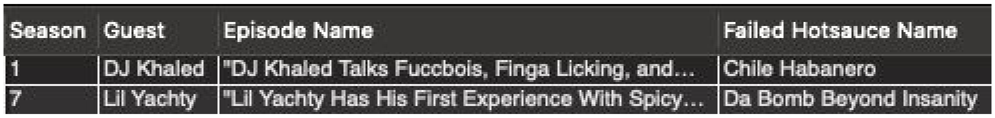
Profession	Quantity	Failures	Fail Percentage
Actor	1	0	0
Chef	2	0	0
Comedian	1	0	0
Musician	5	1	20
Producer	1	1	100

Query 8: Show the relationship between fail rate, hot sauce scoville, and pepper scoville.



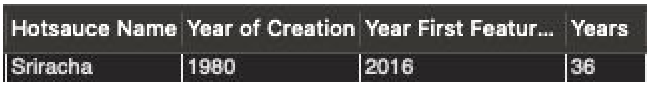
HS_Name	HS_Scoville	Pep_Scoville	Fail_Count
Chile Habanero	5790	250000	1
Da Bomb Beyond Insanity	135600	250000	1

Query 9: Shows info about the guests who have failed the Hot Ones Challenge



Season	Guest	Episode Name	Failed Hotsauce Name
1	DJ Khaled	"DJ Khaled Talks Fuccbois, Finga Licking, and…	Chile Habanero
7	Lil Yachty	"Lil Yachty Has His First Experience With Spicy…	Da Bomb Beyond Insanity

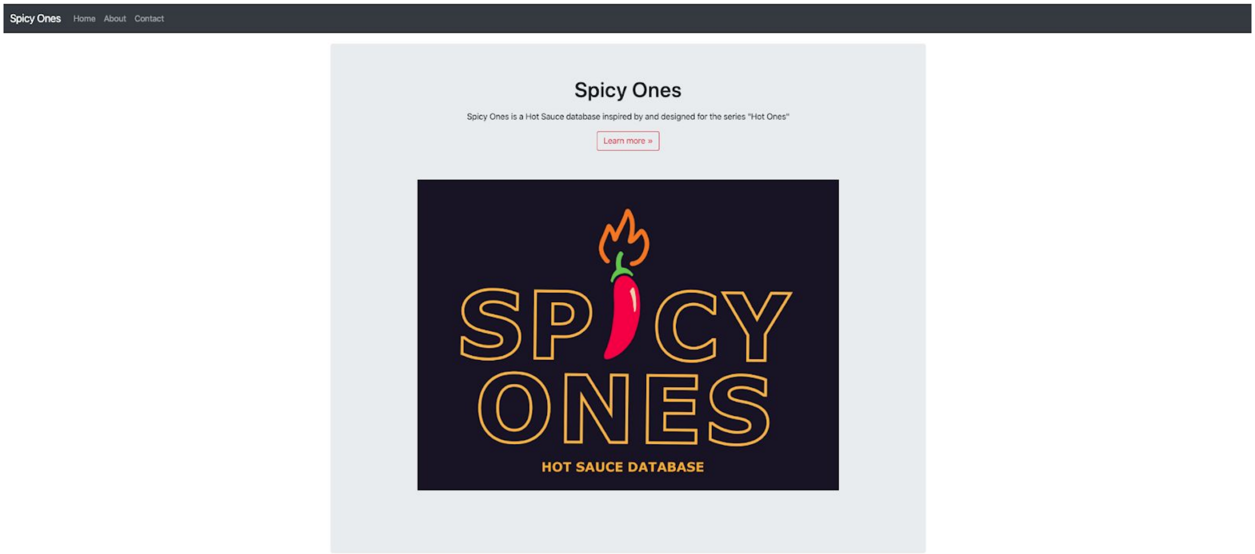
Query 10: Show the hot sauce that was created the longest time before its appearance on an episode.



Hotsauce Name	Year of Creation	Year First Featur…	Years
Sriracha	1980	2016	36

Appendix D. Proof of working queries

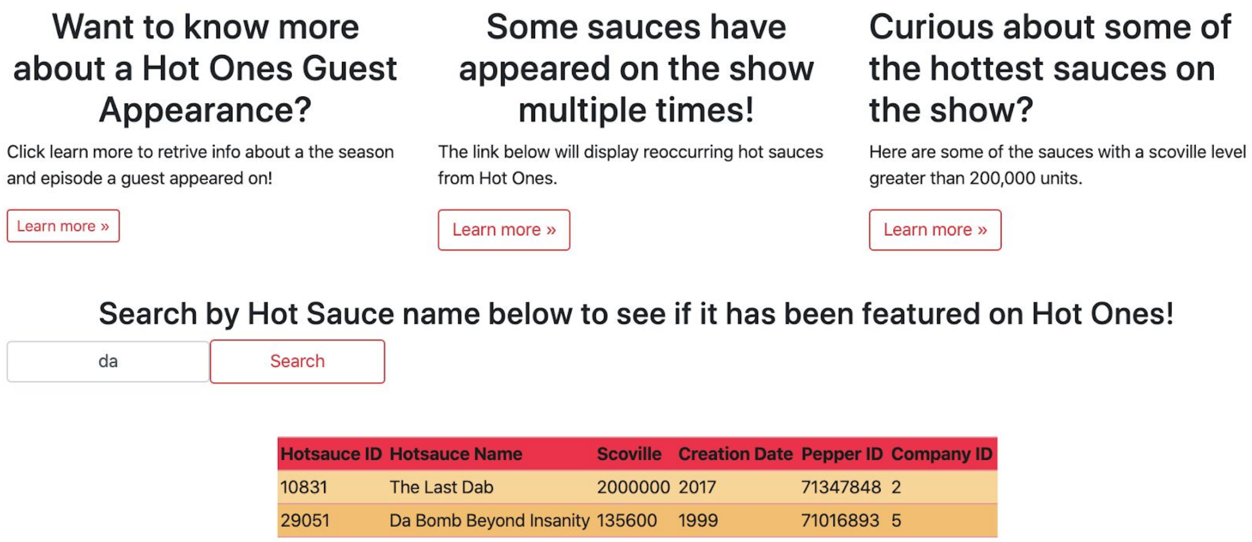
Screenshots of interface



Spicy Ones

Spicy Ones is a Hot Sauce database inspired by and designed for the series "Hot Ones"

Appendix E1. Web Interface



Want to know more about a Hot Ones Guest Appearance?

Click learn more to retrive info about a the season and episode a guest appeared on!

Some sauces have appeared on the show multiple times!

The link below will display reoccurring hot sauces from Hot Ones.

Curious about some of the hottest sauces on the show?

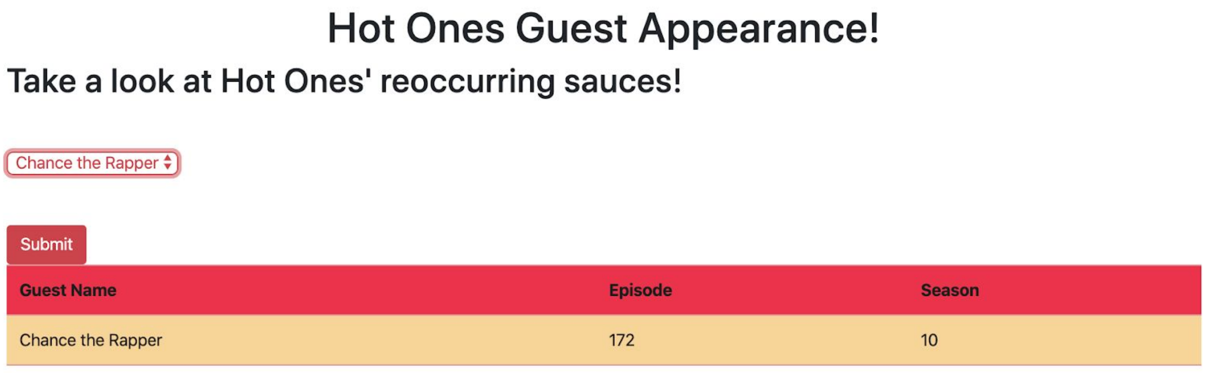
Here are some of the sauces with a scoville level greater than 200,000 units.

Search by Hot Sauce name below to see if it has been featured on Hot Ones!

da

Hotsauce ID	Hotsauce Name	Scoville	Creation Date	Pepper ID	Company ID
10831	The Last Dab	2000000	2017	71347848	2
29051	Da Bomb Beyond Insanity	135600	1999	71016893	5

Appendix E2. Learn More Section



Hot Ones Guest Appearance!

Take a look at Hot Ones' reoccurring sauces!

Chance the Rapper

Guest Name	Episode	Season
Chance the Rapper	172	10

Appendix E3. Hot Ones Guest Appearance Query

References

"The Chilli Hunter." The Chilli Hunter, thechillihunter.blogspot.com/.

"First We Feast | Where Food, Drink & Pop Culture Converge." *First We Feast*, firstwefeast.com/.

"Hot Ones." *Wikipedia*, 12 Mar. 2020, en.wikipedia.org/wiki/Hot_Ones.

"Hot Ones Collection." *Heat*, Heat Hot Sauce Shop, heathotsauce.com/collections/hot-ones.

"Hot Ones Hot Sauces." *HEATONIST*, heatonist.com/collections/hot-ones-hot-sauces.

"Stack Overflow Developer Survey 2019." Stack Overflow, insights.stackoverflow.com/survey/2019.