TASTE are a new Limerick based importer and distributor of beer to pubs, restaurants and off-licenses around Ireland. They are planning to import over 5,900 different beers from over 1,400 international breweries

They have a complete database of the beers they plan on importing along with information about the breweries they will import from. The following are the tables in the database along with some sample records from each table.

## beers (5,901 records)

| # | Name | Type | Collation | Attributes | Null | Default | Comments | Extra |
|---|------|------|-----------|------------|------|---------|----------|-------|
| 1 | id 🔑 | int(21) | | | No | None | | AUTO_INCREMENT |
| 2 | brewery_id | int(21) | | | No | 0 | | |
| 3 | name | varchar(255) | utf8_unicode_ci | | No | | | |
| 4 | cat_id | int(11) | | | No | 0 | | |
| 5 | style_id | int(11) | | | No | 0 | | |
| 6 | abv | float | | | No | 0 | Alcohol by volume is a measure of how much alcohol is contained in a given volume of an alcoholic beverage. | |
| 7 | ibu | float | | | No | 0 | International Bitterness Units scale, a gauge of beer's bitterness | |
| 8 | srm | float | | | No | 0 | Standard Reference Method is the colour system used by brewers to specify finished beer and malt colour. | |
| 9 | description | text | utf8_unicode_ci | | No | None | | |
| 10 | add_user | int(11) | | | No | 0 | | |
| 11 | last_mod | datetime | | | No | 0000-00-00 00:00:00 | | |
| 12 | image | text | latin1_swedish_ci | | No | None | | |
| 13 | buy_price | double | | | No | 0 | The buy_price is the price for 6 bottles | |
| 14 | sell_price | double | | | No | None | The sell_price is the price for 6 bottles | |

| id | brewery_id | name | cat_id | style_id | abv Alcohol by volume is a measure of how much alcohol... | ibu International Bitterness Units scale, a gauge of b... | srm Standard Reference Method is the colour system use... | description | add_user | last_mod | image | buy_price The buy_price is the price for 6 bottles | sell_price The sell_price is the price for 6 bottles |
|----|------------|------|--------|----------|------|------|------|-------------|----------|----------|-------|-----------|------------|
| 1 | 812 | Hocus Pocus | 11 | 116 | 4.5 | 0 | 0 | Our take on a classic summer ale.  A toast to weed... | 0 | 2019-03-09 13:16:58 | no_image.jpg | 14.93 | 17.17 |
| 2 | 264 | Grimbergen Blonde | -1 | -1 | 6.7 | 0 | 0 | | 0 | 2019-03-06 05:19:50 | no_image.jpg | 12.71 | 14.62 |
| 3 | 779 | Widdershins Barleywine | -1 | -1 | 9.1 | 0 | 0 | | 0 | 2019-03-10 01:26:43 | no_image.jpg | 14.29 | 16.43 |
| 4 | 287 | Lucifer | -1 | -1 | 8.5 | 0 | 0 | | 0 | 2019-03-07 09:57:12 | no_image.jpg | 6.82 | 7.84 |

## breweries (1,414 records)

| # | Name | Type | Collation | Attributes | Null | Default | Comments | Extra |
|---|------|------|-----------|------------|------|---------|----------|-------|
| 1 | id 🔑 | int(21) | | | No | None | | AUTO_INCREMENT |
| 2 | name | varchar(255) | utf8_unicode_ci | | No | | | |
| 3 | address1 | varchar(255) | utf8_unicode_ci | | No | | | |
| 4 | address2 | varchar(255) | utf8_unicode_ci | | No | | | |
| 5 | city | varchar(255) | utf8_unicode_ci | | No | | | |
| 6 | state | varchar(255) | utf8_unicode_ci | | No | | | |
| 7 | code | varchar(25) | utf8_unicode_ci | | No | | | |
| 8 | country | varchar(255) | utf8_unicode_ci | | No | | | |
| 9 | phone | varchar(50) | utf8_unicode_ci | | No | | | |
| 10 | website | varchar(255) | utf8_unicode_ci | | No | | | |
| 11 | image | varchar(255) | utf8_unicode_ci | | No | | | |
| 12 | description | text | utf8_unicode_ci | | No | None | | |
| 13 | add_user | int(11) | | | No | 0 | | |
| 14 | last_mod | datetime | | | No | 0000-00-00 00:00:00 | | |
| 15 | credit_limit | double | | | No | 0 | | |
| 16 | email | varchar(50) | utf8_unicode_ci | | No | None | contacts email address | |

| id | name | address1 | address2 | city | state | code | country | phone | website | image | description | add_user | last_mod | credit_limit | email contacts email address |
|----|------|----------|----------|------|-------|------|---------|-------|---------|-------|-------------|----------|----------|--------------|-------|
| 1 | (512) Brewing Company | 407 Radam, F200 | | Austin | Texas | 78745 | United States | 512.707.2337 | http://512brewing.com/ | no_image.jpg | (512) Brewing Company is a microbrewery located in... | 0 | 2019-03-06 03:12:40 | 1603.88 | admin@515brewing.com |
| 2 | 21st Amendment Brewery Cafe | 563 Second Street | | San Francisco | California | 94107 | United States | 1-415-369-0900 | http://www.21st-amendment.com/ | no_image.jpg | The 21st Amendment Brewery offers a variety of awa... | 0 | 2019-03-10 13:17:02 | 3597.95 | sales@21stAmendment.com |
| 3 | 3 Fonteinen Brouwerij Ambachtelijke Geuzestekerij | Hoogstraat 2A | | Beersel | Vlaams Brabant | | Belgium | 32-02-/-306-71-03 | http://www.3fonteinen.be/index.htm | no_image.jpg | | 0 | 2019-03-10 03:17:10 | 6178.11 | tom@FonteinenBrouwerij.be |
| 4 | Aass Brewery | Ole Steensgt. 10 Posthoks | | Drammen | | | Norway | 47-32-26-60-00 | http://www.aass.no | no_image.jpg | Aass Brewery was established in | 0 | 2019-03-05 09:48:48 | 6596.68 | |

## breweries_geocode (1,304 records)

| # | Name | Type | Collation | Attributes | Null | Default | Comments | Extra |
|---|------|------|-----------|------------|------|---------|----------|-------|
| 1 | id 🔑 | int(11) | | | No | None | | AUTO_INCREMENT |
| 2 | brewery_id | int(11) | | | No | 0 | | |
| 3 | latitude | float | | | No | 0 | | |
| 4 | longitude | float | | | No | 0 | | |

| id | brewery_id | latitude | longitude |
|----|-----------|----------|-----------|
| 1 | 1 | 30.2234 | -97.7697 |
| 2 | 2 | 37.7825 | -122.393 |
| 3 | 3 | 50.7668 | 4.3081 |
| 4 | 4 | 59.7451 | 10.2135 |

*styles (141 records)*

| # | Name | Type | Collation | Attributes | Null | Default | Comments | Extra |
|---|------|------|-----------|------------|------|---------|----------|-------|
| 1 | id 🔑 | int(11) | | | No | None | | AUTO_INCREMENT |
| 2 | cat_id | int(11) | | | No | 0 | | |
| 3 | style_name | varchar(255) | utf8_unicode_ci | | No | | | |
| 4 | last_mod | datetime | | | No | 0000-00-00 00:00:00 | | |

| id | cat_id | style_name | last_mod |
|----|--------|------------|----------|
| 1 | 1 | Classic English-Style Pale Ale | 2010-10-24 13:53:31 |
| 2 | 1 | English-Style India Pale Ale | 2010-06-15 19:14:38 |
| 3 | 1 | Ordinary Bitter | 2010-06-15 19:14:54 |
| 4 | 1 | Special Bitter or Best Bitter | 2010-06-15 19:15:02 |
| 5 | 1 | Extra Special Bitter | 2010-06-15 19:15:09 |

*categories (11 records)*

| # | Name | Type | Collation | Attributes | Null | Default | Comments | Extra |
|---|------|------|-----------|------------|------|---------|----------|-------|
| 1 | id 🔑 | int(11) | | | No | None | | AUTO_INCREMENT |
| 2 | cat_name | varchar(255) | latin1_swedish_ci | | No | | | |
| 3 | last_mod | datetime | | | No | 0000-00-00 00:00:00 | | |

| id | cat_name | last_mod |
|----|----------|----------|
| 1 | British Ale | 2010-10-24 13:50:10 |
| 2 | Irish Ale | 2010-06-08 00:00:00 |
| 3 | North American Ale | 2010-06-08 00:00:00 |
| 4 | German Ale | 2010-06-08 00:00:00 |

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**Task 1:** *To be uploaded to Moodle by 11:59pm on March 9th 2020.*

- Develop a CRUD Spring MVC application for the *'breweries'* table in taste database. This will entail the following:
    - A mechanism to **display all** records in the *'breweries'* table. As there are a lot of records to display (over 1,400), you **_may wish_** to use some 3rd party library to help with pagination. You must also render an image for each record.
    - A mechanism to **edit** an existing record in the *'breweries'* table. Once the user has selected a record that they wish to edit, (by whatever means) they are to be presented with a prepopulated form for that record which they can then edit. Ensure that a latitude and longitude value is presented to the user for potential updating as well (these values will come from the *'breweries_geocode'* table). Once the update has been made, the *date_mod* field should be updated with the current date/time. There is no requirement for you to update the image for a given record.

- A mechanism to **delete** an existing record from the 'breweries' table. After selecting a record for deletion, the user must confirm their intention to delete the selected record. Once a record in the *'breweries'* table has been deleted, a corresponding record in the *'breweries_geocode'* table will have to be deleted too.
- A mechanism to **insert** a complete record into the 'breweries' table. When inserting the record and rather than have the user select a date for the *date_mod* field, the current date/time can be taken from the system and inserted into the table for this field. You will also have to allow the user to specify a value for the latitude and longitude (from the *'breweries_geocode'* table). There is no requirement for you to upload an image for a given record.

For the insert/update all fields are to be required input and data must be validated (on the server) before being made permanent on the database (in a real life application a combination of client and server side validation would be used). Any validation errors must be displayed neatly on the browser.

| Field | Type | Validation | |
|---|---|---|---|
| **id** | Integer | Auto-increment | Must not be a negative number. |
| **name** | Alphanumeric | Required. | Must be <= 50 chars. |
| **address1** | Alphanumeric | Required. | Must be <= 50 chars. |
| **address2** | Alphanumeric | Required. | Must be <= 50 chars. |
| **city** | Alphanumeric | Required. | Must be <= 30 chars. |
| **state** | Alphanumeric | Required | Must be <= 20 chars. |
| **code** | Numeric. | Required | Must not be greater than 5 digits |
| **country** | Alphanumeric | Required | |
| **phone** | Alphanumeric | Required | |
| **website** | Alphanumeric | Required | Must represent a valid web address. |
| **image** | Alphanumeric | Required | |
| **description** | Alphanumeric | Required | |
| **add_user** | Integer | Required | Must not be greater than 2 digits. Must not be a negative number. |
| **last_mod** | Date | Required | Must not be a date in the future |
| **credit_limit** | Floating point (Double) | Required | Must have a max of 6 digits before the decimal point and 2 afterwards. |
| **email** | Alphanumeric | Required | Must represent a valid email address |

*You can decide on the correct validation for the latitude and longitude fields yourself.*

**Note:**

1. This assignment is to be developed using **Spring MVC**.
2. You must use **MAVEN** to manage your projects dependencies.
3. You must use **JPA**, with all queries to be implemented as Named Queries in your Entity Classes.
4. You must use **Tomcat** as your server/container.
5. You are not permitted to use any **stylesheets or templates**.
6. You must strictly adhere to the **MVC** principles.
7. Use appropriate measures to ensure that all errors are handled gracefully.
8. You must take appropriate measures to prevent "double posting" within your application.
9. This assignment will be worth 10% of your total marks for this module.