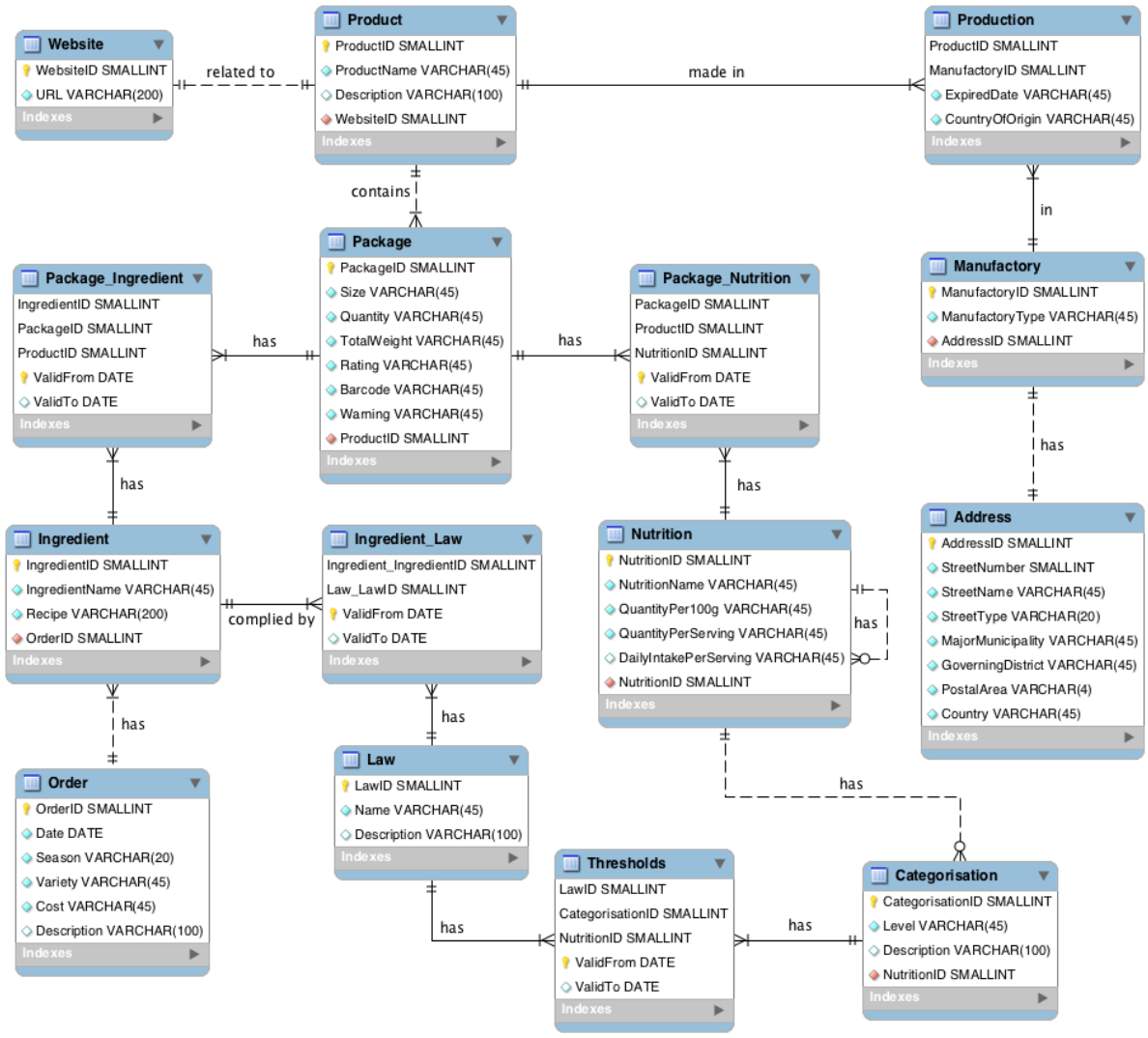
# INFO20003 Database Systems – Assignment 1

The diagram above is the Physical Data Model for database design, according to the description of new food labelling laws, provided by the Batmanian government. Due to software issue on Mac, foreign key cannot be shown in the diagram.



# Assumption

In diagram, there are 15 entities in total for database design. As the goal of storing information for new food labelling laws, “Package” is the main entity connected to “Ingredient”, “Product” and “Nutrition”, which are the most relevant information.

First of all, for the general information of Product, only name is stored in “Product” entity, others are stored in “Package” entity instead, because size, quantity and weight are depending on using what kind of package, so it might be different. And also, rating, barcode and warning need to be provided on the package. To be specific, since the formula to determine the traffic light rating of product is not expected to change in the future, rating is one of the not-null attributes in “Package”, instead of one independent entity.

Secondly, the relationship between “Product” and “Package” is mandatory one-to-many, because product can have more than one different packages, and package contains only one kind of product. Since website address related to product is mentioned, the relationship is mandatory one-to-one. Furthermore, product usually has at least one production in Manufactory, “Production” contains expired date and country of origin which are general information in production line. “Manufactory” connects to “Address” with one-to-one relationship, in case of changing manufactory address which will be more easily to update and delete.

Next, “Package” connects to “Ingredient” through “Package_Ingredient” which stores valid date of using ingredient, same as “Package_Nutrition” in the other side. In “Ingredient” entity, Name and recipe need to be stored in case of changing ingredients which may affect the recipe. Moreover, it need to be comply with the laws, “Ingredient_Law” would be helpful to check the information of Law. Because The CEO prefer flexible changing of Laws, independent entity would be the best solution for that, which can update and delete though MySQL easily. Nevertheless, “Order” entity records historical data of order date, season, variety of ingredient and cost, which would be useful to analyse the data.

Then, in “Nutrition” entity, name, quantity per 100 grams and quantity per serving are required information, need to be listed in packing, and daily intake per serving is optional recommended information, which can be null. For some nutrition, for example total fat including saturated fat and trans fat and so on, unary relationship would be used for “Nutrition” entity, which can be optional one-to-many. Moreover, some nutrition has categorisation of high and low, so there is optional one-to-many relationship between “Nutrition” and “Categorisation”. Level contains whether nutrition is high or low, determined by thresholds. Since thresholds might be changed by government, connecting to Law would be better option for updating.

Lastly, there is no entity for packing location, which should be considered when the package is designed. Some of entity has optional attributes “Description”, which can store extra information in case.