
OpenCourseWare

Database

Lourdes Moreno López

Paloma Martínez Fernández

José Luis Martínez Fernández

Rodrigo Alarcón García

Project 3 (Relational Model Design (2.1))



The goal of this project is to design a database that will be used to manage a winery that has been awarded a certificate of origin for its wines. The winery is composed of 22 blocks. Each block has a specific surface area in hectares, with a total of 278 hectares in the winery.

Each block must be identified by a specific code comprised of a letter and a number, such as "B12" which both identifies and indicates its location. Moreover, the database must include each block's surface area, production, type of soil and how the grape vine is grown.

A specific variety of vine plant is grown on each block. Each vine variety has its name, origin, colour (garnet cherry, ruby, chestnut tile, purple rose, straw yellow, amber), aroma (red fruits, nuts, violets, green pepper, liquorice, vanilla) and a description field with information regarding its characteristics (e.g. "needs sun and high temperatures"). This winery has the following varieties: Tempranillo or Cencibel, Cabernet, Merlot, Shiraz, Carignane, Prieto Picudo, Petit Verdot, Malbec, Graciano, Viognier and Sauvignon Blanc. The same variety may be grown on different blocks.

During the harvest, the grapes are picked from each block, and the juice is placed in vats where the fermentation and maturation process occurs. Currently, this winery has 40 vats, each of which is identified by a code. Each vat has a capacity and the vintage, or year, the grape was harvested. The vats store the juice of the same variety of grape for a specific period of time. They are then cleaned so they can store the juice from a different variety of grape. The juice stored in each vat comes from the same block.

After the fermentation and maturation process, which occurs in the vats, the juice is placed into barrels where the blending and fining of the different varieties is carried out. Thus, each barrel may store juice coming from different vats, thus mixing different varieties. Each barrel is identified by a specific code; its measurements, weight, and capacity must be recorded. The material (French oak, American oak, Spanish oak, acacia, and cherry) the barrels are made of must also be recorded.

The database must be designed such that for each barrel, the following information should be able to be inferred: which vat the juice comes from, the time spent in the vat, the variety, and the block.

After the barrel process, the wine is put into bottles during the bottling phase. Each wine is identified by a specific name. The bottles are identified by a specific code for the type of wine they contain. The bottles have different shapes (Bordeaux, Burgundy, Rhine), sizes (standard magnum, split) and corks (natural, synthetic, agglomerate).

The database must be designed in such a way so as to clearly identify the different varieties which contained in each wine bottle as well as its vintage. Every wine has a tasting note, which is comprised of three characteristics: look, smell and taste. What is more, each wine must have a description with its recommended pairing.

Some of the winery's wines are exported via companies. The fiscal identification number, name, and countries in which the wines are distributed must be recorded for each company. One wine is distributed by the same company.

This winery's wines are entered into yearly competitions so that a single wine may have been awarded the same award in different years. Each competition has a name, scope, and organising body. Additionally, each competition has various categories and each category awards 1st, 2nd, and 3rd place prizes.

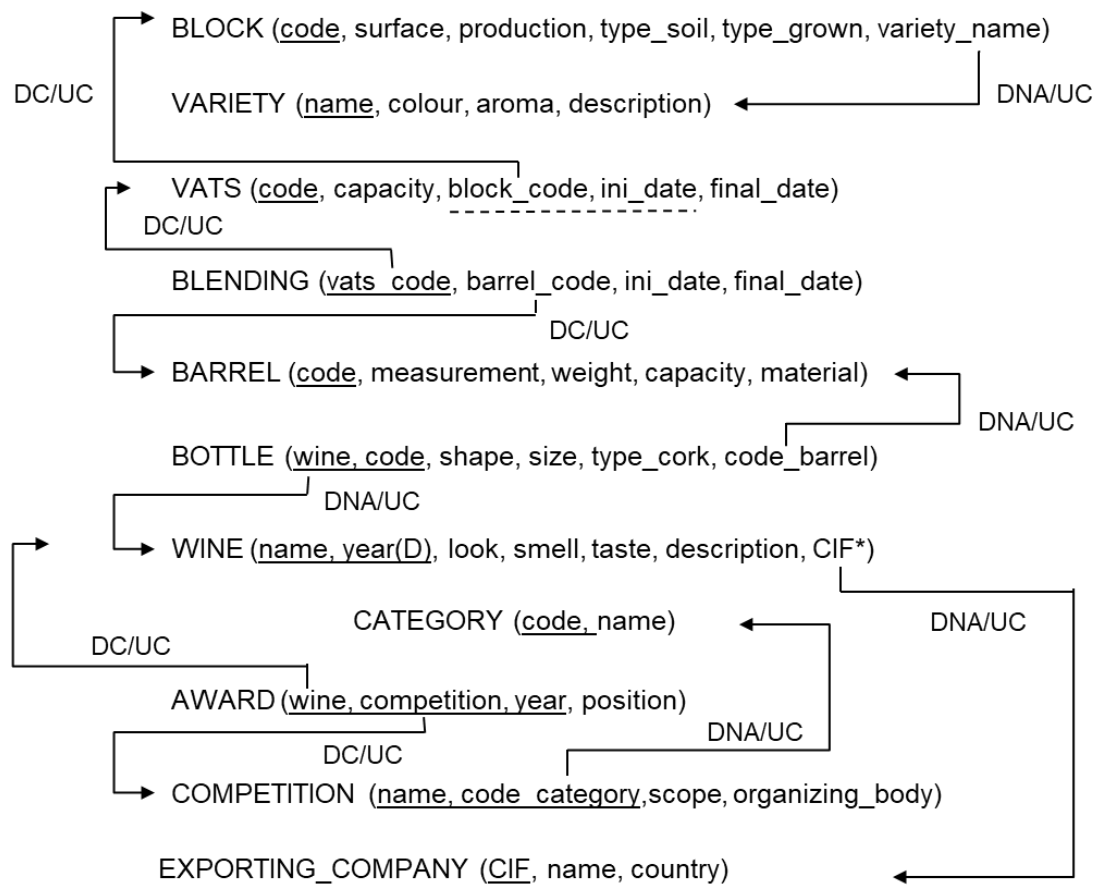
Requested information

You must:

- Obtain the relational diagram according to requirements with the primary and alternative keys. Indicate the foreign keys with their delete and update options.
- Write additional semantic assumptions to the statement, if needed
- Write additional semantic assumptions to the scheme, if needed

SOLUTION

Partial solution, some semantic assumptions are missing.



Additional semantic assumptions to the statement.

VARIETY is identified by name

WINE is identified by name and year

Additional semantic assumptions to the scheme.

Constrains between dates

The winery is composed of 22 blocks, 278 hectares and 40 vats.

DOMAINS

VARIETY.name={Tempranillo or Cencibel, Cabernet, Merlot, Shiraz, Carignane, Prieto Picudo, Petit, Verdot, Malbec, Graciano, Viognier and Sauvignon Blanc}

VARIETY.colour = {garnet cherry, ruby, chestnut tile, purple rose, straw yellow, amber}

VARIETY.aroma={red fruits, nuts, violets, green pepper, liquorice, vanilla}

BARREL. Material={French oak, American oak, Spanish oak, acacia, and cherry}

BOTTLE.shape={Bordeaux, Burgundy, Rhine}

BOTTLE.size={standard magnum, split}

BOTTLE. type_cork={natural, synthetic, agglomerate}

CATEGORY.position={1st, 2nd, 3rd}