

## Practical Exam: Grocery Store Sales

FoodYum is a grocery store chain that is based in the United States.

Food Yum sells items such as produce, meat, dairy, baked goods, snacks, and other household food staples.

As food costs rise, FoodYum wants to make sure it keeps stocking products in all categories that cover a range of prices to ensure they have stock for a broad range of customers.

### Data

The data is available in the table `products`.

The dataset contains records of customers for their last full year of the loyalty program.

Column Name	Criteria
product_id	Nominal. The unique identifier of the product. Missing values are not possible due to the database structure.
product_type	Nominal. The product category type of the product, one of 5 values (Produce, Meat, Dairy, Bakery, Snacks). Missing values should be replaced with "Unknown".
brand	Nominal. The brand of the product. One of 7 possible values. Missing values should be replaced with "Unknown".
weight	Continuous. The weight of the product in grams. This can be any positive value, rounded to 2 decimal places. Missing values should be replaced with the overall median weight.
price	Continuous. The price the product is sold at, in US dollars. This can be any positive value, rounded to 2 decimal places. Missing values should be replaced with the overall median price.
average_units_sold	Discrete. The average number of units sold each month. This can be any positive integer value. Missing values should be replaced with 0.
year_added	Nominal. The year the product was first added to FoodYum stock. Missing values should be replaced with 2022.
stock_location	Nominal. The location that stock originates. This can be one of four warehouse locations, A, B, C or D Missing values should be replaced with "Unknown".

### Task 1

In 2022 there was a bug in the product system. For some products that were added in that year, the `year_added` value was not set in the data. As the year the product was added may have an impact on the price of the product, this is important information to have.

Write a query to determine how many products have the `year_added` value missing. Your output should be a single column, `missing_year`, with a single row giving the number of missing values.

index	...	↑↓	missing_year	...
		0		
Rows: 1				↗ Expand

## Task 2

Given what you know about the year added data, you need to make sure all of the data is clean before you start your analysis. The table below shows what the data should look like.

Write a query to ensure the product data matches the description provided. Do not update the original table.

Column Name		Criteria	
product_id		Nominal. The unique identifier of the product. Missing values are not possible due to the database structure.	
product_type		Nominal. The product category type of the product, one of 5 values (Produce, Meat, Dairy, Bakery, Snacks). Missing values should be replaced with "Unknown".	
brand		Nominal. The brand of the product. One of 7 possible values. Missing values should be replaced with "Unknown".	
weight		Continuous. The weight of the product in grams. This can be any positive value, rounded to 2 decimal places. Missing values should be replaced with the overall median weight.	
price		Continuous. The price the product is sold at, in US dollars. This can be any positive value, rounded to 2 decimal places. Missing values should be replaced with the overall median price.	
average_units_sold		Discrete. The average number of units sold each month. This can be any positive integer value. Missing values should be replaced with 0.	
year_added		Nominal. The year the product was first added to FoodYum stock. Missing values should be replaced with last year (2022).	
stock_location		Nominal. The location that stock originates. This can be one of four warehouse locations, A, B, C or D Missing values should be replaced with "Unknown".	

...	↑↓	p...	...	↑↓	prod...	...	↑↓	brand	...	↑↓	...	↑↓	...	↑↓	average_units_...	...	↑↓	y...	...	↑↓	stock_lo...	...	↑↓
0					1	Bakery		TopBrand			602.61		11				15		2022		C		
1					2	Produce		SilverLake			478.26		8.08				22		2022		C		
2					3	Produce		TastyTreat			532.38		6.16				21		2018		B		
3					4	Bakery		StandardYums			453.43		7.26				21		2021		D		
4					5	Produce		GoldTree			588.63		7.88				21		2020		A		
5					6	Meat		TopBrand			612.06		16.2				24		2017		A		
6					7	Produce		GoldTree			320.49		8.01				21		2019		B		
7					8	Meat		SilverLake			535.19		15.77				28		2021		A		
8					9	Meat		StandardYums			375.07		11.57				30		2020		A		
9					10	Meat		TastyTreat			506.34		13.94				27		2018		C		
10					11	Dairy		StandardYums			345.07		9.26				26		2020		B		

Rows: 1,700

Expand

## Task 3

To find out how the range varies for each product type, your manager has asked you to determine the minimum and maximum values for each product type.

Write a query to return the `product_type`, `min_price` and `max_price` columns.

...	↑↓	prod...	...	↑↓	pr	...	↑↓	pr	...	↑↓
0		Bakery			6.26			11.88		
1		Dairy			8.33			13.97		
2		Meat			11.48			16.98		
3		Produce			3.46			8.78		
4		Snacks			5.2			10.72		

Rows: 5

Expand

Task 4

The team want to look in more detail at meat and dairy products where the average units sold was greater than ten.

Write a query to return the `product_id` , `price` and `average_units_sold` of the rows of interest to the team.



...	↑↓	p...	...	↑↓	...	↑↓	average_units_...	...	↑↓
0				6			16.2		24
1				8			15.77		28
2				9			11.57		30
3				10			13.94		27
4				11			9.26		26
5				14			11.92		30
6				16			10.79		23
7				19			13.62		26
8				20			13.03		22
9				23			13.07		22
10				24			10.98		23

Rows: 698

Expand

FORMATTING AND NAMING CHECK

Use the code block below to check that your outputs are correctly named and formatted before you submit your project.

This code checks whether you have met our automarking requirements: that the specified DataFrames exist and contain the required columns. It then prints a table showing  for each column that exists and  for any that are missing, or if the DataFrame itself isn't available.

If a DataFrame or a column in a DataFrame doesn't exist, carefully check your code again.

IMPORTANT: even if your code passes the check below, this does not mean that your entire submission is correct. This is a check for naming and formatting only.