Group Coursework Submission Form

Specialist Masters Programme

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MSc in: Business Analytics

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Module Title: Digital Technologies and Value Creation

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Declaration:

By submitting this work, we declare that this work is entirely our own except those parts duly identified and referenced in my submission. It complies with any specified word limits and the requirements and regulations detailed in the coursework instructions and any other relevant programme and module documentation. In submitting this work we acknowledge that we have read and understood the regulations and code regarding academic misconduct, including that relating to plagiarism, as specified in the Programme Handbook. We also acknowledge that this work will be subject to a variety of checks for academic misconduct.

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DIGITAL TECHNOLOGIES AND VALUE CREATION

Group Project

E- commerce shop for Wine

<u>INTRODUCTION</u>

Being shrewd analysts, who have decided to open an e- commerce shop for wine. Before opening any business, an effective market analysis is important for gaining profits in the long run.

Wine, said to be a drink for all celebratory occasion. Many households throughout the world have a tradition of popping the cork on the bottle of a sparkling, bubbly champagne and toasting as the clock strikes midnight on New Year's Eve. That champagne is nothing but sparkling wine. Wine is said to be one of the most favourite drinks of people around the globe. One of the highly and widely purchased alcoholic beverage has a high demand and supply everywhere in the world. When in moderation, wine have health benefits too, making it a potential option for all health-conscious people.

Significant shift in the consumer behaviour towards online market, the e- commerce industry is becoming more prominent and businesses are expected to compete in multichannel market. E- commerce generates new chances for businesses. Online wine retailers may envision the advantages of having access to a worldwide client base, a limitless product line, and minimal operating expenses. Moreover, there is no requirement of a physical store and online stores makes it feasible for retailers to adapt to the dynamic environment quicker. The growing popularity of wine among all age groups, from the young to the elderly, is a crucial element driving market expansion worldwide. During widespread closures and limitations on hotels and restaurants throughout the globe brought on by the COVID-19 pandemic, the worldwide wine delivery system was interrupted. The demand and consumption of wine in the global markets is increasing day by day. Even after ease in quarantine lockdown, consumers are still inclined towards online trade. Online markets of drinks are expected to increase in the upcoming years. The industry is adopting a rustic landscape for consumers globally, gaining popularity in the global markets. Online sales are playing a major role in United Kingdom, United States, Italy, France and others.

An alcoholic drink, a fermented grape juice is often used to make wine. The wine market is divided into segments based on the kind of product, colour, distribution method, and region. Market sizing and forecasting for each segment have been done using value. One of the key elements predicted to drive the wine market's growth in the next years is product premiumization. To meet the dynamic consumer expectations, market players are focusing on creating new flavour-infused wines.

There are two types of grapes wine: white grapes and black grapes (typically deep red coloured). Within those types, there are hundreds of varieties used to prepare various wine varietals and blends. There are many types of wines, the most common ones been red and white wine.

RESEARCH PLAN

Our E-commerce wine shop strives to provide consumers with convenient access to quality fermented beverages from the comfort of their homes. For efficient study, we examined Laithwaites, an e-commerce store just for wines.

Laithwaites is an e-commerce platform that operates in the United Kingdom. The reason for choosing this platform is because it provides a diverse data set to analyse. A wider data set provides a diverse range of wine that is analysed and evaluated for our online store.

Our business been a start- up business. We decided to focus more on a particular type of wine. For our analyses we took the comparison between the most common types of wine- red wine and white wine. The analysis is on the basis of the common attributes a consumer views before purchasing a wine like Country, Alcohol Content, Rating and Price.

Country: It has been asserted that consumer's opinions of wine are impacted by it's country of origin. It is highly common for a consumer to refer the country of production before purchasing.

Alcohol by Volume (ABV): In the realm of spirits, wine is known to have comparatively lower alcohol content. Consumers check the ABV for multiple reasons- in an professional setting a wine with low ABV is preferred etc.

Rating: The most common habit of a consumer before purchasing any item, is to scroll down to the ratings and reviews of that particular good.

Price: The cost of a bottle of wine is determined by a variety of factors- from the vineyard to process of manufacturing. Usually, consumers consider an expensive wine to be better tasting than a cheap wine. On important occasions, it's always the expensive bottle that comes out of the shelf. A common belief- the more expensive the wine, the better it tastes.

Considering these common attributes and characteristics consumer check before purchasing the fermented drink, we have considered these factors for our analysis.

We plan to check relationship among multiple attributes like ABV, price, country, Ratings. In this way, we can aim to maximize our sales by keeping quality inventory.

We plan to examine how price index varies in relation to ABV and ratings to target customers looking for not so expensive but good quality wine according to their demands.

We also look to forward to find how the quality of wine, associated with ratings, varies in relation to price, ABV and country to make decisions on what characteristics are desired by

customers. We also plan to know which type of wine is preferred by consumers so that we can have more varieties in that wine as it would be beneficial in terms of profitability.

DATA SOURCE

We have used lathwaites e-commerce website as a data source for this analysis as it is a dedicated platform just for selling wines. They have variety of wines in their inventory that can be used for understanding consumer's demand. Our business been a start- up business. We decided to focus more on a particular type of wine. For our analyses we took the comparison between the most common types of wine- red wine and white wine due to their popularity popular in the market. The analysis is on the basis of the common attributes a consumer views before purchasing a wine like Country, Alcohol Content, Rating and Price.

APPROACH TO SCRAPING DATA

The approach we followed to scrape data is as follows:

- The data source we selected has a dynamic structure, so each time the pagination button is pressed, a new set of HTML pages are delivered by the browser. Therefore, we had to use Selenium's methods to collect all of the potential links to various wines that were present on all pages.

- After gathering all the links, we utilised beautiful soap to extract the data required for our investigation. Beautiful Soap had some problems extracting the data, so we had to add additional conditions to work around them

- Finally, we created a dataframe for further investigation using pandas.

CHALLENGES FACED & SOLUTIONS

- The div tag within the list tag with the same class contains the data that we collected from the data source. Without using the index of the div tag within the list, it was therefore impossible to scrape the data. The problem emerged because each wine's list

tag had a different number of div tags, meaning that each wine's list tag included a different quantity of data. As a result, employing indexes to acquire data became challenging. In order to use indexing to extract data, we overcome this difficulty by scraping information from links that had a predetermined amount of div tags inside of a list tag.

- The website contained numerous pages, but only ten results were shown on any given page. It took a long time for Selenium to scrape about 200 pages. This problem required us to increase the results per page attribute's value to its maximum in order to speed up pagination. The results per page feature was implemented using a dropdown menu. We utilised the Select class from Selenium to solve this problem.

- We had to use selenium to perform pagination in order to get data from all pages. The problem with this was that there was no button tag to click on. So, we had to find another way to switch pages. After reviewing the documentation for Selenium, we discovered that we could achieve the desired result by utilising the ActionChains class. We obtained the a tag for switching pages and passed it to the ActionChains object. In this way, we overcome the pagination problem.

PRE- PROCESSING OF DATA

- Because all of the numerical variables in the dataframe obtained through scraping were objects, it was difficult to perform statistical analysis on them, so we had to convert them to floats using the pandas to_numeric() function.

- We discovered some missing values in the column ratings while exploring the dataset. Because this variable was important in our research plan, we replaced the NA values with the mean rating value.

- Similarly, the price column had one row with missing value. However, because this is just one row, we decided to remove it from the dataset.
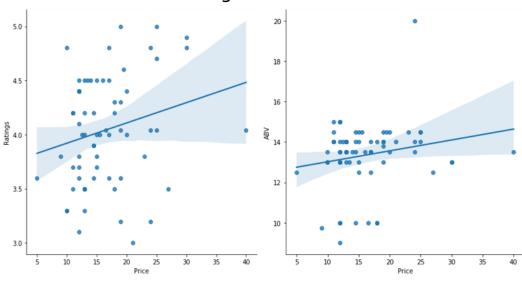
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LEXICAL OF DATASET

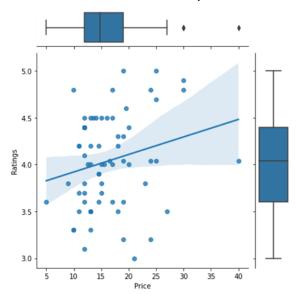| Variables	Description	Unit
Names	Name of wine	Name
Country	Origin of wine	Country
ABV	Alcohol by Volume	Percentage of alcohol by volume
Price	Cost of wine per bottle	Pound
Ratings	Average Ratings	Rating scale out of 5

VISUALISATIONS

RED WINE

1. Regression Plot

Left graph-

The plot shows that there is a linear relationship between ratings and price
As the price of red wine increases, ratings also increase.

Right Graph-
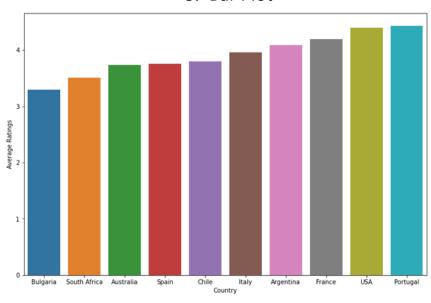
The plot shows that there is a positive linear relationship between price and ABV.
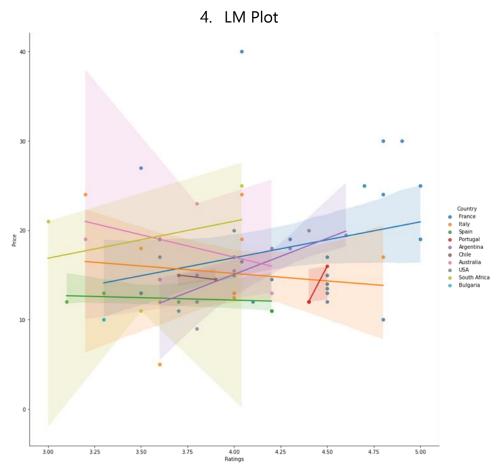
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2. Joint Grid Graph

This boxplot gives the range of ABV that should be considered to maintain highly rated stock.

3. Bar Plot
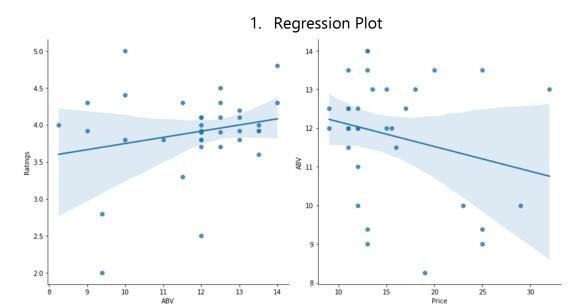
This plot gives us the information about how the average ratings vary depending on the country of origin

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4. LM Plot

This plot shows us relationship between price and ratings of red wine for different countries.

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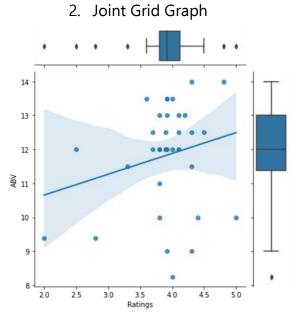# WHITE WINE

1. Regression Plot

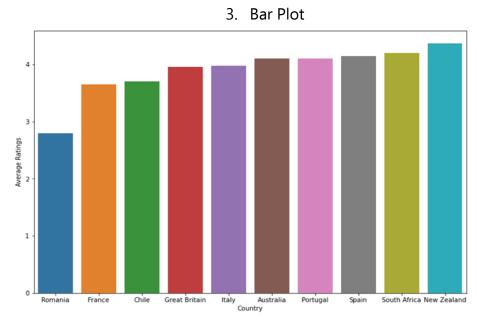**Left Graph**- *Considering Ratings and ABV as two variables*

The graph shows that as the Alcohol content increases, higher the ratings. The line has a positive slope and shows positive relation.

Right Graph- *Considering ABV and price as two variables*

The graph shows that as the price decreases, lower the ABV. The line has a negative slope and shows negative relation.

2. Joint Grid Graph
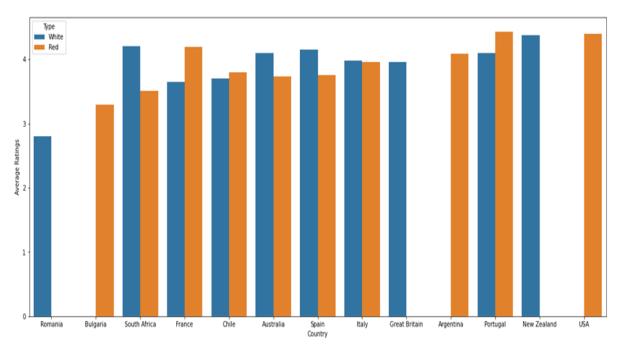

This boxplot gives the range of ABV that should be considered to maintain highly rated stock.

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3. Bar Plot

This plot gives us the information about how the average ratings vary depending on the country of origin

Comparison of Red and White wine considering country and average ratings as two variables

This plot shows how the average ratings vary depending on the country of origin for both red and white wines.

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__INTERPRETATION__

From our Analysis, we inferred that for red wine, as the price rises, ratings also tends to increase, thus making it more appealing to consumer. Similarly, in the case of white wine, we should sell wines with high ABV because they are less expensive and highly rated by consumers.

Consumers would also like red wine from Argentina, France, Italy, and white wine from New Zealand, South Africa, Spain since they have average ratings over 4. Secondly, a consumer would choose Italian wine since most of them has rating of at least 4, and the price drops as the rating improves. As average rating for red wine is more as compared to white wine, there would be a higher demand for red wine, so maintaining a big quantity of red wine on hand would be more cost-effective for the business.

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