**CCT College Dublin**

**Assessment Cover Page**

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| **Module Title:** | Statistics for Data Analytics  Programming for Data Analytics  Data Preparation and Visualisation  Machine Learning for Data Analytics |
| **Assessment Title:** | [CA2 50%](https://moodle.cct.ie/mod/assign/view.php?id=115129) Integrated Assessment |
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| **Assessment Due Date:** | 06/01/2023(11/01/2023 after PMC) |
| **Date of Submission:** | 11/01/2023 |

**Declaration**

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| By submitting this assessment, I confirm that I have read the CCT policy on Academic Misconduct and understand the implications of submitting work that is not my own or does not appropriately reference material taken from a third party or other source. I declare it to be my own work and that all material from third parties has been appropriately referenced. I further confirm that this work has not previously been submitted for assessment by myself or someone else in CCT College Dublin or any other higher education institution. |

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**Report for Beef Price Analysis in Ireland**

**and**

**a quick comparison to Spain**

MSc in Data Analytics

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***Abstract***

*Keywords: beef, beef prices, data analysis, statistics, visualisation, machine learning*

**0. Introduction**

In

**1. Agriculture and beef production**

The emergence of agriculture, dating back thousands of years ago, marked a significant milestone in the historical development of human civilisation. It is the major source of food and income for majority of people around the world (Branco, 2020).

According to Branco (2020), food production in agriculture is a complex and multi-faceted process that involves a range of factors including farming size, soil management, water and electricity usage, pest and disease control, food security monitoring etc. Data science, for example artificial intelligence, now plays an important role in modern agriculture management, which have led to significant increases in food production, allowing for the feeding of growing global populations. However, the fast development of modern agriculture consequently raises concerns about the environmental and the potential loss of biodiversity (ibid.). Additionally, the use of chemicals for fertilising and pest control can have negative effects on soil and water quality but also on food safety. Therefore, organic farming and organic food production are being promoted in order to maintain sustainability.

Animal production is one of the two major branches in agriculture, alongside crop production. Within animal production, there are various sub-sectors, including beef production, dairy production, pig production, and poultry production, to name a few. Despite the increasing demand for chicken and other meats, beef production continues to play a crucial role in meeting the protein needs of the global population, providing essential nutrients and energy for human health and development (Lewis Kahn and David Cottle, 2014).

The price of beef is determined by a variety of factors, including supply and demand, production costs, and government policies. To elaborate, the demand for beef is affected by consumer preferences, population growth, and income levels, and the supply of beef is influenced by factors such as weather conditions, disease outbreaks, and production costs as well as government policies (Croxton, 1905). An increase in demand will lead to a higher price, however, an increase in supply will lead to a lower price. The production costs of beef encompass a wide range of expenses, e.g. equipment and facilities, veterinary care, feeding and labour.

**1.1 Common Agriculture Policy (CAP)**

The European Union's Common Agriculture Policy (CAP), first established in 1962 and regularly amended, plays a significant role in shaping the agricultural industry in Europe. It was proposed to, according to official website of European Commission:

1. Ensure the continuity of food production and distribution;
2. Ensure a supply of safe and affordable food;
3. Encourage younger generations to take up farming and promote environmentally friendly farming;
4. Practice LEADER method to thrive remote and mountainous areas with disadvantages;
5. Reduce power imbalance and help small farms etc.

The latest publication of the CAP places a stronger emphasis on environmental protection and organic farming, while also promoting fairness and innovation within the industry.

**2. Data collection**

The main purpose of this report was to examine and visualise the dynamic change of beef prices in Ireland as well as analyse the possible

Jupyter notebook version 6.4.8 and Python version 3.9.12 were used for exploratory data analysis (EDA), visualisation and machine learning in our report.

**3. Data preparation**

In order to

**3.1 Processing of beef price dataset**

Table 1: Details of features in original data

|  |  |  |
| --- | --- | --- |
| FN | Attribute name | Description |
| 1 | type\_stands | types of stands in Dublin (7 types) |
| 2 | X | longitude |
| 3 | Y | latitude |
| 4 | Easting | easting |
| 5 | Northing | northing |
| 6 | location\_stand | address where stands locate |
| 7 | no\_stands | numbers of stands in the location |

**3.2 Processing of beef production dataset**

In regards

**3.3 Processing of beef feeding price dataset**

**3.4 Processing of pig meat price dataset**

**4. Statistics**

In this section, we firstly briefly have an overview of . Statistical analysis is integrated in between.

**4.1 Basic statistics**

T

Table

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**Figure 1: First half** **of the basic statistics in relation to Ireland**

Table

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**Figure 2: Second half of the basic statistics in relation to Ireland**

*Overview:*

* The average bull

Graphical user interface

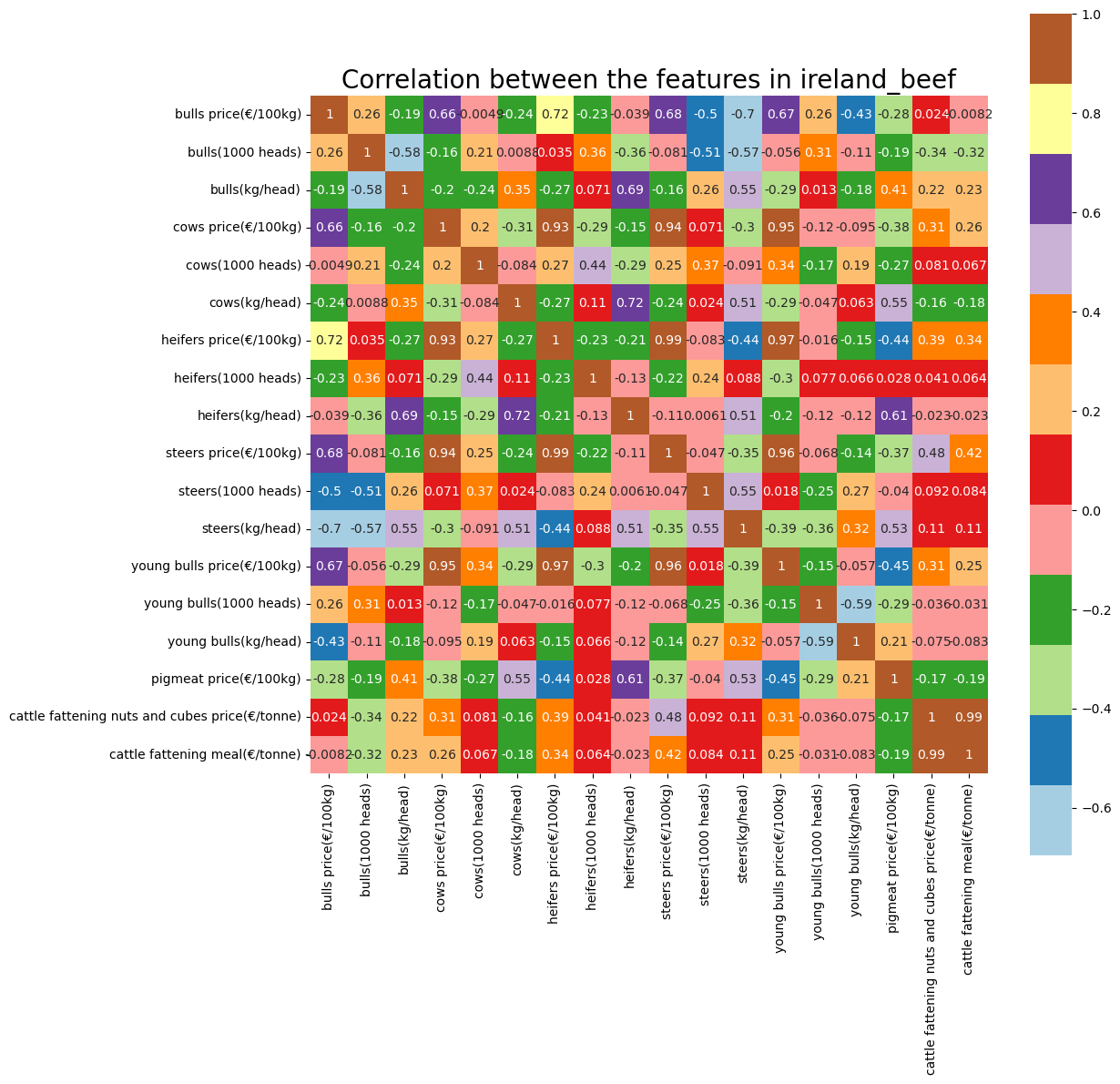
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**4.2 Hypothesis test**

A circle map function was implemented after. The advantage of this visualisation is

**5. Visualisation**

In this section,



Chart, histogram

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Graphical user interface, chart, line chart

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Chart, histogram

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Chart, histogram

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Chart, bar chart, histogram

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Chart, scatter chart

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Chart, line chart

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Chart, histogram

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Chart, histogram

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Chart, bar chart, line chart, histogram

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Chart, bar chart

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**6. Machine Learning and sentimental analysis**

In our study, we applied two supervised learning models to train and test our data and make predictions. It is worth mentioning that since the original categorical data stand\_type is practically distinctive, there is no point in learning on this feature. So we brought in the five areas of Dublin as our dependent learning feature. Before starting machine learning, we encoded feature stand\_type using installed package.

**6.1 Linear regression**

KNN

**6.2 Sentimental analysis**

before scaling was 0.44, and after it increased to 0.92. Besides, there are two important arguments (i.e. C and gamma) that can potentially affect our model. GridSearchCV was used to test and find out the best hyperparameter. However, after we implement the best scores of these two arguments, the accuracy stayed the same.

**7. Conclusion**

In order to promote cycling, the assembly of abundant and safe bike parking facilities is extremely important. Through our study, we found out that in Dublin there is not only a lack of diversity in the type of bike parking stands but also imbalanced distribution across the city. The analysis may address the required attention for other areas, northside especially, as well as the openness into other type of stands.

**8. Discussion**

In this section, the author discusses and reflects on this study.

The author is aware of the possible biases generated by the specific handling method we chose to deal with missing value in our data. Deletion method is plausible since the percentage of the missing values is lower than 5% in the whole dataset.

The target audience for this study is aiming mainly to the Dublin City Council. If extra data is collected considering the cyclists preference. For instance, the promotion of Bike Locker ([*https://www.bikelocker.ie/*](https://www.bikelocker.ie/)) and Cyc-Lok([*https://cyc-lok.ie/*](https://cyc-lok.ie/)), different insights may be received consequently.

Lastly, the author is also aware the difference of handling geospatial data than normal data and the variety of tools that can be used to generate better analysis, such as GDAL and so on.

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