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CSC 315 Computer Databases

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Project Phase IIb - Group 1

Our database project aims to help Silvies Valley Ranch to find correlations between the birth, weaning, winter, and sale weights of their goat stock. We will do this by using the data given to create visually appealing graphs that show the predicted weights overtime for new goats. We will base these predictions off of pre-existing goats already in the database, so any new goats can be accurately weight-mapped and monitored. This will require us to do extensive data analysis on the following data provided from the database: Live Weight, Birth Weight, Weaning Weight, Winter Weight, Sale Weight, Goat Name (for identification purposes), and Goat Gender. We will perform statistical operations (such as averaging birth weights by gender and comparing it to respective weaning weights, etc) to find these correlations and display them as graphs. We wish to know if the birth weights actually correlate with the future weights of the baby goats or if there is any correlation between the current weights of goats and how much they weighed at birth looking back at previous information. We will explore the question of how using the correlations to develop an approximate correlation constant can benefit the farm dramatically. This will help to solve a variety of unanswered questions about how these weights correspond which will allow for the farmers to predict the weight growth of the goats overtime, and look for any abnormal weight patterns which could be both beneficial or detrimental to the stock.

Regarding our group's personal topic to benefit the stakeholder, finding abnormalities and correlating which goats produced an increased number of abnormalities within the herd is our focus. For this, we would need to create “family trees” based on specific goat traits. Specifically, we wish to find abnormalities in goat weights, colors, and vigor scores, so these are the data sets we will be analyzing. We will use a family tree system to find correlations between specific traits and goat parents. We will find which goat dams and bucks produce the most offspring with these traits on average, and display it in a search-type application. For example, the farmer may use the filter “High Vigor Score Producers” to sort out which goats in the database would produce offspring with high Vigor Scores. We can find which parents produce the most outliers in terms of height and weight. This can be an important finding in terms of breeding goats who consistently produce outliers in terms of height and weight. The abnormally large goats would be much more suitable for livestock as larger goats would produce more milk and thus more profit. The abnormally small goats could be identified and their parents could be prevented from breeding in the future. Also, wanted abnormalities such as specific rare colors or abnormally vigorous goats could be identified. Their parents could be made to breed even more in the future. This would provide a feasible alternative to the much more common cattle farms of today, as selective breeding would lead to a better herd health overall.

An important topic going forward is sustainability. It has been found that goats produce a much smaller CO₂ footprint than the dominant form of livestock in the United States, which are cows. Cows have been the traditional source of red meat in the United States for many years. They are typically raised in inhumane, crowded dirt farms

on concentrated animal feeding operations (CAFOs). This is unethical, but goat ranches are not at the scale to support the growing population of hungry people all over the world. However, Silvies Valley Ranch already provides a much more fulfilling life for their goats as they are free roam. This begs the question: how do goats compete with cows? Goats feed off the respective land they inhabit and do not require extra imported food, which eliminates excess carbon emissions. They are also much smaller than cows, so their methane emissions (a greenhouse gas produced from pastured livestock) differ greatly from cows. Though this may seem like an insignificant feat, on a larger scale it can create quite a lasting impact! Goats are not only more “clean” than their bovine counterparts they can also produce milk and nutritional rich meats for human beings. The production on a massive scale will have a much smaller carbon footprint than the cows they compete with. Goat meat is also a viable meat product when compared to beef in terms of nutritional value and scalability. That is why our focus is on correlating weights and abnormalities, as larger goats would produce more meat, milk, and livestock and *still* cause less of an environmental impact than cows. Improving this goat ranch will set an example for other goat ranches in the United States to grow larger but still treat their animals in an ethical way.

Use Case: Viewing weight Projection:

1. System prompts users to enter the KEY of the specific baby goat.
2. User enters the specific KEY of the baby goat.
3. System validates to check if the goat is in the database.
 - 3.a. *Baby goat was not found.*
 1. *The use case jumps back to step 1.*
 - 3.b. *Invalid KEY for baby goat.*
 1. *The use case jumps back to step 1.*
4. User confirms baby goat selection.
5. Baby goat weight projections are displayed.
6. Actor is prompted back to step 1 of use case.

Use case: Inputting new Goat Information

1. Actor is prompted to input OR reinput goat information.
2. The Actor input the new goat information.
3. The system validates input selection.
 - 3.a. User input doesn't match up with inputted data type
 1. *Error message prompted to Actor.*
 2. *Invalid section cleared from input selection.*
 3. *The use case repeats at step 1.*
 - 3.b. Invalid bounds entered in input selection.
 1. *Error message prompted to Actor.*
 2. *Invalid section cleared from input selection.*
 3. *The use case repeats at step 1.*
4. Actor confirms input and confirms selection.
 - 4.a System displayed incorrect selection.
 1. *Actor is prompted to edit selection(s).*
 2. *The use case repeats at step 1.*
5. Goat is successfully updated in the database.
6. Use case jumps back to step 1.

Citations of Websites Used

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