Celtics Over/Under

(COMP3125 Individual Project)

\*Note: Do not used sub-title

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*Abstract*—This electronic document is a “live” template and already defines the components of your paper [title, text, heads, etc.] in its style sheet. *\*CRITICAL: Do Not Use Symbols, Special Characters, Footnotes, or Math in Paper Title or Abstract*. (*provide a short abstract*)

Keywords—example1, example2, example3, example 4, example 5 (provide 3-5 keywords)

# Introduction (*Heading 1*)

Provide an introduction of your topics. Make sure you include the following part. What’s your topic? Why is it important or interesting? What’s the current research/results in this area. Include necessary citation.

This project focuses on predicting whether the total combined score of Boston Celtics games will be over or under the line set by oddsmakers. To do this, data from ESPN will be used to track key performance metrics.

The analysis will consider the Celtics' offensive rating, defensive rating, and 3-point shooting percentage, as well as the offensive and defensive ratings of their opponents. A key assumption is that if the Celtics shoot over 45% from 3-point range, they are more likely to exceed the predicted total score. This approach aims to create a simple but effective model to estimate the likelihood of the game total going over or under.

# Datasets

## Source of dataset (Heading 2)

In this part, you should introduce your datasets. Where did you download it? Is it a credible source? When were the datasets generated? How were the datasets generated by the creator? If you create the datasets, how did you generate it?

The dataset for this project comes from ESPN, where key statistics for Boston Celtics games and their opponents are collected. It includes data like the points scored by the Celtics' starters and bench, their 3-point shooting percentage, and the offensive and defensive ratings of both teams. The data is manually entered into a CSV format, making it easy to organize and analyze. This dataset will be used to predict whether the total combined score of a game will go over or under the set line based on various performance factors.

## Character of the datasets

What’s the format and size of the datasets? What parameters/columns/rows/character and their units are included in this dataset. Use a table to explain this is recommended. Did you clean the data or convert any unit in the dataset? If so, what’s the formula/rule did you apply? Did you combine any datasets? If so, how do you combine them? Did you create any new category for analysis in the datasets? If so, what and how do you create?

The dataset focuses on important statistics that can affect the outcome of Celtics games. It includes data such as the points scored by the Celtics' starters and bench, their 3-point shooting percentage, and defensive ratings, along with the offensive and defensive ratings of their opponents. These statistics help provide a clear picture of the game and allow for analysis of what factors may influence whether the total score will go over or under the predicted line.

# Methodology

In this part, you should give an introduction of the methods/model. First, what’s the method/model. What’s the assumption of this method/model. What’s the advantage/disadvantage of this method/model. Why did you choose it. What Python module or function do you apply to apply this method/model. Any optional input/extra work did you adjust to make the results better. If you have multiple methods, feel free to use subsection A., B. to separate them.

Example: Before you begin to format your paper, first write and save the content as a separate text file. Complete all content and organizational editing before formatting. Please note sections A-D below for more information on proofreading, spelling and grammar.

## Method A

This project uses a classification model, where the goal is to predict one of two outcomes: Over or Under. The method assumes that the offensive and defensive ratings of both teams, along with the Celtics' 3-point shooting percentage, play a role in determining the total score. The main advantage of this method is that it provides a clear and simple prediction (over or under), which is useful for sports betting analysis. However, a disadvantage is that small changes in the data, such as player injuries or unusual game conditions, could affect the prediction.

This method was chosen because it directly aligns with the goal of predicting over or under outcomes. To improve the accuracy of the model, adjustments may be made, such as creating new features (like accounting for player injuries) or scaling the data to make sure differences in the range of values (like percentages vs. ratings) don’t affect the model's performance. The model will also be tested using cross-validation to ensure it works well on different parts of the data.

Identify applicable funding agency here. If none, delete this text box.

# Results

In this part, you need to select a reasonable way to deliver the result of your topic. For example, equation or numerical results, or visualization of your result. You also need to provide a clear explanation of all results and how to understand the results. If there exist any unexpected results, please explain why or possible cause of this special result. You can use subsection A. B. to separate your results.

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## Result A

Example: XXX

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## Results B

Example: Headings, or heads, are organizational devices that guide the reader through your paper. There are two types: component heads and text heads.

## Results C

#### Positioning Figures and Tables: Place figures and tables at the top and bottom of columns. Avoid placing them in the middle of columns. Large figures and tables may span across both columns. Figure captions should be below the figures; table heads should appear above the tables. Insert figures and tables after they are cited in the text. Use the abbreviation “Fig. 1”, even at the beginning of a sentence.

1. Table Type Styles

| Table Head | Table Column Head | | |
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| Table column subhead | Subhead | Subhead |
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1. Sample of a Table footnote. (*Table footnote*)
2. Example of a figure caption. (*figure caption*)

Figure Labels: Use 8 point Times New Roman for Figure labels. Use words rather than symbols or abbreviations when writing Figure axis labels to avoid confusing the reader. As an example, write the quantity “Magnetization”, or “Magnetization, M”, not just “M”. If including units in the label, present them within parentheses. Do not label axes only with units. In the example, write “Magnetization (A/m)” or “Magnetization {A[m(1)]}”, not just “A/m”. Do not label axes with a ratio of quantities and units. For example, write “Temperature (K)”, not “Temperature/K”.

# Discussion

Every method/project has its shortage or weakness. Please discuss the unsatisfied results in your project. And discuss the feasible suggestions of future work to revise/improve your result.

Example: xxx

# Conclusion

In this part, you should summarize your project. What important results did you find for your topic and what’s the effect of this result on the real-world?

Example: xxx

##### Acknowledgment *(Heading 5)*

The preferred spelling of the word “acknowledgment” in America is without an “e” after the “g”. Avoid the stilted expression “one of us (R. B. G.) thanks ...”. Instead, try “R. B. G. thanks...”. Put sponsor acknowledgments in the unnumbered footnote on the first page.

##### References

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1. G. Eason, B. Noble, and I. N. Sneddon, “On certain integrals of Lipschitz-Hankel type involving products of Bessel functions,” Phil. Trans. Roy. Soc. London, vol. A247, pp. 529–551, April 1955. *(references)*
2. J. Clerk Maxwell, A Treatise on Electricity and Magnetism, 3rd ed., vol. 2. Oxford: Clarendon, 1892, pp.68–73.
3. I. S. Jacobs and C. P. Bean, “Fine particles, thin films and exchange anisotropy,” in Magnetism, vol. III, G. T. Rado and H. Suhl, Eds. New York: Academic, 1963, pp. 271–350.
4. K. Elissa, “Title of paper if known,” unpublished.
5. R. Nicole, “Title of paper with only first word capitalized,” J. Name Stand. Abbrev., in press.
6. Y. Yorozu, M. Hirano, K. Oka, and Y. Tagawa, “Electron spectroscopy studies on magneto-optical media and plastic substrate interface,” IEEE Transl. J. Magn. Japan, vol. 2, pp. 740–741, August 1987 [Digests 9th Annual Conf. Magnetics Japan, p. 301, 1982].
7. M. Young, The Technical Writer’s Handbook. Mill Valley, CA: University Science, 1989.

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