Objective

You have been hired by the U.S. bicycle team to help them train for the Tour de France. The head trainer recently read an article, which presents the results of a study about the effects of the consumption of chocolate (dark chocolate and white chocolate) on a number of important outcome variables during cycling. These outcome variables included: oxygen consumption (ml/kg/min), heart rate (bpm), blood lactate (BLa), blood pressure (mmHg), and an all-out bicycle sprint performance (meters).

The experimental setup consisted of a randomized crossover design where the various outcome variables of $n = 9$ male participants was measured in two trials after participants consumed either dark chocolate (40 grams of Dove) or white chocolate (40 grams of Milkybar), each for two weeks. A crossover design is a repeated measurements design such that each subject receives the two different treatments (dark chocolate versus white chocolate) during the different two-week time periods, i.e., the patients **cross over** from one treatment to another during the course of the experiment. The order of which treatment was received in the first time period was randomized. Prior to receiving the first treatment, each participant underwent baseline measurements on the outcome variables.

The trainer was specifically interested in the results for the all-out sprint performance which measured the distance traveled (in meters) for a two-minute time trial. He would like to know how the regular consumption of chocolate affects the total distance covered during an all-out sprint and if the type of chocolate consumed matters.

Some of these results are presented in the table below.

Distance Covered (in meters = m) during Time Trial* Note: *n* = 9 for each condition

	Baseline	**White Chocolate (WC)**	**Dark Chocolate (DC)**
Mean (m)	1367	1419	1606
Std dev (m)	171	248	158
***p*-value** (compared to baseline)	-	0.319	0.001

Dark Chocolate: 95% Confidence Interval for the population average change in total distance covered (dark chocolate over baseline) is 165 m to 314 m; (*p*-value 0.001).

Dark versus White Chocolate: 95% Confidence Interval for the population average change in total distance covered (dark chocolate over white chocolate) is 82 m to 292 m; (*p*-value = 0.003).

The trainer knows you have some statistics background and wants your help on understanding and interpreting these results. Based on the results from the article, write a memorandum to the trainer addressing his questions and explaining what these statistics results show.

Your memorandum should include a little discussion about the benefits of using a crossover design. Although this sample size is small, you can consider it a reasonable one for this type of study, and can thus focus on interpreting the results. Be sure to comment about the two provided confidence intervals, including an interpretation of both confidence intervals, and an explanation of the meaning of the confidence level in context. Finally, include in your memorandum your recommendation for or against inclusion of chocolate (and if inclusion, which type of chocolate) in the athletes' diet.

Data is from: Patel, R. K.; Brouner, J.; Spendiff, O. *Journal of the International Society of Sports Nutrition*. **2015** 12:47.

A Few Notes for Completing the Assignment

Some Items to keep in mind:

- When your memorandum is read by your peers, they will play the role of the head trainer with minimal statistical literacy, who is trying to understand these results.
- Since you are explaining this to your client, the head trainer, you should take care to carefully edit and proofread your memorandum.
- Your memorandum should be between 350-500 words (excluding header, footer, citations). In case you aren't sure what memorandum (or, "memo") format should look like:

https://owl.purdue.edu/owl/subject_specific_writing/professional_technical_writing/memos/sample_memo.html

- You will need to include citations and sources when discussing the data from this study. When referencing the data, you can use the following source: R. K.; Brouner, J.; Spendiff, O. *Journal of the International Society of Sports Nutrition*. **2015** 12:47. If you use additional sources in your response, be sure to include in-text citations and a references section and use MLA format.
- **Please do NOT post a request for a peer review on the Forums.** Coursera automatically assigns reviewers for you and posting a request doesn't make the process faster. Typically, 7 to 10 days are needed to accumulate the necessary 3 reviews.
- To preserve the discussion forums for course content questions and conversation course staff may delete posts that request peer reviews.

A Few Notes for Providing High Quality Peer Review

1. Use respectful language whether you are suggesting improvements to or praising your peer.

2. Look over your peer’s memo to quickly get an overview of the piece.

3. Next, read the memo *more slowly* keeping the rubric in mind.

4. As you re-read, note the pieces of texts that let you directly address the rubric prompts in your online responses.

5. In your online responses, focus on larger issues (higher order concerns) of content and argument rather than lower order concerns like grammar and spelling.

6. Be very specific in your responses, referring to your peer’s actual language, mentioning terms and concepts that are either present or missing, and following the directions in the rubric.

7. Peer Review is important and helpful (to both the reviewer and receiver of the review), so be sure your online responses are detailed enough (minimum word count for each of the 4 criteria is 30 words).

8. Peer Review is most helpful if received in a timely basis.. Complete your thoughtful online feedback for all your assigned submissions ASAP so you can provide that feedback and thus earn your points for this helpful exercise.

Grading Criteria

The Coursera peer review system will assign peer graders to your assignment until you have received three grades/reviews from fellow students. This process usually takes about 10 days but sometimes takes as long as 15 days. Please be patient!

These are the criteria that will be used to grade your assignment. You will need to pay attention to these, both as a learner and as a peer reviewer.

1. This memorandum should be written to be understandable to the trainer who has basic statistical literacy. Comment on whether this was achieved. What parts were written well? What parts would be more difficult to understand?

2. Comment on how the memorandum addresses the benefits of using a crossover design. What is explained well? What is missing? How might the description be improved?

3. Comment on how the memorandum addresses the provided confidence intervals, including an interpretation of both confidence intervals, and an explanation of the meaning of the confidence level in context. What is explained well? What is missing? How might the description be improved?

4. Comment on the recommendation for or against inclusion of chocolate (and if inclusion, which type of chocolate) in the athletes' diet. Does the recommendation align with the data provided? What is missing? How might the recommendation be improved?