Experimentation and Evaluation **2024**

Students: Davide Frova, Costanza Rodriguez Gavazzi

Project 2 **Due date:** Monday, 19 December 2024, 06:00 PM

---

1. Abstract

2. Introduction

Introduce the topic of investigation to the reader and motivate why you did the experiment.

1. Hypotheses

Null Hypothesis: There is no significant difference in reading speed between camelCase and kebab-case.

Alternative Hypothesis: Users perform better with kebab-case compared to camelCase.

3. Method

1. Variables

1.1. Independent Variable

Case Style: camelCase, kebab-case

1.2. Dependent Variables

Response Time: in milliseconds;
Correctness: true/false

1.3. Control Variables

Same questions presented in random order.

1.4. Blocking Variable

Previous programming experience: true/false.

2. Design

Single-Factor Experiment

Within-Subject Design: Participants experienced both case styles in random order to reduce bias

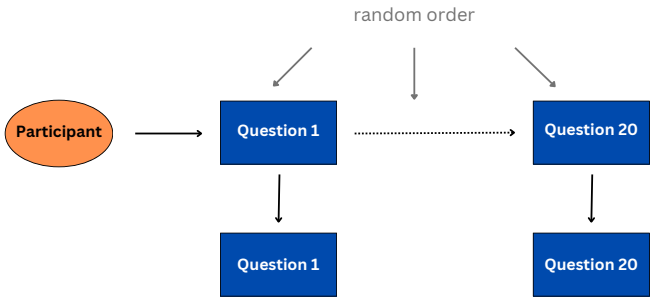

Figure 1: Design of the experiment

3. Participants

Total participant: 36

Age range:
Programming experience: n participants

4. Apparatus and Materials

Web app built with Next.js, React, and TypeScript, deployed on Vercel. //todo davide

5. Procedure

Participants:

- Provided their age and if they had programming background.
- Completed a warm-up tutorial.
- Answered 10 camelCase and 10 kebab-case questions, randomly shuffled.

Recorded data included response times, correctness, age of participant and programming background.

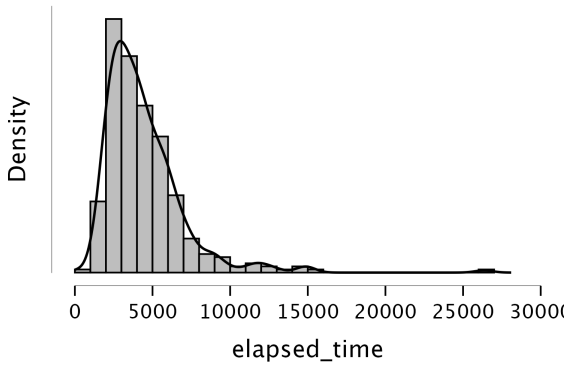

Figure 2: Distribution of Correct Answers for camelCase

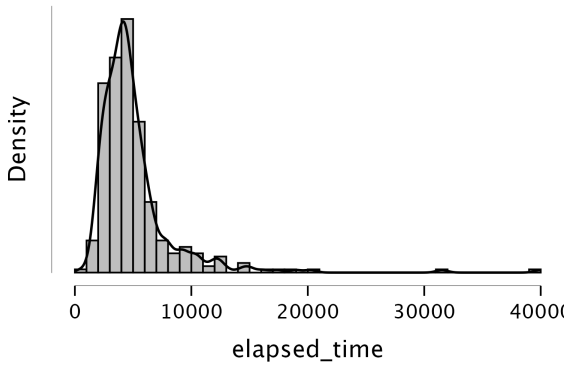

Figure 3: Distribution of Correct Answers for kebab-case

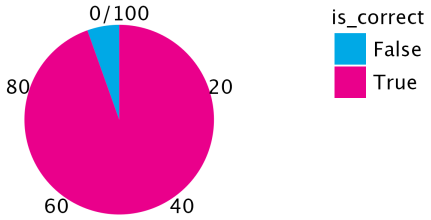

Figure 4: Correct Answers for camelCase with No Programming Background

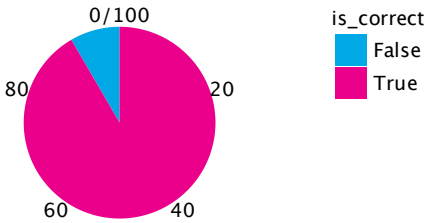

Figure 5: Correct Answers for camelCase with Programming Background

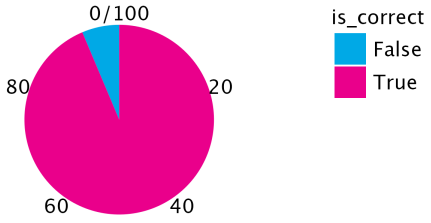

Figure 6: Correct Answers for kebab-case with No Programming Background

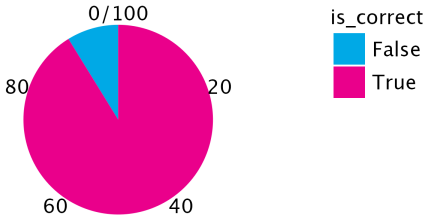

Figure 7: Correct Answers for kebab-case with Programming Background

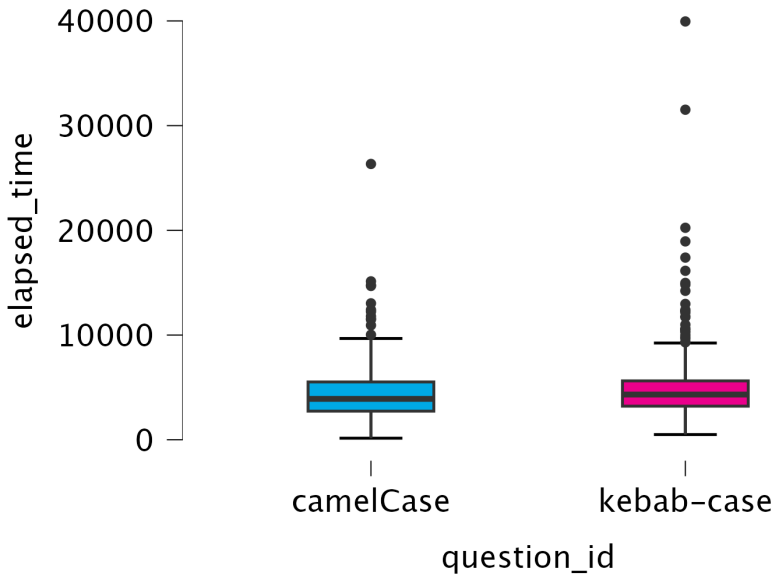

Figure 8: camelCase vs kebab-case: Elapsed Time

Table 1: Descriptive Statistics CSBG

		Mean	Std. Deviation	Minimum	Maximum	25th percentile	50th percentile	75th percentile
elapsed_time	camelCase	3969.640	2113.221	150.000	15059.000	2548.250	3511.000	4987.750
	kebab-case	4567.916	3290.778	328.000	39951.000	3007.250	4007.500	5118.750

4. Results

1. Visual Overview

2. Descriptive Statistics

3. Inferential Statistics

5. Discussion

1. Compare Hypotheses with Results

The null hypothesis is supported as no significant advantage was found for kebab-case over camelCase.

2. Limitations and Threats to Validity

- Small sample size may limit generalizability.
- Variations in user familiarity with case styles could affect results.

3. Conclusions

Case style does not significantly impact response time or accuracy. Future research could explore larger samples or different demographics.

6. Appendix

1. Reproduction Package

// todo davide aggiungere link // todo davide scrivere il readme

Table 2: Descriptive Statistics NON CSBG

		Mean	Std. Deviation	Minimum	Maximum	25th percentile	50th percentile	75th percentile
elapsed_time	camelCase	5296.818	3376.998	1744.000	26341.000	3200.250	4419.500	6334.250
	kebab-case	6310.291	4330.106	1771.000	31522.000	3637.000	4952.500	7584.250

Table 3: Descriptive Statistics

	Mean	Std. Deviation	Minimum	Maximum	25th percentile	50th percentile	75th percentile
camelCase	4442.718	2609.916	150.000	26341.000	2734.000	3904.000	5522.000
kebab-case	5119.937	3691.977	497.000	39951.000	3209.500	4319.000	5624.000

Table 4: Paired Samples T-Test

Measure 1		Measure 2	t	df	p	Cohen's d	SE Cohen's d
kebab-case	-	camelCase	3.515	359	1.000	0.185	0.064

Note. For all tests, the alternative hypothesis specifies that kebab-case is less than camelCase.