

# Estimating qualitative parameters for assessment of body balance in a simulated ambulatory setting

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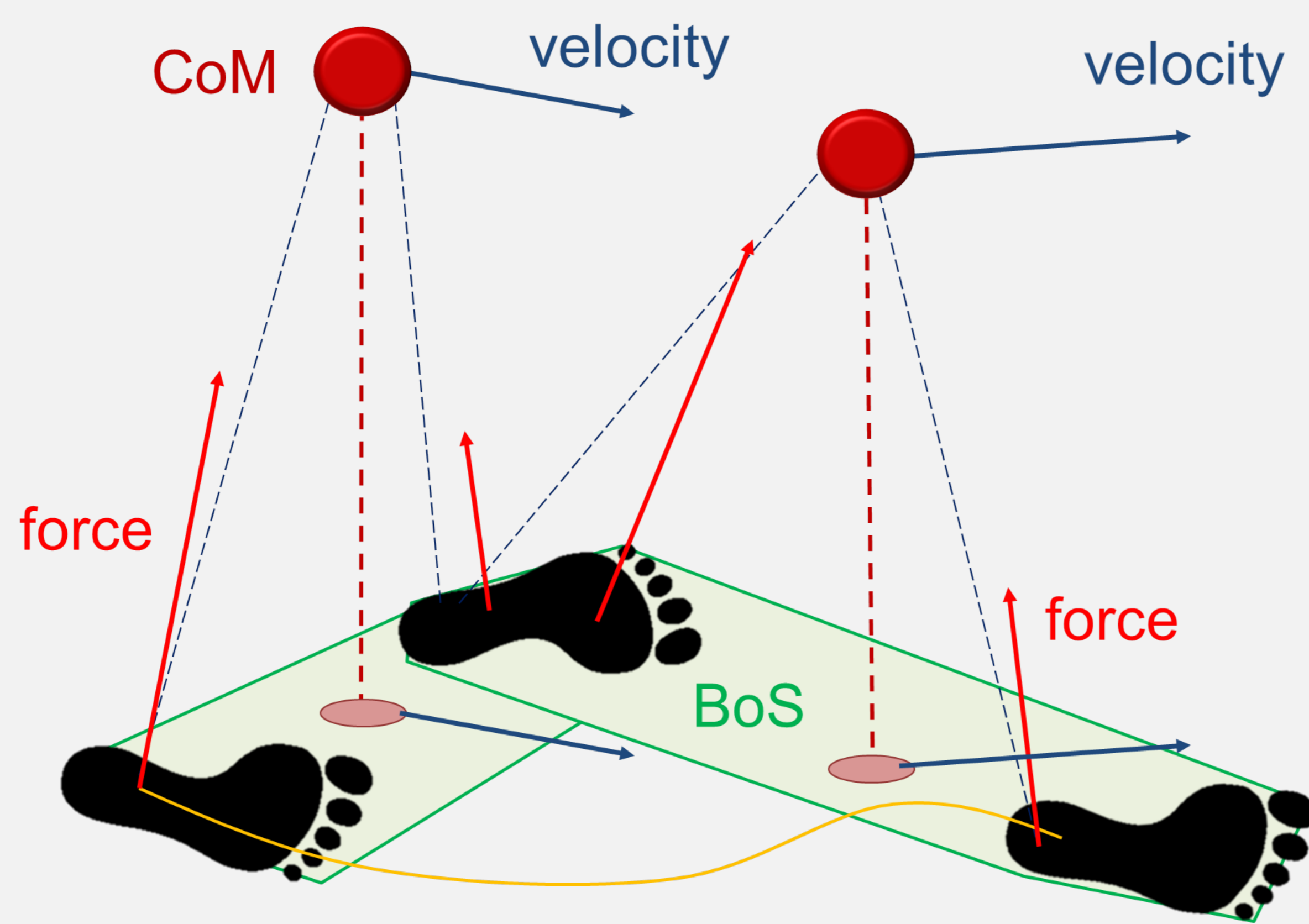
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## Introduction

- Continuous daily-life monitoring of balance control of stroke survivors, is essential for optimal guidance of rehabilitation therapy
- Assessment of dynamic balance control and stability, by estimating the movement of centre of mass (CoM) related to foot positions [1, 2]



Qualitative parameters of balance; position and velocity of CoM related to the relative foot positions and borders of base of support (BoS)

## Methods

- Evaluation in 20 stroke patients
- Tests in a simulated ambulatory setting
- Prototype of the INTERACTION system, a more unobtrusive system is under development



Left: Xsens MVN Biomech, Right-up: Xsens MVN Studio, Right-down: Instrumented force shoe

- Compared with the results of commonly used clinical balance assessments

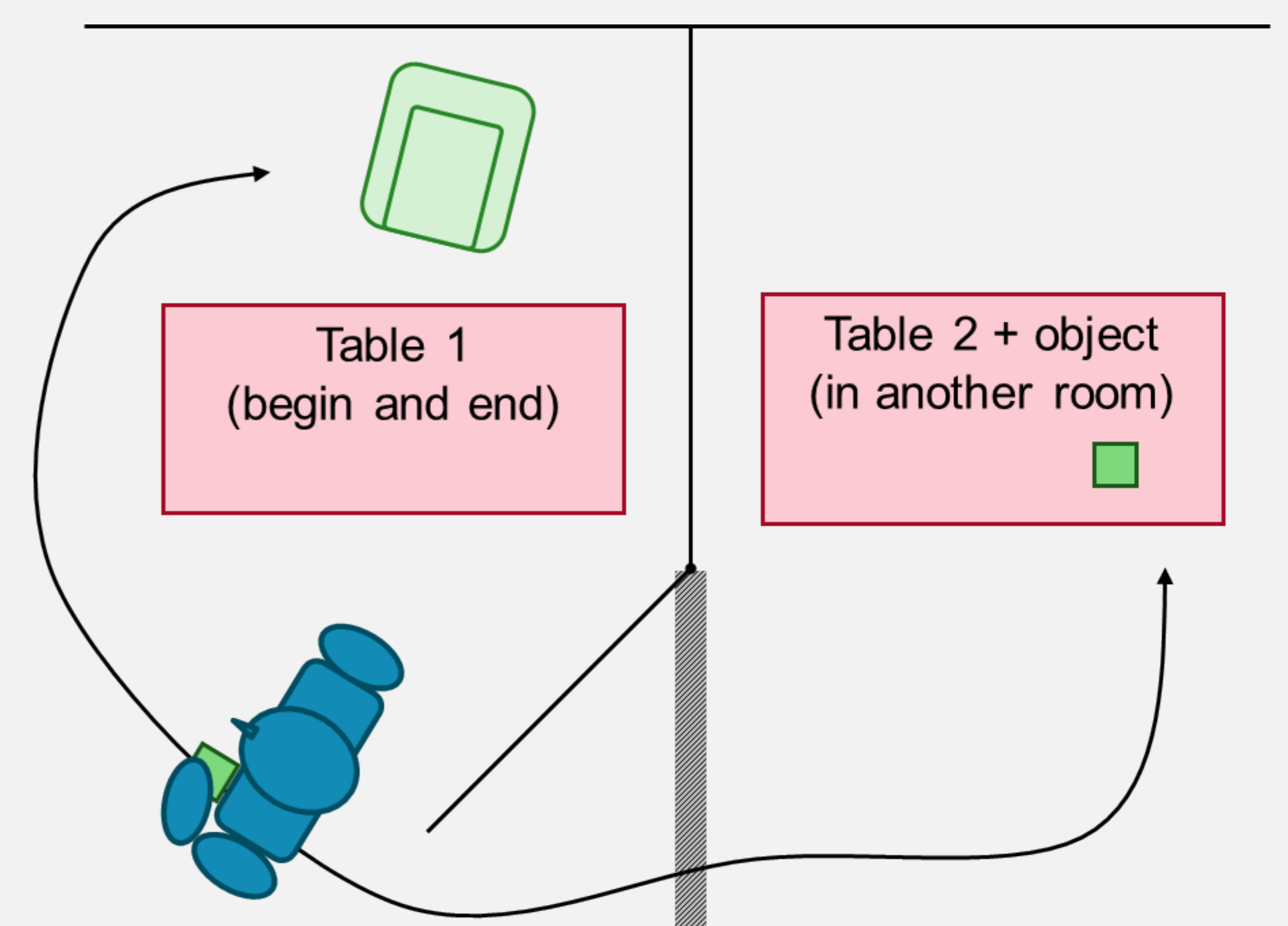
## Protocol

Clinical balance assessments:

- Berg Balance Scale [3]
- Timed 'Up & Go' [4]

Subjects will perform daily-life tasks in a simulated ambulatory setting:

- Sitting, rising up and walking
- Moving objects and opening a door



Top-down view of the simulated ambulatory setting in which subjects move around and perform tasks

## Hypothesis

Qualitative parameters of dynamic balance control and stability can be estimated using the INTERACTION system in a simulated ambulatory setting

## References

- [1] Hof et al. *J. Biomech.*, 2005.
- [2] Schepers et al. *IEEE Trans. Biomed. Eng.*, 2009.
- [3] Berg et al. *Physiother. Can.*, 1989.
- [4] Podsiadlo et al. *J. Am. Geriatr. Soc.*, 1991.

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