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**Bachelor Thesis Artificial Intelligence**

# **EFFICIENT GENERATION FOR COLLECTIVE DECISION MAKING**

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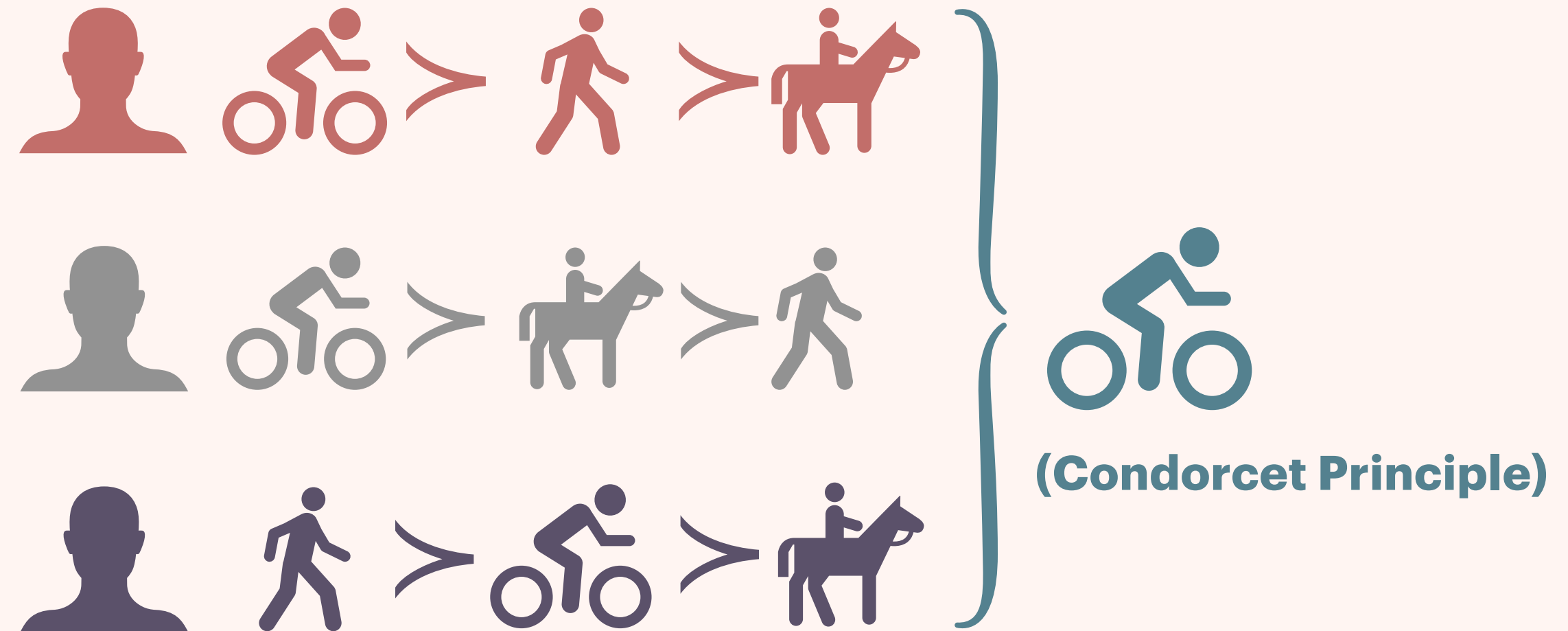
SUPERVISOR: A. BOIXEL (ILLC)

**Nienke Reints, May 15th**

AMSTERDAM

# PROBLEM DESCRIPTION

- **Group Decision**
- **Voting Rules & Axioms**
- **Justification**
- **Efficient**



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# RESEARCH QUESTION

- **A. Boixel, U. Endriss**
  - **Justification = Explanation + Normative Basis**
- **Efficiency**

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# METHOD

- **Literature research**
- **Designing the algorithms**
- **Evaluating the efficiency**

# MODEL

- **Agents**  $N^* = \{ \text{red person}, \text{dark person}, \text{light person} \}$
- **Alternatives**  $X = \{ \text{bicycle}, \text{walking}, \text{horse} \}$
- **Preferences**  $\mathcal{L}(X) = \{ \text{red bicycle} > \text{red walking} > \text{red horse} \quad \text{dark bicycle} > \text{dark horse} > \text{dark walking} \quad \text{light walking} > \text{light bicycle} > \text{light horse} \}$
- **Instances of axioms**  $Inst_{>_{N^*}}(A)$  **A is an axiom**

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# ALGORITHMS

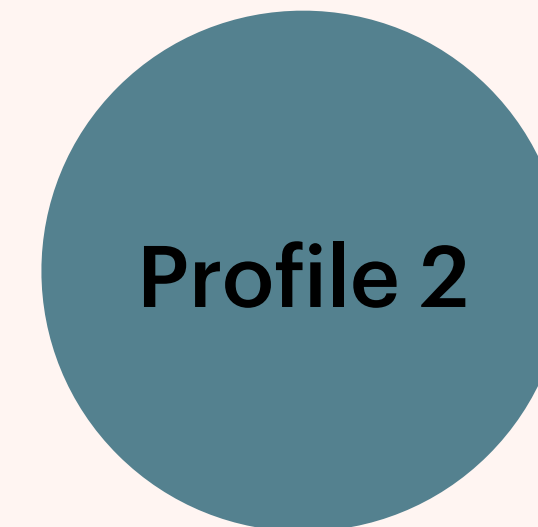
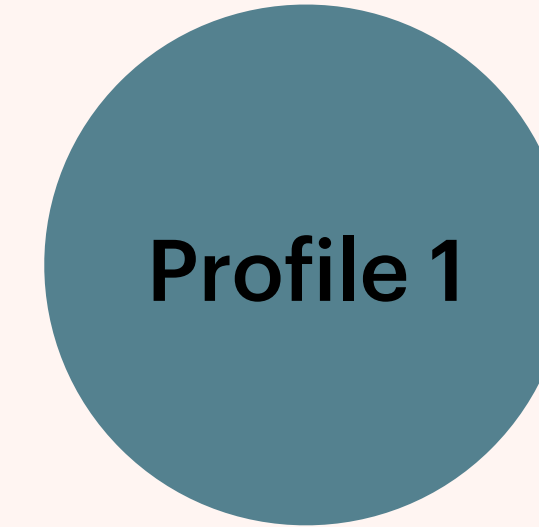
- **Limit number of instances**
- **1 profile axioms**
- **2 profile axioms**

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# ALGORITHM 1

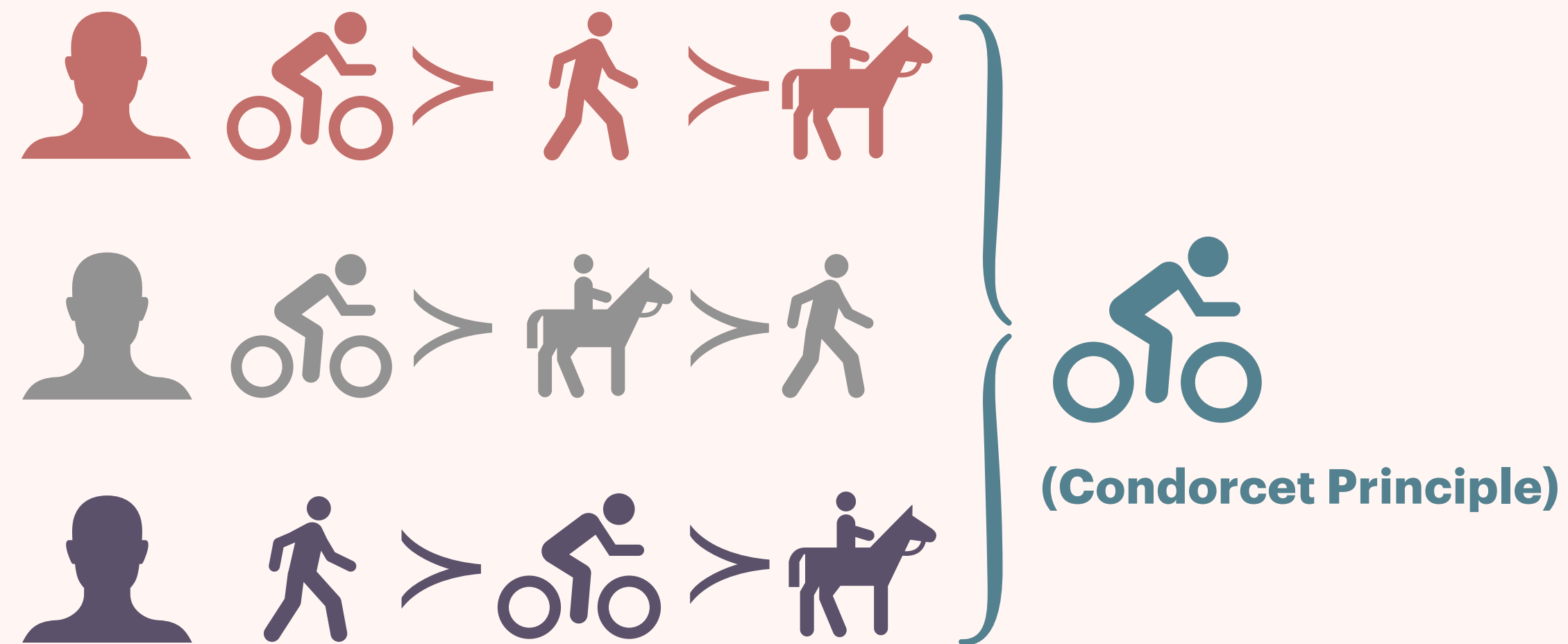
➤ **Target Profile**

➤ **Instances**



# ALGORITHM 1

## ➤ Example

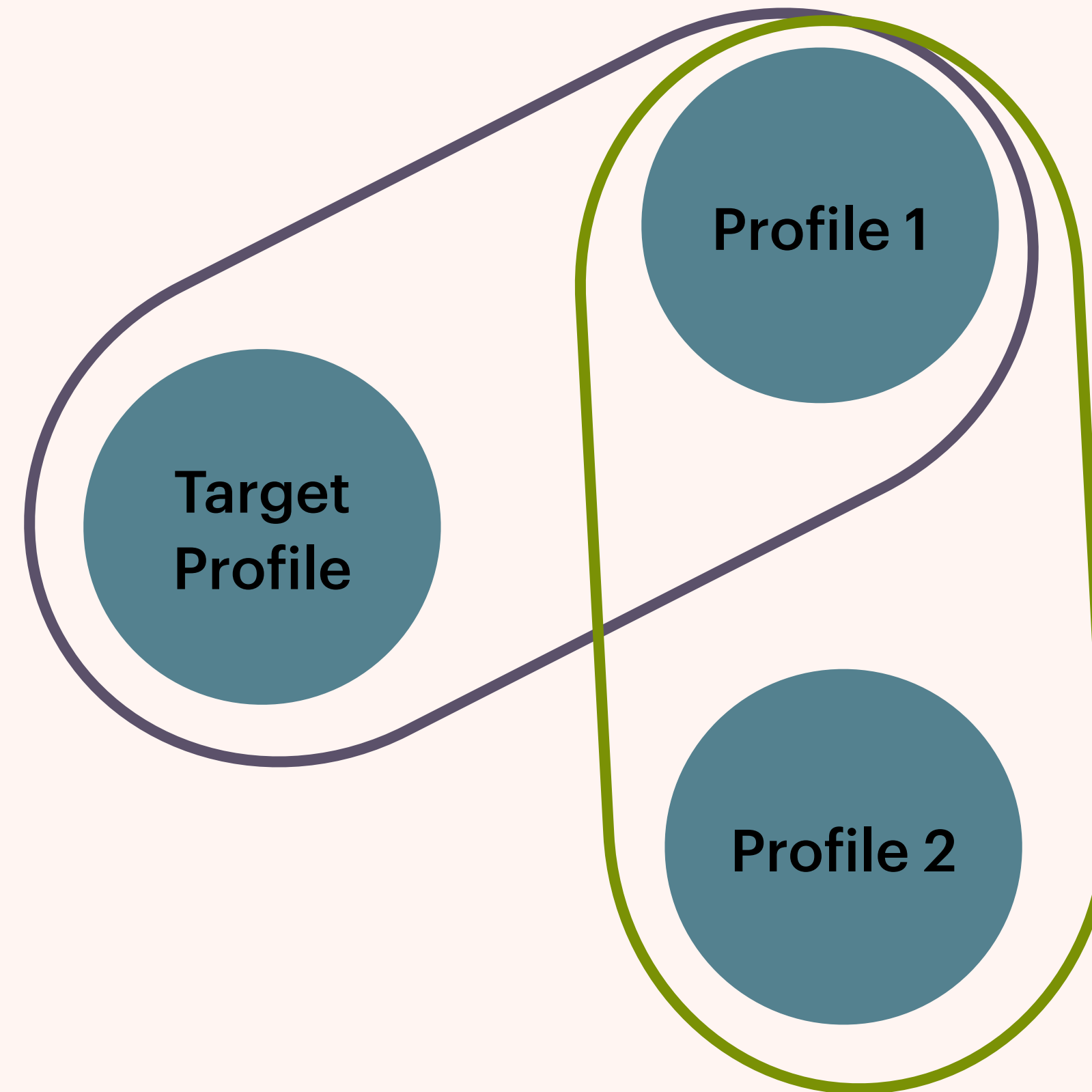




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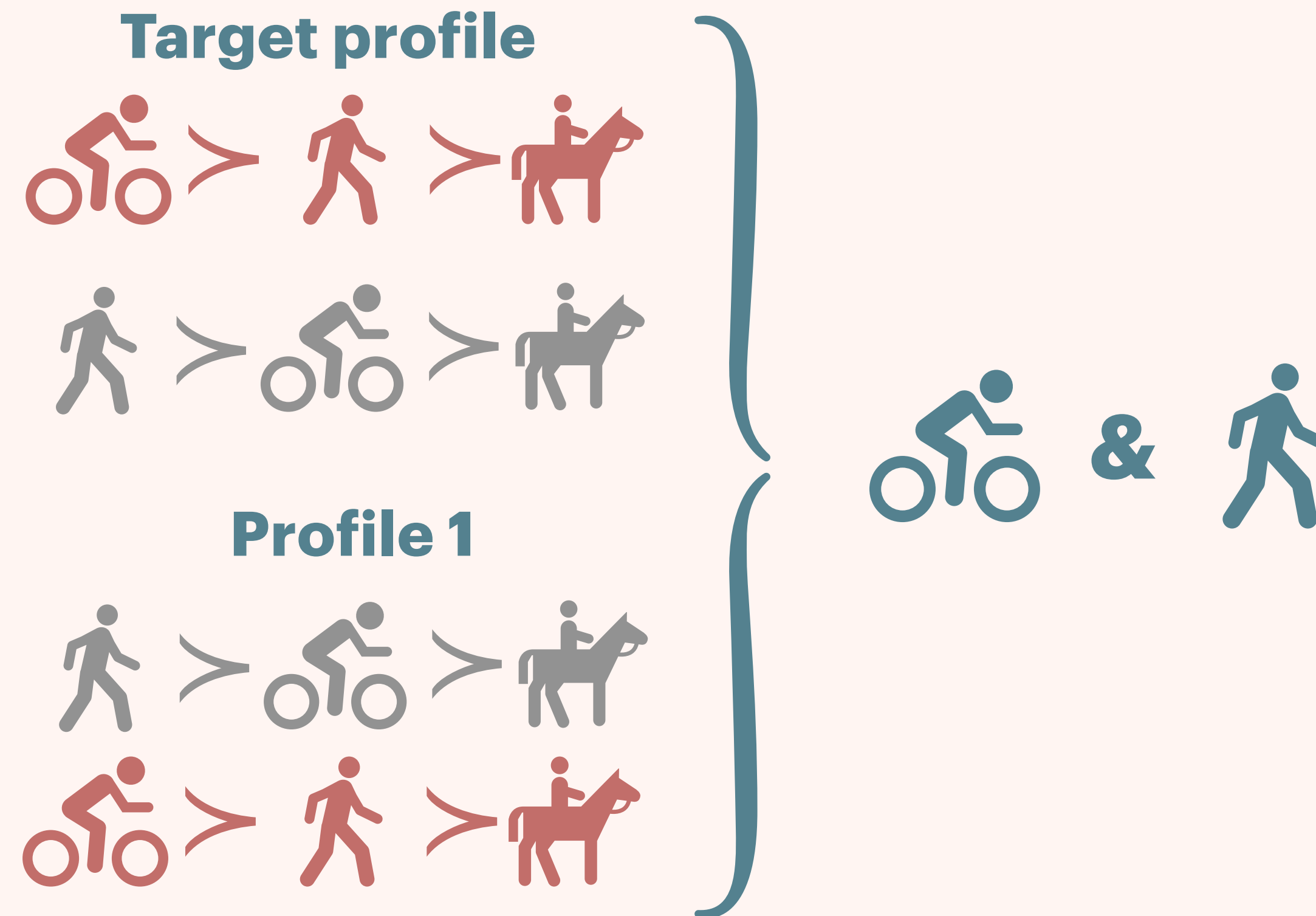
# ALGORITHM 2

## ➤ **Breath-first approach**



# ALGORITHM 2

## ➤ Example



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# NEXT MONTH

➤ **Implementation**

➤ **Evaluation**