# Choice with multiple alternatives – 5.2
# Specification of the deterministic part

Michel Bierlaire

Solution to the practice quiz: model

## 1 Model specification

1. $\mathcal{C} = \{\text{walk}, \text{bicycle}, \text{car}, \text{bus}\}$
2. $|\mathcal{C}_n| = 4 - 1 = 3$
3. Deterministic part of the utility functions:
   - $V_{\text{walk,n}} = \text{ASC}_{\text{walk}} + \beta_{\text{distance}} \cdot distance_{\text{n}}$
   - $V_{\text{bicycle,n}} = \text{ASC}_{\text{bicycle}} + \beta_{\text{distance}} \cdot distance_{\text{n}}$
   - $V_{\text{car,n}} = \text{ASC}_{\text{car}} + \beta_{\text{time}} \cdot time_{\text{car,n}} + \beta_{\text{cost}} \cdot cost_{\text{car,n}}$
   - $V_{\text{bus,n}} = \beta_{\text{time}} \cdot time_{\text{bus,n}} + \beta_{\text{cost}} \cdot cost_{\text{bus,n}}$
4. As no assumption about the distribution of the error terms has been specified, there is not enough information to know the type of model.
   - ☐ ~~logit~~,
   - ☐ ~~probit~~,
   - ■ I don't know.

## 2 Model parameters

1. As the coefficient of travel is negative, the higher the travel time of an alternative, the **lower** its utility.

- ☐ ~~true~~,
- ■ false.

2. As the coefficient of travel cost is positive, the higher the travel cost of an alternative, the higher its utility.

   - ■ true,
   - ☐ ~~false~~.

3. As the coefficient of distance is negative, the higher the travel distance of an alternative, the **lower** its utility.

   - ☐ ~~true~~,
   - ■ false.

4. We would expect the three variables (travel time, travel cost and distance) to be associated with negative coefficients. The positive cost coefficient implies that an increase of the cost of an alternative would increase its attractivity. It is not consistent with our expectations.