Choice with multiple alternatives – 5.2
Specification of the deterministic part

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Solution to the practice quiz: qualitative variables

1. We use three dummy variables $z_{\text{vc},n}$, $z_{\text{rc},n}$ and $z_{\text{nc},n}$ defined as follows:

Level of comfort for n	$z_{\text{vc},n}$	$z_{\text{rc},n}$	$z_{\text{nc},n}$
very comfortable	1	0	0
comfortable	0	0	0
rather comfortable	0	1	0
not comfortable	0	0	1

2. The model specification is

$$\begin{aligned} V_{\text{car},n} &= \beta\text{time} \cdot \text{Travel time}_{\text{car},n} \\ V_{\text{metro},n} &= \text{ASC}_{\text{metro}} + \beta\text{time} \cdot \text{Travel time}_{\text{car},n} + \beta_{\text{vc}} \cdot z_{\text{vc},n} + \beta_{\text{rc}} \cdot z_{\text{rc},n} + \beta_{\text{nc}} \cdot z_{\text{nc},n}. \end{aligned}$$

3. The estimates of the parameters are

   - $\text{ASC}_{\text{metro}}$: -0.35,
   - β_{time}: -0.231,
   - β_{vc}: 0.90,
   - β_{rc}: -0.10,
   - β_{nc}: -1.10.

   The alternative specific constant and the coefficients of the dummy variables have changed. On the one hand, considering that β_{vc} has been normalized to zero in the first model, and β_{c} in the second, the value of the coefficients of the dummy variables has increased by 0.90, so that the coefficient for the level "comfortable" becomes 0. On the other hand, in order to keep the values of the differences in utilities unchanged, the value of the $\text{ASC}_{\text{metro}}$ has decreased by 0.90.