

| Flat  | Bedrooms | Size | Central | Floor | Elevator | Pets | Garden | Price |
|-------|----------|------|---------|-------|----------|------|--------|-------|
| $a_1$ | 1        | 50   | yes     | 1     | no       | yes  | 0      | 300   |
| $a_2$ | 2        | 45   | yes     | 0     | no       | yes  | 0      | 335   |
| $a_3$ | 2        | 65   | no      | 2     | no       | yes  | 0      | 350   |
| $a_4$ | 2        | 55   | no      | 1     | yes      | no   | 15     | 330   |
| $a_5$ | 3        | 55   | yes     | 0     | no       | yes  | 15     | 350   |
| $a_6$ | 2        | 60   | yes     | 3     | no       | no   | 0      | 370   |
| $a_7$ | 3        | 65   | yes     | 1     | no       | yes  | 12     | 375   |

Table 5.1: Available apartments

If we match Carlos's requirements and the available apartments, we see that

- flat  $a_1$  is not acceptable because it has one bedroom only (rule  $r_2$ );
- flats  $a_4$  and  $a_6$  are unacceptable because pets are not allowed (rule  $r_4$ );
- for  $a_2$ , Carlos is willing to pay \$300, but the price is higher (rules  $r_7$  and  $r_9$ );
- flats  $a_3$ ,  $a_5$ , and  $a_7$  are acceptable (rule  $r_1$ ).

### 5.10.3 Selecting an Apartment

So far, we have identified the apartments acceptable to Carlos. This selection is valuable in itself because it reduces the focus to relevant flats, which may then be physically inspected. But it is also possible to reduce the number further, even down to a single apartment, by taking further preferences into account. Carlos's preferences are based on price, garden size, and size, in that order. We represent them as follows:

$$r_{10} : \text{acceptable}(X) \Rightarrow \text{cheapest}(X)$$

$$r_{11} : \text{acceptable}(X), \text{price}(X, Z), \text{acceptable}(Y), \text{price}(Y, W), \\ W < Z \Rightarrow \neg \text{cheapest}(X)$$

$$r_{12} : \text{cheapest}(X) \Rightarrow \text{largestGarden}(X)$$