A client wants you to design the logic for a device to control a forced-air furnace.

- The logic will have three inputs:
    - hot – this input will be active ('1') if the furnace is too hot.
    - door – this input will be active if the furnace door is open.
    - fuel – this input will be active when fuel is present.
- The logic will have two outputs.
    - blow – turns on the blower fan when active.
        - Should not be active if the door is open, if there is no fuel, or if the furnace is too hot.
        - Otherwise, should be active.
    - alert – sounds an alarm to let someone know that something is wrong.
        - Should be active in two situations: 1) when the furnace is out of fuel, and 2) when the door is open and the furnace is too hot.
        - Otherwise, should be inactive.

Use the description above to write two Boolean expressions – one for each output.

There are different forms that these expressions could take. None is better than any other. For example, you can say that the blower should be *off* if any of the bad things is true, or it should be *on* if all of the bad things are not true.

$$blow = \overline{door + \overline{fuel} + hot} = \overline{door} \cdot fuel \cdot \overline{hot}$$

$$alert = \overline{fuel} + door \cdot hot$$