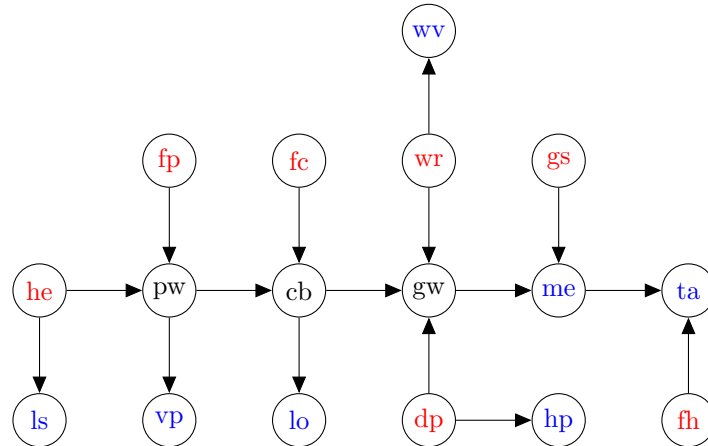# 1 Graphical model

- Nodes that indicate failure are coloured red
- Nodes that may be observed are coloured blue

2 Variable list

Failures (you're trying to detect these):

0. `he`: No electricity

1. `fp`: Fried power supply unit

2. `fc`: Fried circuit board

3. `wr`: Water reservoir empty

4. `gs`: Group head gasket seal broken

5. `dp`: Dead pump

6. `fh`: Fried heating element

Mechanism (these are unobservable):

7. `pw`: Power supply unit works

8. `cb`: Circuit board works

9. `gw`: Get water out of group head

Diagnostic (these are the tests the mechanic can run - observable):

10. `ls`: Room lights switch on

11. `vp`: A voltage is measured across power supply unit

12. `lo`: Power light switches on

13. `wv`: Water visible in reservoir

14. `hp`: Can hear pump

15. `me`: Makes espresso

16. `ta`: Makes a hot, tasty espresso

3   Conditional probability distributions

- $P(\texttt{he})$

- $P(\texttt{fp})$

- $P(\texttt{fc})$

- $P(\texttt{wr})$

- $P(\texttt{gs})$

- $P(\texttt{dp})$

- $P(\texttt{fh})$

- $P(\texttt{pw} \mid \texttt{he, fp})$

- $P(\texttt{cb} \mid \texttt{pw, fc})$

- $P(\texttt{gw} \mid \texttt{cb, wr, dp})$

- $P(\texttt{ls} \mid \texttt{he})$

- $P(\texttt{vp} \mid \texttt{pw})$

- $P(\texttt{lo} \mid \texttt{cb})$

- $P(\texttt{wv} \mid \texttt{wr})$

- $P(\texttt{hp} \mid \texttt{dp})$

- $P(\texttt{me} \mid \texttt{gw, gs})$

- $P(\texttt{ta} \mid \texttt{me, fh})$