Continuous Time MC

- Need to model not only where to go from a state but also when

- Rate matrix $Q$

- Transition probability matrix $\Gamma$

- Still need to deal with black holes
  - irreducibility
Continuous Time MC

- **Rate matrix** $Q$
  - Rate of transitions from state $i$ to state $j$:
    - $q_{ij}$
  - Negative rate of transitions from the state $i$:
    - $q_{ii}$

- **Transition probability matrix** $\Gamma$
  - Probability of transitions from state $i$ to state $j$:
    - $P_{ij} = \frac{q_{ij}}{q_{ii}}$
  - No transition back to the state itself:
    - $P_{ii} = 0$