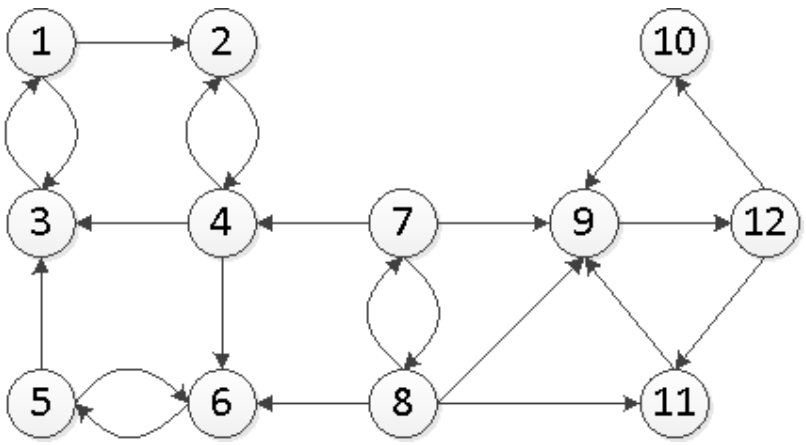
8. Exercise: Periodic states

Exercise: Periodic states

3/4 points (ungraded)

Consider a Markov chain with the following transition probability graph:



1. How many recurrent classes are there?

   2 ▼ ✔ **Answer:** 2

2. How many periodic recurrent classes are there?

   2 ▼ ✔ **Answer:** 2

3. What is the smallest period among these?

   2 ▼ ✔ **Answer:** 2

4. What is the largest period among these?

   4 ▼ ✖ **Answer:** 3

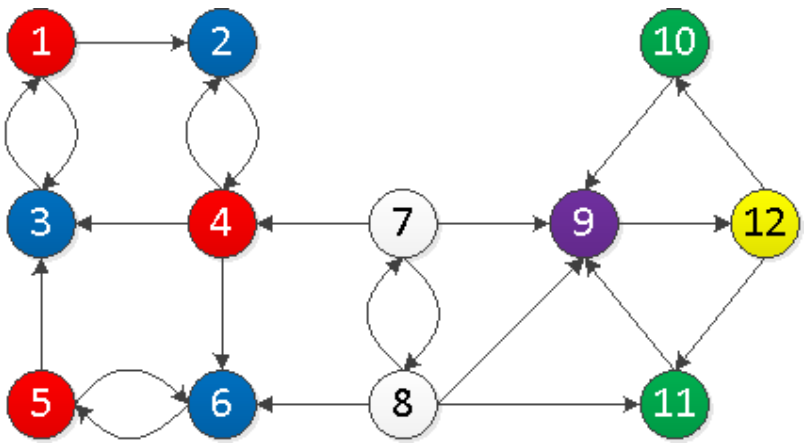
Solution:

1. There are two recurrent classes: $\{1, 2, 3, 4, 5, 6\}$ and $\{9, 10, 11, 12\}$.

2. Both of the recurrent classes are periodic.

3. The recurrent class $\{1, 2, 3, 4, 5, 6\}$ has a period of 2. In the figure below, the state within this recurrent class alternates between a red state and a blue state.

4. The recurrent class $\{9, 10, 11, 12\}$ has a period of 3. In the figure below, the state within this recurrent class cycles from a purple state, to a yellow state, to a green state, and back to a purple state.



提交 你已经尝试了3次（总共可以尝试3次）