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Вариант: 7
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Теория вероятностей и математическая статистика

Индивидуальное домашнее задание №4

Матрица вероятностей перехода однородной цепи Маркова имеет вид

$$\frac{1}{10}\begin{pmatrix} 0 & 0 & 6 & 4 & 0 & 0 & 0 & 0 \\ 0 & 5 & 0 & 0 & 4 & 0 & 1 & 0 \\ 4 & 0 & 0 & 0 & 0 & 6 & 0 & 0 \\ 7 & 0 & 0 & 0 & 0 & 3 & 0 & 0 \\ 0 & 3 & 0 & 0 & 2 & 0 & 5 & 0 \\ 0 & 0 & 3 & 7 & 0 & 0 & 0 & 0 \\ 0 & 2 & 0 & 0 & 2 & 0 & 6 & 0 \\ 0 & 0 & 1 & 0 & 4 & 0 & 4 & 1 \end{pmatrix}$$

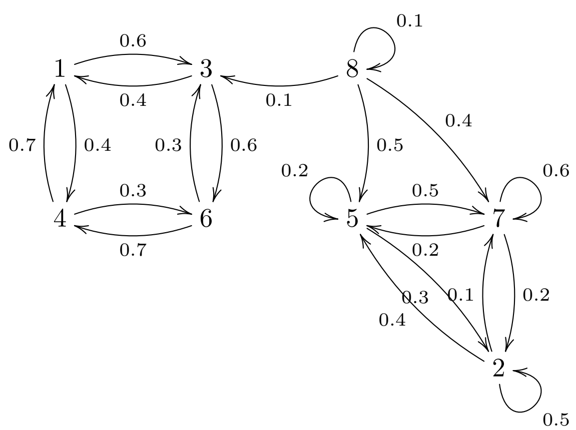
Задание 1. *Определить матрицу вероятностей перехода за два шага.*

Решение. Матрица вероятностей перехода за два шага считается возведение исходной матрицы в квадрат (сколько шагов, такая и степень). Возведя заданную матрицу во вторую степень, получаем:

$$\frac{1}{100}\begin{pmatrix} 52 & 0 & 0 & 0 & 0 & 48 & 0 & 0 \\ 0 & 39 & 0 & 0 & 30 & 0 & 31 & 0 \\ 0 & 0 & 42 & 58 & 0 & 0 & 0 & 0 \\ 0 & 0 & 51 & 49 & 0 & 0 & 0 & 0 \\ 0 & 31 & 0 & 0 & 26 & 0 & 43 & 0 \\ 61 & 0 & 0 & 0 & 0 & 39 & 0 & 0 \\ 0 & 28 & 0 & 0 & 24 & 0 & 48 & 0 \\ 4 & 20 & 1 & 0 & 20 & 6 & 48 & 1 \end{pmatrix}$$

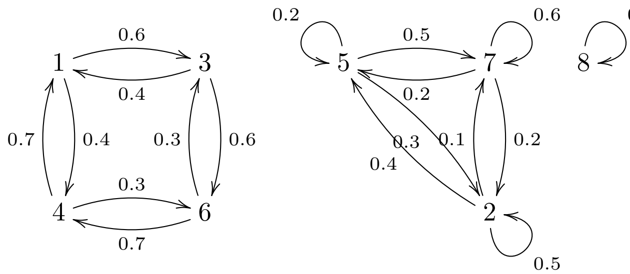
□

Задание 2. *Выделить классы сообщающихся состояний*



Решение. Состояния 1, 3, 4, 6 являются одним классом, т.к. находятся в одном двунаправленном цикле. Аналогичная ситуция с состояниями 2, 5, 7. А состояние 8 является отдельным от первых двух классов.

Итого классы:



□

Задание 3. *Есть ли невозвратные состояния?*

Решение. Состояние 8 является невозвратным, т.к. за конечное или бесконечное число шагов, выйдя из него, есть вероятность (100%) в него не вернуться.

У остальных состояний вероятности не вернуться нет, т.к. они находятся в циклах, образованных классами, и из этих циклов нельзя выйти в другие классы.

□

Задание 4. *Найти период в каждом из классов.*

Решение. Класс содержащий 1, 3, 4 и 6 состояния имеет период 2, т. к. в любое состояние можно вернуться сделав кратное двум количество переходов: например $1 \longrightarrow 3 \longrightarrow 6 \longrightarrow 3 \longrightarrow 1$ или $1 \longrightarrow 4 \longrightarrow 1$.

Класс содержащий 2, 5 и 7 состояния является апериодическим(то есть имеет период 1), т. к. возможные пути возвращаения в исходное состояние могут быть кратны 2 или 3, но из-за наличия петель число должно быть кратно 1, то есть период = 1.

Класс с состояние 8 также апериодический. □

Задание 5. *Вычислить финальные вероятности в каждом классе.*

Решение. Для вычисления финальных вероятнестей запишем матрицы каждого класса и решим систему уравнений. Для состояний 1, 3, 4, 6:

$$\begin{pmatrix} 0 & 0.6 & 0.4 & 0 \\ 0.4 & 0 & 0 & 0.6 \\ 0.7 & 0 & 0 & 0.3 \\ 0 & 0.3 & 0.7 & 0 \end{pmatrix}$$

Далее транспонируем матрицу, вычтем единичную и заменим последнее уравнение засчет условия нормировки:

$$\begin{pmatrix} -1 & 0.4 & 0.7 & 0 & 0 \\ 0.6 & -1 & 0 & 0.3 & 0 \\ 0.4 & 0 & -1 & 0.7 & 0 \\ 1 & 1 & 1 & 1 & 1 \end{pmatrix}$$

Упростим матрицу:

$$\begin{pmatrix} 0 & 0 & \frac{-7}{10} & 0 & \frac{-203}{1090} \\ 0 & 0 & 0 & \frac{-3}{10} & \frac{-36}{545} \\ \frac{17}{7} & 0 & 0 & 0 & \frac{1037}{1526} \\ 0 & \frac{218}{51} & 0 & 0 & 1 \end{pmatrix}$$

Тогда вектор финальных вероятностей для 1, 3, 4 и 6 состояний будет равен $(\frac{61}{218}, \frac{51}{218}, \frac{29}{109}, \frac{24}{109})$

Для класса из 2, 5 и 7 алгоритм вычислений будет такой же: Матрица состояний:

$$\begin{pmatrix} 0.5 & 0.4 & 0.1 \\ 0.3 & 0.2 & 0.5 \\ 0.2 & 0.2 & 0.6 \end{pmatrix}$$

Подготовленная для решения СЛАУ матрица:

$$\begin{pmatrix} -0.5 & 0.3 & 0.2 & 0 \\ 0.4 & -0.8 & 0.2 & 0 \\ 0.1 & 0.5 & -0.4 & 0 \\ 1 & 1 & 1 & 1 \end{pmatrix}$$

Преобразованная матрица:

$$\begin{pmatrix} \frac{-1}{2} & 0 & 0 & \frac{-11}{68} \\ 0 & \frac{-14}{25} & 0 & \frac{-63}{425} \\ 0 & 0 & \frac{17}{7} & 1 \end{pmatrix}$$

Тогда вектор финальных вероятностей для 2, 5 и 7 состояний будет равен $(\frac{11}{34}, \frac{9}{34}, \frac{7}{17})$

□

Задание 6. *Смоделировать траектории цепи Маркова длины 10, 50, 100 и 1000 шагов, начинающихся в различных состояниях для каждого случая.*

Решение. Тректории для состояния 1:

10 шагов:

1 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1

50 шагов:

1 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 4 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 6 -> 3 -> 6 -> 3 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1

1000 шагов: 1 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 4 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 6 -> 3 -> 6 -> 3 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 1 -> 4 -> 6 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 3 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 3 -> 1 -> 3 -> 1 -> 3 -> 1 -> 4 -> 6 -> 3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 6 -> 3 -> 6 -> 4 -> 1 -> 4 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 6 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 3 -> 1 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 3 -> 1 -> 3 -> 6 -> 3 -> 6 -> 3 -> 1 -> 4 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 4 -> 6 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 6 -> 3 -> 1 -> 4 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 3 -> 1 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 6 -> 3 -> 6 -> 3 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 3 -> 6 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 3 -> 6 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 3 -> 6 -> 3 -> 6 -> 3 -> 1 -> 4 -> 1 -> 3 -> 1 -> 4 -> 6 -> 4 -> 1 -> 4 -> 6 -> 3 -> 6 -> 3 -> 1 -> 3 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 4 -> 1 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 6 -> 3 -> 6 -> 4 ->

1 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 3 -> 6 -> 4 -> 6 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 3 -> 6 -> 3 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 6 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 3 -> 6 -> 3 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 1 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 6 -> 3 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 6 -> 3 -> 6 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 3 -> 1 -> 3 -> 6 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4 -> 6 -> 3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 6 -> 3 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 4 -> 6 -> 3 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 3 -> 1 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 6 -> 3 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 6 -> 3 -> 1 -> 4 -> 1 -> 3 -> 1 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 6 -> 3 -> 6 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 3 -> 1 -> 3 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 3 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 6 -> 4 -> 6 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6

Траектория для состояния 2:

10 шагов:

2 -> 2 -> 5 -> 7 -> 7 -> 7 -> 5 -> 2 -> 2 -> 2 -> 2

50 шагов:

2 -> 2 -> 5 -> 7 -> 7 -> 7 -> 5 -> 2 -> 2 -> 2 -> 2 -> 5 -> 7 -> 2 -> 2 -> 7 -> 7 -> 5 -> 5 -> 7 -> 7 -> 7 -> 2 -> 2 -> 5 -> 2 -> 5 -> 2 -> 5 -> 2 -> 5 -> 7 -> 7 -> 7 -> 7 -> 2 -> 2 -> 2 -> 5 -> 7 -> 2 -> 2 -> 7 -> 5 -> 2 -> 2 -> 2 -> 7 -> 7 -> 5 -> 7

1000 шагов:

2 -> 2 -> 5 -> 7 -> 7 -> 7 -> 5 -> 2 -> 2 -> 2 -> 2 -> 5 -> 7 -> 2 -> 2 -> 7 -> 7 -> 5 -> 5 -> 7 -> 7 -> 7 -> 2 -> 2 -> 5 -> 2 -> 5 -> 2 -> 5 -> 2 -> 5 -> 7 -> 7 -> 7 -> 7 -> 2 -> 2 -> 2 -> 5 -> 7 -> 2 -> 2 -> 7 -> 5 -> 2 -> 2 -> 2 -> 7 -> 7 -> 5 -> 7 -> 7 -> 7 -> 7 -> 5 -> 7 -> 2 -> 5 -> 7 -> 5 -> 5 -> 7 -> 7 -> 5 -> 7 -> 7 -> 7 -> 7 -> 7 -> 5 -> 2 -> 5 -> 7 -> 2 -> 2 -> 5 -> 7 -> 7 -> 7 -> 7 -> 7 -> 2 -> 2 -> 5 -> 7 -> 7 -> 7 -> 7 -> 2 -> 2 -> 5 -> 7 -> 5 -> 7 -> 7 -> 7 -> 2 -> 2 -> 7 -> 5 -> 7 -> 5 -> 7 -> 7 -> 7 -> 2 -> 5 -> 7 -> 7 -> 2 -> 2 -> 2 -> 7 -> 5 -> 5 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 2 -> 7 -> 2 -> 5 -> 7 -> 7 -> 5 -> 5 -> 5 -> 7 -> 7 -> 7 -> 7 -> 7 -> 2 -> 5 -> 5 -> 2 -> 5 -> 5 -> 2 -> 2 -> 7 -> 2 -> 5 -> 7 -> 5 -> 5 -> 7 -> 2 -> 2 -> 5 -> 5 -> 7 -> 5 -> 2 -> 5 -> 7 -> 7 -> 7 -> 7 -> 2 -> 5 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 2 -> 5 -> 2 -> 5 -> 5 -> 2 -> 2 -> 5 -> 5 -> 7 -> 7 -> 2 -> 5 -> 2 -> 5 -> 7 -> 7 -> 7 -> 7 -> 5 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 2 -> 2 -> 5 -> 7 -> 7 -> 7 -> 5 -> 7 -> 5 -> 5 -> 7 -> 5 -> 2 -> 2 -> 2 -> 2 -> 7 -> 7 -> 7 -> 7 -> 2 -> 7 -> 7 -> 5 -> 2 -> 5 -> 7 -> 7 -> 7 -> 5 -> 7 -> 2 -> 7 -> 2 -> 2 -> 2 -> 5 -> 2 -> 2 -> 2 -> 5 -> 7 -> 7 -> 5 -> 5 -> 2 -> 5 -> 2 -> 2 -> 5 -> 2 -> 2 -> 5 -> 7 -> 5 -> 2 -> 7 -> 5 -> 7 -> 5 -> 7 -> 7 -> 7 -> 7 -> 2 -> 5 -> 7 -> 5 -> 7 -> 5 -> 5 -> 2 -> 2 -> 5 -> 2 -> 5 -> 2 -> 2 -> 2 -> 2 -> 5 -> 7 -> 7 -> 7 -> 5 -> 5 -> 2 -> 2 -> 5 -> 2 -> 5 -> 2 -> 5 -> 7 -> 7 -> 7 -> 5 -> 2 -> 2 -> 5 -> 7 -> 7 -> 2 -> 5 -> 2 -> 2 -> 2 -> 2 -> 2 -> 5 -> 5 -> 7 -> 5 -> 7 -> 5 -> 7 -> 7 -> 2 -> 2 -> 5 -> 2 -> 2 -> 5 -> 7 -> 7 -> 5 -> 7 -> 7 -> 7 -> 5 -> 7 -> 7 -> 7 -> 7 -> 2 -> 5 -> 7 -> 5 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 5 -> 5 -> 2 -> 2 -> 2 -> 7 -> 7 -> 5 -> 7 -> 5 -> 7 -> 7 -> 5 -> 2 -> 7 -> 2 -> 5 -> 2 -> 7 -> 7 -> 7 -> 2 -> 5 -> 7 -> 2 -> 5 -> 7 -> 7 -> 7 -> 5 -> 7 -> 7 -> 7 -> 5 -> 5 -> 2 -> 5 -> 7 -> 5 -> 7 -> 7 -> 2 -> 2 -> 2 -> 5 -> 7 -> 7 -> 2 -> 5 -> 2 -> 5 -> 2 -> 5 -> 2 -> 5 -> 5 -> 2 -> 2 -> 5 -> 5 -> 7 -> 5 -> 7 -> 7 -> 5 -> 7 -> 7 -> 7 -> 5 -> 5 -> 7 -> 7 -> 7 -> 7 -> 7 -> 2 -> 5 -> 5 -> 2

-> 2 -> 2 -> 5 -> 7 -> 5 -> 7 -> 2 -> 7 -> 7 -> 5 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 5 -> 2 -> 2 -> 5 -> 5
-> 5 -> 7 -> 7 -> 5 -> 5 -> 7 -> 2 -> 2 -> 2 -> 5 -> 7 -> 7 -> 5 -> 5 -> 7 -> 7 -> 5 -> 7 -> 7 -> 7 -> 2
-> 5 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 2 -> 7 -> 5 -> 7 -> 5 -> 7 -> 7 -> 5 -> 7 -> 5 -> 2 -> 5 -> 5
-> 7 -> 5 -> 7 -> 5 -> 7 -> 7 -> 7 -> 5 -> 2 -> 2 -> 2 -> 5 -> 5 -> 5 -> 5 -> 2 -> 2 -> 2 -> 2 -> 2 -> 5
-> 5 -> 7 -> 5 -> 5 -> 7 -> 2 -> 2 -> 2 -> 5 -> 2 -> 5 -> 5 -> 2 -> 5 -> 2 -> 2 -> 2 -> 2 -> 2 -> 2 -> 7
-> 5 -> 7 -> 7 -> 7 -> 5 -> 5 -> 2 -> 5 -> 7 -> 7 -> 2 -> 7 -> 7 -> 5 -> 5 -> 5 -> 5 -> 5 -> 2 -> 2 -> 2
-> 2 -> 5 -> 7 -> 7 -> 7 -> 7 -> 7 -> 5 -> 7 -> 2 -> 2 -> 5 -> 7 -> 2 -> 7 -> 7 -> 5 -> 7 -> 7 -> 7 -> 7
-> 7 -> 7 -> 7 -> 7 -> 5 -> 7 -> 2 -> 2 -> 5 -> 7 -> 7 -> 5 -> 5 -> 7 -> 5 -> 2 -> 5 -> 7 -> 2 -> 7 -> 7
-> 7 -> 5 -> 7 -> 7 -> 5 -> 2 -> 2 -> 2 -> 2 -> 2 -> 2 -> 5 -> 2 -> 7 -> 7 -> 7 -> 2 -> 2 -> 2 -> 5 -> 5
-> 7 -> 2 -> 5 -> 7 -> 2 -> 5 -> 7 -> 5 -> 2 -> 2 -> 2 -> 5 -> 7 -> 2 -> 2 -> 2 -> 2 -> 5 -> 7 -> 2 -> 2
-> 2 -> 2 -> 5 -> 7 -> 5 -> 7 -> 5 -> 5 -> 5 -> 5 -> 2 -> 5 -> 7 -> 7 -> 5 -> 5 -> 2 -> 2 -> 2 -> 2 -> 5
-> 7 -> 7 -> 7 -> 7 -> 7 -> 2 -> 2 -> 5 -> 2 -> 2 -> 2 -> 2 -> 2 -> 2 -> 2 -> 5 -> 2 -> 5 -> 2 -> 5 -> 7
-> 7 -> 5 -> 7 -> 7 -> 5 -> 5 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 5 -> 7 -> 5 -> 2 -> 2 -> 2
-> 5 -> 7 -> 7 -> 5 -> 2 -> 5 -> 2 -> 2 -> 5 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 5 -> 7 -> 7 -> 2 -> 5
-> 5 -> 5 -> 5 -> 5 -> 5 -> 7 -> 7 -> 7 -> 5 -> 2 -> 2 -> 5 -> 7 -> 5 -> 7 -> 7 -> 7 -> 2 -> 2 -> 2 -> 5
-> 2 -> 2 -> 2 -> 2 -> 2 -> 2 -> 2 -> 2 -> 2 -> 5 -> 5 -> 5 -> 5 -> 2 -> 5 -> 7 -> 7 -> 7 -> 7 -> 5 -> 7
-> 5 -> 7 -> 7 -> 5 -> 5 -> 7 -> 2 -> 5 -> 7 -> 7 -> 7 -> 5 -> 2 -> 2 -> 2 -> 7 -> 2 -> 2 -> 5 -> 7 -> 5
-> 7 -> 7 -> 7 -> 5 -> 7 -> 5 -> 7 -> 7 -> 7 -> 5 -> 2 -> 2 -> 2 -> 5 -> 5 -> 7 -> 2 -> 2 -> 5 -> 7 -> 7
-> 7 -> 7 -> 5 -> 7 -> 5 -> 2 -> 2 -> 2 -> 5 -> 7 -> 2 -> 5 -> 2 -> 5 -> 7 -> 7 -> 5 -> 7 -> 5 -> 5 -> 2
-> 2 -> 2 -> 5 -> 7 -> 2 -> 5 -> 7 -> 2 -> 7 -> 7 -> 7 -> 2 -> 2 -> 2 -> 5 -> 2 -> 2 -> 5 -> 2 -> 7 -> 7
-> 7 -> 7 -> 5 -> 7 -> 5 -> 5 -> 2 -> 2 -> 5 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 5 -> 2 -> 2 -> 2 -> 2
-> 5 -> 7 -> 7 -> 2 -> 2 -> 2 -> 2 -> 2 -> 7 -> 7 -> 7 -> 7 -> 2 -> 5 -> 5 -> 2 -> 5 -> 2 -> 2 -> 5 -> 7
-> 7 -> 7 -> 7 -> 7 -> 5 -> 2 -> 2 -> 2 -> 5 -> 7 -> 7 -> 7 -> 7 -> 2 -> 2 -> 5 -> 2 -> 2 -> 2 -> 7 -> 7
-> 7 -> 7 -> 7 -> 7 -> 5 -> 7 -> 7 -> 7 -> 7 -> 2 -> 5 -> 7 -> 7 -> 5 -> 2 -> 5 -> 7 -> 5 -> 7 -> 7 -> 7
-> 7 -> 5 -> 7 -> 2 -> 2 -> 2 -> 5 -> 2 -> 2 -> 2 -> 2 -> 2 -> 2 -> 2 -> 2 -> 2 -> 2 -> 5 -> 5 -> 5 -> 2
-> 2 -> 2 -> 2 -> 2 -> 5 -> 7 -> 7 -> 5 -> 2 -> 2 -> 2 -> 5 -> 7 -> 2 -> 2 -> 5 -> 5 -> 7 -> 5 -> 7 -> 7
-> 7 -> 7 -> 7 -> 2 -> 2 -> 7 -> 2 -> 2 -> 2 -> 7 -> 7 -> 2 -> 2 -> 5 -> 2 -> 2 -> 5 -> 2 -> 5 -> 7 -> 7
-> 2 -> 5 -> 5 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 5 -> 2 -> 2 -> 2 -> 5

Траектория для состояния 3:

10 шагов:

3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 3 -> 1 -> 4 -> 6 -> 4

50 шагов:

3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 3 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 3 -> 1 -> 3
-> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 6 -> 3 -> 6 -> 3 -> 1 -> 3 -> 1
-> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4

1000 шагов:

3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 3 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 3 -> 1 -> 3
-> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 6 -> 3 -> 6 -> 3 -> 1 -> 3 -> 1
-> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4
-> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 3 -> 6
-> 3 -> 1 -> 4 -> 1 -> 3 -> 6 -> 3 -> 1 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 6 -> 4
-> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1
-> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 6 -> 3 -> 6 -> 3 -> 6 -> 3
-> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 3 -> 1 -> 4 -> 6 -> 3 -> 6 -> 4 -> 6
-> 3 -> 6 -> 4 -> 6 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 6 -> 3 -> 1 -> 4
-> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 4 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 1
-> 3 -> 1 -> 4 -> 1 -> 4 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4
-> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 3 -> 1 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1
-> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 3 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4
-> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1
-> 3 -> 6 -> 4 -> 6 -> 4 -> 6 -> 3 -> 6 -> 3 -> 1 -> 3 -> 6 -> 4 -> 6 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4
-> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 3 -> 6 -> 4 -> 1
-> 3 -> 1 -> 3 -> 6 -> 3 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4

-> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4 -> 6 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6
-> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3
-> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 6 -> 3 -> 6 -> 4 -> 6
-> 4 -> 6 -> 3 -> 1 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 4 -> 6 -> 4
-> 1 -> 4 -> 1 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6
-> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 3 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4
-> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6
-> 3 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3
-> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1
-> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4 -> 6 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4
-> 6 -> 4 -> 1 -> 4 -> 6 -> 3 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1
-> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4
-> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6
-> 4 -> 6 -> 4 -> 1 -> 4 -> 6 -> 3 -> 6 -> 3 -> 1 -> 3 -> 6 -> 3 -> 6 -> 3 -> 6 -> 3 -> 1 -> 4 -> 1 -> 3
-> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6
-> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4
-> 1 -> 3 -> 1 -> 3 -> 6 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1
-> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 3
-> 6 -> 4 -> 6 -> 3 -> 1 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 1
-> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 3 -> 6 -> 3 -> 1 -> 4 -> 6 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3
-> 6 -> 4 -> 6 -> 4 -> 6 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 4 -> 6 -> 3 -> 6 -> 3 -> 6
-> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4
-> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6
-> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 3 -> 1 -> 4 -> 1 -> 3
-> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 4 -> 6 -> 4 -> 1 -> 4 -> 6 -> 3 -> 6
-> 4 -> 1 -> 4 -> 6 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4
-> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6
-> 4 -> 1 -> 3 -> 6 -> 3 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 6 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4
-> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 3 -> 1 -> 4 -> 6
-> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4
-> 1 -> 4 -> 1 -> 3 -> 6 -> 3 -> 1 -> 3 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3

Траектория для состояния 4:

10 шагов:

4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4

50 шагов:

4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4
-> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 3 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 3 -> 1
-> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4

1000 шагов:

4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4
-> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 3 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 3 -> 1
-> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4 -> 6 -> 3 -> 6 -> 4 -> 6 -> 3 -> 1 -> 3
-> 1 -> 3 -> 1 -> 3 -> 1 -> 4 -> 1 -> 4 -> 6 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 6
-> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 3 -> 6 -> 4 -> 6 -> 3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 6 -> 3
-> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1
-> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 3 -> 6 -> 4 -> 1 -> 4
-> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 3 -> 1 -> 4 -> 1 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1
-> 4 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3
-> 6 -> 3 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1
-> 4 -> 1 -> 3 -> 6 -> 3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3
-> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1
-> 3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 6 -> 3 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4
-> 1 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1

-> 4 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 4 -> 6 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 3 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 3 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 3 -> 1 -> 4 -> 1 -> 4 -> 6 -> 3 -> 1 -> 3 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 3 -> 1 -> 3 -> 1 -> 3 -> 1 -> 4 -> 6 -> 4 -> 6 -> 4 -> 6 -> 3 -> 1 -> 3 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 3 -> 6 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4 -> 6 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 3 -> 1 -> 3 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 1 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 3 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 6 -> 3 -> 1 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 3 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 1 -> 4 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 6 -> 4 -> 6 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 3 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 6 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 1 -> 4 -> 6 -> 3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 3 -> 1 -> 3 -> 6 -> 4 -> 6 -> 3 -> 1 -> 4 -> 6 -> 3 -> 1 -> 3 -> 1 -> 4 -> 6 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 6 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3

Траектория для состояния 5:

10 шагов:

5 -> 2 -> 2 -> 5 -> 7 -> 7 -> 7 -> 5 -> 7 -> 7 -> 7

50 шагов:

5 -> 2 -> 2 -> 5 -> 7 -> 7 -> 7 -> 5 -> 7 -> 7 -> 7 -> 5 -> 5 -> 7 -> 5 -> 5 -> 7 -> 2 -> 5 -> 7 -> 7 -> 5 -> 7 -> 5 -> 7 -> 2 -> 5 -> 5 -> 7 -> 7 -> 7 -> 7 -> 5 -> 7 -> 5 -> 7 -> 7 -> 7 -> 7 -> 2 -> 7 -> 2 -> 5 -> 2 -> 5 -> 2 -> 5 -> 7 -> 5 -> 2 -> 2 -> 5 -> 5 -> 2 -> 7

1000 шагов:

5 -> 2 -> 2 -> 5 -> 7 -> 7 -> 7 -> 5 -> 7 -> 7 -> 7 -> 5 -> 5 -> 7 -> 5 -> 5 -> 7 -> 2 -> 5 -> 7 -> 7 -> 5 -> 7 -> 5 -> 7 -> 2 -> 5 -> 5 -> 7 -> 7 -> 7 -> 7 -> 5 -> 7 -> 5 -> 7 -> 7 -> 7 -> 7 -> 2 -> 7 -> 2 -> 5 -> 2 -> 5 -> 2 -> 5 -> 7 -> 5 -> 2 -> 2 -> 5 -> 5 -> 2 -> 7 -> 7 -> 5 -> 7 -> 7 -> 2 -> 7 -> 7 -> 7 -> 5 -> 7 -> 5 -> 2 -> 2 -> 7 -> 2 -> 7 -> 2 -> 5 -> 2 -> 2 -> 5 -> 2 -> 2 -> 5 -> 5 -> 7 -> 5 -> 5 -> 2 -> 5 -> 5 -> 5 -> 7 -> 5 -> 7 -> 2 -> 2 -> 2 -> 5 -> 7 -> 5 -> 2 -> 5 -> 5 -> 7 -> 5 -> 7 -> 7 -> 2 -> 2 -> 5 -> 5 -> 7 -> 7 -> 7 -> 7 -> 7 -> 2 -> 2 -> 5 -> 7 -> 7 -> 5 -> 2 -> 2 -> 5 -> 7 -> 7 -> 7 -> 7 -> 2 -> 5 -> 7 -> 7 -> 2 -> 2 -> 5 -> 5 -> 7 -> 7 -> 7 -> 2 -> 2 -> 5 -> 7 -> 7 -> 7 -> 5 -> 7 -> 7 -> 7 -> 5 -> 2 -> 2 -> 5 -> 7 -> 5 -> 7 -> 7 -> 7 -> 7 -> 7 -> 5 -> 7 -> 7 -> 7 -> 7 -> 2 -> 2 -> 2 -> 2 -> 2 -> 7 -> 7 -> 2 -> 7 -> 7 -> 5 -> 7 -> 5 -> 7 -> 5 -> 7 -> 7 -> 5 -> 7 -> 2 -> 2 -> 2 -> 5 -> 5 -> 5 -> 2 -> 7 -> 7 -> 7 -> 5 -> 2 -> 7 -> 2 -> 5 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 2 -> 2 -> 2 -> 2 -> 2 -> 2 -> 5 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 2 -> 2 -> 7 -> 5 -> 7 -> 2 -> 2 -> 2 -> 7 -> 5 -> 2 -> 5 -> 7 -> 5 -> 2

-> 5 -> 2 -> 2 -> 2 -> 7 -> 5 -> 2 -> 2 -> 2 -> 2 -> 2 -> 2 -> 2 -> 2 -> 2 -> 5 -> 5 -> 2 -> 2 -> 7 -> 7 -> 7 -> 7 -> 2 -> 5 -> 5 -> 7 -> 7 -> 5 -> 2 -> 2 -> 2 -> 2 -> 5 -> 5 -> 2 -> 7 -> 7 -> 7 -> 7 -> 5 -> 5 -> 7 -> 2 -> 2 -> 2 -> 5 -> 2 -> 5 -> 2 -> 7 -> 2 -> 5 -> 7 -> 2 -> 7 -> 7 -> 2 -> 7 -> 7 -> 2 -> 2 -> 5 -> 2 -> 2 -> 5 -> 2 -> 7 -> 7 -> 7 -> 5 -> 2 -> 2 -> 5 -> 5 -> 7 -> 7 -> 7 -> 5 -> 7 -> 7 -> 7 -> 2 -> 5 -> 7 -> 5 -> 2 -> 5 -> 7 -> 7 -> 2 -> 2 -> 7 -> 5 -> 7 -> 7 -> 5 -> 2 -> 5 -> 7 -> 7 -> 7 -> 5 -> 7 -> 7 -> 7 -> 7 -> 5 -> 7 -> 2 -> 2 -> 5 -> 2 -> 5 -> 7 -> 7 -> 2 -> 5 -> 7 -> 2 -> 2 -> 2 -> 5 -> 7 -> 7 -> 5 -> 7 -> 7 -> 2 -> 5 -> 2 -> 2 -> 7 -> 5 -> 2 -> 5 -> 5 -> 7 -> 5 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 5 -> 5 -> 5 -> 5 -> 7 -> 5 -> 7 -> 7 -> 2 -> 2 -> 2 -> 5 -> 7 -> 2 -> 5 -> 7 -> 5 -> 7 -> 2 -> 5 -> 2 -> 2 -> 2 -> 5 -> 5 -> 2 -> 2 -> 5 -> 7 -> 5 -> 7 -> 5 -> 7 -> 7 -> 5 -> 5 -> 2 -> 2 -> 5 -> 2 -> 5 -> 2 -> 5 -> 5 -> 5 -> 2 -> 5 -> 7 -> 2 -> 7 -> 7 -> 2 -> 2 -> 5 -> 7 -> 5 -> 7 -> 7 -> 2 -> 2 -> 2 -> 5 -> 7 -> 5 -> 7 -> 2 -> 7 -> 5 -> 7 -> 5 -> 7 -> 5 -> 2 -> 2 -> 7 -> 7 -> 7 -> 5 -> 5 -> 2 -> 2 -> 5 -> 2 -> 5 -> 7 -> 5 -> 2 -> 2 -> 5 -> 7 -> 2 -> 7 -> 7 -> 7 -> 2 -> 7 -> 7 -> 2 -> 2 -> 7 -> 2 -> 2 -> 7 -> 7 -> 5 -> 7 -> 7 -> 7 -> 2 -> 5 -> 7 -> 7 -> 2 -> 2 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 2 -> 5 -> 7 -> 7 -> 5 -> 7 -> 2 -> 5 -> 5 -> 5 -> 2 -> 2 -> 2 -> 5 -> 7 -> 2 -> 2 -> 2 -> 5 -> 7 -> 2 -> 5 -> 7 -> 7 -> 7 -> 7 -> 7 -> 5 -> 7 -> 7 -> 2 -> 5 -> 2 -> 5 -> 5 -> 5 -> 5 -> 5 -> 7 -> 5 -> 2 -> 2 -> 2 -> 5 -> 7 -> 7 -> 7 -> 7 -> 5 -> 5 -> 7 -> 2 -> 2 -> 5 -> 5 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 2 -> 2 -> 7 -> 5 -> 5 -> 2 -> 5 -> 2 -> 5 -> 7 -> 2 -> 5 -> 5 -> 7 -> 7 -> 7 -> 5 -> 7 -> 5 -> 7 -> 2 -> 5 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 2 -> 2 -> 5 -> 2 -> 2 -> 2 -> 5 -> 7 -> 5 -> 5 -> 2 -> 2 -> 2 -> 2 -> 5 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 5 -> 7 -> 5 -> 2 -> 5 -> 7 -> 7 -> 2 -> 2 -> 5 -> 2 -> 5 -> 2 -> 5 -> 2 -> 2 -> 7 -> 5 -> 2 -> 5 -> 2 -> 2 -> 5 -> 2 -> 5 -> 7 -> 7 -> 7 -> 7 -> 5 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 2 -> 5 -> 7 -> 7 -> 7 -> 2 -> 5 -> 2 -> 7 -> 7 -> 7 -> 7 -> 2 -> 2 -> 2 -> 5 -> 2 -> 2 -> 5 -> 2 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 5 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 5 -> 2 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 5 -> 5 -> 7 -> 7 -> 7 -> 7 -> 7 -> 5 -> 7 -> 7 -> 2 -> 7 -> 7 -> 7 -> 7 -> 7 -> 2 -> 2 -> 2 -> 2 -> 2 -> 2 -> 2 -> 2 -> 2 -> 5 -> 7 -> 5 -> 7 -> 7 -> 7 -> 2 -> 2 -> 2 -> 2 -> 5 -> 2 -> 2 -> 5 -> 2 -> 7 -> 7 -> 7 -> 2 -> 5 -> 5 -> 7 -> 7 -> 5 -> 5 -> 7 -> 7 -> 7 -> 5 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 2 -> 5 -> 7 -> 7 -> 7 -> 5 -> 2 -> 2 -> 2 -> 2 -> 5 -> 2 -> 2 -> 5 -> 5 -> 5 -> 2 -> 5 -> 2 -> 5 -> 7 -> 7 -> 7 -> 2 -> 5 -> 7 -> 7 -> 7 -> 2 -> 5 -> 7 -> 7 -> 5 -> 5 -> 2 -> 2 -> 5 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 5 -> 2 -> 5 -> 7 -> 5 -> 7 -> 2 -> 7 -> 5 -> 2 -> 5 -> 7 -> 7 -> 5 -> 2 -> 5 -> 5 -> 2 -> 7 -> 5 -> 7 -> 5 -> 2 -> 2 -> 2 -> 2 -> 5 -> 7 -> 7 -> 2 -> 2 -> 5 -> 5 -> 5 -> 7 -> 5 -> 7 -> 7 -> 7 -> 2 -> 5 -> 5 -> 7 -> 7 -> 7 -> 7 -> 2 -> 2 -> 2 -> 2 -> 5 -> 7 -> 5 -> 7 -> 2 -> 2 -> 5 -> 7 -> 5 -> 7 -> 7 -> 7 -> 5 -> 7 -> 5 -> 2 -> 2 -> 2 -> 5 -> 7 -> 7 -> 7 -> 5 -> 5 -> 7 -> 7 -> 7 -> 7 -> 7 -> 2 -> 2 -> 2 -> 5 -> 2 -> 5 -> 5 -> 5 -> 2 -> 2 -> 5 -> 7 -> 7 -> 2 -> 5 -> 2 -> 2 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 2 -> 5 -> 2 -> 2 -> 5 -> 2 -> 5 -> 2 -> 5 -> 7 -> 2 -> 7 -> 7 -> 2 -> 2 -> 2 -> 5 -> 2 -> 2 -> 2 -> 2 -> 5 -> 2 -> 5 -> 7 -> 7 -> 2 -> 5 -> 2 -> 5 -> 7 -> 5 -> 2 -> 2 -> 5 -> 7 -> 7 -> 7 -> 5 -> 5 -> 5 -> 7 -> 2 -> 5 -> 5 -> 7 -> 2 -> 2 -> 2 -> 2 -> 5 -> 7 -> 7 -> 2 -> 2 -> 2 -> 2 -> 2 -> 2 -> 5 -> 7 -> 7 -> 2 -> 5 -> 5 -> 7 -> 7 -> 5 -> 2 -> 5 -> 5 -> 7 -> 7 -> 7 -> 7 -> 5 -> 2 -> 7 -> 7 -> 5 -> 7 -> 5 -> 5 -> 7 -> 2 -> 2 -> 2 -> 2 -> 2 -> 2 -> 7 -> 5 -> 7 -> 5 -> 7 -> 2 -> 2 -> 5 -> 5 -> 2

Траектория для состояния 6:

10 шагов:

6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 6 -> 3 -> 1

50 шагов:

6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 6 -> 3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1

1000 шагов:

6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 6 -> 3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 6 -> 3 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 6 -> 3 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 3

-> 6 -> 3 -> 6 -> 3 -> 1 -> 3 -> 6 -> 3 -> 6 -> 3 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6
-> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3
-> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 4 -> 6 -> 4 -> 1
-> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 6 -> 3 -> 6 -> 3 -> 1 -> 4 -> 6 -> 4
-> 1 -> 3 -> 6 -> 4 -> 6 -> 3 -> 1 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 4 -> 6 -> 3 -> 6 -> 3 -> 6 -> 3 -> 6
-> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 6 -> 4
-> 1 -> 3 -> 1 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 6
-> 4 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3
-> 6 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1
-> 4 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4
-> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 6
-> 4 -> 1 -> 4 -> 6 -> 4 -> 6 -> 3 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4
-> 1 -> 3 -> 6 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 3 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 6 -> 3 -> 1
-> 4 -> 1 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 6 -> 3 -> 1 -> 4 -> 1 -> 4 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3
-> 6 -> 3 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1
-> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 4 -> 6 -> 4
-> 6 -> 4 -> 1 -> 3 -> 6 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1
-> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 3 -> 6 -> 3 -> 1 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4
-> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 3 -> 1 -> 3 -> 6
-> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 3 -> 6 -> 3 -> 1 -> 3 -> 1 -> 4
-> 1 -> 3 -> 1 -> 4 -> 1 -> 4 -> 1 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 3 -> 1 -> 4 -> 1
-> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 4 -> 6 -> 3 -> 6 -> 4 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3
-> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 6 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4 -> 6
-> 4 -> 6 -> 3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 3 -> 1 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3
-> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 3 -> 6 -> 3 -> 1 -> 3 -> 1 -> 3 -> 6
-> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 3
-> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1
-> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 6 -> 4
-> 1 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1
-> 4 -> 1 -> 3 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 3 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 6 -> 3 -> 1 -> 3
-> 6 -> 4 -> 6 -> 3 -> 1 -> 4 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1
-> 4 -> 1 -> 4 -> 6 -> 3 -> 1 -> 4 -> 1 -> 4 -> 6 -> 3 -> 1 -> 3 -> 1 -> 4 -> 1 -> 4 -> 6 -> 3 -> 6 -> 4
-> 1 -> 3 -> 1 -> 4 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 3 -> 6 -> 3 -> 1
-> 4 -> 6 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 4
-> 1 -> 4 -> 6 -> 3 -> 6 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 3 -> 6 -> 3 -> 1 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1
-> 3 -> 6 -> 3 -> 6 -> 3 -> 1 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3 -> 1 -> 3
-> 6 -> 4 -> 6 -> 3 -> 1 -> 4 -> 6 -> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 1 -> 4 -> 1 -> 4 -> 6
-> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 1 -> 4 -> 6 -> 4 -> 1 -> 3 -> 6 -> 4 -> 6 -> 4 -> 6 -> 4
-> 1 -> 3 -> 6 -> 3 -> 6 -> 3 -> 6 -> 3 -> 6 -> 4 -> 6 -> 4 -> 6 -> 3 -> 6 -> 3 -> 6 -> 3 -> 6 -> 4 -> 1
-> 3 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1 -> 3 -> 6 -> 4 -> 1 -> 4 -> 1

Траектория для состояния 7:

10 шагов:

7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 5 -> 5 -> 7 -> 7 -> 2

50 шагов:

7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 5 -> 5 -> 7 -> 7 -> 2 -> 2 -> 5 -> 7 -> 7 -> 2 -> 2 -> 5 -> 7 -> 2 -> 5
-> 7 -> 7 -> 7 -> 7 -> 5 -> 2 -> 2 -> 2 -> 2 -> 2 -> 5 -> 7 -> 7 -> 7 -> 2 -> 2 -> 5 -> 7 -> 7 -> 5 -> 5
-> 2 -> 2 -> 5 -> 2 -> 2 -> 5 -> 2 -> 5 -> 2 -> 2 -> 5 -> 7 -> 5

1000 шагов:

7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 5 -> 5 -> 7 -> 7 -> 2 -> 2 -> 5 -> 7 -> 7 -> 2 -> 2 -> 5 -> 7 -> 2 -> 5
-> 7 -> 7 -> 7 -> 7 -> 5 -> 2 -> 2 -> 2 -> 2 -> 2 -> 5 -> 7 -> 7 -> 7 -> 2 -> 2 -> 5 -> 7 -> 7 -> 5 -> 5
-> 2 -> 2 -> 5 -> 2 -> 2 -> 5 -> 2 -> 5 -> 2 -> 2 -> 5 -> 7 -> 5 -> 7 -> 2 -> 2 -> 2 -> 5 -> 5 -> 5 -> 5
-> 7 -> 5 -> 2 -> 5 -> 5 -> 7 -> 7 -> 7 -> 5 -> 7 -> 7 -> 7 -> 5 -> 7 -> 2 -> 5 -> 2 -> 5 -> 7 -> 7 -> 7
-> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 5 -> 7 -> 2 -> 5 -> 7 -> 7 -> 5 -> 7 -> 7 -> 7 -> 2 -> 2 -> 2 -> 2 -> 2

-> 5 -> 7 -> 5 -> 2 -> 2 -> 5 -> 5 -> 2 -> 2 -> 5 -> 7 -> 7 -> 7 -> 7 -> 5 -> 7 -> 5 -> 5 -> 2 -> 5 -> 7
-> 2 -> 5 -> 2 -> 5 -> 7 -> 5 -> 7 -> 5 -> 2 -> 2 -> 5 -> 2 -> 5 -> 7 -> 5 -> 2 -> 2 -> 5 -> 2 -> 5 -> 2
-> 2 -> 2 -> 7 -> 7 -> 2 -> 2 -> 5 -> 2 -> 5 -> 7 -> 2 -> 5 -> 7 -> 2 -> 2 -> 2 -> 7 -> 5 -> 7 -> 2 -> 5
-> 7 -> 2 -> 5 -> 5 -> 5 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 5 -> 2 -> 2 -> 2 -> 5 -> 7 -> 5 -> 2 -> 7
-> 7 -> 7 -> 5 -> 2 -> 5 -> 2 -> 2 -> 2 -> 2 -> 5 -> 7 -> 7 -> 7 -> 5 -> 5 -> 2 -> 2 -> 2 -> 5 -> 7 -> 7
-> 7 -> 7 -> 5 -> 7 -> 7 -> 7 -> 7 -> 5 -> 7 -> 7 -> 2 -> 2 -> 7 -> 7 -> 5 -> 7 -> 7 -> 7 -> 7 -> 2 -> 7
-> 7 -> 7 -> 5 -> 2 -> 2 -> 2 -> 2 -> 5 -> 7 -> 2 -> 5 -> 7 -> 2 -> 2 -> 2 -> 5 -> 7 -> 7 -> 5 -> 2 -> 2
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-> 7 -> 2 -> 5 -> 2 -> 5 -> 7 -> 7 -> 5 -> 2 -> 5 -> 2 -> 5 -> 5 -> 2 -> 5 -> 7 -> 7 -> 7 -> 7 -> 7 -> 5
-> 5 -> 5 -> 7 -> 7 -> 5 -> 5 -> 2 -> 2 -> 5 -> 2 -> 2 -> 5 -> 7 -> 2 -> 2 -> 2 -> 2 -> 7 -> 2 -> 5 -> 2
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-> 7 -> 7 -> 2 -> 2 -> 2 -> 2 -> 5 -> 2 -> 2 -> 7 -> 7 -> 2 -> 2 -> 2 -> 5 -> 7 -> 7 -> 7 -> 7 -> 7 -> 2
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-> 7 -> 7 -> 7 -> 5 -> 2 -> 2 -> 2 -> 5 -> 7 -> 5 -> 7 -> 5 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 5
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-> 7 -> 7 -> 7 -> 2 -> 2 -> 2 -> 5 -> 7 -> 7 -> 2 -> 2 -> 2 -> 2 -> 2 -> 2 -> 5 -> 7 -> 5 -> 5 -> 2 -> 2
-> 5 -> 5 -> 5 -> 5 -> 7 -> 2 -> 5 -> 7 -> 7 -> 7 -> 7 -> 2 -> 2 -> 5 -> 2 -> 5 -> 7 -> 7 -> 7 -> 7 -> 5
-> 7 -> 2 -> 5 -> 7 -> 7 -> 2 -> 2 -> 2 -> 2 -> 2 -> 2 -> 2 -> 2 -> 2 -> 5 -> 7 -> 7 -> 7 -> 7 -> 5 -> 7
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-> 2 -> 5 -> 7 -> 2 -> 2 -> 7 -> 2 -> 5 -> 7 -> 5 -> 5 -> 7 -> 7 -> 7 -> 5 -> 2 -> 5 -> 5 -> 5 -> 2 -> 5
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-> 5 -> 7 -> 7 -> 2 -> 5 -> 2 -> 5 -> 7 -> 7 -> 7 -> 5 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 7 -> 2 -> 5 -> 7
-> 2 -> 5 -> 2 -> 2 -> 7 -> 2 -> 2 -> 5 -> 7 -> 7 -> 2 -> 2 -> 5 -> 2 -> 5 -> 2 -> 2 -> 2 -> 2 -> 2 -> 5
-> 7 -> 2 -> 5 -> 2 -> 5 -> 7 -> 2 -> 5 -> 5 -> 7 -> 7 -> 7 -> 7 -> 2

Траектория для состояния 8:

10 шагов:

8 -> 7 -> 2 -> 2 -> 2 -> 2 -> 7 -> 7 -> 5 -> 7 -> 5

50 шагов:

8 -> 7 -> 2 -> 2 -> 2 -> 2 -> 7 -> 7 -> 5 -> 7 -> 5 -> 7 -> 2 -> 2 -> 2 -> 2 -> 2 -> 2 -> 2 -> 5 -> 2
-> 2 -> 2 -> 5 -> 5 -> 7 -> 7 -> 7 -> 2 -> 2 -> 2 -> 2 -> 2 -> 5 -> 7 -> 7 -> 7 -> 5 -> 7 -> 7 -> 7 -> 2
-> 2 -> 7 -> 7 -> 7 -> 2 -> 2 -> 5 -> 5 -> 5 -> 5 -> 7 -> 7 -> 2

1000 шагов:

8 -> 7 -> 2 -> 2 -> 2 -> 2 -> 7 -> 7 -> 5 -> 7 -> 5 -> 7 -> 2 -> 2 -> 2 -> 2 -> 2 -> 2 -> 2 -> 5 -> 2
-> 2 -> 2 -> 5 -> 5 -> 7 -> 7 -> 7 -> 2 -> 2 -> 2 -> 2 -> 2 -> 5 -> 7 -> 7 -> 7 -> 5 -> 7 -> 7 -> 7 -> 2

-> 2 -> 7 -> 7 -> 7 -> 2 -> 2 -> 5 -> 5 -> 5 -> 5 -> 7 -> 7 -> 2 -> 2 -> 7 -> 5 -> 7 -> 7 -> 7 -> 7 -> 2
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-> 7 -> 7 -> 7 -> 7 -> 7 -> 5 -> 7 -> 7 -> 2 -> 5 -> 2 -> 5 -> 5 -> 2

□

Задание 7. *Вычислить процент времени нахождения ЦМ в каждом из состояний. Сравнить результат с вектором финальных вероятностей.*

Решение. Для представленных в задании 6 траекторий среднее время нахождения в состояниях будет иметь следующий вид:

	1	2	3	4	5	6	7	8
1	0.28015	0.0	0.23511	0.2649	0.0	0.21985	0.0	0.0
2	0.0	0.32151	0.0	0.0	0.26517	0.0	0.41333	0.0
3	0.27901	0.0	0.23258	0.26742	0.0	0.221	0.0	0.0
4	0.28148	0.0	0.23416	0.26584	0.0	0.21853	0.0	0.0
5	0.0	0.32257	0.0	0.0	0.26408	0.0	0.41336	0.0
6	0.2796	0.0	0.23222	0.26779	0.0	0.2204	0.0	0.0
7	0.0	0.32067	0.0	0.0	0.26478	0.0	0.41456	0.0
8	0.0	0.31838	0.0	0.0	0.26445	0.0	0.41718	0.0

Таким образом полученные числа несколько схожи с вычесленными ранее финальными вероятностями в задании 5.

□

Сслыка на код: https://github.com/dart-mih/tv$_4$