1. A bank classifies loans as paid in full (F), in good standing (G), in arrears (A), or as a bad debt (B). Loans move between the categories according to the following transition probability:

	B	**A**	**G**	**F**
B	1	0	0	0
A	.1	.5	.4	0
G	0	.1	.8	.1
F	0	0	0	1

What fraction of loans in good standing are eventually paid in full? What is the answer for those in arrears?

2. The company where John works puts employees into 3 categories: good, great and excellent. They update the category of each employee at the end of each month:

- if John is in the good category, the next month he will be good with probability $1/2$ and great with probability $1/2$;

- if John is in the great category, the next month he will be good with probability $1/6$, great with probability $1/2$ and excellent with probability $1/3$;

- if John is in the excellent category, the next month he will be in the excellent category with probability $1/2$ and great with probability $1/2$.

Employees get a bonus based on their category: employees in the good category get a bonus of 90 Euros per month, employees in the great category get a bonus of 150 Euros per month, and employees in the excellent category get a bonus of 300 euros per month. Compute the long-term average monthly bonus of John.