Example 1.11: Weather occupancy (Section 1.6)

Transition matrix

In[35]:=
```
P := {{0.8, 0.2}, {0.5, 0.5}};
P // MatrixForm
```

Out[36]//MatrixForm=

$$\begin{pmatrix} 0.8 & 0.2 \\ 0.5 & 0.5 \end{pmatrix}$$

Occupancy matrix at day zero

In[37]:=
```
M0 := {{1, 0}, {0, 1}};
M0 // MatrixForm
```

Out[38]//MatrixForm=

$$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$$

Occupancy matrix at day 1

In[39]:=
```
M1 := M0 + P;
M1 // MatrixForm
```

Out[40]//MatrixForm=

$$\begin{pmatrix} 1.8 & 0.2 \\ 0.5 & 1.5 \end{pmatrix}$$

Occupancy matrix at day 6

In[41]:=
```
M7 := M0 + MatrixPower[P, 1] + MatrixPower[P, 2] + MatrixPower[P, 3] +
    MatrixPower[P, 4] + MatrixPower[P, 5] + MatrixPower[P, 6];
M7 // MatrixForm
```

Out[42]//MatrixForm=

$$\begin{pmatrix} 5.40807 & 1.59193 \\ 3.97982 & 3.02019 \end{pmatrix}$$

On Monday it's sunny. What's the expected number of cloudy days in a week?

Matrix element M7(2,1) (from sunny to cloudy):

In[43]:=
```
M721 := M7[[2, 1]];
M721
```

Out[44]=
```
3.97982
```