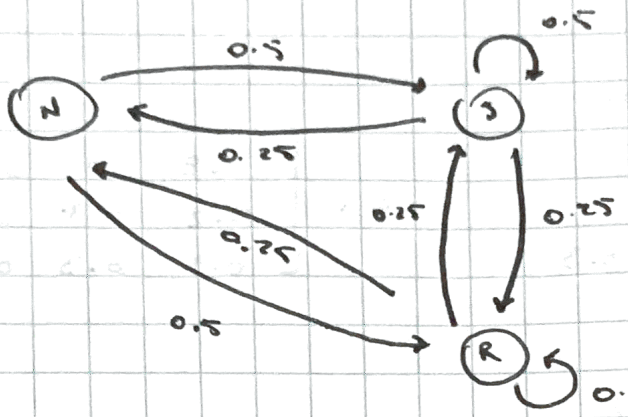
EXAMPLE 1.1

(a)



$$P = \begin{bmatrix} 0 & 0.5 & 0.5 \\ 0.25 & 0.5 & 0.25 \\ 0.25 & 0.5 & 0.25 \end{bmatrix}$$

(b) Calculate P^4 for rainy day from a nice day

$$P^4 = \begin{array}{c} \\ N \\ S \\ R \end{array} \begin{array}{c} \begin{array}{ccc} N & S & R \end{array} \\ \begin{bmatrix} 0.2031 & 0.5 & 0.2969 \\ 0.1992 & 0.5 & 0.3008 \\ 0.1992 & 0.5 & 0.3008 \end{bmatrix} \end{array}$$

Probability = 0.2969 //

(c) Long term probability

$$P^{10} = \begin{bmatrix} 0.2 & 0.5 & 0.2\overline{99} \\ 0.1\overline{99} & 0.5 & 0.3 \\ 0.1\overline{99} & 0.5 & 0.3 \end{bmatrix}$$

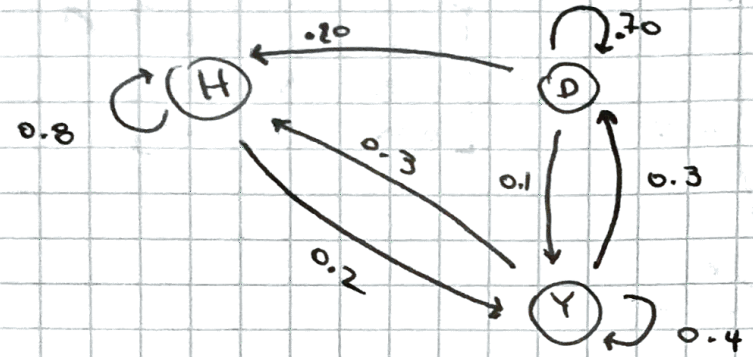
P(Nice day) = 0.2

P (Snowy day) = 0.5

P (Rainy day) = 0.3

EXAMPLE 11.6

(a)



$$P = \begin{bmatrix} 0.8 & 0 & 0.2 \\ 0.2 & 0.7 & 0.1 \\ 0.3 & 0.3 & 0.4 \end{bmatrix}$$

(b) Calculate P^3 from $S_0 = \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix}$ (H, D, Y)

$$P^3 = \begin{matrix} H \\ D \\ Y \end{matrix} \begin{bmatrix} 0.644 & 0.114 & 0.242 \\ 0.413 & 0.409 & 0.178 \\ 0.477 & 0.306 & \boxed{0.217} \end{bmatrix} \quad ; \text{ PROBABILITY} = 0.217 \text{ //}$$

(c) ~~Same~~ P^{3+4}, $S_0 = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$

PROBABILITY of great-granddaughter going to Dartmouth given the great grandfather went to Harvard

$$P^4 = \begin{bmatrix} 0.6106 & \boxed{0.1524} & 0.237 \\ 0.4656 & 0.3397 & 0.1942 \\ 0.5079 & 0.2793 & 0.2128 \end{bmatrix}$$

PROBABILITY = 0.1524 OR 15.24%.