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Dynamic Model in Bio - HW 15

① $(u, v) \rightarrow (u^2 + vu + \frac{1}{4}v^2, -2vu - 2u^2 + 2u - \frac{1}{2}v^2 + v)$

② $20\% \rightarrow AA$
 $30\% \rightarrow Aa$

(i) Right now?

$$30 + 20 = 50\%$$

$$p = 0.2 + \left(\frac{1}{2}\right)(0.3) = 0.20 + 0.15 = 0.35$$

$$q = 1 - (0.35) = 0.65$$

(ii) Next generation $\Rightarrow (0.65)^2 = 0.4225 = 42.25\%$

(iii) Ten generations $\Rightarrow 42.25\%$

③ $50\% \rightarrow aA$ $30\% \rightarrow aa$

(i) Right now? $\Rightarrow 50 - 30 = 20\%$

$$p = 0.20 + \left(\frac{1}{2}\right)(0.5) = 0.45 \quad 1 - 0.45 = 0.55 = q$$

(ii) Next generation? $(0.45)^2 = 0.2025 = 20.25\%$

(iii) ten generations? 20.25%