Equations needed to solve the programming exercises

$$p + q = 1 \; (or \quad q = 1 - p)$$ **(Eq. P1)**

Allele frequencies sum up to 1

$$\bar{w} = p^2 w_{11} + 2pqw_{12} + q^2 w_{22}$$ **(Eq. P2)**

Population's mean fitness

$$p_{t+1} = ({p_t}^2 w_{11} + p_t q_t w_{12})/\bar{w}$$ **(Eq. P3)**

Changes in allele frequency by selection

$$p_{t+1} = (1 - \mu)({p_t}^2 w_{11} + p_t q_t w_{12})/\bar{w}$$ **(Eq. P4)**

Changes in allele frequency by mutation and selection

$$\hat{q} = \sqrt{\frac{\mu}{s}}$$ **(Eq. P5)**

Equilibrium frequency of deleterious recessive alleles under mutation-selection balance