POPULATION GENETICS ANSWERS

Genetic drift

Problem 1

P(no a) = $5.96 \cdot 10^{-8}$
P(no A) = 0.3436
P(pol) = 0.6564

Problem 2

t = 54.10 generations (N = 12)
t = 1104.09 generations (N = 240)

Problem 3

P(fix) = 0.05263
P(loss) = 0.994737
Average time to fixation = 380 generations
Average time to loss = 10.49 generations

Problem 4

P = 0.1025

Problem 5

<u>Generation 1</u>
Population 1 P = 0.1488
Population 2 P = 0.1169

<u>Generation 2</u>
Population 1 P = 0.1186
Population 2 P = 0.0204

Problem 6

P = 0.21095

Problem 7

Current N_e = 2156.86 individuals
Lowest census N_e = 3.64 individuals
H_5 = 0.01336

Problem 8

Ne = 29.666 individuals

Mutation

Problem 1

$p_{10} = 0.49990$
$p_{100} = 0.49900$
$p_{1000} = 0.49010$
$p_{10000} = 0.40936$
Extremely slow change

Problem 2

$q_1 = 0.2037$
$q_2 = 0.2074$
$q_3 = 0.2110$
$p_{eq} = 0.2308$
$q_{eq} = 0.7692$