

Evolution via mutation without selection : Algorithm

Divide population of size N equally between two types of individuals A and B represented by the numbers 0 & 1

Define mutation rates u_1 and u_2

Start loop over generations (total =T)

 Start loop over entire population (size=N)

 Check if the individual chosen is of type 0 or type 1

 If type 0, mutate individual from 0 to 1 with probability u_1

 Pick a random number r between 0 and 1

 If $r < u_1$, mutate individual from 0 to 1, else leave unchanged

 If type 1, mutate individual from 1 to 0 with probability u_2

 Pick a random number r between 1 and 0

 If $r < u_2$, mutate individual from 1 to 0, else leave unchanged

 Close loop over population

Calculate frequency of type 0 and type 1 in the population

Record generation versus frequency data

Close loop over generations

Assignment 1

1. Run simulations using $u_1=0.003$ and $u_2=0.001$ for 3 different population sizes $N=50, 1000, 10000$
2. Repeat simulation for $N=1000$ using $u_1=0.07$ and $u_2=0.001$; Use $T=2000$ in both cases.

Verify if the equilibrium value for frequency of type 0 and type 1 matches with theoretical predictions