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A Simple simulation of the Moran process

The population is evolved using the moran process where at each iteration one individual is chosen for reproduction with probability proportional to fitness and another individual is chosen for death randomly. In the following simulation fitness of the two types in the population is assumed to be the same

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The simulation of Moran process is carried out for one trial, starting from an initial population with equal frequency for both types, till fixation and the following plot is obtained.

The simulation was then carried out for 100 trails and the number of times each type was fixed was counted. Each trial was started with an equal number of type 0 and type 1 in the population.

Fraction of times type 0 was fixed: 0.52
Fraction of times type 1 was fixed: 0.48

The theoretical value of fixation probability for either subtypes is the frequency of the subtypes in the initial population.(The theoretical analysis leading to this is present in Martin A Nowak's book mentioned in the reference)

Since all the trials started with equal numbers of each subtype, the theoretical value of fixation probability of each subtype is 0.5 .
The simulated value of fixation probability(the fraction of times each subtype was fixed) matches with theoretical prediction. The simulations will give more accurate results if the number of trials is increased.

Reference

Evolutionary dynamics, exploring the equations of life. Martin A Nowak