

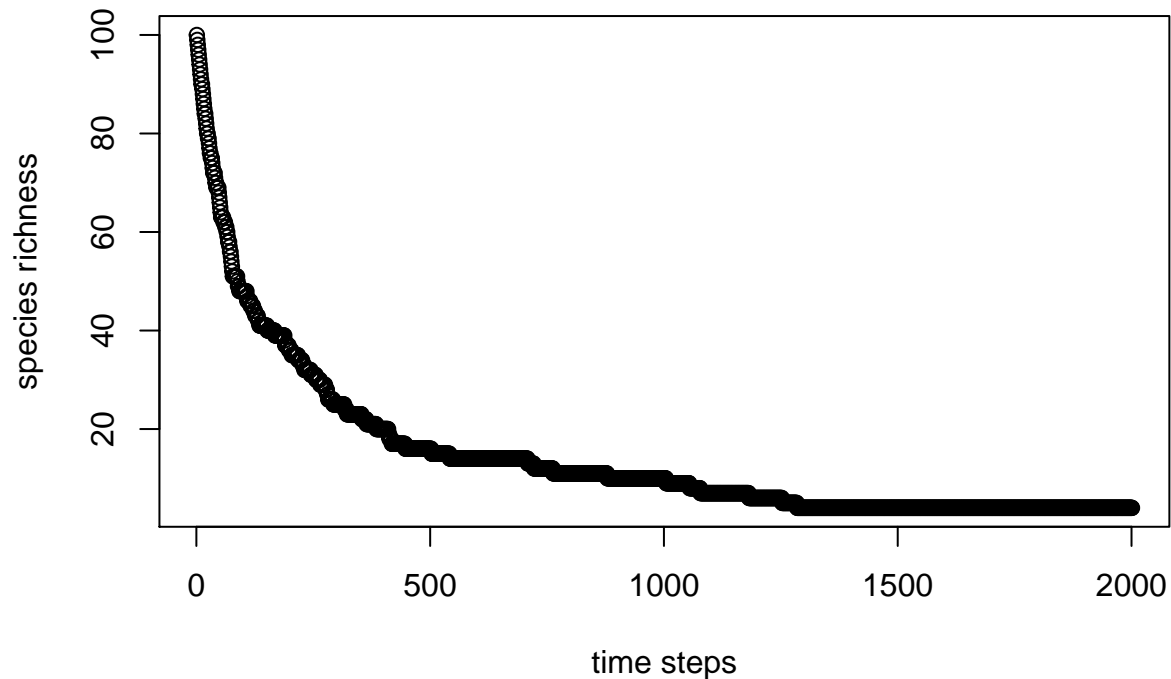
HPC Coursework

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question_8()

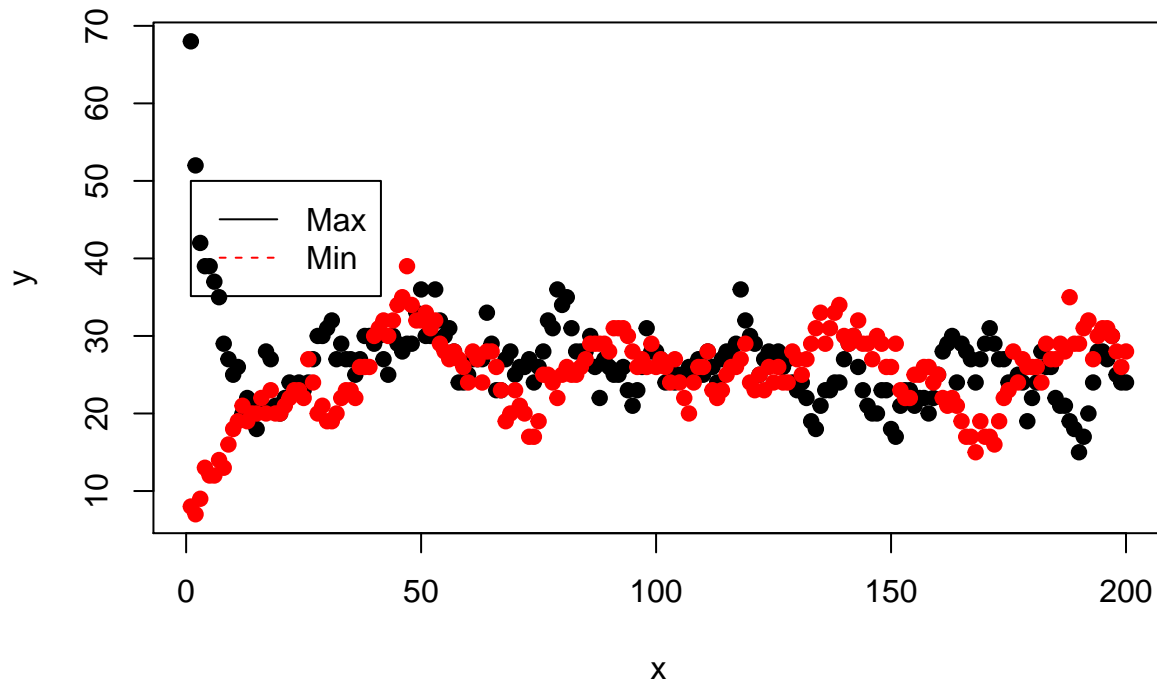
Species richness without new species



The graph plots species richness of community starting with maximum diversity of 100 species. The speciation rate is 0.1. In this model, new species are not introduced, therefore each step either maintains or reduces richness, so eventually the richness will decrease. For example, if composition was initially 1,2,3,4,5, the next step must reduce richness to for example, 2,2,3,4,5. Another step will either maintain this, e.g. 5,2,3,4,5, or reduce it, 2,2,3,3,5. There is not a mechanism in neutral step for increasing richness and therefore over many steps it will approach 1.

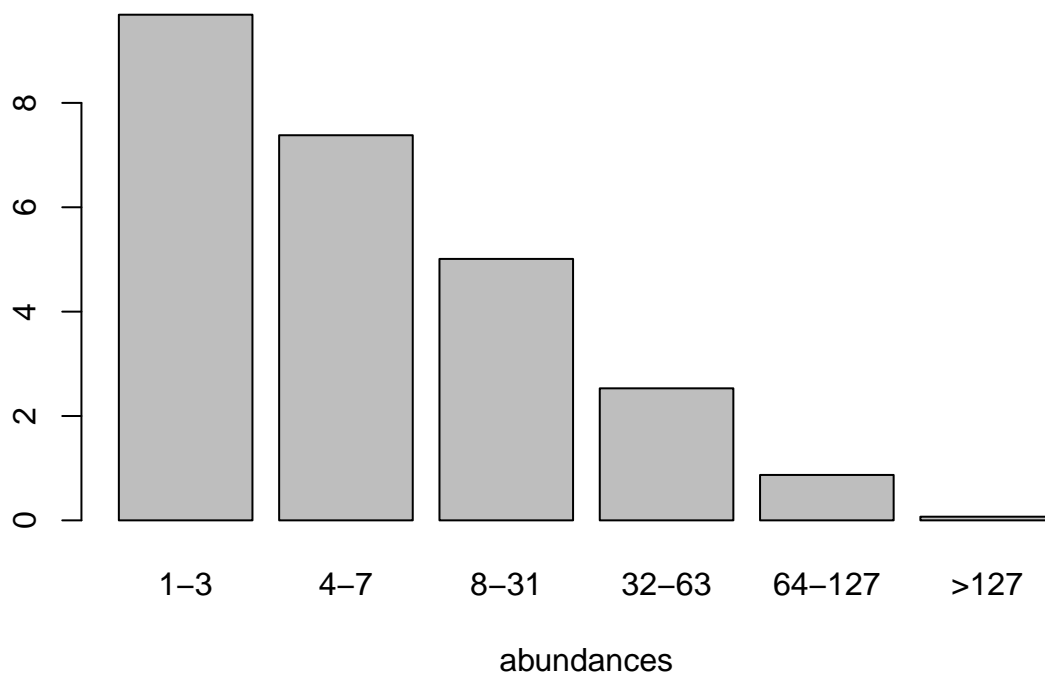
question_12()

Species richness over time with speciation



Question 12. Species richness as a time series over 200 generations. Speciation rate is 0.1 and maximal and minimal communities of 100 species were used. The speciation rate causes both communities to approach the same value after sufficient generations. In this simulation a species richness of approximately 30 is reached after around 50 generations. The higher the speciation rate, the richer the final community and vice versa.

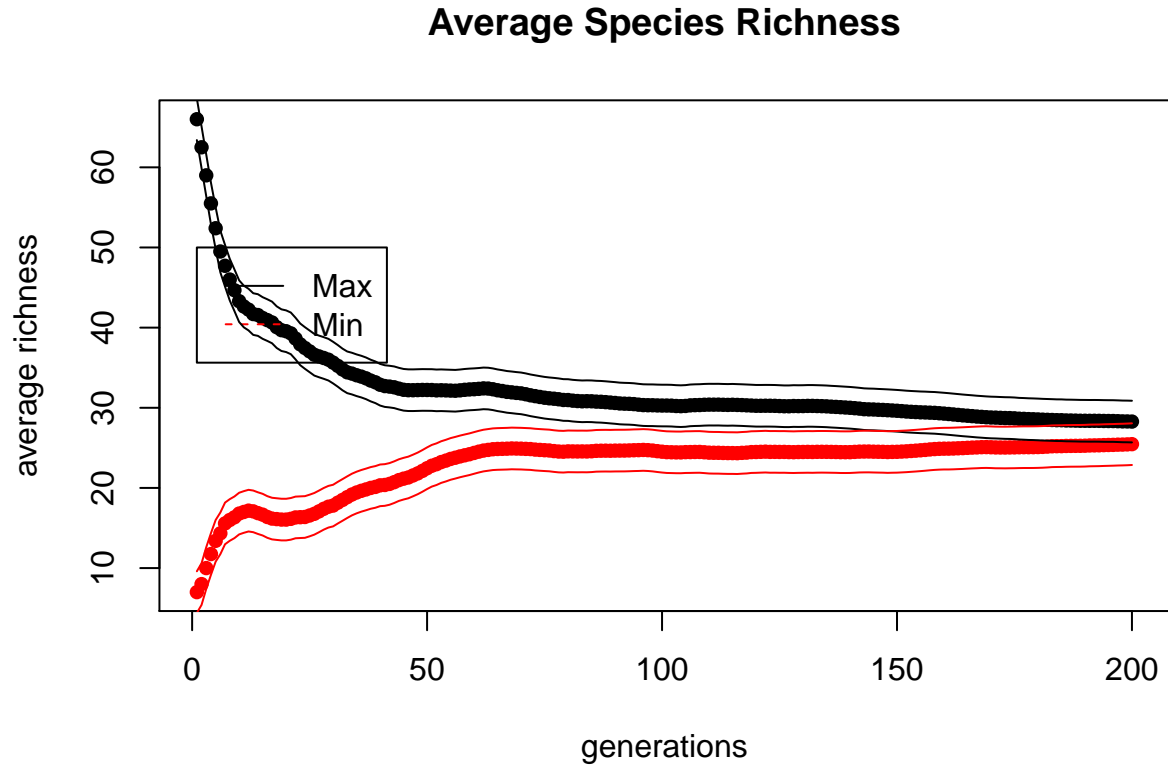
Average abundances in octets



The graph shows the average abundances of the community after the burn-in of 200 generations. The

distribution of abundances would change if the speciation rate changed. A higher speciation rate would result in a richer community and therefore the first octet would have a higher frequency. A low speciation rate results in a community of low richness and therefore the frequencies of the larger octets increase at the expense of the smaller.

`challenge_A()`



The graph is a plot of average richness values as the times increments. The confidence intervals were calculated using the variance of the values from 50 to 100 increments. If the entire series was used, the confidence interval would be larger.

`challenge_B()`

Average Species Richness

