

Solution to Homework 13

Question. Suppose that we have 2 models of El Paso weather in August: according to the general desert model, the probability of rain is 0.1, and according to the monsoon season model, it rains with probability 0.6. If it rains, which models will be selected by the Maximum Likelihood method? Which model will be selected if it does not rain?

Answer. Maximum likelihood means selecting the model for which the probability of observed events is the largest. So:

- If it rains, then we should select the second model, since its probability of rain is larger: $0.6 > 0.1$.
- The first model predicts the probability of not raining as $1 - 0.1 = 0.9$, while the second model predicts the probability of not raining as $1 - 0.6 = 0.4$. So, when it does not rain, we should select the first model, because for this model, the probability if not raining is larger: $0.9 > 0.4$.