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Mini Project 3

(a) A light, thin fish is caught in the North Atlantic in the Summer. What is the probability it is a SeaBass? How about Tuna?

> pabxcd_cond_abxcd(NULL, NULL, 'summer', 'northAtlantic','light','thin')
"salmon prob"
0.1
"tuna prob"
0.1
"seabass prob"
0.8

We take our probs from parent Prob * child prob / total prob salmon + total prob tuna + total prob seabass for each of our classes and choose the highest value for classification.

b) An average, light fish is caught in the North Atlantic. What is the probability it is winter? spring? summer? Autumn?
First you find your class based on just the evidence you have:
"salmon prob"
0.4
"tuna prob"
0.175
"seabass prob"
0.425
We classify this fish as a seabass based on its normalized prob value.

Then we take the P(seabass | winter) * P(winter) / sum of all of the prior * conditional probs of seabass and season

We repeat this for each season P(seabass | summer) etc... Until we make a decision based on the highest prob.

I was not able to incorporate this correctly into my belief network, as I was not sure what P(x | a) would be in this situation.

(c) A median, thin fish is caught in the Summer. What is the probability it came from the Mid Atlantic?

Again we find the most likely class for this fish first.
"salmon prob"

0.3916667

"tuna prob"

0.2583333

"seabass prob"

0.35

We can then classify this as a salmon.

From here we would use our P(x | b) and P(b) and plug them into our same formula as above, and then choose the highest probability.