Competencia: "Bets of life"

$$p = \mathfrak{b}$$

Bayesian methods

Abstract

It is a problem of inference with bets in which the prize is distributed in the proportion of the resources that people have at the end of the betting process.

Prize A prize equivalent to US$1,000 will be awarded. Every person enrolled starts with resources equivalent to $\omega = 1$. The prize will be distributed proportionally to the resources that each person has once the betting process is completed[1] The award does not become effective unless a growth rate of more than 10% per time step is achieved.

Inference The inference problem is a four-door Monty Hall in which the person hiding the gift has a bias that changes over a 365-day cycle. Each person enrolled will receive a sequence of data consisting of the position of the gifts in 2190 consecutive days, six complete cycles, starting on the day of the year the person chooses when enrolling (expressed as a number between 1 and 365).

Bets Following the Monty Hall idea, at each time step, the person will be able to choose a box and then another of the boxes in which the gift is not in will be shown. Unlike Monty Hall, the goal is not for the person to choose a single box, but to bet all their resources, allocating proportions b_h of their resources to the different hidden hypotheses h, such that $\sum_h b_h = 1$. The bookmaker offers a payoff $q = 2.75$ for each of the hypotheses. Then, at each time step, the wealth is updated as, $\omega_{t+1} = \omega_t b_r q$, where r index is the actual position of the gift at time step t. After each time step, individuals can give and receive resources.

Product The deliverable consists of a piece of software (Python, Julia or R) with the functions:

1. `elegir_caja(tiempo)`, that given the time `tiempo` (positive integer) returns the chosen box (an integer between 1 and 4);
2. `apostar_y_repartir(pista,tiempo)`, that given the box without a gift `pista` (an integer between 1 and 4) and the time `tiempo` (positive integer) returns: the bet (list of positive floats of length 4 that sum up to 1); and the reciprocity policy (a dictionary that has as keys the identifiers of the persons to whom resources are donated, and as a value the proportion of resources donated to them).

Dates Registrations will be received until August 1. Submissions will be received until October 12. Results will be announced on December 10.

Help Read "Properties of the epistemic-evolutionary cost function" and look for people to cooperate with.

[1] The payment of the prize is made by international transfer to an IBAN account in one of the following currencies: ARG - USD - EUR - CHF - GBP - JPY - AUD - CAD - SEK - HKD - NOK - DKK - AED - SGD. The exchange between these currencies is free of charge. A fixed cost of 4 dollars plus the additional cost included by the banks involved in the transfer must be deducted from the transfer.