# Modelling the interview

The process: we evaluate an interview about *willing to donate*; the interview is on persons and obtains yes.

A seller wishes to evaluate the probability of donating a foreseen price and she performs an interview on persons and obtains yes.

Our seller only knows from experience that on average, a user is interested to this product with probability of mostly below with a maximum probability around .

Propose:

* A) A probability model for the variable measuring the number of yes in the interviews. What parameters does it have and where does it evolve?
* B) An a priori distribution for the parameter.
* C) A posterior distribution for after the interview of 20 calls reaching two positives.

Solution:

1. Model

Assume the answers are independent and equally distribution with probability of obtaining yes to be (a number between and ); this is a Bernoulli distribution (TODO: cite). We, thus, count with the number of successes to the Bernoulli experiments in repetitions; that is, K follows a binomial distribution (TODO: cite a justification).

1. Model for the Parameter

We want a distribution for which gives values that are bounded and “*mostly below with a maximum probability around* ”: Let’s find a beta distribution that matches this.

Exploration in plotting the pdf of the beta distribution suggests that and are appropriate parameters.

x = np.linspace(0,1, 1000)

a = 1.5; b = 6

def f(t):

return beta.pdf(t, a,b)

y = f(x)

plt.axvline(0.7); plt.axvline(0.1);

fig= mp.pyplot.plot(x, y)

f(0.7)

1. Calculation of the posterior

One way is to apply the Bayes theorem:

Which is proportional to the pdf of the Beta distribution with and .

Hence, for our case: and .

Non Bayesian? MLE gives not exactly.