

A markov/probability question

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Hi,

I need to do some computation for a cache architecture. I have arrived at a simplified model and I need help to get it solved. Here is the problem.

Balls are being put into and removed from a bucket, one arrival and one departure in each unit time.

Arrivals:

Balls that are arriving have equal probability that they can have any color from b different colors.

Departure:

Balls from the bucket are departing in following way, a) All colors are selected, whose balls haven't been departed in last c unit times. b) Then from selected colors, a ball is departed of the color which has maximum number of balls. Thus, in every window of c unit time, balls of c different colors need to be sent. ($c < b$)

The bucket has N balls initially, with equal number of balls of every b color.

Now, when this process is carried out for very long time say T (T is trillions), how many times will the bucket be having balls of only c colors ($c < b$).

In other words, after a long time and in steady state, what is the probability that the bucket will have balls of only c colors ($c < b$).

Thanks in advance,

Regards,

Sailesh