math probability question for seven American nights

The Urth list — 9 messages, 4 voices, 07 Sep 2014

https://urth.darkrealm.vip/thread/urth/6656

Marc Aramini — 07 Sep 2014, 12:34

I had a quick question but trying to articulate it to look it up independently is hard.

Is there a statistically most probable day for Nadan to eat the special one of the six eggs on any given day given that the first day is 1/6 and then from there the probability that the egg is there begins to be something like 1/5 on the next day (but the chance that it isn't there should be factored in somehow, but I wasn't sure if it was 1/5 - 1/6 ... Then 1/4-1/5-1/6 etc.) Or is the system set up in such a way that the chance of getting the egg is always 1/6 regardless on any given morning assuming no eggs are stolen or disappear?

Gerry Quinn — 07 Sep 2014, 13:19 · in reply to Marc Aramini

> On 07/09/2014 13:34, Marc Aramini wrote:
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I don't have the book to hand, but if he is given six eggs, one special, and eats one every day at random, the chance of getting the special egg on any day is indeed 1/6, as you reckoned in your other post.

The easiest way to see it is to imagine he decided at random the order to eat them in advance, and laid all six in a row, each marked with its day for eating. Clearly the chance is the same for each day!

- Gerry Quinn

Gerry Quinn — 07 Sep 2014, 13:26 · in reply to Gerry Quinn

> On 07/09/2014 14:19, Gerry Quinn wrote:
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Actually, that is the chance before the experiment, If the first egg is to be eaten on Sunday, then before he eats it he knows that the chance of eating the special egg on any given day (say Tuesday) is 1/6.

But that presupposes he has no clue as to when he has eaten the special egg. If he can tell immediately, then after he eats Sunday's egg. he knows that either it was the special one, or it wasn't. Depending on which, the chance that he will eat the special egg on Tuesday becomes either zero, or 1/5.

If he has some information that might help him decide which egg is special, but cannot be certain, the answer is somewhere in between. I cannot remember the story well, but I suspect this is most likely the situation!

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Marc Aramini — 07 Sep 2014, 14:13 · in reply to Gerry Quinn

Thanks.

(Almost every Middle Eastern name in the text is from the Adventures of Hajji Baba, and interestingly enough, the detective sent to look for Nadan at the start of the book, Hassan Kerbalai, is the name of Hajji Baba's father. I may have to read at least some of that book beyond the chapters dealing with Nadan and Mirza and Osman Aga (a writer in Seven American Nights and Baba's master in the older text, who sends him to purchase lamb-skins to start the novel). Baba means father or grandfather, and when (in Wolfe's story) Nadan sees the old American man who has the writing machine at the musuem he calls him grandfather. Pretty sure Hajji Baba tries to defraud Nadan in Morier's book)

The play Visit to a Small Planet is by (EuGENE) Gore Vidal and the cat in the play is named Rosemary - the second play, Mary Rose, with the two disappearances of the titular character for periods of time, also seems to play on Rosemary's name besides the allusions to Nadan's disappearance.

Even though The Adventures of Hajji Baba was very critical of the Middle Eastern/Persian characters, it was popular there as kind of a satire that revealed their societal shortcomings. The same is true of Visit to a Small Planet and its take on McCarthyism for America. Ironically these Americans see it as a kind of testament to their old greatness.

On Sun, Sep 7, 2014 at 6:26 AM, Gerry Quinn <gerry at bindweed.com> wrote:

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Gwern Branwen — 07 Sep 2014, 14:16 · in reply to Gerry Quinn

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Exactly. On the other hand, if he has some source of information about the egg, then conditional on his new information each day, he may be able to update his beliefs as he goes along and do better than guessing just 1/6th each day.

As it happens, there's some literary precedent here: Graham Green's novel https://en.wikipedia.org/wiki/Doctor_Fischer_of_Geneva_or_The_bomb_party

And if one doesn't know the egg is there, then it becomes an interesting statistical problem: http://gwern.net/docs/statistics/1994-falk

gwern

Dimitar Nikolov — 07 Sep 2014, 20:06 · in reply to Gerry Quinn

It does depend what question exactly you're asking. Indeed, the probability starts at 1/6, then assuming you know that wasn't the special egg, the probability for the next day is 1/5 and so on.

You could however, ask the question, on which day is he most likely to eat the egg?

Then, you start with 1/6 for the first day once again. But the probability the egg is eaten on the second day, is 1/6 times the probability it wasn't eaten on the first day (=5/6), so .~.139. The probability it was eaten on the third day is 1/6 times the probability it wasn't eaten on either previous day, and so on. This is given by the geometric distribution that you can read about on Wikipedia and results in the following probabilities:

eaten on day 1: 0.167
eaten on day 2: 0.139
eaten on day 3: 0.116
eaten on day 4: 0.096
eaten on day 5: 0.080
eaten on day 6: 0.067

So, in this phrasing of the question, which I think was the original question, he was most likely to eat the egg on the first day. Perhaps someone else can verify or challenge this, as I am not familiar with this particular story.

Best,
Dimitar

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Marc Aramini — 07 Sep 2014, 20:17 · in reply to Dimitar Nikolov

hmmm ... but all the probabilities add up to .665 then ... and if he eats all six, he's GOING to eat the egg on one of those days ... sometimes I feel like probabiity is the most nebulous and abstract aspect of lower math.

On Sun, Sep 7, 2014 at 1:06 PM, Dimitar Nikolov <dimitar.g.nikolov at gmail.com

wrote:

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Gerry Quinn — 07 Sep 2014, 20:20 · in reply to Dimitar Nikolov

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Those probabilities don't add to 1! You're forgetting that tghere is one fewer egg every day.

Your figures work for a scenario in which he adds an ordinary egg every day, so he always has six, and chooses at random from them. Of course this could go on forever, as the special egg might never be chosen. You'll find that the limit of the sum of probabilities goes to 1.0 after infinitely many days.

- Gerry Quinn

Dimitar Nikolov — 07 Sep 2014, 20:49 · in reply to Gerry Quinn

You are right! This would only work for an infinite number of eggs. Sorry for bringing my own confusion into this.

> On Sun, Sep 7, 2014 at 4:20 PM, Gerry Quinn <gerry at bindweed.com> wrote:
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