Re: E[X]E[exp(−at)] >= E[X*exp(−at)]?

Source: http://sci.tech−archive.net/Archive/sci.math/2007−10/msg00878.html

- *From*: hrubin@xxxxxxxxxxxxxxxxxxxx (Herman Rubin)
- *Date*: 4 Oct 2007 21:47:54 −0400

In article <1191528351.961000.93220@xxxxxxxxxxxxxxxxxxxxxxxxxxxx>,
Yecloud <yecloud@xxxxxxxxx> wrote:

> On Oct 4, 3:46 pm, hru...@xxxxxxxxxxxxxxxxxxxx (Herman Rubin) wrote:
>
> > In article <1191517449.363752.244...@xxxxxxxxxxxxxxxxxxxxxxxxxxxx>,
> >
> > Yecloud <yecl...@xxxxxxxxx> wrote:
> >
> > > On Oct 4, 12:27 pm, s...@xxxxxxxxxxxxxx wrote:
> > >
> > > > On 4 Oct, 16:50, Yecloud
> > > > <yecl...@xxxxxxxxx> wrote:
> > > >
> > > > > Hi, all,
> > > > > Suppose X>=0, t>=0 are
> > > > > random variables with
> > > > > arbitrary distributions
> > > > > and a > 0, do we have
> > > > > E[X]E[exp(−at)] >=
> > > > > E[X*exp(−at)]?
> >
> > The random variable Y = exp(−at) can be any random variable
> > in the open interval (0,1). There is no reason it should
> > be positively correlated with X.
>
> "negatively" correlated?
>
> > In fact, t=X gives a counterexample if X is non−trivial.

> The above example is not a counterexample. Another example, if t=X
> and X~exp(lambda), nontrivial, the inequality holds. Could you
> construct a counterexample?

Ok, I had the signs mixed up. Take X = 1 − exp(−at),
or any decreasing function of t.

−−
This address is for information only. I do not claim that these views
are those of the Statistics Department or of Purdue University.
Herman Rubin, Department of Statistics, Purdue University
hrubin@xxxxxxxxxxxxxxx Phone: (765)494−6054 FAX: (765)494−0558
.