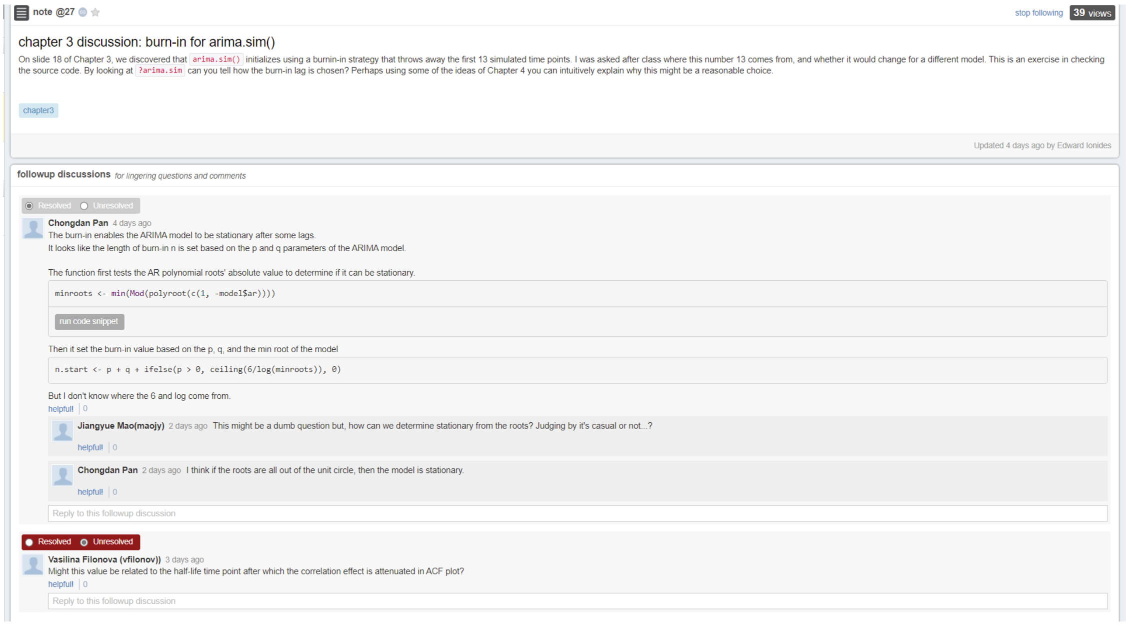
STATS531 Week2 Participation

Author: Chongdan Pan(pandapcd)

I've two participation records at Piazza this week.

1. Discuss the question related to burn-in



note @27

stop following 39 views

chapter 3 discussion: burn-in for arima.sim()

On slide 18 of Chapter 3, we discovered that `arima.sim()` initializes using a burnin-in strategy that throws away the first 13 simulated time points. I was asked after class where this number 13 comes from, and whether it would change for a different model. This is an exercise in checking the source code. By looking at `?arima.sim` can you tell how the burn-in lag is chosen? Perhaps using some of the ideas of Chapter 4 you can intuitively explain why this might be a reasonable choice.

chapter3

Updated 4 days ago by Edward Ionides

followup discussions *for lingering questions and comments*

Resolved Unresolved

Chongdan Pan 4 days ago

The burn-in enables the ARIMA model to be stationary after some lags.
It looks like the length of burn-in n is set based on the p and q parameters of the ARIMA model.

The function first tests the AR polynomial roots' absolute value to determine if it can be stationary.

```
minroots <- min(Mod(polyroot(c(1, -model$ar))))
```

run code snippet

Then it set the burn-in value based on the p, q, and the min root of the model

```
n.start <- p + q + ifelse(p > 0, ceiling(6/log(minroots)), 0)
```

But I don't know where the 6 and log come from.

helpful! | 0

Jiangyue Mao(maojy) 2 days ago This might be a dumb question but, how can we determine stationary from the roots? Judging by it's casual or not...?

helpful! | 0

Chongdan Pan 2 days ago I think if the roots are all out of the unit circle, then the model is stationary.

helpful! | 0

Reply to this followup discussion

Resolved Unresolved

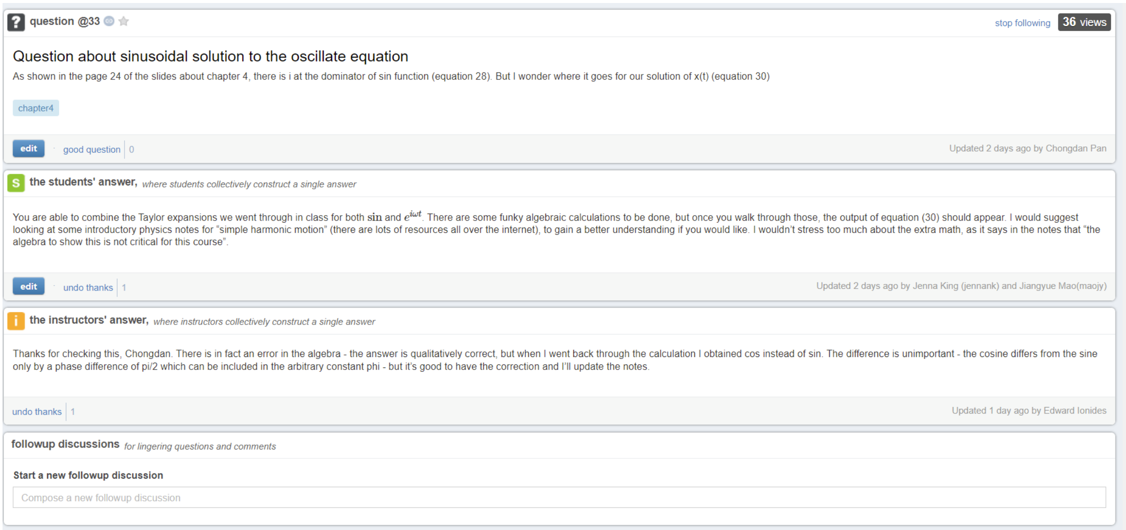
Vasilina Filonova (vfilonov)) 3 days ago

Might this value be related to the half-life time point after which the correlation effect is attenuated in ACF plot?

helpful! | 0

Reply to this followup discussion

2. Post a question related the sinusoidal solution to the oscillate equation



question @33

stop following 36 views

Question about sinusoidal solution to the oscillate equation

As shown in the page 24 of the slides about chapter 4, there is i at the dominator of sin function (equation 28). But I wonder where it goes for our solution of x(t) (equation 30)

chapter4

edit good question | 0

Updated 2 days ago by Chongdan Pan

the students' answer, *where students collectively construct a single answer*

You are able to combine the Taylor expansions we went through in class for both $\sin$ and $e^{i\omega t}$. There are some funky algebraic calculations to be done, but once you walk through those, the output of equation (30) should appear. I would suggest looking at some introductory physics notes for "simple harmonic motion" (there are lots of resources all over the internet), to gain a better understanding if you would like. I wouldn't stress too much about the extra math, as it says in the notes that "the algebra to show this is not critical for this course".

edit undo thanks | 1

Updated 2 days ago by Jenna King (jennank) and Jiangyue Mao(maojy)

the instructors' answer, *where instructors collectively construct a single answer*

Thanks for checking this, Chongdan. There is in fact an error in the algebra - the answer is qualitatively correct, but when I went back through the calculation I obtained cos instead of sin. The difference is unimportant - the cosine differs from the sine only by a phase difference of pi/2 which can be included in the arbitrary constant phi - but it's good to have the correction and I'll update the notes.

undo thanks | 1

Updated 1 day ago by Edward Ionides

followup discussions *for lingering questions and comments*

Start a new followup discussion

Compose a new followup discussion