1. Statistical Models and Identifiability

For each of the following examples, define a statistical model and check whether the parameter of interest is identifiable. Follow the definitions closely; it is helpful to consider the following: What is Θ and P_θ? What would it mean for the model to be identifiable?

(a)

4/4 points (graded)

1. One observes n i.i.d. Poisson random variables with unknown parameter λ.

- (●) λ identifiable
- ( ) λ not identifiable

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2. One observes n i.i.d. exponential random variables with parameter λ, which is unknown but a priori known to be no larger than 10.

- (●) λ identifiable
- ( ) λ not identifiable

✔

3. One observes n i.i.d. uniform random variables in the interval $[0, \theta]$, where θ is unknown.

- (●) θ identifiable
- ( ) θ not identifiable

✔

4. One observes n i.i.d. Gaussian random variables with unknown parameters μ, σ^2.

- (●) (μ, σ^2) identifiable
- ( ) (μ, σ^2) not identifiable

✔

Submit You have used 1 of 1 attempt

✔ Correct (4/4 points)

(b)

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3/4 points (graded)

1. One observes the sign of n i.i.d. Gaussian random variables with unknown parameters μ, σ^2 .

- (μ, σ^2) identifiable
- (μ, σ^2) not identifiable ✔

2. *StatGen* is a statistical procedure to test the relevance of genes. When well calibrated, it outputs the (random) proportion of active genes in a (random) cell. We want to estimate the distribution of this proportion. To that end, we take n iid cells and submit them to *StatGen*. We model the output of *StatGen* as n random variables $X_1, \ldots, X_n$ that have uniform distribution on $[0, \theta]$ for some unknown theta.

- θ identifiable ✔
- θ not identifiable

3. The US Census Bureau is interested in finding out the average commute time of Bostonians. To that end, it randomly selects n individuals, with replacement, among the people who work and live in the Boston area, and asks to each if their commute time is at least 20 minutes. The commute time of a random person is assumed to follow an exponential distribution with parameter λ .

- λ identifiable ✔
- λ not identifiable

4. Willy Wonka's contains 67 identical machines. Each machine has a lifetime that is modeled as an exponential random variable with some unknown parameter λ . After a certain time $T = 500$ days, one has observed the lifetimes of all machines that have stopped working before T . The parameter of interest is λ .

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○ λ identifiable

● λ not identifiable

✖

Submit You have used 1 of 1 attempt

✱ Partially correct (3/4 points)

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Topic: Unit 2 Foundation of Inference:Homework 1: Estimation, Confidence Interval, Modes of Convergence / 1. Statistical Models and Identifiability

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[STAFF] Can you please extend the deadline.

question posted about 24 hours ago by **yuvraj_97**

Please can you extend the due date. If possible then please extend the due date.

This post is visible to everyone.

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5 responses

abhishekdly
about 17 hours ago

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+1 (already missed deadline of an exercise, since this course started immediately after the machine learning course)

posted about 15 hours ago by **sandipan_dey**

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sjuneja
about 17 hours ago

I am starting to think that my decision to take up this course plus the Data Analysis course while not having fully completed the probability course was not a smart decision after all 😂😅

Same here sjuneja.
I also wanted to do Markov chain before deadline but cause I enrolled in these 2 courses I haven't watched lecture 1 of Markov chain. :(

posted about 11 hours ago by **yuvraj_97**

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joseeefcof
about 16 hours ago

+1

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Shota_Natenadze
about 10 hours ago

+1.

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karenechu (Staff)
about 6 hours ago

We are considering an extension and will email later today. Keep up the good work! Sorry for the lack of break. (We couldn't have launched machine learning earlier.)

Nothing to apologize for! We all can see the kind of work you all have to put through to release and work on these courses for us. Thanks!

posted about 3 hours ago by **sjuneja**

Dr.Karenchu i am thankful for your contribution to the course.We are fortunate to have the support of people like you.

posted about an hour ago by **abhishekdly**

Thank you very much!

posted less than a minute ago by **sandipan_dey**

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