Hypothesis Testing

Is there a home court advantage in basketball?

Home Court Advantage

In a typical year, **home teams win 60%** of NBA games

Sportsnet

Sports Illustrated

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March 11, 2020

Photo from Live Production

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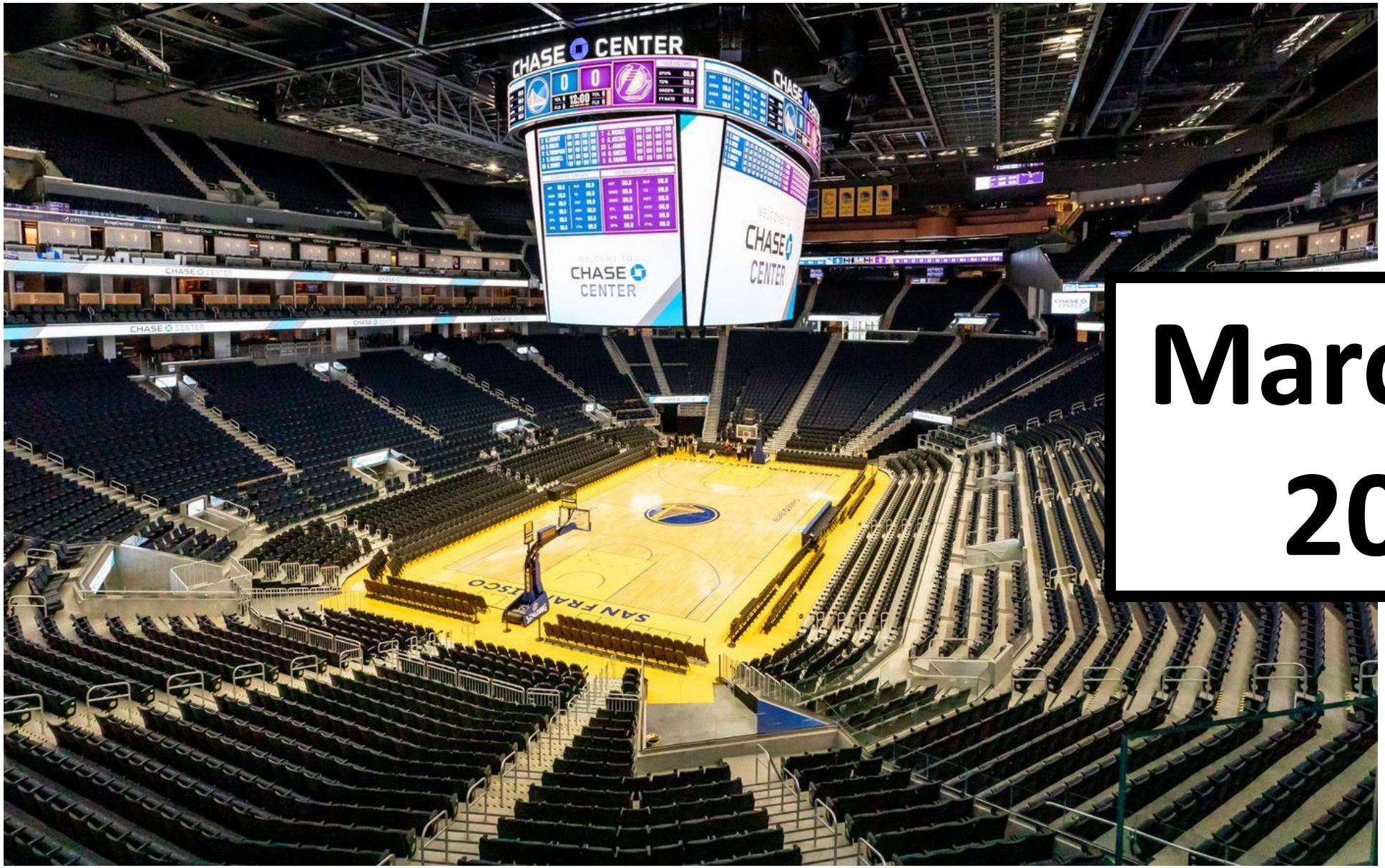

March 12, 2020

Image from Curbed San Francisco

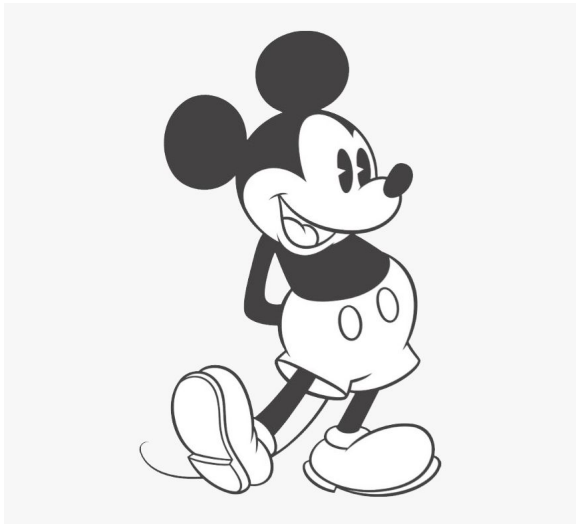

Image from Sporting News

Summer 2020: The NBA Bubble

(at Disneyworld)

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Empty Neutral Court

Images from USA Today

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How the bubble worked:

- 22 teams
- Each played 8 games to finish season
- “Home” and “Away” designations **randomly assigned** for each game

“Home” in the bubble

Images from The New York Times

Home stadium sounds

Virtual cheerleaders

Livestream fans

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Was it enough to make up for the lack of 20,000 screaming fans?

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Image from GSW / Twitter

In the bubble…

The teams randomly assigned to be “home” won 49 (56%) times.

Image from Basketball Forever

In the bubble…

The teams randomly assigned to be “home” won 49 (56%) times.

The “away” teams won only 39 (44%) times.

Image

In the bubble…

The teams randomly assigned to be “home” won 49 times. **The “away” teams won only 39 times.**

Today’s Key Analysis

Did “home” teams have a real advantage in the bubble?

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Hypothesis A

There was **no** true home team advantage in the bubble. Homes teams won more often **by chance alone**.

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Hypothesis B

There **was** a home team advantage in the bubble. Homes teams won more often because they had **a true advantage**.

Images from The New York Times

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Hypothesis A: No true home court advantage

Hypothesis B: True home court advantage

Before we do any analysis, which hypothesis would you assume to be true? Why?

Hypothesis A: No true home court advantage

Hypothesis B: True home court advantage

Before we do any analysis, which hypothesis would you assume to be true? Why?

Hypothesis A – it's a neutral court and there aren't even fans in the stands!

Hypothesis A: No true home court advantage

- Null Hypothesis
- “Dull” Hypothesis: Nothing interesting is happening
- Assume it to be true

Hypothesis B: True home court advantage

- Alternative Hypothesis
- Usually the hypothesis we think of first

Hypothesis A: No true home court advantage

- Null Hypothesis
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Is there enough evidence to “reject” the null hypothesis? *We are **not** trying to prove the alternative hypothesis.*

Null Hypothesis: No true home court advantage

In a world where there is no home court advantage, what proportion (percentage) of games would we expect home teams to win?

Null Hypothesis: No true home court advantage

In a world where there is no home court advantage, what proportion (percentage) of games would we expect home teams to win?

50%

What we observed:

Of the 88 games played, the home teams won 49 times (**56% of the games**)

Our Question: In a world where there is no home court advantage, what are the chances that home teams win 49 or more of the 88 games played?

Our Question: In a world **where there is no home court advantage**, what are the chances that home teams win 49 or more of the 88 games played?

In this world, every game is **like a coin flip**! (p = 0.5)

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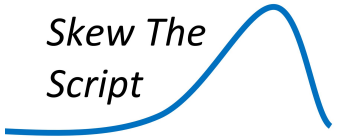
NOW TO NOTEBOOK 4



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