# Finding Mistakes in Basketball Stories: Text S021

In this document you will find:

* Our guidelines on pages 2-5.
* An example basketball story which we have marked up on pages 6 and 7.
* The story we would like you to mark up, on page 8. We give links to basketball-reference.com for the box score information as well as the season schedule for each team (such that you can find other games which might be mentioned in the text). We also include a link to an online calendar for the month the game was played in.
* Space for any additional comments you may have on page 9 (you can leave any optional feedback here, or on the Mechanical Turk form, whichever is easier).
* Participant Information Sheet, along with contact information for the researchers on page 10.

Please mark up the game summary on page 8 in a similar way to the example on pages 6/7 and upload the document as instructed on Mechanical Turk.

Thanks for your help!

## Mark-up guidelines

We’ve given you a basketball game story produced by a “deep learning” AI system, as well as links to box score information on basketball-reference.com about the game (the stories focus on box scores, they generally don’t talk about individual goals, penalties, etc). We have also given links for season information of each team (some of the stories say where the next game will be).

We are only interested in whether the presented statements/facts are correct, not whether they are boring and should have been replaced by more interesting statements/facts. We are not interested in spelling or grammar mistakes.

Please read through the stories and mark up cases where:

* numbers are wrong
* names (players, teams, cities, days of the week, etc) are wrong
* words are wrong
* context means people will misunderstand a sentence
* facts are not checkable
* other cases where the story says something which is not true

We give more information below about these types of mistake.

Please mark up the wrong numbers, names, etc by putting them in red. If you’re colour-blind, you can underline them instead. Also please add a note below the story for each mistake; the note should explain the mistake and say which type it is. There is an example on pages 6 and 7.

### Number mistakes

Numbers mistakes are incorrect numbers. For example

* “10-point victory” when margin of victory was 11 pts.
* “six players reached double figures” when only four players did so.

Please mark-up the wrong number by putting it in red or underlining it. It doesn’t matter whether the number is digits (such as 10) or written as a word (such as six). Ordinals (1st, 2nd, third etc.) are also number mistakes.

### Name mistakes

Name mistakes are errors in things that have names. This includes people, cities, teams, stadiums, and days of week. If a word (other than “I”) is always capitalised, it is probably a name. For example

* “on Monday” when game was played on Wednesday.
* “Talking Stick Resort Arena” when game was played in US Airways Arena.
* “Isaiah Thomas had 11 points and 3 rebounds” when he had neither of these statistics, and Gerald Green had both.

Please mark-up the wrong name by putting it in red or underlining it. Please note that days of the week, such as Wednesday, are always name mistakes, not word mistakes.

### Word mistakes

Word mistakes are incorrect or inappropriate words which are not names or numbers. For example

* “out-scored the Suns” when the Suns had a higher score in this period.
* “off the bench” for a player who was on the starting team.
* “strong first half” when team did poorly in first half.

Please mark-up the wrong word(s) by putting it in red or underlining it. We treat mistakes in fixed phrases such as “off the bench” as word mistakes (the AI systems treat fixed phrases in the same way as they treat words). Please note that days of the week (Monday, Tuesday etc.) are **not** word mistakes (they are name mistakes).

### Context mistakes

Context mistakes occur when people reading a sentence are likely to misinterpret it because of its context, even if the sentence is literally true. For example

* “The Suns had six players reach double figures in points. Mike Conley led the way with 24 points.” This is a context mistake because Conley played for the other team (not the Suns). I.e., Conley did score 24 points, but the context implies he played for the Suns, which is wrong.

For the mark-up, try to find the thing which will be misinterpreted (as above), and put it in red or underline it. Please note that if “Mike Conley” should be changed to another player, that would be a name mistake, not a context mistake.

### Facts which are not checkable

Some facts will not be practical to check. We do not expect you to look back further than 4 prior games to check a statement. Please also check each teams’ next game details. For example:

* Please do check: “It was his second double-double in a row, …”. You can find the players per-game history by clicking on their name in the box score, then selecting the appropriate season.
* Please do check: “The Suns' next game will be on the road against the Boston Celtics on Friday”.
* Please do **not** check: “The Wizards came into this game as the worst rebounding team in the NBA.”.

For the mark-up, highlight the text which cannot be checked, and put it in red or underline it. Also indicate that it is the “not checkable” category. Whilst it is possible to check some facts further back than 4 prior games, please do not do so. We need to set a consistent threshold beyond which facts are not checked.

### Other mistakes

If there is a mistake which clearly does not belong to any of the above categories, you may use this category as a last resort. Try to mark-up the wrong text by putting it in red or underlining it. We can’t give precise instructions because the “other” category is very broad.

### Repeated sentences

If a sentence or phrase is repeated, then please treat it as you would any other sentence and highlight all mistakes (even if you did so in a previous sentence). For example

* “The Sun’s next game will be on Friday, while the Sun’s next game will be on Friday” is a bizarre thing to say, but it is not in and of itself an accuracy mistake (assuming that the next game will in fact be on Friday).

You do not, however, need to indicate to us that this sentence was repeated.

### Complex mistakes

If there are multiple ways in which you can annotate a sentence for mistakes, choose the one with the fewest total mistakes. For Example, when choosing between:

* “Isaiah Thomas had 11 points and 3 rebounds.”
* “Isaiah Thomas had 11 points and 3 rebounds.”

The first annotation is preferred as the text describes the exact statistics of another player, Gerald Green. In other words, we can annotate this sentence as one name error (should be Gerald Green) or as two number errors (should be XX points and YY rebounds); we prefer the first because its fewer errors.

If there are multiple ways you can annotate something with the same number of mistakes, please choose the one with the most number mistakes first, followed by name mistakes, then word, context, not checkable and other.

For Example, when choosing between:

* “Eric Bledsoe scored 20 points for the Suns.”
* “Eric Bledsoe scored 20 points for the Suns.”

Where Bledsoe did play for the Suns but had 23 points, whilst Markieff Morris was the only player with 20 points. Please choose the second annotation (numbers before names).

Number > Name > Word > Context > Not Checkable > Other.

Another common complex mistake would be “It was his second double-double in a row”. In this case, please mark the number mistake (second) not the word mistake (*double-double)*. The correct number would be *zeroth*, which would be a strange thing to say, but is what makes the sentence correct.

It can be helpful, when you see many number mistakes in a sentence, to go back and check whether a name mistake might be more appropriate. We acknowledge that some of these sentences can be very muddled. Do not agonize over it, just try to follow the instructions as best you can.

### Number versus words mistakes

Whilst words such as "a" can be equivalent to "one", for example, "one block" vs "a block", this is not always the case. As a simple rule mark "a" or "an" as number mistakes if they are referring to something of which there could be more than one in the current context. In a single game context, these are things such as points, blocks, or steals. The following examples are number mistakes:

* "a block"
* “an assist”
* "It was his second triple-double in a row."

The following examples would **not** be number mistakes, they would be word mistakes:

* "a double-double"
* "a game-high"
* "It was his only double-double of the season."

### Using basketball-reference.com

<https://www.basketball-reference.com> provides methods for quickly viewing, and in some cases averaging, historic information. To get player average statistics over a period of time, you can click on the players name on the box score, then select the season, you will then see the players game log (<https://www.basketball-reference.com/players/t/thomais02/gamelog/2015/>). You can click on one game; the line should turn orange. Then click on a game earlier/later in the season, a box should pop up with averages for all the games you have selected.

Please note: We only ask that you check back as far as 4 prior games (as well as looking at any upcoming games for the teams). So, you would check “He has scored 30 plus points in 4 of his last 5 games” (this game plus 4 prior) but would **not** check “The Wizards came into this game as the worst rebounding team in the NBA.” (it would require checking all NBA teams to that point).

Another screen worth being aware of is the play-by-play (<https://www.basketball-reference.com/boxscores/pbp/201411050PHO.html>) which can be accessed from the box score.

### A note on field goals / three-pointers

This caused some confusion in our previous experiment. On basketball-reference.com, the box score lists field goals as FG (field goal) and FGA (field goal attempts). This is the total number of shots, from any range, except the free throw line (FT/FTA). Three-pointers are tracked in the 3P/3PA column and should be read as “the number of FGs/FGAs which were shot from beyond the three-point arc”. Each entry in this column is worth 1 point, not 3 points.

You can see this by calculating ((1\*FT)+(1\*3P)+(2\*FG)) and it should match the players points total. In our example story on the following page, we see on the linked box score that Mike Conley had 9-FGs, 3-3Ps and 3-FTs. ((1\*3)+(1\*3)+(2\*9)) = (3+3+18) = 24, which is what the site lists his points total.

Note also, that the texts will sometimes refer to 3P/3PA as FG3/FG3A.

## Example marked-up story

Game played on 5-Nov-2014, between Memphis Grizzlies and Phoenix Suns.

Main box score data

* <https://www.basketball-reference.com/boxscores/201411050PHO.html>

Other useful data

* Home team season schedule: <https://www.basketball-reference.com/teams/PHO/2015_games.html>
* Visiting team season schedule: <https://www.basketball-reference.com/teams/MEM/2015_games.html>
* Online calendar: <https://www.timeanddate.com/calendar/monthly.html?year=2014&month=11&country=1>

Story, with mistakes in underlined red

The Memphis Grizzlies (5-2) defeated the Phoenix Suns (3-2) Monday 1-2 at the Talking Stick Resort Arena in Phoenix. The Grizzlies had a strong first half where they out-scored the Suns 59-42, to coast to a 10-point victory in front of their home crowd. The Grizzlies were led by Isaiah Thomas, who scored 15 points (4-10 FG, 1-4 3Pt, 6-6 FT). He also had six rebounds and five assists in 26 minutes. Eric Bledsoe had 23 points (9-12 FG, 2-2 3Pt, 3-4 FT), five rebounds and four assists, while Bledsoe added 24 points (9-14 FG, 2-4 3Pt, 3-4 FT), five rebounds and four assists. The Suns had six players reach double figures in points. Mike Conley led the way with 24 points (9-14 FG, 3-4 3Pt ,3-5 FT) and 11 assists, while Tony Allen chipped in with nine points (4-6 FG, 1-1 FT) and a pair of assists. The Suns had six players reach double figures in points in this one. Tony Allen had nine points (4-6 FG, 1-1 FT) and a pair of assists off the bench. The Suns' next game will be on the road against the Boston Celtics on Friday, while the Suns will be at home against the Portland Trail Blazers on Friday.

LIST OF MISTAKES

5-2 - should be 5-0 [number]

Monday – Wednesday [name]

1-2 - score was 102-91 [number]

1-2 - score was 102-91 [number]

Talking Stick Resort Arena - that is the name now, but in 2014 the Stadium was called US Airways Arena [name]

strong – first half was not strong [word]

outscored – Suns outscored Grizzlies [word]

59-42 – actual score was 46-52 [number]

59-42 – actual score was 46-52 [number]

coast – they had to catch up from behind [word]

10 point – should be 11 point [number]

home – Game was in Phoenix [word]

led – Thomas did not lead the Grizzlies [word]

Isaiah Thomas – Thomas played for Suns, not Grizzlies [context]

six – one rebound [number]

five – two assists [number]

Eric Bledsoe – Bledsoe played for the Suns, not Grizzlies [context]

24, 14, 4 – correct figures for Bledsoe are in previous clause (23, 12, 2) [number]

24, 14, 4 – correct figures for Bledsoe are in previous clause (23, 12, 2) [number]

24, 14, 4 – correct figures for Bledsoe are in previous clause (23, 12, 2) [number]

six – only four Sun players reached double figures [number]

Mike Conley – Conley plays for the Grizzlies, not Suns [context]

Tony Allen – Allen plays for the Grizzlies, not Suns. [context]

Pair – one assist [number]

six – only four Grizzly players reached double figures [number]

off the bench – Allen was a starter [word]

on the road – home game [word]

Boston Celtics – next game is against Sacramento [name]

Portland Trail Blazers – next game is against Sacramento [name]

## Story to be marked-up

Please mark up the following story. Links to the statistics for the game on basketball-reference.com, as well as each team’s season are included below to assist you.

Main box score data

* <https://www.basketball-reference.com/boxscores/201611250SAC.html>

Other useful data

* Home team season schedule: <https://www.basketball-reference.com/teams/SAC/2017_games.html>
* Visiting team season schedule: <https://www.basketball-reference.com/teams/HOU/2017_games.html>
* Online calendar: <https://www.timeanddate.com/calendar/monthly.html?year=2016&month=11&country=1>

STORY

The Houston Rockets defeated the Sacramento Kings, 117-104, at Golden 1 Center on Saturday. The Rockets (10-6) came in to Saturday's contest with a strong start to the season, but the Rockets (10-6) came in to Saturday's contest with a 38-point first quarter, and the Kings (6-10) were able to pull away in the second half. However, the Rockets (10-6) battled back to make it a one-point game at the end of the third quarter, but the Kings battled back to make it a one-point game at the end of the third quarter. However, the Kings were able to pull away in the fourth quarter, outscoring the Kings (6-10) by a 38-19 margin over the final 12 minutes. James Harden led the way for Houston with 23 points, nine rebounds, an assist and five blocks. Eric Gordon was next with 14 points, two rebounds, an assist and a steal. Clint Capela followed with 17 points, three rebounds, three assists, two steals and two blocks. Trevor Ariza was next with a double-double of 18 points, 10 rebounds, three assists, two steals and two blocks. Trevor Ariza was next with a double-double of 18 points, 10 rebounds, three assists and two steals. Sam Dekker was productive in a reserve role as well with 17 points, three rebounds, three assists, two steals and two blocks. James Harden led the way for Houston with 23 points, nine rebounds, an assist and five blocks. Rudy Gay was next with 10 points, four rebounds, three assists and three steals. Darren Collison was next with a 18-point, 10-rebound double-double that also included four assists, two steals and a pair of blocks. Darren Collison was next with 18 points, four assists, three rebounds and two steals. Rudy Gay posted a 10-point, 12-rebound double-double that also included three assists, three steals and three blocks. Darren Collison led the bench with 18 points, four assists, three rebounds and two steals. The Rockets head back home to face off with the San Antonio Spurs on Saturday night, while the Kings remain home and await the Golden State Warriors on Saturday evening.

LIST OF MISTAKES

<please list mistakes here, as well as marking them up in the story>

## Comments

If you have any comments about this exercise, please write them below

## Appendix

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**Telephone: ++44-1224-273443**

**Email: e.reiter@abdn.ac.uk**

**PARTICIPANT INFORMATION SHEET**

Measuring Accuracy of Sports Stories

Principal Investigator(s): Ehud Reiter

Other researchers: Craig Thomson

I am a Professor of Computing Science at the University of Aberdeen in the UK. I would like to invite you to consider participating in the research project Marking up Sports Stories. Below is some information about the project, to help you decide whether you would like to take part.

**Participation in the research project is completely voluntary. You can withdraw from the project at any time, without having to give a reason.**

AIMS

The aim of the project is to identify mistakes in computer-generated summaries of basketball games. These summaries were produced by “deep learning” neural-network algorithms, and identifying the mistakes in the summaries will help us understand the type of mistakes that deep learning systems make.

WHAT YOU WILL BE ASKED TO DO

We will give you a set of instructions and several computer-generated summaries of basketball games. We would like you to tell us about mistakes in the summaries, following the instructions.

RISKS

There are no risks. You can drop out at any time if you wish.

DATA MANAGEMENT AND STORAGE

We will store your summaries on the university computer system, and analyse them. We will not store your name and personal details, everything will be fully anonymised. We would like to make the summaries available to other interested researchers as well, by putting them in a research repository at Aberdeen University or elsewhere.

CONFIDENTIALITY AND ANONYMITY

The University’s Privacy Notice for Research Participants is available [here](https://www.abdn.ac.uk/about/privacy/research-participants-938.php)

The identity of participants will not be released to anyone outside the research team. The data you provide will be analysed and may be used in publications, dissertations, reports or presentations derived from the research project, but this will be done in such a way that your identity is not disclosed.

CONSENT

If you agree to take part in the research, you will be asked to indicate your consent by ticking a box on an online Consent Form.

Thank you for considering taking part in this research.

If you have any questions about this research, please contact me:

Ehud Reiter phone: +44-1224-273443 email: e.reiter@abdn.ac.uk

For any queries regarding ethical concerns you may contact the Convener of the Physical Sciences & Engineering Ethics Board at the University of Aberdeen:

Email: [copsethics@abdn.ac.uk](mailto:copsethics@abdn.ac.uk)

This research project was approved by the Physical Sciences & Engineering Ethics Board on 15/05/2020.