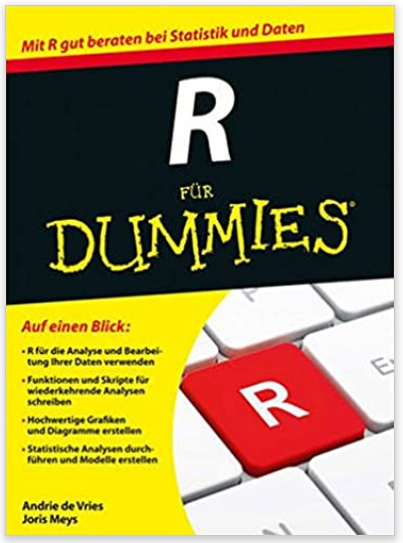
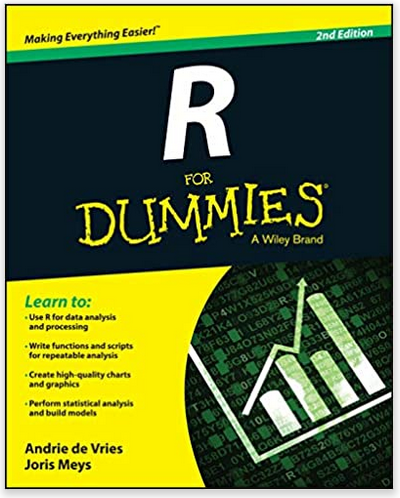
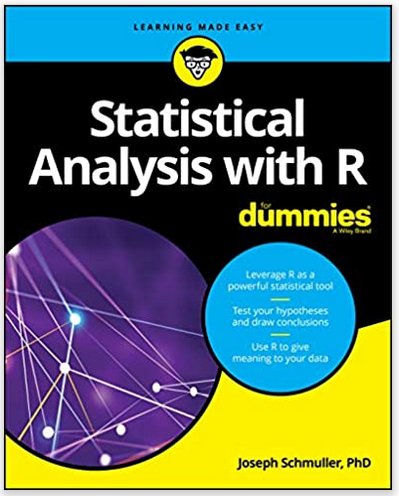
**Introduction to R**

Resources:



[https://r4ds.had.co.nz/introduction.html]

<https://cran.r-project.org>: You can find various manuals there, e.g. https://cran.r-project.org/doc/manuals/r-release/R-intro.html

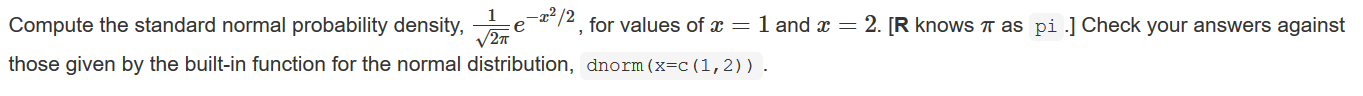
<https://www.r-graph-gallery.com/>

<https://www.data-to-viz.com/>

<https://github.com/kingaa/R_Tutorial> and <http://kingaa.github.io/R_Tutorial/>

Exercises:

Ex 1:



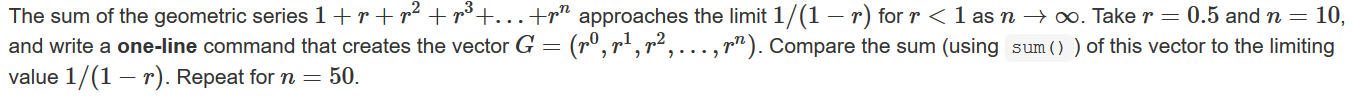
Ex 2:



Ex 3:



Ex 4:



Ex 5:

Verify that converges to as .

Ex 6:

Check that does not converge. Calculate this sum for n=10, n=1000, n=100000, and n=10000000.

Ex 7:

In the dataframe hurricanes.csv, compute a new factor variable categorizing MinPressure\_before into quartiles (1,2,3,4) (use the function “cut”).

Ex 8:

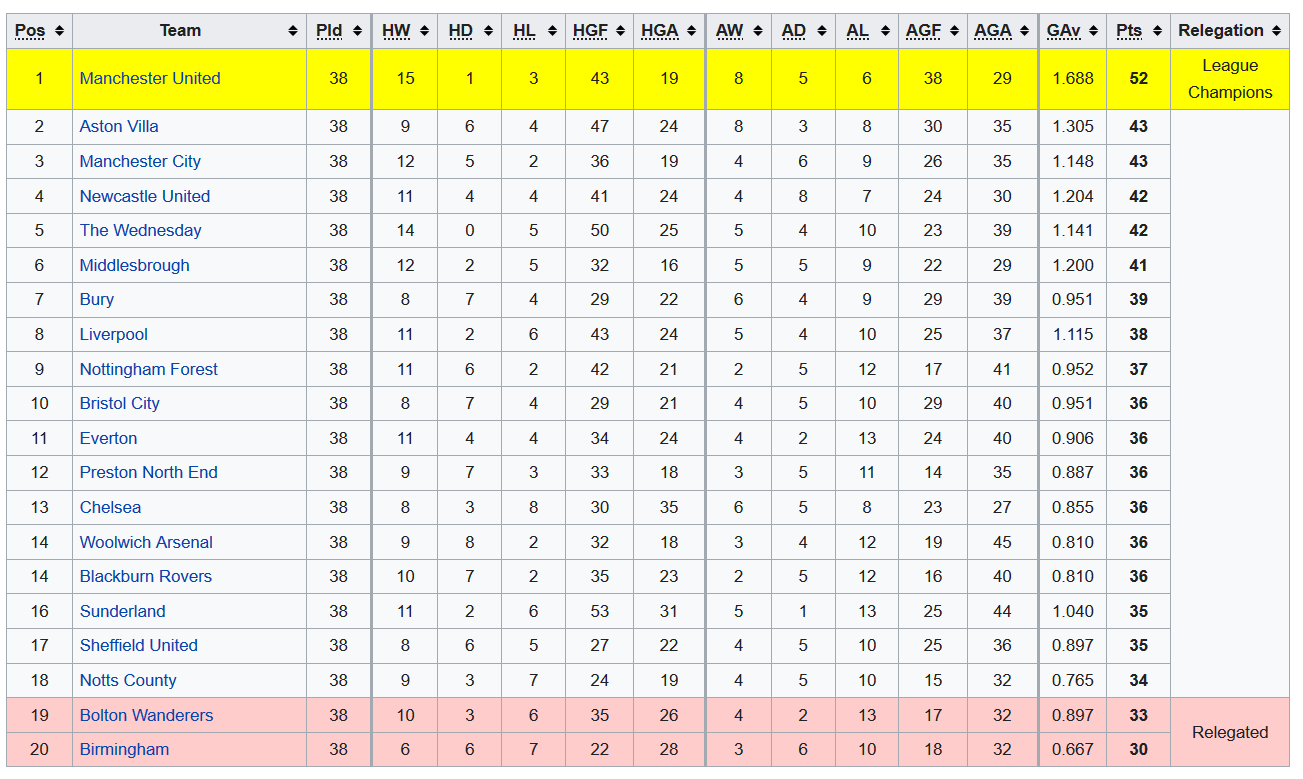
Write a function that assigns the values 1,2,…, n randomly to n people X[1], X[2],…,X[n] (Hint: use the function runif to generate random numbers).

Dataframe “england” from the R package “engsoccerdata”

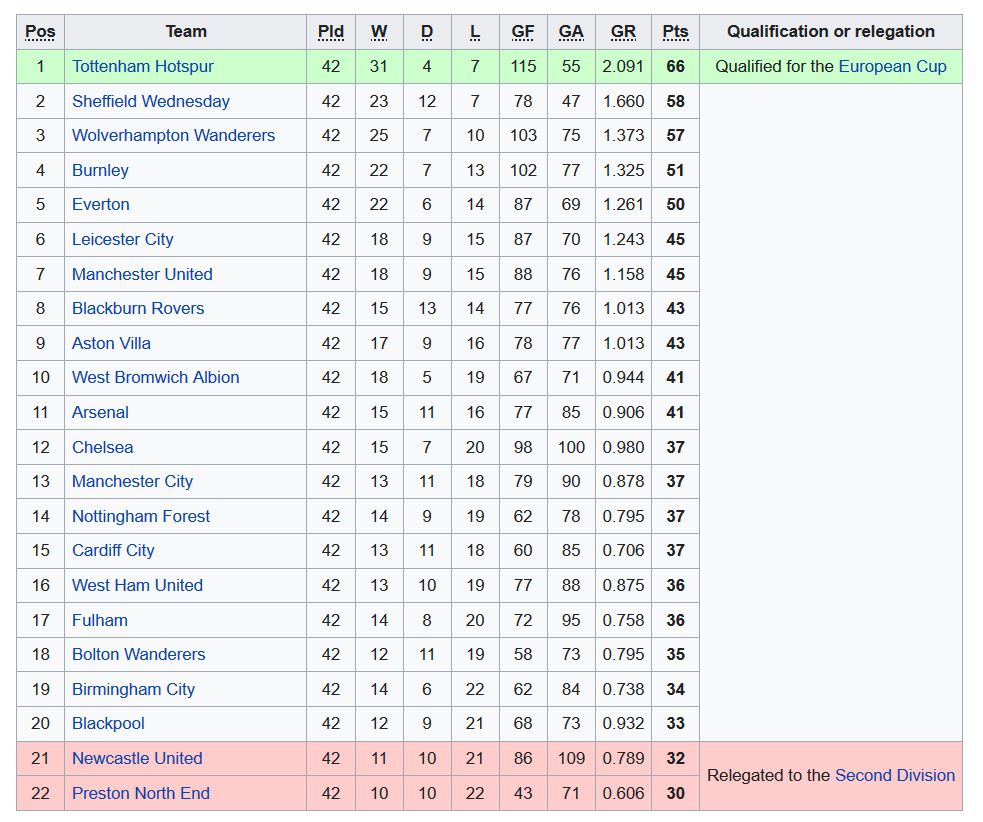
Questions one could be interested in:

* What were the final standings per season (rank/position, number of games, wins, draws, losses, goals for, goals against, goal difference, points)?
* Which team won the championship the most often? (Bar chart of the most successful teams.)
* How many different teams participated in the English Premier League since its beginnings?
* What was the game with the most goals? What was the victory with the highest goal difference?
* Did the change to the 3-1-0 system introduced in 1981 lead to more decisive games? Did it lead to more goals?
* In which seasons have there been ties in the final ranking (i.e. same number of points, same number of goals, plus same number of goals for)?
* What was the smallest margin deciding between first and second place?
* What was the average number of goals per game per season? Plot over time. Standard deviation as bars.
* How big is the advantage of playing at home?

Final standings of season 1907 (<https://en.wikipedia.org/wiki/1907%E2%80%9308_Football_League>):



Final standings of season 1960 (<https://en.wikipedia.org/wiki/1960%E2%80%9361_in_English_football>):



Final standings of season 2005 (<https://en.wikipedia.org/wiki/2004%E2%80%9305_FA_Premier_League>):

