French given names per year per department

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The aim of the activity is to develop a methodology to answer a specific question on a given dataset.

The dataset is the set of Firstname given in France on a large period of time. given names data set of INSEE, we choose this dataset because it is sufficiently large, you can't do the analysis by hand, the structure is simple

You need to use the *tidyverse* for this analysis. Unzip the file *dpt2019_txt.zip* (to get the **dpt2019.csv**). Read in R with this code. Note that you might need to install the `readr` package with the appropriate command.

Download Raw Data from the website

```
file = "dpt2020_txt.zip"
if(!file.exists(file)){
  download.file("https://www.insee.fr/fr/statistiques/fichier/2540004/dpt2020_csv.zip",
    destfile=file)
}
#unzip(file)
```

Build the Dataframe from file

```
firstNames <- read_delim("dpt2020.csv",delim =";")
```

```
## Rows: 3727553 Columns: 5

## -- Column specification --------------------------------------------------------
## Delimiter: ";"
## chr (3): preusuel, annais, dpt
## dbl (2): sexe, nombre

##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

inspect the data

We see that we have one year which is in unknown format 'xxxx'

```
100*length(firstNames$annais[firstNames$annais=="XXXX"])/nrow(firstNames)
```

```
## [1] 0.9991541
```

We see that we have almost 1% of rows with this value in our dataset so we can delete it because the ratio is ot significant

We see that we have a uncommon noun “PRENOM_RARE” let see it

```
nrow(newfirstNames %>%filter(preusuel=="_PRENOMS_RARES"))
```

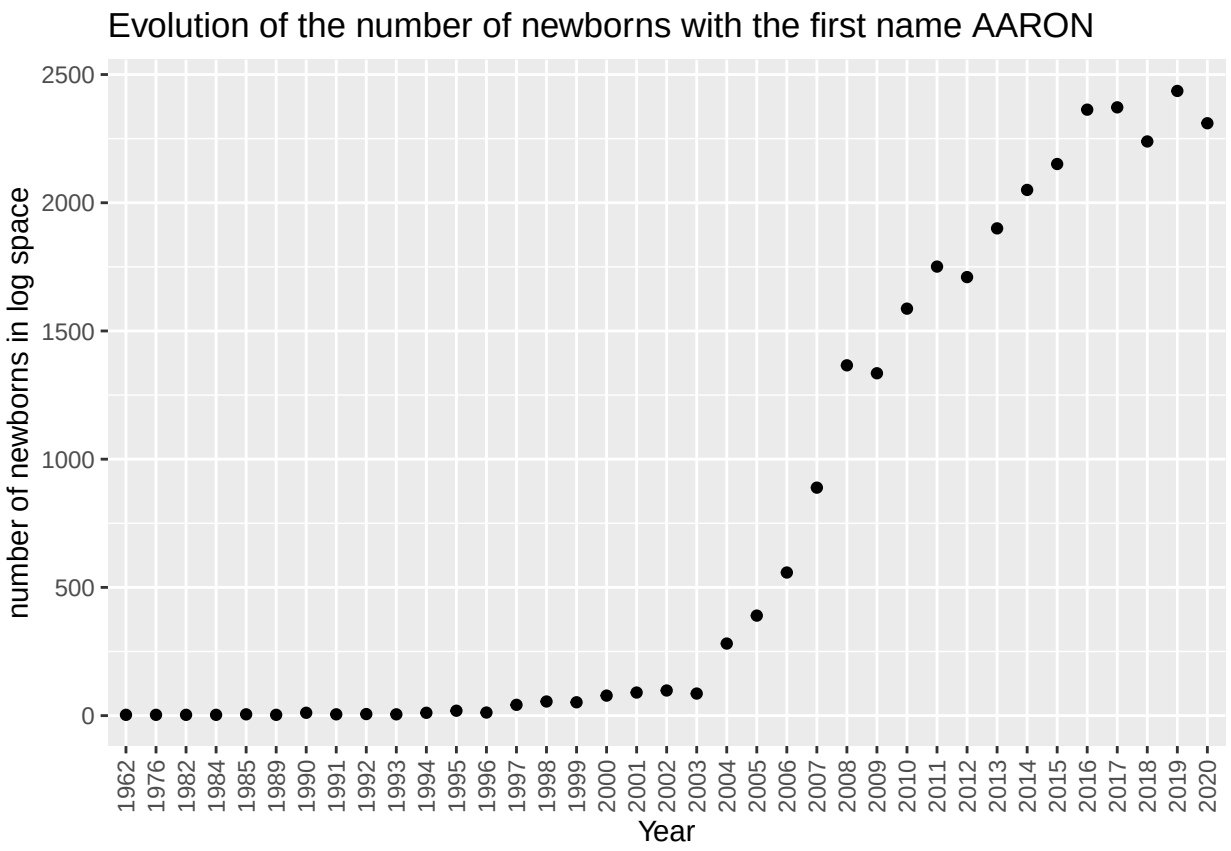
```
## [1] 22035
```

```
## With the following command we group the dataframe by preusuel and by annais and we count the total n
newfirstNames<- newfirstNames %>% group_by(preusuel,annais) %>% summarise(frequency = sum(nombre)) %>% a
```

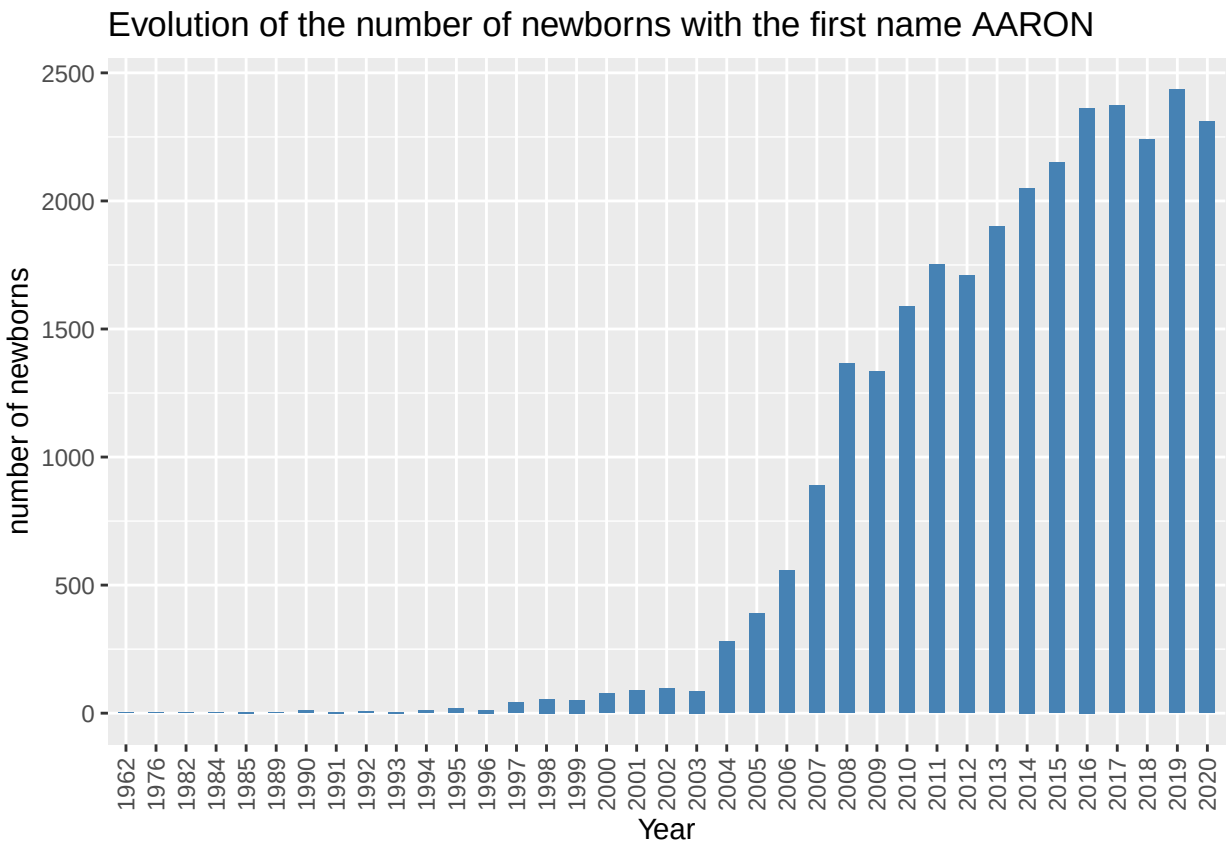
```
## `summarise()` has grouped output by 'preusuel'. You can override using the `.groups` argument.
```

We see that there are not missing values, in the next chunk we will visualise graphics

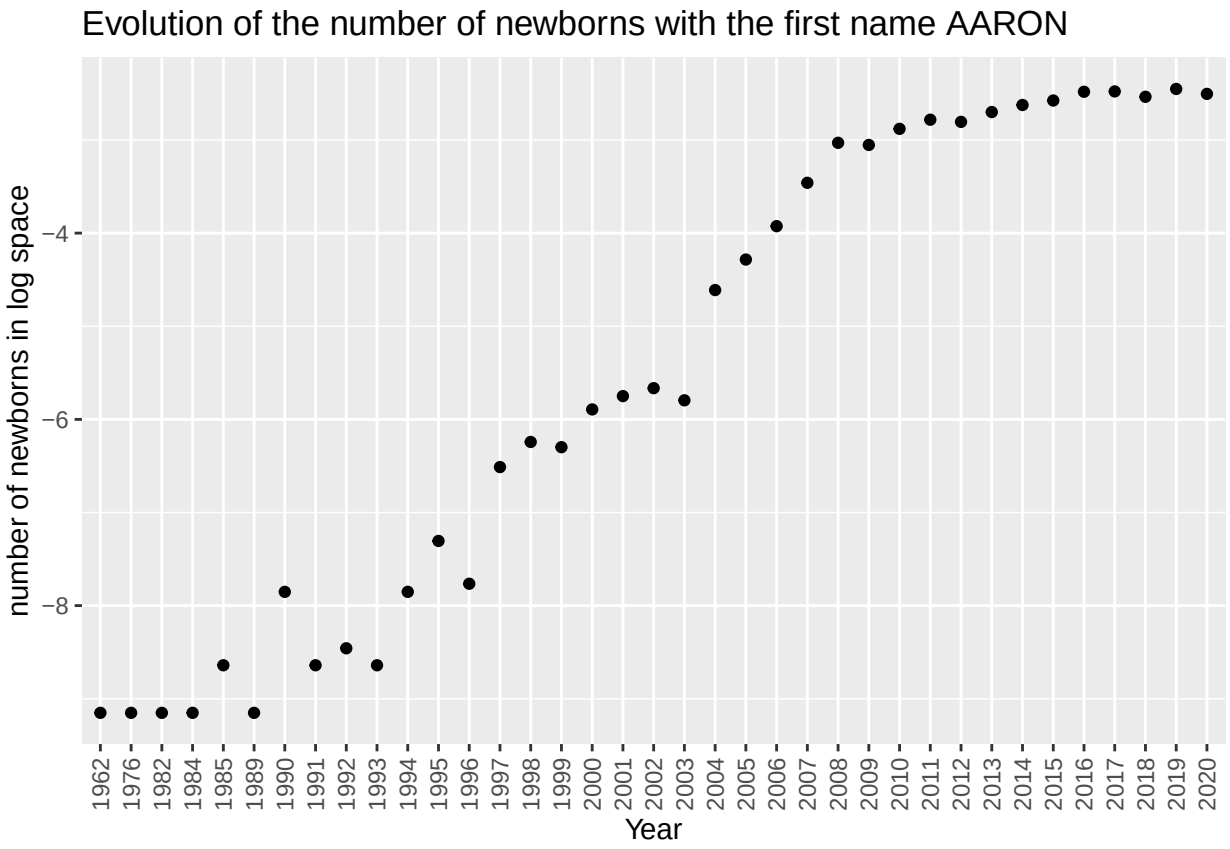
```
aaron_df$log_norm_freq <- log(x = aaron_df$frequency/(sum(aaron_df$frequency)))
a1 <- ggplot(data = aaron_df) + geom_point(mapping = aes(x = annais, y = frequency)) + theme(axis.text.
a2 <- ggplot(data=aaron_df, aes(x=annais, y=frequency))+geom_bar(stat="identity", fill="steelblue", wid
## We plot the data in the log-space
a3 <- ggplot(data = aaron_df) + geom_point(mapping = aes(x = annais, y = log_norm_freq)) + theme(axis.t
a1
```



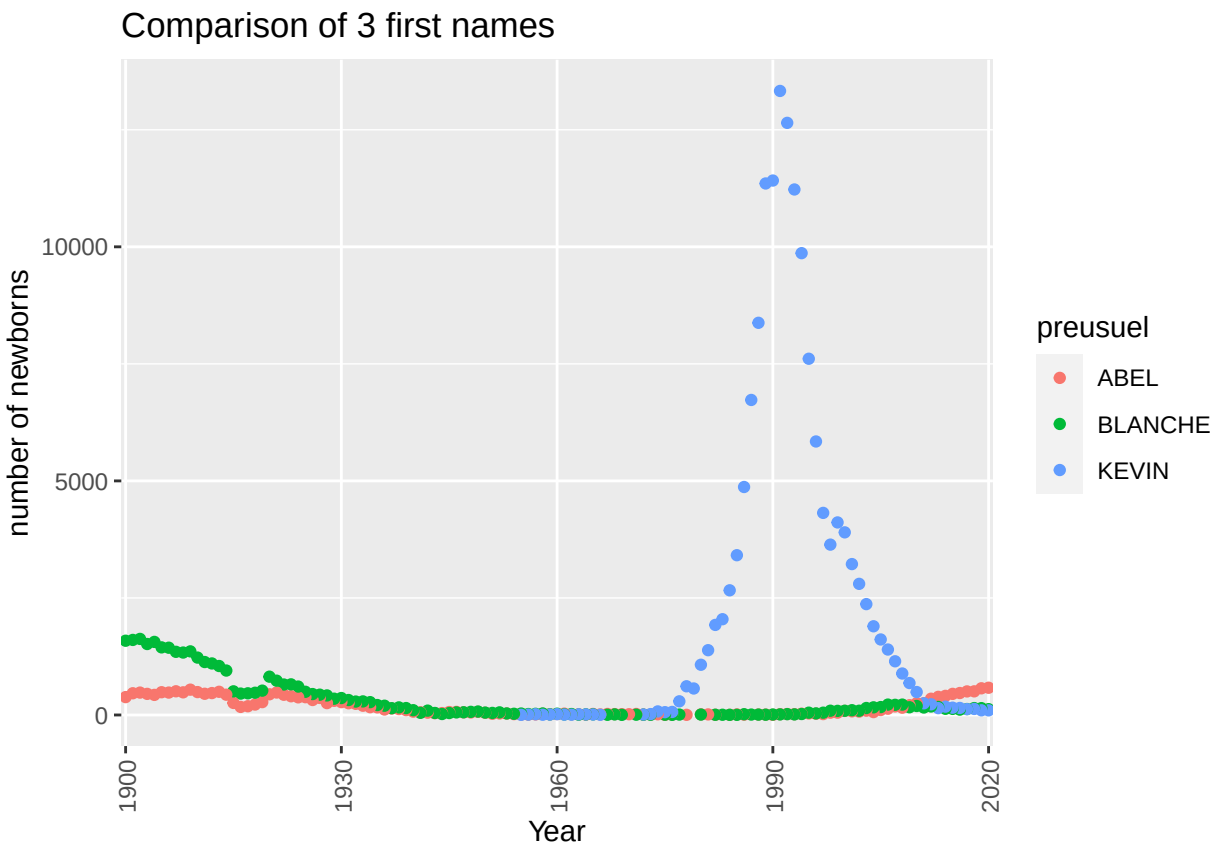
```
a2
```


Evolution of the number of newborns with the first name AARON
number of newborns
2500
2000
1500
1000
500
0
1962
1976
1982
1984
1985
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Year

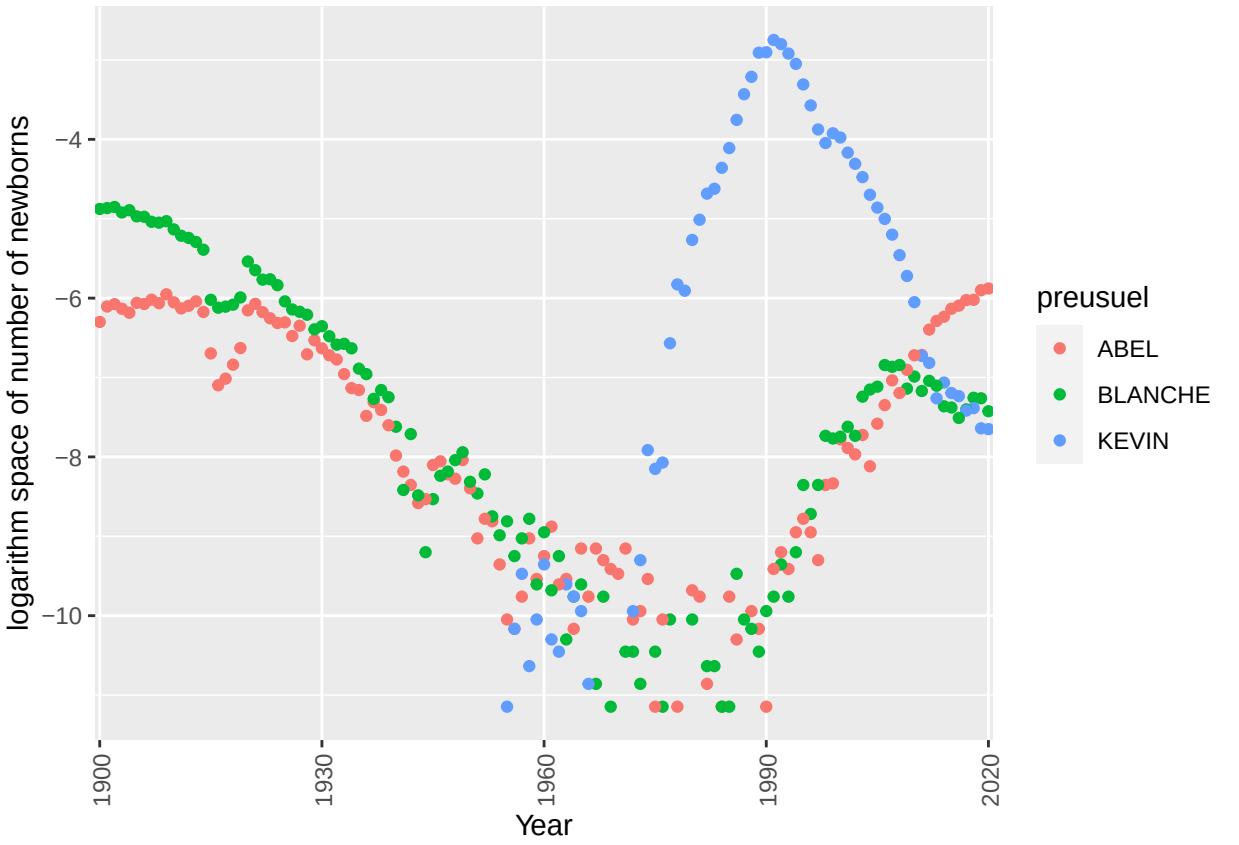
```
a3
```




```
newfirstNames <-drop_na(newfirstNames)
multiple_names <- newfirstNames%>%filter(preusuel=="ABEL" | preusuel=="BLANCHE" |preusuel=="KEVIN")
labels <- seq(1900, 2020, length.out=5)
a4 <- ggplot(data = multiple_names, aes(x = annais, y = frequency, color = preusuel))+ geom_point() + tl
a4
```




```
multiple_names$log_norm_freq <- log(x = multiple_names$frequency/(sum(multiple_names$frequency)))
a5 <- ggplot(data = multiple_names, aes(x = annais, y = log_norm_freq, color = preusuel))+ geom_point()
a5
```




```
## We can easily compare frequency of birth in the log space because
```

With this graph we can see that the first name Kevin has been most popular than the other ones between 1975 and ~2005 but after this it decreases in popularity and the first name ABEL become most popular

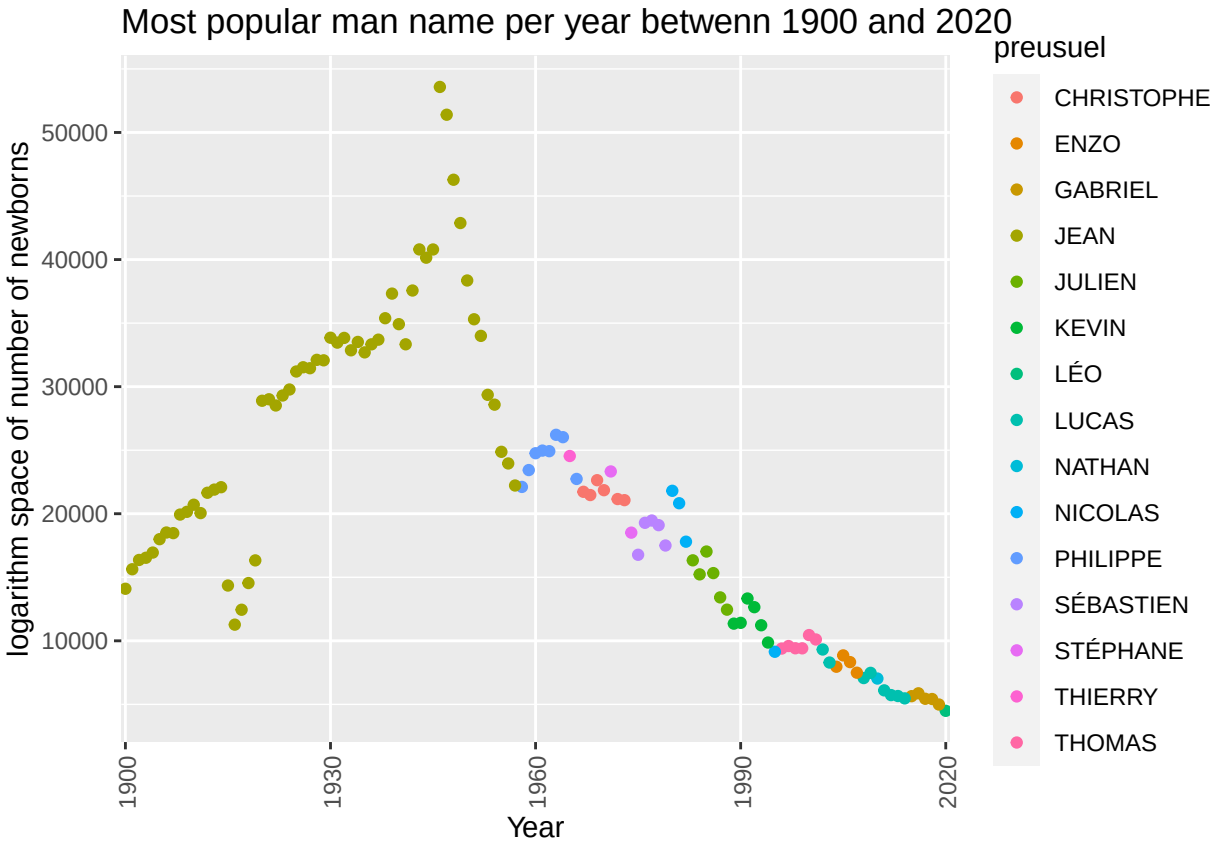
```
names_per_year <- firstNames %>% group_by(preusuel, annais, sexe) %>% summarise(frequency = sum(nombre)
```

```
## `summarise()` has grouped output by 'preusuel', 'annais'. You can override using the `.groups` argume
```

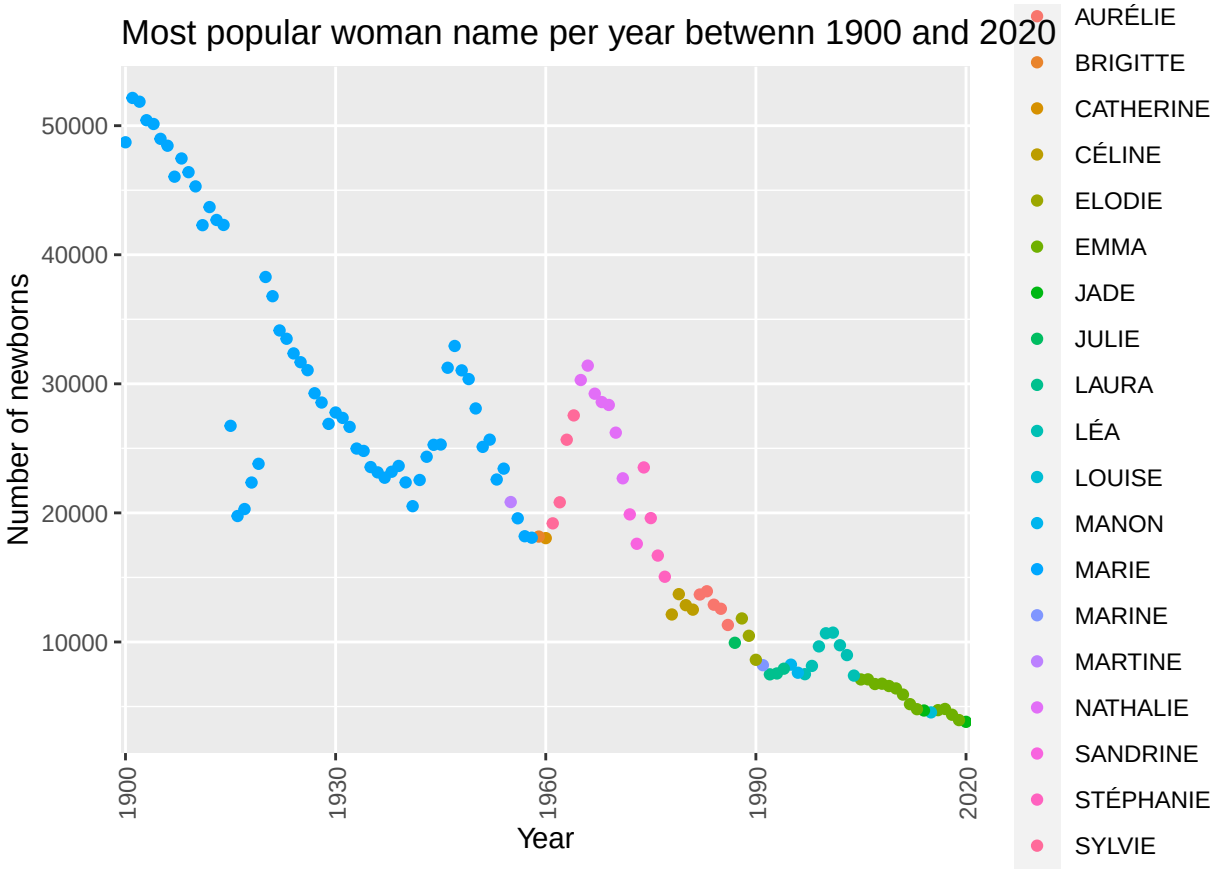
```
names_per_year <- names_per_year %>% filter(annais != "XXXX")
names_per_year <- names_per_year %>% filter(preusuel != "_PRENOMS_RARES")
names_per_year <- names_per_year %>% group_by(annais, sexe) %>% top_n(n = 1)
```

```
## Selecting by frequency
```

```
man_per_year <- names_per_year %>% filter(sexe == 1)
a6 <- ggplot(data = man_per_year, aes(x = annais, y = frequency, color = preusuel, fill=preusuel))+ geo
woman_per_year <- names_per_year %>% filter(sexe == 2)
a7 <- ggplot(data = woman_per_year, aes(x = annais, y = frequency, color = preusuel, fill=preusuel))+ g
a6
```


Most popular man name per year betwenn 1900 and 2020
logarithm space of number of newborns
50000
40000
30000
20000
10000
1900
1930
1960
1990
2020
Year
preusuel
CHRISTOPHE
ENZO
GABRIEL
JEAN
JULIEN
KEVIN
LÉO
LUCAS
NATHAN
NICOLAS
PHILIPPE
SÉBASTIEN
STÉPHANE
THIERRY
THOMAS

a7



We see with this graph that between 1900 and almost 1960 Jean was the most popular man name and Marie for the woman side, another remark is that the number of newborns with the most popular name decreases from 1960 both for man and woman side "'

Translation in english of variables names: sexe -> gender preusuel (prénom usuel) -> Firstname annais (année de naissance) -> Birth year dpt (département) -> department (administrative area unit) nombre -> number All of these following questions may need a preliminary analysis of the data, feel free to present answers and justifications in your own order and structure your report as it should be for a scientific report.

1. Choose a firstname and analyse its frequency along time. Compare several firstnames frequency
2. Establish, by gender, the most given firstname by year.
3. Make a short synthesis
4. Advanced (not mandatory) : is the firstname correlated with the localization (department) ? What could be a method to analyze such a correlation.

The report should be a pdf knitted from a notebook (around 3 pages including figures), the notebook and the report should be delivered.