In [1]:
```
library(caretEnsemble)
library(RColorBrewer)
library(tm)
library(datarium)
library(leaps)
library(glmnet)
library(pls)
library(gam)
library(splines)
library(MVA)
library(nortest)
library(mvnormtest)
library(pastecs)
library(mvtnorm)
library(igraph)
library(dplyr)
library(ggplot2)
library(ggraph)
library(caret)
library(car)
library(mlbench)
library(tidyverse)
library(MASS)
library(ISLR)
library(psych)
library(faraway)
library(pls)
library(Matrix)
library(stats)
library(biotools)
library(ggpubr)
library(broom)
library(leaps)
library(tidyverse)
library(funModeling)
library(Hmisc)
library(rpart)
library(readr)
library(party)
library(partykit)
library(rpart.plot)
library(stringr)
library(reshape2)
```

```
Loading required package: NLP

Loading required package: Matrix

Loaded glmnet 4.1-2


Attaching package: ‘pls’


The following object is masked from ‘package:stats’:

    loadings
```

```
Loading required package: splines

Loading required package: foreach

Loaded gam 1.20


Loading required package: HSAUR2

Loading required package: tools


Attaching package: ‘igraph’


The following objects are masked from ‘package:stats’:

    decompose, spectrum


The following object is masked from ‘package:base’:

    union


Attaching package: ‘dplyr’


The following objects are masked from ‘package:igraph’:

    as_data_frame, groups, union


The following objects are masked from ‘package:pastecs’:

    first, last


The following objects are masked from ‘package:stats’:

    filter, lag


The following objects are masked from ‘package:base’:

    intersect, setdiff, setequal, union


Attaching package: ‘ggplot2’


The following object is masked from ‘package:NLP’:

    annotate


The following object is masked from ‘package:caretEnsemble’:
```

```
    autoplot

Loading required package: lattice

Attaching package: ‘caret’

The following object is masked from ‘package:pls’:

    R2

Loading required package: carData

Attaching package: ‘car’

The following object is masked from ‘package:dplyr’:

    recode

── Attaching packages ─────────────────────────────────────── tidyverse 1.3.1 ──

✓ tibble  3.1.3     ✓ purrr   0.3.4
✓ tidyr   1.1.3     ✓ stringr 1.4.0
✓ readr   2.0.1     ✓ forcats 0.5.1

── Conflicts ────────────────────────────────────────── tidyverse_conflicts() ──
✕ purrr::accumulate()     masks foreach::accumulate()
✕ ggplot2::annotate()     masks NLP::annotate()
✕ tibble::as_data_frame() masks dplyr::as_data_frame(), igraph::as_data_frame()
✕ ggplot2::autoplot()     masks caretEnsemble::autoplot()
✕ purrr::compose()        masks igraph::compose()
✕ tidyr::crossing()       masks igraph::crossing()
✕ tidyr::expand()         masks Matrix::expand()
✕ tidyr::extract()        masks pastecs::extract()
✕ dplyr::filter()         masks stats::filter()
✕ dplyr::first()          masks pastecs::first()
✕ dplyr::groups()         masks igraph::groups()
✕ dplyr::lag()            masks stats::lag()
✕ dplyr::last()           masks pastecs::last()
✕ purrr::lift()           masks caret::lift()
✕ tidyr::pack()           masks Matrix::pack()
✕ car::recode()           masks dplyr::recode()
✕ purrr::simplify()       masks igraph::simplify()
✕ purrr::some()           masks car::some()
✕ tidyr::unpack()         masks Matrix::unpack()
✕ purrr::when()           masks foreach::when()

Attaching package: ‘MASS’

The following object is masked from ‘package:dplyr’:

    select
```

```
Attaching package: ‘psych’

The following object is masked from ‘package:car’:

    logit

The following objects are masked from ‘package:ggplot2’:

    %+%, alpha


Attaching package: ‘faraway’

The following object is masked from ‘package:psych’:

    logit

The following objects are masked from ‘package:car’:

    logit, vif

The following object is masked from ‘package:lattice’:

    melanoma

The following objects are masked from ‘package:HSAUR2’:

    epilepsy, toenail

---
biotools version 4.2

Loading required package: Hmisc

Loading required package: survival

Attaching package: ‘survival’

The following objects are masked from ‘package:faraway’:

    rats, solder

The following object is masked from ‘package:caret’:

    cluster

Loading required package: Formula
```

```
Attaching package: ‘Hmisc’


The following object is masked from ‘package:psych’:

    describe


The following objects are masked from ‘package:dplyr’:

    src, summarize


The following objects are masked from ‘package:base’:

    format.pval, units


funModeling v.1.9.4 :)
Examples and tutorials at livebook.datascienceheroes.com
 / Now in Spanish: librovivodecienciadedatos.ai


Attaching package: ‘rpart’


The following object is masked from ‘package:faraway’:

    solder


Loading required package: grid

Loading required package: modeltools

Loading required package: stats4


Attaching package: ‘modeltools’


The following object is masked from ‘package:car’:

    Predict


The following object is masked from ‘package:igraph’:

    clusters


Loading required package: strucchange

Loading required package: zoo


Attaching package: ‘zoo’
```

```
The following objects are masked from ‘package:base’:

    as.Date, as.Date.numeric

Loading required package: sandwich

Attaching package: ‘strucchange’

The following object is masked from ‘package:stringr’:

    boundary

Loading required package: libcoin

Attaching package: ‘partykit’

The following objects are masked from ‘package:party’:

    cforest, ctree, ctree_control, edge_simple, mob, mob_control,
    node_barplot, node_bivplot, node_boxplot, node_inner, node_surv,
    node_terminal, varimp


Attaching package: ‘reshape2’

The following object is masked from ‘package:tidyr’:

    smiths
```

In [2]:

```
data01 <- read.csv('Environment_Temperature_change_E_All_Data_NOFLAG.csv', header=TRUE, s
head(data01)
```

A data.frame: 6 × 66

	Area.Code	Area	Months.Code	Months	Element.Code	Element	Unit	Y1961	Y1962	Y1
	<int>	<chr>	<int>	<chr>	<int>	<chr>	<chr>	<dbl>	<dbl>	<c
1	2	Afghanistan	7001	January	7271	Temperature change	°C	0.777	0.062	2
2	2	Afghanistan	7001	January	6078	Standard Deviation	°C	1.950	1.950	1
3	2	Afghanistan	7002	February	7271	Temperature change	°C	-1.743	2.465	3
4	2	Afghanistan	7002	February	6078	Standard Deviation	°C	2.597	2.597	2
5	2	Afghanistan	7003	March	7271	Temperature change	°C	0.516	1.336	0

	Area.Code	Area	Months.Code	Months	Element.Code	Element	Unit	Y1961	Y1962	Y1
	<int>	<chr>	<int>	<chr>	<int>	<chr>	<chr>	<dbl>	<dbl>	<c
6	2	Afghanistan	7003	March	6078	Standard Deviation	°C	1.512	1.512	1

In [3]:
```
# Check the dimensions
dim(data01)
```

9656 · 66

In [7]:
```
#Get the unique values of columns Months
unique(data01[c("Months")])
```

A data.frame: 17 × 1

	Months
	<chr>
1	January
3	February
5	March
7	April
9	May
11	June
13	July
15	August
17	September
19	October
21	November
23	December
25	Dec Jan Feb
27	Mar Apr May
29	Jun Jul Aug
31	Sep Oct Nov
33	Meteorological year

In [8]:
```
# Get values where months is in : 'January', 'February', 'March', 'April', 'May', 'June',
data02 <- data01 %>% filter(Months %in% c("January", "February", "March", "April", "May",
                                          "November", "December"))
```

In [9]:
```
#Turn years columns into rows using melt function
data03 <- melt(data02, id.vars=c("Area.Code", "Area", "Months.Code", "Months", "Element.C
```

```
head(data03)
```

A data.frame: 6 × 9

	Area.Code	Area	Months.Code	Months	Element.Code	Element	Unit	variable	value
	<int>	<chr>	<int>	<chr>	<int>	<chr>	<chr>	<fct>	<dbl>
1	2	Afghanistan	7001	January	7271	Temperature change	°C	Y1961	0.777
2	2	Afghanistan	7001	January	6078	Standard Deviation	°C	Y1961	1.950
3	2	Afghanistan	7002	February	7271	Temperature change	°C	Y1961	-1.743
4	2	Afghanistan	7002	February	6078	Standard Deviation	°C	Y1961	2.597
5	2	Afghanistan	7003	March	7271	Temperature change	°C	Y1961	0.516
6	2	Afghanistan	7003	March	6078	Standard Deviation	°C	Y1961	1.512

In [10]:

```
# Rename column where names is "variable" and "value"
names(data03)[names(data03) == "variable"] <- "Years"
names(data03)[names(data03) == "value"] <- "Value"
head(data03)
```

A data.frame: 6 × 9

	Area.Code	Area	Months.Code	Months	Element.Code	Element	Unit	Years	Value
	<int>	<chr>	<int>	<chr>	<int>	<chr>	<chr>	<fct>	<dbl>
1	2	Afghanistan	7001	January	7271	Temperature change	°C	Y1961	0.777
2	2	Afghanistan	7001	January	6078	Standard Deviation	°C	Y1961	1.950
3	2	Afghanistan	7002	February	7271	Temperature change	°C	Y1961	-1.743
4	2	Afghanistan	7002	February	6078	Standard Deviation	°C	Y1961	2.597
5	2	Afghanistan	7003	March	7271	Temperature change	°C	Y1961	0.516
6	2	Afghanistan	7003	March	6078	Standard Deviation	°C	Y1961	1.512

In [11]:

```
# Years without the 'Y' letter
data04 <- data03 %>%
      mutate_at("Years", str_replace, "Y", "")
```

In [12]:

```
head(data04)
```

A data.frame: 6 × 9

	Area.Code	Area	Months.Code	Months	Element.Code	Element	Unit	Years	Value
	<int>	<chr>	<int>	<chr>	<int>	<chr>	<chr>	<chr>	<dbl>
1	2	Afghanistan	7001	January	7271	Temperature change	°C	1961	0.777
2	2	Afghanistan	7001	January	6078	Standard Deviation	°C	1961	1.950
3	2	Afghanistan	7002	February	7271	Temperature change	°C	1961	-1.743
4	2	Afghanistan	7002	February	6078	Standard Deviation	°C	1961	2.597
5	2	Afghanistan	7003	March	7271	Temperature change	°C	1961	0.516
6	2	Afghanistan	7003	March	6078	Standard Deviation	°C	1961	1.512

In [14]:
```
sum(is.na(data04))
```

55211

In [15]:
```
data04 <- na.omit(data04)
```

In [16]:
```
sum(is.na(data04))
```

0

In [4]:
```
data01_eda <- function(data01)
{
  glimpse(data01)
  print(status(data01))
  freq(data01)
  print(profiling_num(data01))
  plot_num(data01)
  describe(data01)
}
```

In [6]:
```
data01_eda(data01)
```

```
Rows: 9,656
Columns: 66
$ Area.Code    <int> 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, …
$ Area         <chr> "Afghanistan", "Afghanistan", "Afghanistan", "Afghanistan…
$ Months.Code  <int> 7001, 7001, 7002, 7002, 7003, 7003, 7004, 7004, 7005, 700…
$ Months       <chr> "January", "January", "February", "February", "March", "M…
$ Element.Code <int> 7271, 6078, 7271, 6078, 7271, 6078, 7271, 6078, 7271, 607…
$ Element      <chr> "Temperature change", "Standard Deviation", "Temperature …
$ Unit         <chr> "°C", "°C", "°C", "°C", "°C", "°C", "°C", "°C", "°C", "°C…
$ Y1961        <dbl> 0.777, 1.950, -1.743, 2.597, 0.516, 1.512, -1.709, 1.406,…
$ Y1962        <dbl> 0.062, 1.950, 2.465, 2.597, 1.336, 1.512, 0.117, 1.406, -…
$ Y1963        <dbl> 2.744, 1.950, 3.919, 2.597, 0.403, 1.512, 0.919, 1.406, -…
$ Y1964        <dbl> -5.232, 1.950, -0.202, 2.597, 1.659, 1.512, -0.533, 1.406…
```

```
$ Y1965        <dbl> 1.868, 1.950, -0.096, 2.597, -0.909, 1.512, -1.816, 1.406…
$ Y1966        <dbl> 3.629, 1.950, 3.397, 2.597, -0.069, 1.512, -1.192, 1.406,…
$ Y1967        <dbl> -1.432, 1.950, 0.296, 2.597, -0.759, 1.512, -1.496, 1.406…
$ Y1968        <dbl> 0.389, 1.950, -2.055, 2.597, 0.496, 1.512, -0.590, 1.406,…
$ Y1969        <dbl> -2.298, 1.950, -3.167, 2.597, 2.481, 1.512, -0.770, 1.406…
$ Y1970        <dbl> 0.804, 1.950, 1.809, 2.597, -0.915, 1.512, 1.439, 1.406, …
$ Y1971        <dbl> -1.487, 1.950, 0.816, 2.597, 1.658, 1.512, 1.534, 1.406, …
$ Y1972        <dbl> -1.305, 1.950, -7.722, 2.597, -1.784, 1.512, -0.602, 1.40…
$ Y1973        <dbl> -2.951, 1.950, 1.838, 2.597, -0.473, 1.512, 1.106, 1.406,…
$ Y1974        <dbl> -1.184, 1.950, -3.706, 2.597, 1.001, 1.512, 1.051, 1.406,…
$ Y1975        <dbl> -0.490, 1.950, -1.239, 2.597, -0.585, 1.512, -0.710, 1.40…
$ Y1976        <dbl> 2.409, 1.950, -1.620, 2.597, -2.817, 1.512, -0.690, 1.406…
$ Y1977        <dbl> -3.014, 1.950, -0.156, 2.597, 3.377, 1.512, 1.070, 1.406,…
$ Y1978        <dbl> -0.663, 1.950, -0.369, 2.597, -1.536, 1.512, 1.484, 1.406…
$ Y1979        <dbl> 1.141, 1.950, 1.072, 2.597, -1.420, 1.512, 1.714, 1.406, …
$ Y1980        <dbl> -0.393, 1.950, -1.222, 2.597, -0.628, 1.512, 2.750, 1.406…
$ Y1981        <dbl> 1.724, 1.950, 1.088, 2.597, 1.166, 1.512, 0.990, 1.406, 1…
$ Y1982        <dbl> 0.678, 1.950, -2.101, 2.597, -1.781, 1.512, 0.461, 1.406,…
$ Y1983        <dbl> 0.524, 1.950, 0.460, 2.597, -2.406, 1.512, -1.410, 1.406,…
$ Y1984        <dbl> -0.058, 1.950, -4.321, 2.597, 1.761, 1.512, 0.613, 1.406,…
$ Y1985        <dbl> 0.435, 1.950, 2.467, 2.597, -0.160, 1.512, 0.810, 1.406, …
$ Y1986        <dbl> 0.332, 1.950, -0.286, 2.597, -3.087, 1.512, -0.249, 1.406…
$ Y1987        <dbl> 2.655, 1.950, 1.409, 2.597, 1.330, 1.512, -0.342, 1.406, …
$ Y1988        <dbl> 1.150, 1.950, 0.170, 2.597, -0.056, 1.512, 1.316, 1.406, …
$ Y1989        <dbl> -1.108, 1.950, -2.890, 2.597, 0.065, 1.512, -1.204, 1.406…
$ Y1990        <dbl> 0.634, 1.950, -0.310, 2.597, -1.000, 1.512, -0.292, 1.406…
$ Y1991        <dbl> 0.018, 1.950, -1.373, 2.597, -0.901, 1.512, -0.364, 1.406…
$ Y1992        <dbl> 0.582, 1.950, -0.120, 2.597, -2.220, 1.512, -1.210, 1.406…
$ Y1993        <dbl> -0.821, 1.950, 1.414, 2.597, -1.449, 1.512, 0.438, 1.406,…
$ Y1994        <dbl> 1.087, 1.950, -1.412, 2.597, 1.312, 1.512, -1.334, 1.406,…
$ Y1995        <dbl> 1.297, 1.950, -0.149, 2.597, -1.451, 1.512, -0.578, 1.406…
$ Y1996        <dbl> -0.718, 1.950, 0.870, 2.597, -0.336, 1.512, -0.214, 1.406…
$ Y1997        <dbl> 1.426, 1.950, 0.043, 2.597, -0.005, 1.512, -0.420, 1.406,…
$ Y1998        <dbl> 0.950, 1.950, -0.540, 2.597, -0.576, 1.512, 1.486, 1.406,…
$ Y1999        <dbl> 0.859, 1.950, 3.222, 2.597, -0.217, 1.512, 0.215, 1.406, …
$ Y2000        <dbl> 1.565, 1.950, -0.901, 2.597, -0.267, 1.512, 3.504, 1.406,…
$ Y2001        <dbl> -0.603, 1.950, 0.707, 2.597, 1.229, 1.512, 2.774, 1.406, …
$ Y2002        <dbl> 1.606, 1.950, 0.985, 2.597, 1.949, 1.512, 0.958, 1.406, 1…
$ Y2003        <dbl> 2.479, 1.950, 1.816, 2.597, -0.158, 1.512, 0.562, 1.406, …
$ Y2004        <dbl> 2.707, 1.950, 2.871, 2.597, 2.753, 1.512, 1.086, 1.406, 1…
$ Y2005        <dbl> 0.109, 1.950, -1.506, 2.597, 1.663, 1.512, -0.060, 1.406,…
$ Y2006        <dbl> -1.606, 1.950, 4.725, 2.597, 1.847, 1.512, 1.217, 1.406, …
$ Y2007        <dbl> 0.431, 1.950, 1.645, 2.597, -0.201, 1.512, 3.027, 1.406, …
$ Y2008        <dbl> -5.553, 1.950, -2.332, 2.597, 4.172, 1.512, 1.359, 1.406,…
$ Y2009        <dbl> 1.518, 1.950, 2.494, 2.597, 2.362, 1.512, -1.459, 1.406, …
$ Y2010        <dbl> 3.601, 1.950, 1.212, 2.597, 3.390, 1.512, 2.591, 1.406, 1…
$ Y2011        <dbl> 1.179, 1.950, 0.321, 2.597, 0.748, 1.512, 1.712, 1.406, 3…
$ Y2012        <dbl> -0.583, 1.950, -3.201, 2.597, -0.527, 1.512, 1.417, 1.406…
$ Y2013        <dbl> 1.233, 1.950, 1.494, 2.597, 2.246, 1.512, -0.052, 1.406, …
$ Y2014        <dbl> 1.755, 1.950, -3.187, 2.597, -0.076, 1.512, 0.585, 1.406,…
$ Y2015        <dbl> 1.943, 1.950, 2.699, 2.597, -0.497, 1.512, 1.589, 1.406, …
$ Y2016        <dbl> 3.416, 1.950, 2.251, 2.597, 2.296, 1.512, 0.980, 1.406, 3…
$ Y2017        <dbl> 1.201, 1.950, -0.323, 2.597, 0.834, 1.512, 1.252, 1.406, …
$ Y2018        <dbl> 1.996, 1.950, 2.705, 2.597, 4.418, 1.512, 1.442, 1.406, 0…
$ Y2019        <dbl> 2.951, 1.950, 0.086, 2.597, 0.234, 1.512, 0.899, 1.406, 0…
                  variable q_zeros      p_zeros q_na      p_na q_inf p_inf
Area.Code       Area.Code       0 0.0000000000    0 0.0000000     0     0
Area                 Area       0 0.0000000000    0 0.0000000     0     0
Months.Code   Months.Code       0 0.0000000000    0 0.0000000     0     0
Months             Months       0 0.0000000000    0 0.0000000     0     0
Element.Code Element.Code       0 0.0000000000    0 0.0000000     0     0
```

Element	Element	0	0.0000000000	0	0.0000000	0	0
Unit	Unit	0	0.0000000000	0	0.0000000	0	0
Y1961	Y1961	7	0.0007249379	1369	0.1417771	0	0
Y1962	Y1962	1	0.0001035626	1334	0.1381524	0	0
Y1963	Y1963	2	0.0002071251	1362	0.1410522	0	0
Y1964	Y1964	1	0.0001035626	1404	0.1454018	0	0
Y1965	Y1965	7	0.0007249379	1375	0.1423985	0	0
Y1966	Y1966	2	0.0002071251	1292	0.1338028	0	0
Y1967	Y1967	4	0.0004142502	1309	0.1355634	0	0
Y1968	Y1968	4	0.0004142502	1311	0.1357705	0	0
Y1969	Y1969	6	0.0006213753	1330	0.1377382	0	0
Y1970	Y1970	6	0.0006213753	1348	0.1396023	0	0
Y1971	Y1971	2	0.0002071251	1353	0.1401201	0	0
Y1972	Y1972	1	0.0001035626	1333	0.1380489	0	0
Y1973	Y1973	2	0.0002071251	1262	0.1306959	0	0
Y1974	Y1974	5	0.0005178128	1282	0.1327672	0	0
Y1975	Y1975	3	0.0003106877	1376	0.1425021	0	0
Y1976	Y1976	3	0.0003106877	1447	0.1498550	0	0
Y1977	Y1977	4	0.0004142502	1399	0.1448840	0	0
Y1978	Y1978	3	0.0003106877	1329	0.1376346	0	0
Y1979	Y1979	2	0.0002071251	1366	0.1414664	0	0
Y1980	Y1980	3	0.0003106877	1373	0.1421914	0	0
Y1981	Y1981	7	0.0007249379	1380	0.1429163	0	0
Y1982	Y1982	3	0.0003106877	1419	0.1469553	0	0
Y1983	Y1983	2	0.0002071251	1451	0.1502693	0	0
Y1984	Y1984	1	0.0001035626	1397	0.1446769	0	0
Y1985	Y1985	3	0.0003106877	1440	0.1491301	0	0
Y1986	Y1986	0	0.0000000000	1388	0.1437448	0	0
Y1987	Y1987	2	0.0002071251	1372	0.1420878	0	0
Y1988	Y1988	0	0.0000000000	1383	0.1432270	0	0
Y1989	Y1989	3	0.0003106877	1399	0.1448840	0	0
Y1990	Y1990	5	0.0005178128	1417	0.1467481	0	0
Y1991	Y1991	3	0.0003106877	1498	0.1551367	0	0
Y1992	Y1992	1	0.0001035626	1302	0.1348384	0	0
Y1993	Y1993	2	0.0002071251	1341	0.1388774	0	0
Y1994	Y1994	0	0.0000000000	1283	0.1328708	0	0
Y1995	Y1995	2	0.0002071251	1247	0.1291425	0	0
Y1996	Y1996	1	0.0001035626	1217	0.1260356	0	0
Y1997	Y1997	2	0.0002071251	1347	0.1394988	0	0
Y1998	Y1998	1	0.0001035626	1286	0.1331814	0	0
Y1999	Y1999	1	0.0001035626	1332	0.1379453	0	0
Y2000	Y2000	0	0.0000000000	1314	0.1360812	0	0
Y2001	Y2001	2	0.0002071251	1415	0.1465410	0	0
Y2002	Y2002	2	0.0002071251	1344	0.1391881	0	0
Y2003	Y2003	1	0.0001035626	1266	0.1311102	0	0
Y2004	Y2004	2	0.0002071251	1241	0.1285211	0	0
Y2005	Y2005	2	0.0002071251	1232	0.1275891	0	0
Y2006	Y2006	0	0.0000000000	1153	0.1194076	0	0
Y2007	Y2007	1	0.0001035626	1122	0.1161972	0	0
Y2008	Y2008	0	0.0000000000	1181	0.1223074	0	0
Y2009	Y2009	0	0.0000000000	1237	0.1281069	0	0
Y2010	Y2010	0	0.0000000000	1221	0.1264499	0	0
Y2011	Y2011	0	0.0000000000	1219	0.1262428	0	0
Y2012	Y2012	3	0.0003106877	1306	0.1352527	0	0
Y2013	Y2013	0	0.0000000000	1229	0.1272784	0	0
Y2014	Y2014	0	0.0000000000	1279	0.1324565	0	0
Y2015	Y2015	0	0.0000000000	1295	0.1341135	0	0
Y2016	Y2016	0	0.0000000000	1308	0.1354598	0	0
Y2017	Y2017	0	0.0000000000	1290	0.1335957	0	0
Y2018	Y2018	1	0.0001035626	1307	0.1353563	0	0
Y2019	Y2019	1	0.0001035626	1291	0.1336993	0	0

	type	unique
Area.Code	integer	284
Area	character	284
Months.Code	integer	17
Months	character	17
Element.Code	integer	2
Element	character	2
Unit	character	1
Y1961	numeric	2612
Y1962	numeric	2561
Y1963	numeric	2673
Y1964	numeric	2686
Y1965	numeric	2721
Y1966	numeric	2552
Y1967	numeric	2665
Y1968	numeric	2717
Y1969	numeric	2537
Y1970	numeric	2491
Y1971	numeric	2673
Y1972	numeric	2668
Y1973	numeric	2499
Y1974	numeric	2691
Y1975	numeric	2645
Y1976	numeric	2732
Y1977	numeric	2482
Y1978	numeric	2456
Y1979	numeric	2407
Y1980	numeric	2370
Y1981	numeric	2478
Y1982	numeric	2494
Y1983	numeric	2576
Y1984	numeric	2571
Y1985	numeric	2531
Y1986	numeric	2472
Y1987	numeric	2492
Y1988	numeric	2339
Y1989	numeric	2577
Y1990	numeric	2442
Y1991	numeric	2414
Y1992	numeric	2785
Y1993	numeric	2673
Y1994	numeric	2562
Y1995	numeric	2496
Y1996	numeric	2536
Y1997	numeric	2608
Y1998	numeric	2590
Y1999	numeric	2509
Y2000	numeric	2672
Y2001	numeric	2541
Y2002	numeric	2529
Y2003	numeric	2519
Y2004	numeric	2299
Y2005	numeric	2457
Y2006	numeric	2629
Y2007	numeric	2602
Y2008	numeric	2634
Y2009	numeric	2496
Y2010	numeric	2745
Y2011	numeric	2543
Y2012	numeric	2637
Y2013	numeric	2411

```
Y2014          numeric   2527
Y2015          numeric   2652
Y2016          numeric   2657
Y2017          numeric   2602
Y2018          numeric   2720
Y2019          numeric   2697
```

```
Warning message in freq_logic(data = data, input = input[i], plot, na.rm, path_out = path
_out):
“Skipping plot for variable 'Area' (more than 100 categories)”
```

	Area	frequency	percentage
1	Afghanistan	34	0.35
2	Africa	34	0.35
3	Albania	34	0.35
4	Algeria	34	0.35
5	American Samoa	34	0.35
6	Americas	34	0.35
7	Andorra	34	0.35
8	Angola	34	0.35
9	Anguilla	34	0.35
10	Annex I countries	34	0.35
11	Antarctica	34	0.35
12	Antigua and Barbuda	34	0.35
13	Argentina	34	0.35
14	Armenia	34	0.35
15	Aruba	34	0.35
16	Asia	34	0.35
17	Australia	34	0.35
18	Australia and New Zealand	34	0.35
19	Austria	34	0.35
20	Azerbaijan	34	0.35
21	Bahamas	34	0.35
22	Bahrain	34	0.35
23	Bangladesh	34	0.35
24	Barbados	34	0.35
25	Belarus	34	0.35
26	Belgium	34	0.35
27	Belgium-Luxembourg	34	0.35
28	Belize	34	0.35
29	Benin	34	0.35
30	Bhutan	34	0.35
31	Bolivia (Plurinational State of)	34	0.35
32	Bosnia and Herzegovina	34	0.35
33	Botswana	34	0.35
34	Brazil	34	0.35
35	British Virgin Islands	34	0.35
36	Brunei Darussalam	34	0.35
37	Bulgaria	34	0.35
38	Burkina Faso	34	0.35
39	Burundi	34	0.35
40	Cabo Verde	34	0.35
41	Cambodia	34	0.35
42	Cameroon	34	0.35
43	Canada	34	0.35
44	Caribbean	34	0.35
45	Cayman Islands	34	0.35
46	Central African Republic	34	0.35
47	Central America	34	0.35
48	Central Asia	34	0.35
49	Chad	34	0.35
50	Channel Islands	34	0.35

51	Chile	34	0.35
52	China	34	0.35
53	China, Hong Kong SAR	34	0.35
54	China, Macao SAR	34	0.35
55	China, mainland	34	0.35
56	China, Taiwan Province of	34	0.35
57	Christmas Island	34	0.35
58	Cocos (Keeling) Islands	34	0.35
59	Colombia	34	0.35
60	Comoros	34	0.35
61	Congo	34	0.35
62	Cook Islands	34	0.35
63	Costa Rica	34	0.35
64	Côte d'Ivoire	34	0.35
65	Croatia	34	0.35
66	Cuba	34	0.35
67	Cyprus	34	0.35
68	Czechia	34	0.35
69	Czechoslovakia	34	0.35
70	Democratic People's Republic of Korea	34	0.35
71	Democratic Republic of the Congo	34	0.35
72	Denmark	34	0.35
73	Djibouti	34	0.35
74	Dominica	34	0.35
75	Dominican Republic	34	0.35
76	Eastern Africa	34	0.35
77	Eastern Asia	34	0.35
78	Eastern Europe	34	0.35
79	Ecuador	34	0.35
80	Egypt	34	0.35
81	El Salvador	34	0.35
82	Equatorial Guinea	34	0.35
83	Eritrea	34	0.35
84	Estonia	34	0.35
85	Eswatini	34	0.35
86	Ethiopia	34	0.35
87	Ethiopia PDR	34	0.35
88	Europe	34	0.35
89	European Union	34	0.35
90	Falkland Islands (Malvinas)	34	0.35
91	Faroe Islands	34	0.35
92	Fiji	34	0.35
93	Finland	34	0.35
94	France	34	0.35
95	French Guiana	34	0.35
96	French Polynesia	34	0.35
97	French Southern and Antarctic Territories	34	0.35
98	Gabon	34	0.35
99	Gambia	34	0.35
100	Georgia	34	0.35
101	Germany	34	0.35
102	Ghana	34	0.35
103	Gibraltar	34	0.35
104	Greece	34	0.35
105	Greenland	34	0.35
106	Grenada	34	0.35
107	Guadeloupe	34	0.35
108	Guatemala	34	0.35
109	Guinea	34	0.35
110	Guinea-Bissau	34	0.35
111	Guyana	34	0.35

112	Haiti	34	0.35
113	Holy See	34	0.35
114	Honduras	34	0.35
115	Hungary	34	0.35
116	Iceland	34	0.35
117	India	34	0.35
118	Indonesia	34	0.35
119	Iran (Islamic Republic of)	34	0.35
120	Iraq	34	0.35
121	Ireland	34	0.35
122	Isle of Man	34	0.35
123	Israel	34	0.35
124	Italy	34	0.35
125	Jamaica	34	0.35
126	Japan	34	0.35
127	Jordan	34	0.35
128	Kazakhstan	34	0.35
129	Kenya	34	0.35
130	Kiribati	34	0.35
131	Kuwait	34	0.35
132	Kyrgyzstan	34	0.35
133	Land Locked Developing Countries	34	0.35
134	Lao People's Democratic Republic	34	0.35
135	Latvia	34	0.35
136	Least Developed Countries	34	0.35
137	Lebanon	34	0.35
138	Lesotho	34	0.35
139	Liberia	34	0.35
140	Libya	34	0.35
141	Liechtenstein	34	0.35
142	Lithuania	34	0.35
143	Low Income Food Deficit Countries	34	0.35
144	Luxembourg	34	0.35
145	Madagascar	34	0.35
146	Malawi	34	0.35
147	Malaysia	34	0.35
148	Maldives	34	0.35
149	Mali	34	0.35
150	Malta	34	0.35
151	Marshall Islands	34	0.35
152	Martinique	34	0.35
153	Mauritania	34	0.35
154	Mauritius	34	0.35
155	Mayotte	34	0.35
156	Melanesia	34	0.35
157	Mexico	34	0.35
158	Micronesia	34	0.35
159	Micronesia (Federated States of)	34	0.35
160	Middle Africa	34	0.35
161	Midway Island	34	0.35
162	Monaco	34	0.35
163	Mongolia	34	0.35
164	Montenegro	34	0.35
165	Montserrat	34	0.35
166	Morocco	34	0.35
167	Mozambique	34	0.35
168	Myanmar	34	0.35
169	Namibia	34	0.35
170	Nauru	34	0.35
171	Nepal	34	0.35
172	Net Food Importing Developing Countries	34	0.35

173	Netherlands	34	0.35
174	Netherlands Antilles (former)	34	0.35
175	New Caledonia	34	0.35
176	New Zealand	34	0.35
177	Nicaragua	34	0.35
178	Niger	34	0.35
179	Nigeria	34	0.35
180	Niue	34	0.35
181	Non-Annex I countries	34	0.35
182	Norfolk Island	34	0.35
183	North Macedonia	34	0.35
184	Northern Africa	34	0.35
185	Northern America	34	0.35
186	Northern Europe	34	0.35
187	Norway	34	0.35
188	Oceania	34	0.35
189	OECD	34	0.35
190	Oman	34	0.35
191	Pacific Islands Trust Territory	34	0.35
192	Pakistan	34	0.35
193	Palau	34	0.35
194	Palestine	34	0.35
195	Panama	34	0.35
196	Papua New Guinea	34	0.35
197	Paraguay	34	0.35
198	Peru	34	0.35
199	Philippines	34	0.35
200	Pitcairn Islands	34	0.35
201	Poland	34	0.35
202	Polynesia	34	0.35
203	Portugal	34	0.35
204	Puerto Rico	34	0.35
205	Qatar	34	0.35
206	Republic of Korea	34	0.35
207	Republic of Moldova	34	0.35
208	Réunion	34	0.35
209	Romania	34	0.35
210	Russian Federation	34	0.35
211	Rwanda	34	0.35
212	Saint Helena, Ascension and Tristan da Cunha	34	0.35
213	Saint Kitts and Nevis	34	0.35
214	Saint Lucia	34	0.35
215	Saint Pierre and Miquelon	34	0.35
216	Saint Vincent and the Grenadines	34	0.35
217	Samoa	34	0.35
218	San Marino	34	0.35
219	Sao Tome and Principe	34	0.35
220	Saudi Arabia	34	0.35
221	Senegal	34	0.35
222	Serbia	34	0.35
223	Serbia and Montenegro	34	0.35
224	Seychelles	34	0.35
225	Sierra Leone	34	0.35
226	Singapore	34	0.35
227	Slovakia	34	0.35
228	Slovenia	34	0.35
229	Small Island Developing States	34	0.35
230	Solomon Islands	34	0.35
231	Somalia	34	0.35
232	South Africa	34	0.35
233	South America	34	0.35

234	South Georgia and the South Sandwich Islands	34	0.35	
235	South Sudan	34	0.35	
236	South-Eastern Asia	34	0.35	
237	Southern Africa	34	0.35	
238	Southern Asia	34	0.35	
239	Southern Europe	34	0.35	
240	Spain	34	0.35	
241	Sri Lanka	34	0.35	
242	Sudan	34	0.35	
243	Sudan (former)	34	0.35	
244	Suriname	34	0.35	
245	Svalbard and Jan Mayen Islands	34	0.35	
246	Sweden	34	0.35	
247	Switzerland	34	0.35	
248	Syrian Arab Republic	34	0.35	
249	Tajikistan	34	0.35	
250	Thailand	34	0.35	
251	Timor-Leste	34	0.35	
252	Togo	34	0.35	
253	Tokelau	34	0.35	
254	Tonga	34	0.35	
255	Trinidad and Tobago	34	0.35	
256	Tunisia	34	0.35	
257	Turkey	34	0.35	
258	Turkmenistan	34	0.35	
259	Turks and Caicos Islands	34	0.35	
260	Tuvalu	34	0.35	
261	Uganda	34	0.35	
262	Ukraine	34	0.35	
263	United Arab Emirates	34	0.35	
264	United Kingdom	34	0.35	
265	United Republic of Tanzania	34	0.35	
266	United States of America	34	0.35	
267	United States Virgin Islands	34	0.35	
268	Uruguay	34	0.35	
269	USSR	34	0.35	
270	Uzbekistan	34	0.35	
271	Vanuatu	34	0.35	
272	Venezuela (Bolivarian Republic of)	34	0.35	
273	Viet Nam	34	0.35	
274	Wake Island	34	0.35	
275	Wallis and Futuna Islands	34	0.35	
276	Western Africa	34	0.35	
277	Western Asia	34	0.35	
278	Western Europe	34	0.35	
279	Western Sahara	34	0.35	
280	World	34	0.35	
281	Yemen	34	0.35	
282	Yugoslav SFR	34	0.35	
283	Zambia	34	0.35	
284	Zimbabwe	34	0.35	

	cumulative_perc
1	0.35
2	0.70
3	1.05
4	1.40
5	1.75
6	2.10
7	2.45
8	2.80
9	3.15

10	3.50
11	3.85
12	4.20
13	4.55
14	4.90
15	5.25
16	5.60
17	5.95
18	6.30
19	6.65
20	7.00
21	7.35
22	7.70
23	8.05
24	8.40
25	8.75
26	9.10
27	9.45
28	9.80
29	10.15
30	10.50
31	10.85
32	11.20
33	11.55
34	11.90
35	12.25
36	12.60
37	12.95
38	13.30
39	13.65
40	14.00
41	14.35
42	14.70
43	15.05
44	15.40
45	15.75
46	16.10
47	16.45
48	16.80
49	17.15
50	17.50
51	17.85
52	18.20
53	18.55
54	18.90
55	19.25
56	19.60
57	19.95
58	20.30
59	20.65
60	21.00
61	21.35
62	21.70
63	22.05
64	22.40
65	22.75
66	23.10
67	23.45
68	23.80
69	24.15
70	24.50

71	24.85
72	25.20
73	25.55
74	25.90
75	26.25
76	26.60
77	26.95
78	27.30
79	27.65
80	28.00
81	28.35
82	28.70
83	29.05
84	29.40
85	29.75
86	30.10
87	30.45
88	30.80
89	31.15
90	31.50
91	31.85
92	32.20
93	32.55
94	32.90
95	33.25
96	33.60
97	33.95
98	34.30
99	34.65
100	35.00
101	35.35
102	35.70
103	36.05
104	36.40
105	36.75
106	37.10
107	37.45
108	37.80
109	38.15
110	38.50
111	38.85
112	39.20
113	39.55
114	39.90
115	40.25
116	40.60
117	40.95
118	41.30
119	41.65
120	42.00
121	42.35
122	42.70
123	43.05
124	43.40
125	43.75
126	44.10
127	44.45
128	44.80
129	45.15
130	45.50
131	45.85

```
132          46.20
133          46.55
134          46.90
135          47.25
136          47.60
137          47.95
138          48.30
139          48.65
140          49.00
141          49.35
142          49.70
143          50.05
144          50.40
145          50.75
146          51.10
147          51.45
148          51.80
149          52.15
150          52.50
151          52.85
152          53.20
153          53.55
154          53.90
155          54.25
156          54.60
157          54.95
158          55.30
159          55.65
160          56.00
161          56.35
162          56.70
163          57.05
164          57.40
165          57.75
166          58.10
167          58.45
168          58.80
169          59.15
170          59.50
171          59.85
172          60.20
173          60.55
174          60.90
175          61.25
176          61.60
177          61.95
178          62.30
179          62.65
180          63.00
181          63.35
182          63.70
183          64.05
184          64.40
185          64.75
186          65.10
187          65.45
188          65.80
189          66.15
190          66.50
191          66.85
192          67.20
```

```
193         67.55
194         67.90
195         68.25
196         68.60
197         68.95
198         69.30
199         69.65
200         70.00
201         70.35
202         70.70
203         71.05
204         71.40
205         71.75
206         72.10
207         72.45
208         72.80
209         73.15
210         73.50
211         73.85
212         74.20
213         74.55
214         74.90
215         75.25
216         75.60
217         75.95
218         76.30
219         76.65
220         77.00
221         77.35
222         77.70
223         78.05
224         78.40
225         78.75
226         79.10
227         79.45
228         79.80
229         80.15
230         80.50
231         80.85
232         81.20
233         81.55
234         81.90
235         82.25
236         82.60
237         82.95
238         83.30
239         83.65
240         84.00
241         84.35
242         84.70
243         85.05
244         85.40
245         85.75
246         86.10
247         86.45
248         86.80
249         87.15
250         87.50
251         87.85
252         88.20
253         88.55
```

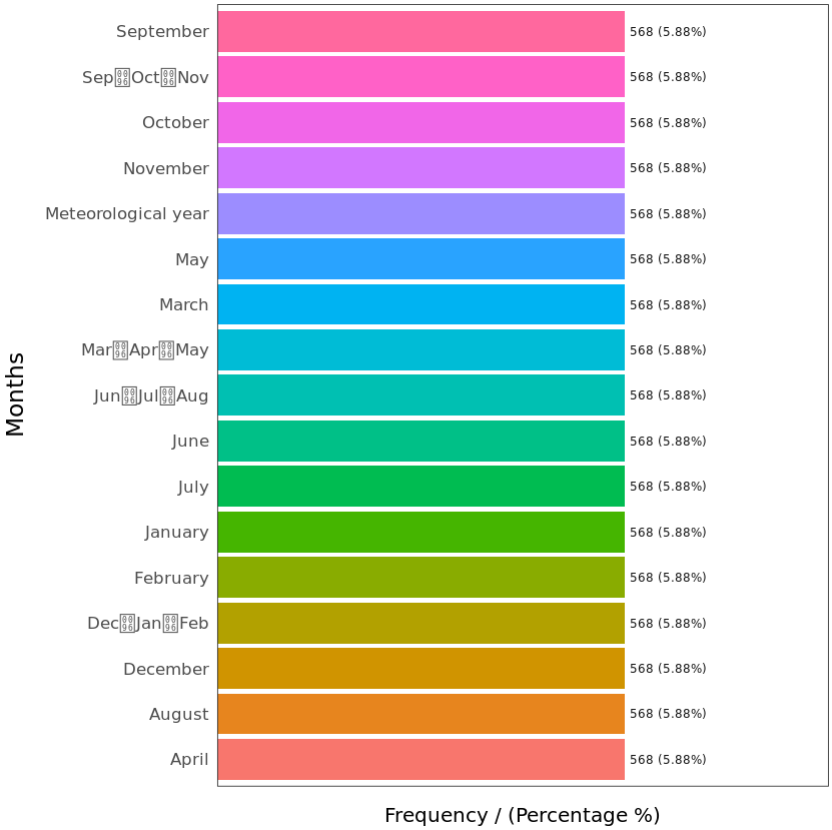
```
254           88.90
255           89.25
256           89.60
257           89.95
258           90.30
259           90.65
260           91.00
261           91.35
262           91.70
263           92.05
264           92.40
265           92.75
266           93.10
267           93.45
268           93.80
269           94.15
270           94.50
271           94.85
272           95.20
273           95.55
274           95.90
275           96.25
276           96.60
277           96.95
278           97.30
279           97.65
280           98.00
281           98.35
282           98.70
283           99.05
284          100.00
```

```
Warning message:
“`guides(<scale> = FALSE)` is deprecated. Please use `guides(<scale> = "none")` instead.”
                  Months frequency percentage cumulative_perc
1                  April       568       5.88            5.88
2                 August       568       5.88           11.76
3               December       568       5.88           17.64
4  Dec\u0096Jan\u0096Feb       568       5.88           23.52
5               February       568       5.88           29.40
6                January       568       5.88           35.28
7                   July       568       5.88           41.16
8                   June       568       5.88           47.04
9  Jun\u0096Jul\u0096Aug       568       5.88           52.92
10 Mar\u0096Apr\u0096May       568       5.88           58.80
11                March       568       5.88           64.68
12                  May       568       5.88           70.56
13   Meteorological year       568       5.88           76.44
14              November       568       5.88           82.32
15               October       568       5.88           88.20
16 Sep\u0096Oct\u0096Nov       568       5.88           94.08
17             September       568       5.88          100.00
```

```
Warning message:
“`guides(<scale> = FALSE)` is deprecated. Please use `guides(<scale> = "none")` instead.”
             Element frequency percentage cumulative_perc
1 Standard Deviation      4828         50              50
2 Temperature change      4828         50             100
```

```
Warning message:
```

```
“`guides(<scale> = FALSE)` is deprecated. Please use `guides(<scale> = "none")` instead.”
```




```
  Unit frequency percentage cumulative_perc
1   °C      9656        100             100
```

	variable	mean	std_dev	variation_coef	p_01	p_05
1	Area.Code	821.8063380	1781.0722132	2.1672651216	3.00000	15.00000
2	Months.Code	7009.8823529	6.0382550	0.0008613918	7001.00000	7001.00000
3	Element.Code	6674.5000000	596.5308899	0.0893746183	6078.00000	6078.00000
4	Y1961	0.4024326	0.7015668	1.7433150141	-1.43356	-0.62170
5	Y1962	0.3155267	0.7137775	2.2621779303	-1.89564	-0.72480
6	Y1963	0.3173926	0.8531333	2.6879434840	-2.94170	-0.80135
7	Y1964	0.2693823	0.7492159	2.7812363148	-1.88574	-0.86445
8	Y1965	0.2178387	0.7394185	3.3943399317	-1.84300	-0.91600
9	Y1966	0.3764192	0.7373698	1.9589059153	-1.68411	-0.61400
10	Y1967	0.2632386	0.7254210	2.7557543098	-1.71980	-0.83400
11	Y1968	0.2448705	0.7549000	3.0828544393	-1.89124	-0.89980
12	Y1969	0.3821724	0.7253127	1.8978681283	-2.12700	-0.72350
13	Y1970	0.3653225	0.6624121	1.8132257061	-1.62986	-0.61560
14	Y1971	0.2409342	0.7273129	3.0187195994	-1.77488	-0.80090
15	Y1972	0.3025530	0.7658947	2.5314393192	-2.19112	-0.90190
16	Y1973	0.4276914	0.6777689	1.5847145554	-1.63435	-0.63170
17	Y1974	0.2618488	0.7688496	2.9362346748	-1.66097	-0.82900
18	Y1975	0.3146533	0.7239645	2.3008325202	-1.38884	-0.71000
19	Y1976	0.2211123	0.7555869	3.4172085859	-1.93092	-0.98820
20	Y1977	0.4229776	0.6770943	1.6007804412	-1.63444	-0.59960
21	Y1978	0.3554881	0.6622277	1.8628692090	-1.50418	-0.71610
22	Y1979	0.4424650	0.6703768	1.5150956307	-1.56254	-0.50120
23	Y1980	0.4382698	0.6385851	1.4570591516	-1.62418	-0.66000
24	Y1981	0.4376935	0.7015702	1.6028801930	-1.84525	-0.59800
25	Y1982	0.4048569	0.6756929	1.6689673315	-1.83840	-0.61440
26	Y1983	0.5037480	0.7492681	1.4873868467	-2.01668	-0.72120
27	Y1984	0.3669706	0.7003639	1.9085014378	-1.61836	-0.74450
28	Y1985	0.3655111	0.7654911	2.0943033396	-2.33910	-0.64775
29	Y1986	0.3980960	0.7102016	1.7839956259	-1.99432	-0.59265

30	Y1987	0.5355145	0.7568686	1.4133484902	-1.95957	-0.55555
31	Y1988	0.5466615	0.6640385	1.2147159060	-1.22296	-0.30380
32	Y1989	0.4692312	0.7587379	1.6169810220	-1.53400	-0.52900
33	Y1990	0.6217974	0.7243964	1.1650039259	-1.18210	-0.21700
34	Y1991	0.4999914	0.6567536	1.3135297031	-1.48166	-0.49015
35	Y1992	0.4477977	0.8439251	1.8846123212	-2.26829	-0.84275
36	Y1993	0.4390937	0.8178602	1.8626096960	-2.16572	-0.85490
37	Y1994	0.6110779	0.7525113	1.2314491144	-1.33328	-0.35720
38	Y1995	0.6358357	0.7541330	1.1860501881	-1.38244	-0.32900
39	Y1996	0.4772387	0.7252095	1.5195950646	-2.20124	-0.64350
40	Y1997	0.6173408	0.7418121	1.2016249069	-1.70412	-0.45160
41	Y1998	0.8182644	0.7850759	0.9594403256	-1.35341	-0.11955
42	Y1999	0.7044452	0.7238108	1.0274905482	-1.00778	-0.19855
43	Y2000	0.6741906	0.7837541	1.1625111513	-1.19159	-0.29290
44	Y2001	0.7416733	0.7816834	1.0539457266	-1.13180	-0.12900
45	Y2002	0.8025093	0.8405454	1.0473965230	-1.29535	-0.01390
46	Y2003	0.7694849	0.7948386	1.0329489627	-1.52422	-0.05755
47	Y2004	0.7262366	0.6443643	0.8872649065	-0.72986	0.00280
48	Y2005	0.7774646	0.7203664	0.9265584298	-1.07131	-0.07985
49	Y2006	0.7917951	0.8214890	1.0375019989	-1.27884	-0.11190
50	Y2007	0.8425536	0.8548935	1.0146458598	-1.05670	0.01500
51	Y2008	0.7426140	0.8525615	1.1480546664	-1.18498	-0.21830
52	Y2009	0.8141773	0.6944637	0.8529637121	-0.83732	0.01590
53	Y2010	0.8845043	0.8783033	0.9929892609	-1.64314	-0.07120
54	Y2011	0.7684879	0.7506309	0.9767635453	-1.16568	-0.08820
55	Y2012	0.7889297	0.8585865	1.0882927522	-1.78057	-0.13910
56	Y2013	0.8296470	0.7137531	0.8603094284	-0.96884	0.14230
57	Y2014	0.9138724	0.8159327	0.8928299791	-0.60800	0.17380
58	Y2015	1.0188157	0.8401886	0.8246717891	-0.45700	0.20200
59	Y2016	1.0814910	0.8773986	0.8112860614	-0.70913	0.22300
60	Y2017	1.0033422	0.8098004	0.8071029002	-0.75215	0.21600
61	Y2018	1.0108324	0.8721990	0.8628522309	-0.68672	0.20340
62	Y2019	1.0945994	0.8539530	0.7801511574	-0.43920	0.22700

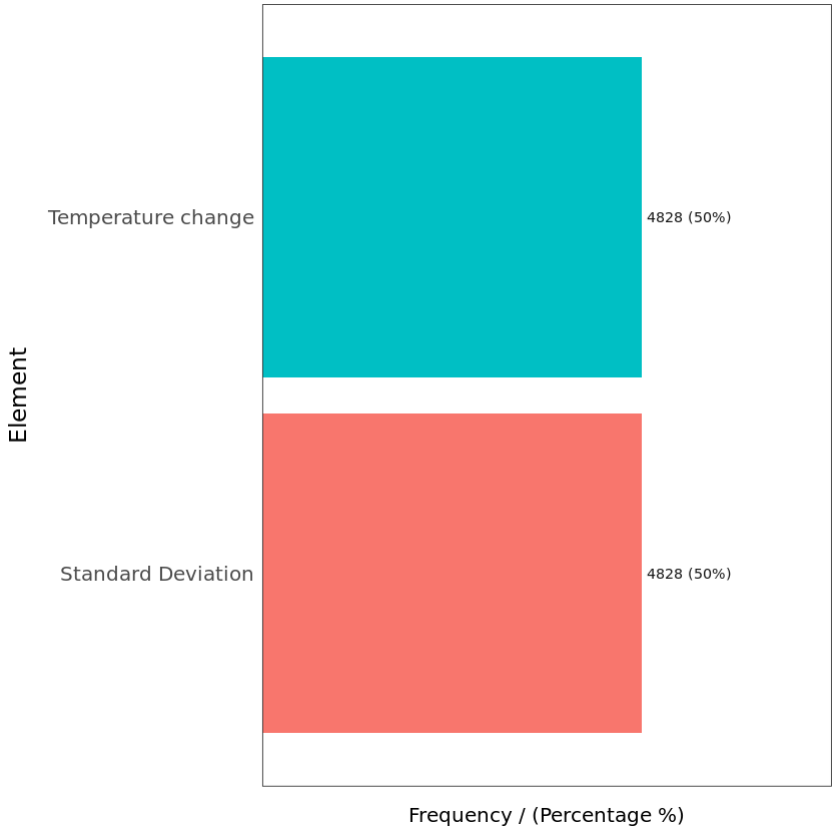
	p_25	p_50	p_75	p_95	p_99	skewness	kurtosis
1	78.00000	153.500	226.25000	5404.00000	5848.00000	2.202022662	5.889252
2	7005.00000	7009.000	7016.00000	7020.00000	7020.00000	0.267969113	1.775841
3	6078.00000	6674.500	7271.00000	7271.00000	7271.00000	0.000000000	1.000000
4	0.05700	0.366	0.67650	1.53670	2.74312	0.637920803	7.726070
5	-0.03300	0.333	0.62700	1.38500	2.24053	-0.603668549	9.675029
6	0.03025	0.355	0.64775	1.44200	2.49514	-1.985041731	17.939090
7	-0.10250	0.326	0.60900	1.35545	2.28294	-0.601020474	10.193778
8	-0.21400	0.303	0.58400	1.33500	2.12760	-0.355691928	7.216236
9	0.05500	0.360	0.66025	1.46070	2.55555	-0.487008416	16.126190
10	-0.16900	0.313	0.60100	1.39670	2.27954	-0.148236736	7.867874
11	-0.16400	0.312	0.59500	1.35780	2.19600	-0.892005532	13.068770
12	0.17100	0.385	0.67700	1.40975	2.29125	-1.219460533	13.296682
13	0.09400	0.367	0.64200	1.37900	2.17316	-0.686843898	10.535485
14	-0.20900	0.305	0.58850	1.37800	2.22286	-0.254901924	8.533430
15	-0.02800	0.346	0.62800	1.38990	2.29656	-0.330394897	12.446658
16	0.20100	0.413	0.70900	1.41300	2.40307	-0.057070597	10.453293
17	-0.18400	0.305	0.58600	1.41270	2.62505	0.443814827	9.543740
18	-0.11500	0.325	0.62500	1.44205	2.58910	0.596911455	8.827817
19	-0.21900	0.309	0.58600	1.35200	2.24144	-0.022946789	6.934706
20	0.17400	0.388	0.69500	1.47820	2.46988	-0.104818679	9.503688
21	0.09100	0.350	0.63300	1.35600	2.17474	-0.604895000	13.538469
22	0.21700	0.406	0.69775	1.47520	2.32366	-0.811313280	13.282919
23	0.24550	0.424	0.70100	1.37000	2.21636	-0.536420647	9.772580
24	0.20500	0.409	0.70900	1.49250	2.46125	-0.560141342	12.287670
25	0.16800	0.390	0.68900	1.42700	2.28960	-0.366818113	8.551106
26	0.26800	0.468	0.82500	1.61900	2.59468	-0.425127727	9.799488
27	0.07700	0.373	0.66600	1.39720	2.32242	0.169788789	11.711335

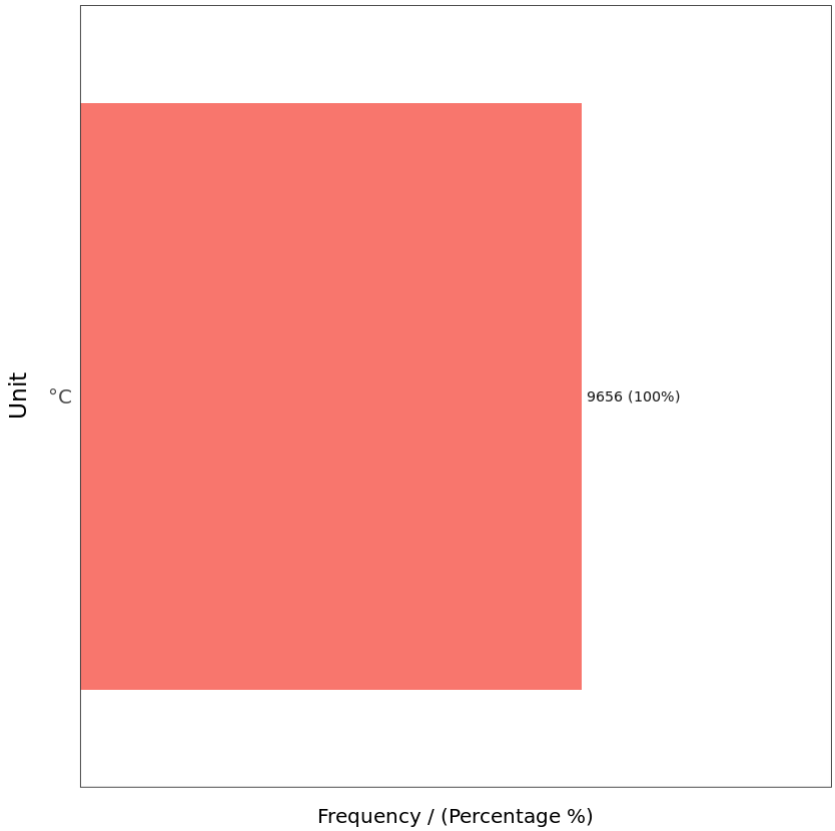
28	0.12300	0.374	0.67400	1.41875	2.26420	-1.727191872	18.456760
29	0.16400	0.380	0.67800	1.42965	2.32233	-1.152611233	15.525039
30	0.29300	0.504	0.85400	1.60385	2.53768	-1.572341434	17.199261
31	0.28500	0.478	0.80200	1.56780	2.54496	-0.808248162	19.832304
32	0.18600	0.404	0.72800	1.67400	3.00748	0.746392979	11.712671
33	0.29800	0.490	0.84850	1.81310	3.17062	1.955799118	17.935856
34	0.26400	0.448	0.75800	1.52400	2.42572	-0.097607206	9.710104
35	0.18425	0.419	0.77700	1.70400	2.97094	0.066204347	9.556175
36	0.21400	0.427	0.74800	1.60300	2.81500	-0.895854842	14.116246
37	0.28900	0.493	0.87400	1.92700	3.13412	0.731850437	10.196435
38	0.32400	0.539	0.90500	1.82920	3.22396	0.862080139	13.875035
39	0.24400	0.450	0.77700	1.56010	2.46200	-0.525014710	10.035629
40	0.30500	0.528	0.93800	1.83660	2.90492	0.195161441	8.681102
41	0.38500	0.715	1.18800	2.09165	3.19586	0.007043154	11.116866
42	0.32700	0.548	0.98825	2.02270	3.16617	1.298661253	9.543990
43	0.30000	0.514	0.93700	2.18595	3.44759	1.211562166	8.208953
44	0.34900	0.596	1.02800	2.11800	3.49860	0.615608584	11.112890
45	0.38000	0.668	1.08425	2.21335	3.71449	0.843929635	16.153424
46	0.37525	0.658	1.06300	2.05800	3.58087	0.588775170	11.360743
47	0.36100	0.597	0.99100	1.82160	2.89372	1.427042225	13.011545
48	0.37300	0.676	1.10400	1.93885	3.02177	0.902244109	12.025715
49	0.37100	0.646	1.08200	2.22790	3.50978	1.419304874	15.110786
50	0.37800	0.667	1.09600	2.36935	4.15241	2.056002718	13.000922
51	0.33700	0.589	1.04250	2.10900	3.74898	0.873656820	18.413338
52	0.38100	0.693	1.13450	2.05860	3.01628	1.061708516	7.992065
53	0.39200	0.771	1.27650	2.40230	3.43596	-0.046711778	10.336515
54	0.36500	0.640	1.09100	2.05800	3.23948	0.583597703	9.587878
55	0.37225	0.651	1.10800	2.32500	3.31851	0.239550883	14.349477
56	0.40850	0.719	1.12600	2.04900	3.22270	0.920224628	9.973387
57	0.41800	0.745	1.19000	2.41900	3.66712	2.009967958	16.061750
58	0.43700	0.858	1.38900	2.55900	3.99500	1.601364831	8.892452
59	0.45700	0.949	1.49600	2.53900	3.88308	1.638478327	11.614057
60	0.44300	0.865	1.36475	2.49200	3.73930	1.158805242	8.161492
61	0.43400	0.810	1.34100	2.68360	4.18056	1.683867578	9.262763
62	0.45500	0.939	1.50800	2.72700	3.91068	1.293065836	6.581908

	iqr	range_98	range_80
1	148.25000	[3, 5848]	[32, 5203]
2	11.00000	[7001, 7020]	[7002, 7019]
3	1193.00000	[6078, 7271]	[6078, 7271]
4	0.61950	[-1.43356, 2.74312]	[-0.329, 1.179]
5	0.66000	[-1.89564, 2.24052999999999]	[-0.3629, 1.0879]
6	0.61750	[-2.9417, 2.49514]	[-0.4167, 1.1154]
7	0.71150	[-1.88574, 2.28294]	[-0.551, 1.062]
8	0.79800	[-1.843, 2.12760000000001]	[-0.616, 1.045]
9	0.60525	[-1.68411, 2.55555000000001]	[-0.3154, 1.127]
10	0.77000	[-1.7198, 2.27954]	[-0.5294, 1.0788]
11	0.75900	[-1.89124, 2.196]	[-0.568, 1.064]
12	0.50600	[-2.127, 2.29125]	[-0.287, 1.107]
13	0.54800	[-1.62986, 2.17316]	[-0.313, 1.0883]
14	0.79750	[-1.77488, 2.22286]	[-0.5508, 1.0676]
15	0.65600	[-2.19112, 2.29656]	[-0.486, 1.084]
16	0.50800	[-1.63435, 2.40307]	[-0.2807, 1.119]
17	0.77000	[-1.66097, 2.62505000000001]	[-0.5567, 1.081]
18	0.74000	[-1.38884, 2.58909999999999]	[-0.499, 1.112]
19	0.80500	[-1.93092, 2.24144]	[-0.6512, 1.0452]
20	0.52100	[-1.63444, 2.46988]	[-0.22, 1.1454]
21	0.54200	[-1.50418, 2.17474]	[-0.319, 1.0734]
22	0.48075	[-1.56254, 2.32366]	[-0.1531, 1.1482]
23	0.45550	[-1.62418, 2.21636]	[-0.163, 1.097]
24	0.50400	[-1.84525, 2.46125]	[-0.1965, 1.1635]
25	0.52100	[-1.8384, 2.2896]	[-0.2764, 1.1394]

26	0.55700	[-2.01668, 2.59468]	[-0.2098, 1.2776]
27	0.58900	[-1.61836, 2.32242]	[-0.3792, 1.1012]
28	0.55100	[-2.3391, 2.2642]	[-0.3145, 1.1165]
29	0.51400	[-1.99432, 2.32233]	[-0.2343, 1.13]
30	0.56100	[-1.95957, 2.53768]	[-0.0746999999999999, 1.275]
31	0.51700	[-1.22296, 2.54496]	[-0.009, 1.2428]
32	0.54200	[-1.534, 3.00747999999999]	[-0.2508, 1.2564]
33	0.55050	[-1.1821, 3.17062]	[0.062, 1.3532]
34	0.49400	[-1.48166, 2.42572]	[-0.0973, 1.209]
35	0.59275	[-2.26829, 2.97094]	[-0.385, 1.2747]
36	0.53400	[-2.16572, 2.815]	[-0.3212, 1.229]
37	0.58500	[-1.33328, 3.13412]	[-0.0168, 1.388]
38	0.58100	[-1.38244, 3.22396]	[0.05, 1.3492]
39	0.53300	[-2.20124, 2.462]	[-0.1392, 1.221]
40	0.63300	[-1.70412, 2.90492]	[-0.0263999999999999, 1.4082]
41	0.80300	[-1.35341, 3.19586]	[0.227, 1.6912]
42	0.66125	[-1.00778, 3.16617000000001]	[0.1503, 1.5364]
43	0.63700	[-1.19159, 3.44759]	[0.014, 1.5639]
44	0.67900	[-1.1318, 3.4986]	[0.186, 1.583]
45	0.70425	[-1.29535, 3.71448999999998]	[0.2291, 1.6528]
46	0.68775	[-1.52422, 3.58087000000001]	[0.22, 1.5761]
47	0.63000	[-0.72986, 2.89372]	[0.219, 1.4436]
48	0.73100	[-1.07131, 3.02177]	[0.216, 1.5667]
49	0.71100	[-1.27884, 3.50977999999999]	[0.212, 1.6598]
50	0.71800	[-1.0567, 4.15241]	[0.236, 1.735]
51	0.70550	[-1.18498, 3.74898]	[0.1568, 1.6006]
52	0.75350	[-0.83732, 3.01628]	[0.23, 1.6342]
53	0.88450	[-1.64314, 3.43596]	[0.237, 1.888]
54	0.72600	[-1.16568, 3.23948]	[0.207, 1.589]
55	0.73575	[-1.78057, 3.31851]	[0.218, 1.737]
56	0.71750	[-0.96884, 3.2227]	[0.26, 1.6244]
57	0.77200	[-0.608, 3.66712]	[0.27, 1.8274]
58	0.95200	[-0.457, 3.995]	[0.281, 1.995]
59	1.03900	[-0.70913, 3.88308000000002]	[0.295, 2.0513]
60	0.92175	[-0.75215, 3.73930000000001]	[0.2855, 1.9615]
61	0.90700	[-0.68672, 4.18056]	[0.281, 2.0982]
62	1.05300	[-0.4392, 3.91068000000001]	[0.295, 2.138]

```
Warning message:
“`guides(<scale> = FALSE)` is deprecated. Please use `guides(<scale> = "none")` instead.”
```






```
data01

 66  Variables      9656  Observations
--------------------------------------------------------------------------------
Area.Code
       n  missing distinct     Info     Mean      Gmd      .05      .10
    9656        0      284        1    821.8     1269     15.0     32.0
     .25      .50      .75      .90      .95
```

```
    78.0    153.5    226.2   5203.0   5404.0

lowest :    1    2    3    4    5, highest: 5815 5817 5848 5849 5873

Value          0    50   100   150   200   250   300   350  5000  5100  5200
Frequency    782  1598  1530  1598  1700  1054   102    34    34   204   170
Proportion 0.081 0.165 0.158 0.165 0.176 0.109 0.011 0.004 0.004 0.021 0.018

Value       5300  5400  5500  5700  5800  5850
Frequency    204   170   170    34   170   102
Proportion 0.021 0.018 0.018 0.004 0.018 0.011

For the frequency table, variable is rounded to the nearest 50
---------------------------------------------------------------------------
Area
       n  missing distinct
    9656        0      284

lowest : Afghanistan    Africa         Albania        Algeria        American Samoa
highest: World          Yemen          Yugoslav SFR   Zambia         Zimbabwe
---------------------------------------------------------------------------
Months.Code
       n  missing distinct     Info     Mean      Gmd      .05      .10
    9656        0       17    0.997     7010    6.893     7001     7002
     .25      .50      .75      .90      .95
    7005     7009     7016     7019     7020

lowest : 7001 7002 7003 7004 7005, highest: 7016 7017 7018 7019 7020

Value       7001  7002  7003  7004  7005  7006  7007  7008  7009  7010  7011
Frequency    568   568   568   568   568   568   568   568   568   568   568
Proportion 0.059 0.059 0.059 0.059 0.059 0.059 0.059 0.059 0.059 0.059 0.059

Value       7012  7016  7017  7018  7019  7020
Frequency    568   568   568   568   568   568
Proportion 0.059 0.059 0.059 0.059 0.059 0.059
---------------------------------------------------------------------------
Months
       n  missing distinct
    9656        0       17

lowest : April                 August                December              Dec Jan Feb Fe
bruary
highest: Meteorological year   November              October               Sep Oct Nov Se
ptember

April (568, 0.059), August (568, 0.059), December (568, 0.059), Dec Jan Feb (568,
0.059), February (568, 0.059), January (568, 0.059), July (568, 0.059), June
(568, 0.059), Jun Jul Aug (568, 0.059), Mar Apr May (568, 0.059), March (568,
0.059), May (568, 0.059), Meteorological year (568, 0.059), November (568,
0.059), October (568, 0.059), Sep Oct Nov (568, 0.059), September (568, 0.059)
---------------------------------------------------------------------------
Element.Code
       n  missing distinct     Info     Mean      Gmd
    9656        0        2     0.75     6674    596.6

Value      6078 7271
Frequency  4828 4828
Proportion  0.5  0.5
---------------------------------------------------------------------------
Element
```

```
       n  missing distinct
    9656        0        2

Value      Standard Deviation Temperature change
Frequency                4828                4828
Proportion                0.5                 0.5
-------------------------------------------------------------------------------
Unit
       n  missing distinct    value
    9656        0        1       °C

Value        °C
Frequency  9656
Proportion    1
-------------------------------------------------------------------------------
Y1961
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8287     1369     2612        1   0.4024   0.7201  -0.6217  -0.3290
     .25      .50      .75      .90      .95
  0.0570   0.3660   0.6765   1.1790   1.5367

lowest : -4.018 -3.521 -3.191 -3.020 -3.009, highest:  4.373  4.476  4.618  4.699  5.771
-------------------------------------------------------------------------------
Y1962
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8322     1334     2561        1   0.3155   0.7235  -0.7248  -0.3629
     .25      .50      .75      .90      .95
 -0.0330   0.3330   0.6270   1.0879   1.3850

lowest : -5.391 -5.037 -4.888 -4.876 -4.826, highest:  3.946  4.100  4.189  4.366  4.373
-------------------------------------------------------------------------------
Y1963
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8294     1362     2673        1   0.3174   0.7954 -0.80135 -0.41670
     .25      .50      .75      .90      .95
 0.03025  0.35500  0.64775  1.11540  1.44200

lowest : -8.483 -7.424 -7.121 -6.705 -6.675, highest:  4.004  4.154  4.189  4.373  4.666
-------------------------------------------------------------------------------
Y1964
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8252     1404     2686        1   0.2694   0.7676  -0.8644  -0.5510
     .25      .50      .75      .90      .95
 -0.1025   0.3260   0.6090   1.0620   1.3554

lowest : -7.309 -5.988 -5.303 -5.232 -5.123, highest:  4.189  4.299  4.362  4.373  5.233
-------------------------------------------------------------------------------
Y1965
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8281     1375     2721        1   0.2178   0.7821   -0.916   -0.616
     .25      .50      .75      .90      .95
  -0.214    0.303    0.584    1.045    1.335

lowest : -4.728 -4.698 -4.452 -4.339 -4.333, highest:  3.906  3.946  4.189  4.373  5.144
-------------------------------------------------------------------------------
Y1966
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8364     1292     2552        1   0.3764   0.7202  -0.6140  -0.3154
     .25      .50      .75      .90      .95
  0.0550   0.3600   0.6603   1.1270   1.4607
```

```
lowest : -8.147 -6.955 -6.886 -6.485 -5.823, highest:  4.943  5.110  5.161  5.267  5.771
---------------------------------------------------------------------------
Y1967
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8347     1309     2665        1   0.2632    0.764  -0.8340  -0.5294
     .25      .50      .75      .90      .95
 -0.1690   0.3130   0.6010   1.0788   1.3967

lowest : -6.531 -5.979 -4.375 -4.178 -3.857, highest:  3.946  4.189  4.282  4.373  4.768
---------------------------------------------------------------------------
Y1968
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8345     1311     2717        1   0.2449   0.7791  -0.8998  -0.5680
     .25      .50      .75      .90      .95
 -0.1640   0.3120   0.5950   1.0640   1.3578

lowest : -8.407 -8.161 -7.330 -7.321 -5.981, highest:  3.906  3.946  4.092  4.189  4.373
---------------------------------------------------------------------------
Y1969
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8326     1330     2537        1   0.3822   0.7028  -0.7235  -0.2870
     .25      .50      .75      .90      .95
  0.1710   0.3850   0.6770   1.1070   1.4097

lowest : -6.784 -6.176 -5.622 -5.401 -5.157, highest:  3.946  4.170  4.189  4.373  4.411
---------------------------------------------------------------------------
Y1970
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8308     1348     2491        1   0.3653   0.6678  -0.6156  -0.3130
     .25      .50      .75      .90      .95
  0.0940   0.3670   0.6420   1.0883   1.3790

lowest : -5.847 -5.518 -5.024 -4.518 -4.374, highest:  3.639  3.906  3.946  4.189  4.373
---------------------------------------------------------------------------
Y1971
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8303     1353     2673        1   0.2409     0.77  -0.8009  -0.5508
     .25      .50      .75      .90      .95
 -0.2090   0.3050   0.5885   1.0676   1.3780

lowest : -7.671 -7.135 -4.380 -3.528 -3.526, highest:  3.665  3.906  3.946  4.189  4.373
---------------------------------------------------------------------------
Y1972
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8323     1333     2668        1   0.3026   0.7677  -0.9019  -0.4860
     .25      .50      .75      .90      .95
 -0.0280   0.3460   0.6280   1.0840   1.3899

lowest : -7.722 -5.533 -4.812 -4.508 -4.170, highest:  4.693  4.981  5.071  6.677  9.475
---------------------------------------------------------------------------
Y1973
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8394     1262     2499        1   0.4277   0.6767  -0.6317  -0.2807
     .25      .50      .75      .90      .95
  0.2010   0.4130   0.7090   1.1190   1.4130

lowest : -4.896 -4.760 -4.716 -4.037 -3.503, highest:  4.819  5.059  5.215  5.600  6.304
---------------------------------------------------------------------------
Y1974
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8374     1282     2691        1   0.2618   0.7919  -0.8290  -0.5567
```

```
     .25      .50      .75      .90      .95 
 -0.1840   0.3050   0.5860   1.0810   1.4127 

lowest : -4.732 -4.698 -4.643 -4.540 -4.162, highest:  4.919  5.138  6.630  6.680  6.912
------------------------------------------------------------------------------
Y1975
       n  missing distinct     Info     Mean      Gmd      .05      .10 
    8280     1376     2645        1   0.3147    0.754   -0.710   -0.499 
     .25      .50      .75      .90      .95 
  -0.115    0.325    0.625    1.112    1.442 

lowest : -6.169 -5.498 -4.370 -3.265 -2.919, highest:  4.794  4.832  4.941  5.124  6.150
------------------------------------------------------------------------------
Y1976
       n  missing distinct     Info     Mean      Gmd      .05      .10 
    8209     1447     2732        1   0.2211   0.8009  -0.9882  -0.6512 
     .25      .50      .75      .90      .95 
 -0.2190   0.3090   0.5860   1.0452   1.3520 

lowest : -4.263 -4.027 -3.468 -3.407 -3.281, highest:  3.946  4.189  4.373  5.049  7.689
------------------------------------------------------------------------------
Y1977
       n  missing distinct     Info     Mean      Gmd      .05      .10 
    8257     1399     2482        1    0.423   0.6785  -0.5996  -0.2200 
     .25      .50      .75      .90      .95 
  0.1740   0.3880   0.6950   1.1454   1.4782 

lowest : -6.495 -4.605 -4.076 -3.659 -3.281, highest:  3.956  4.189  4.373  4.820  4.875
------------------------------------------------------------------------------
Y1978
       n  missing distinct     Info     Mean      Gmd      .05      .10 
    8327     1329     2456        1   0.3555    0.666  -0.7161  -0.3190 
     .25      .50      .75      .90      .95 
  0.0910   0.3500   0.6330   1.0734   1.3560 

lowest : -8.228 -6.373 -5.463 -4.804 -4.794, highest:  3.946  4.152  4.189  4.373  5.956
------------------------------------------------------------------------------
Y1979
       n  missing distinct     Info     Mean      Gmd      .05      .10 
    8290     1366     2407        1   0.4425    0.651  -0.5012  -0.1531 
     .25      .50      .75      .90      .95 
  0.2170   0.4060   0.6977   1.1482   1.4752 

lowest : -6.319 -4.909 -4.867 -4.780 -4.486, highest:  3.906  3.946  4.189  4.373  5.483
------------------------------------------------------------------------------
Y1980
       n  missing distinct     Info     Mean      Gmd      .05      .10 
    8283     1373     2370        1   0.4383   0.6312  -0.6600  -0.1630 
     .25      .50      .75      .90      .95 
  0.2455   0.4240   0.7010   1.0970   1.3700 

lowest : -5.784 -5.273 -3.872 -3.307 -3.048, highest:  3.946  4.125  4.189  4.373  4.519
------------------------------------------------------------------------------
Y1981
       n  missing distinct     Info     Mean      Gmd      .05      .10 
    8276     1380     2478        1   0.4377   0.6853  -0.5980  -0.1965 
     .25      .50      .75      .90      .95 
  0.2050   0.4090   0.7090   1.1635   1.4925 

lowest : -6.591 -6.079 -5.573 -5.055 -4.588, highest:  4.288  4.373  4.459  4.947  6.144
------------------------------------------------------------------------------
```

```
Y1982
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8237     1419     2494        1   0.4049   0.6818  -0.6144  -0.2764
     .25      .50      .75      .90      .95
  0.1680   0.3900   0.6890   1.1394   1.4270

lowest : -4.550 -4.077 -3.665 -3.492 -3.377, highest:  3.906  3.946  4.189  4.373  5.411
------------------------------------------------------------------------------
Y1983
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8205     1451     2576        1   0.5037   0.7393  -0.7212  -0.2098
     .25      .50      .75      .90      .95
  0.2680   0.4680   0.8250   1.2776   1.6190

lowest : -6.101 -5.011 -4.890 -3.652 -3.595, highest:  4.630  4.799  4.996  5.047  6.513
------------------------------------------------------------------------------
Y1984
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8259     1397     2571        1    0.367   0.7108  -0.7445  -0.3792
     .25      .50      .75      .90      .95
  0.0770   0.3730   0.6660   1.1012   1.3972

lowest : -5.437 -4.321 -4.203 -3.891 -3.638, highest:  4.373  4.620  5.997  6.050  9.303
------------------------------------------------------------------------------
Y1985
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8216     1440     2531        1   0.3655    0.725  -0.6478  -0.3145
     .25      .50      .75      .90      .95
  0.1230   0.3740   0.6740   1.1165   1.4187

lowest : -8.411 -8.252 -6.987 -6.913 -5.693, highest:  3.946  4.189  4.373  5.448  5.948
------------------------------------------------------------------------------
Y1986
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8268     1388     2472        1   0.3981   0.6848  -0.5927  -0.2343
     .25      .50      .75      .90      .95
  0.1640   0.3800   0.6780   1.1300   1.4296

lowest : -6.345 -6.307 -6.286 -6.170 -5.434, highest:  3.906  3.946  4.189  4.373  6.845
------------------------------------------------------------------------------
Y1987
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8284     1372     2492        1   0.5355   0.7184  -0.5555  -0.0747
     .25      .50      .75      .90      .95
  0.2930   0.5040   0.8540   1.2750   1.6038

lowest : -8.750 -7.162 -7.028 -5.612 -5.315, highest:  4.189  4.195  4.373  4.491  4.516
------------------------------------------------------------------------------
Y1988
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8273     1383     2339        1   0.5467   0.6371  -0.3038  -0.0090
     .25      .50      .75      .90      .95
  0.2850   0.4780   0.8020   1.2428   1.5678

lowest : -8.963 -6.925 -5.712 -5.637 -5.519, highest:  4.273  4.373  4.493  4.588  4.982
------------------------------------------------------------------------------
Y1989
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8257     1399     2577        1   0.4692   0.7421  -0.5290  -0.2508
     .25      .50      .75      .90      .95
  0.1860   0.4040   0.7280   1.2564   1.6740
```

```
lowest : -5.311 -5.139 -4.064 -3.932 -3.875, highest:  6.088  6.168  6.386  6.780  6.841
------------------------------------------------------------------------------
Y1990
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8239     1417     2442        1   0.6218   0.6845  -0.2170   0.0620
     .25      .50      .75      .90      .95
  0.2980   0.4900   0.8485   1.3532   1.8131

lowest : -4.030 -3.213 -2.853 -2.825 -2.794, highest:  7.233  7.279  7.955  8.521  9.730
------------------------------------------------------------------------------
Y1991
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8158     1498     2414        1      0.5   0.6509  -0.4901  -0.0973
     .25      .50      .75      .90      .95
  0.2640   0.4480   0.7580   1.2090   1.5240

lowest : -4.598 -3.799 -3.780 -3.536 -3.182, highest:  4.189  4.370  4.373  5.001  6.110
------------------------------------------------------------------------------
Y1992
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8354     1302     2785        1   0.4478   0.8321  -0.8427  -0.3850
     .25      .50      .75      .90      .95
  0.1843   0.4190   0.7770   1.2747   1.7040

lowest : -5.414 -4.988 -4.394 -4.384 -4.083, highest:  5.345  5.395  5.407  5.501  6.017
------------------------------------------------------------------------------
Y1993
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8315     1341     2673        1   0.4391   0.7833  -0.8549  -0.3212
     .25      .50      .75      .90      .95
  0.2140   0.4270   0.7480   1.2290   1.6030

lowest : -7.389 -7.368 -6.897 -6.639 -6.323, highest:  4.829  4.926  4.978  4.998  5.989
------------------------------------------------------------------------------
Y1994
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8373     1283     2562        1   0.6111   0.7355  -0.3572  -0.0168
     .25      .50      .75      .90      .95
  0.2890   0.4930   0.8740   1.3880   1.9270

lowest : -5.099 -4.886 -4.271 -3.697 -3.615, highest:  5.256  5.270  5.512  5.738  6.477
------------------------------------------------------------------------------
Y1995
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8409     1247     2496        1   0.6358   0.7173   -0.329    0.050
     .25      .50      .75      .90      .95
   0.324    0.539    0.905    1.349    1.829

lowest : -4.862 -4.393 -3.999 -3.960 -3.881, highest:  6.669  6.692  7.044  7.074  7.221
------------------------------------------------------------------------------
Y1996
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8439     1217     2536        1   0.4772   0.7104  -0.6435  -0.1392
     .25      .50      .75      .90      .95
  0.2440   0.4500   0.7770   1.2210   1.5601

lowest : -4.027 -3.898 -3.842 -3.770 -3.616, highest:  4.209  4.373  4.590  5.028  7.270
------------------------------------------------------------------------------
Y1997
       n  missing distinct     Info     Mean      Gmd      .05      .10
```

```
    8309     1347     2608        1   0.6173   0.7447  -0.4516  -0.0264
     .25      .50      .75      .90      .95
  0.3050   0.5280   0.9380   1.4082   1.8366

lowest : -4.059 -3.972 -3.908 -3.637 -3.536, highest:  4.944  5.129  5.160  5.301  5.637
------------------------------------------------------------------------------
Y1998
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8370     1286     2590        1   0.8183   0.7878  -0.1195   0.2270
     .25      .50      .75      .90      .95
  0.3850   0.7150   1.1880   1.6912   2.0916

lowest : -6.031 -5.799 -5.641 -4.763 -4.387, highest:  5.558  5.617  5.640  5.744  6.816
------------------------------------------------------------------------------
Y1999
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8324     1332     2509        1   0.7044   0.7251  -0.1985   0.1503
     .25      .50      .75      .90      .95
  0.3270   0.5480   0.9882   1.5364   2.0227

lowest : -3.035 -2.808 -2.806 -2.560 -2.369, highest:  6.032  6.598  6.713  6.906  7.017
------------------------------------------------------------------------------
Y2000
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8342     1314     2672        1   0.6742   0.7787  -0.2929   0.0140
     .25      .50      .75      .90      .95
  0.3000   0.5140   0.9370   1.5639   2.1859

lowest : -3.596 -3.363 -2.925 -2.866 -2.791, highest:  5.473  5.604  5.686  5.757  5.836
------------------------------------------------------------------------------
Y2001
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8241     1415     2541        1   0.7417   0.7619   -0.129    0.186
     .25      .50      .75      .90      .95
   0.349    0.596    1.028    1.583    2.118

lowest : -5.493 -5.084 -5.081 -5.059 -4.890, highest:  5.025  5.405  5.515  5.603  6.092
------------------------------------------------------------------------------
Y2002
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8312     1344     2529        1   0.8025   0.7886  -0.0139   0.2291
     .25      .50      .75      .90      .95
  0.3800   0.6680   1.0842   1.6528   2.2133

lowest : -6.170 -6.143 -5.892 -5.355 -5.342, highest:  7.125  7.483  7.597  7.760  8.719
------------------------------------------------------------------------------
Y2003
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8390     1266     2519        1   0.7695    0.765 -0.05755  0.22000
     .25      .50      .75      .90      .95
 0.37525  0.65800  1.06300  1.57610  2.05800

lowest : -6.118 -4.486 -4.333 -4.164 -4.140, highest:  5.534  5.548  5.696  5.837  6.171
------------------------------------------------------------------------------
Y2004
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8415     1241     2299        1   0.7262   0.6403   0.0028   0.2190
     .25      .50      .75      .90      .95
  0.3610   0.5970   0.9910   1.4436   1.8216

lowest : -5.025 -3.483 -2.905 -2.432 -2.424, highest:  6.072  6.122  6.550  7.022  7.461
```

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---------------------------------------------------------------------------
Y2005
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8424     1232     2457        1   0.7775   0.7216 -0.07985  0.21600
     .25      .50      .75      .90      .95
 0.37300  0.67600  1.10400  1.56670  1.93885

lowest : -5.171 -3.537 -3.298 -3.296 -3.176, highest:  6.272  6.805  7.149  7.276  7.651
---------------------------------------------------------------------------
Y2006
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8503     1153     2629        1   0.7918   0.7961  -0.1119   0.2120
     .25      .50      .75      .90      .95
  0.3710   0.6460   1.0820   1.6598   2.2279

lowest : -4.981 -4.835 -4.558 -3.774 -3.340, highest:  6.812  6.886  7.863 10.049 11.331
---------------------------------------------------------------------------
Y2007
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8534     1122     2602        1   0.8426   0.8123    0.015    0.236
     .25      .50      .75      .90      .95
   0.378    0.667    1.096    1.735    2.369

lowest : -3.190 -2.982 -2.468 -2.453 -2.423, highest:  7.155  7.209  7.307  7.541  7.655
---------------------------------------------------------------------------
Y2008
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8475     1181     2634        1   0.7426   0.8022  -0.2183   0.1568
     .25      .50      .75      .90      .95
  0.3370   0.5890   1.0425   1.6006   2.1090

lowest : -9.334 -9.154 -5.952 -5.553 -5.384, highest:  7.340  7.490  7.594  7.837  8.298
---------------------------------------------------------------------------
Y2009
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8419     1237     2496        1   0.8142   0.7178   0.0159   0.2300
     .25      .50      .75      .90      .95
  0.3810   0.6930   1.1345   1.6342   2.0586

lowest : -3.543 -2.447 -2.213 -2.185 -2.070, highest:  4.957  5.668  6.030  6.141  6.415
---------------------------------------------------------------------------
Y2010
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8435     1221     2745        1   0.8845   0.8808  -0.0712   0.2370
     .25      .50      .75      .90      .95
  0.3920   0.7710   1.2765   1.8880   2.4023

lowest : -6.072 -5.651 -5.546 -5.343 -4.957, highest:  5.768  5.847  5.935  6.683  7.190
---------------------------------------------------------------------------
Y2011
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8437     1219     2543        1   0.7685   0.7486  -0.0882   0.2070
     .25      .50      .75      .90      .95
  0.3650   0.6400   1.0910   1.5890   2.0580

lowest : -4.854 -4.511 -4.504 -4.243 -3.804, highest:  4.917  4.979  5.235  5.618  6.531
---------------------------------------------------------------------------
Y2012
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8350     1306     2637        1   0.7889   0.8292  -0.1391   0.2180
     .25      .50      .75      .90      .95
```

```
  0.3723   0.6510   1.1080   1.7370   2.3250

lowest : -5.785 -5.516 -5.319 -5.220 -5.044, highest:  6.291  8.143  8.625  9.007 10.826
------------------------------------------------------------------------------
Y2013
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8427     1229     2411        1   0.8296   0.7141   0.1423   0.2600
     .25      .50      .75      .90      .95
  0.4085   0.7190   1.1260   1.6244   2.0490

lowest : -3.642 -3.428 -3.142 -3.131 -3.115, highest:  5.179  5.405  5.609  6.551  6.738
------------------------------------------------------------------------------
Y2014
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8377     1279     2527        1   0.9139   0.7937   0.1738   0.2700
     .25      .50      .75      .90      .95
  0.4180   0.7450   1.1900   1.8274   2.4190

lowest : -5.367 -3.567 -3.459 -3.379 -3.314, highest:  7.274  8.216  8.577  9.676 11.759
------------------------------------------------------------------------------
Y2015
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8361     1295     2652        1    1.019   0.8568    0.202    0.281
     .25      .50      .75      .90      .95
   0.437    0.858    1.389    1.995    2.559

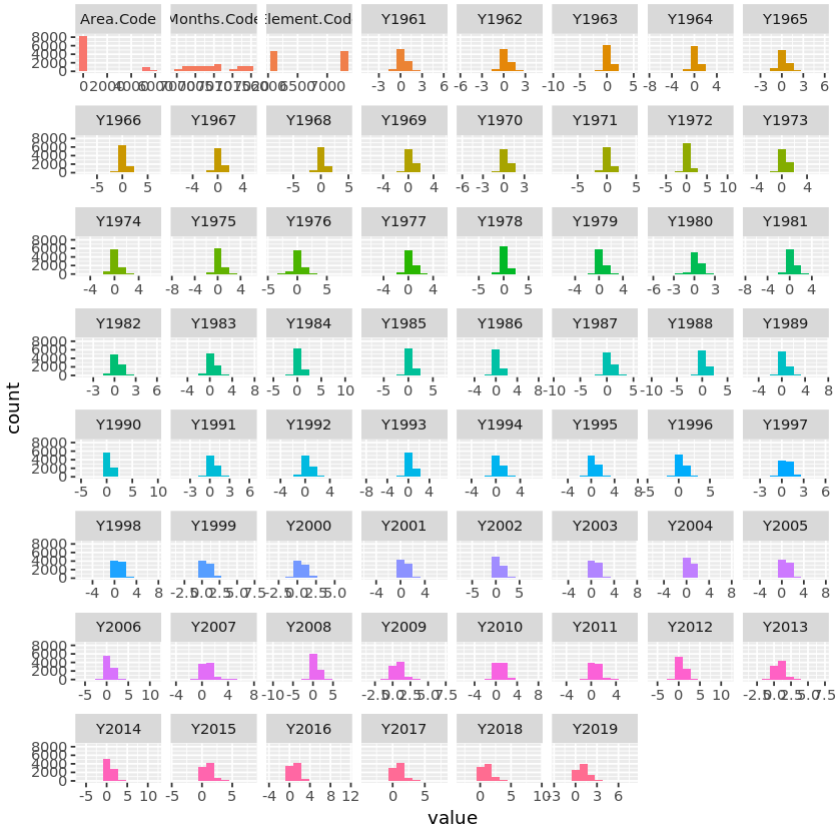
lowest : -4.068 -2.946 -2.462 -2.342 -2.148, highest:  6.179  6.248  7.300  7.473  7.590
------------------------------------------------------------------------------
Y2016
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8348     1308     2657        1    1.081   0.8943    0.223    0.295
     .25      .50      .75      .90      .95
   0.457    0.949    1.496    2.051    2.539

lowest : -3.306 -2.909 -2.880 -2.758 -2.750, highest:  7.399  7.738  8.018  8.435 10.478
------------------------------------------------------------------------------
Y2017
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8366     1290     2602        1    1.003    0.834   0.2160   0.2855
     .25      .50      .75      .90      .95
  0.4430   0.8650   1.3647   1.9615   2.4920

lowest : -3.584 -3.327 -3.295 -3.233 -3.091, highest:  6.372  6.705  7.176  7.267  7.389
------------------------------------------------------------------------------
Y2018
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8349     1307     2720        1    1.011   0.8806   0.2034   0.2810
     .25      .50      .75      .90      .95
  0.4340   0.8100   1.3410   2.0982   2.6836

lowest : -2.216 -2.192 -2.160 -2.002 -1.881, highest:  5.853  6.984  8.385  9.223  9.228
------------------------------------------------------------------------------
Y2019
       n  missing distinct     Info     Mean      Gmd      .05      .10
    8365     1291     2697        1    1.095   0.8965    0.227    0.295
     .25      .50      .75      .90      .95
   0.455    0.939    1.508    2.138    2.727

lowest : -2.644 -2.384 -2.214 -2.088 -1.976, highest:  6.413  6.465  6.487  6.504  7.215
------------------------------------------------------------------------------
```



In [17]:

```
data04_eda <- function(data04)
{
  glimpse(data04)
  print(status(data04))
  freq(data04)
  print(profiling_num(data04))
  plot_num(data04)
  describe(data04)
}
data04_eda(data04)
```

```
Rows: 346,933
Columns: 9
$ Area.Code    <int> 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, …
$ Area         <chr> "Afghanistan", "Afghanistan", "Afghanistan", "Afghanistan…
$ Months.Code  <int> 7001, 7001, 7002, 7002, 7003, 7003, 7004, 7004, 7005, 700…
$ Months       <chr> "January", "January", "February", "February", "March", "M…
$ Element.Code <int> 7271, 6078, 7271, 6078, 7271, 6078, 7271, 6078, 7271, 607…
$ Element      <chr> "Temperature change", "Standard Deviation", "Temperature …
$ Unit         <chr> "°C", "°C", "°C", "°C", "°C", "°C", "°C", "°C", "°C", "°C…
$ Years        <chr> "1961", "1961", "1961", "1961", "1961", "1961", "1961", "…
$ Value        <dbl> 0.777, 1.950, -1.743, 2.597, 0.516, 1.512, -1.709, 1.406,…
                  variable q_zeros      p_zeros q_na p_na q_inf p_inf      type
Area.Code       Area.Code       0 0.0000000000    0    0     0     0   integer
Area                 Area       0 0.0000000000    0    0     0     0 character
Months.Code   Months.Code       0 0.0000000000    0    0     0     0   integer
Months             Months       0 0.0000000000    0    0     0     0 character
Element.Code Element.Code       0 0.0000000000    0    0     0     0   integer
Element           Element       0 0.0000000000    0    0     0     0 character
Unit                 Unit       0 0.0000000000    0    0     0     0 character
Years               Years       0 0.0000000000    0    0     0     0 character
Value               Value      84 0.0002421217    0    0     0     0   numeric
             unique
```

```
Area.Code       284
Area            284
Months.Code      12
Months           12
Element.Code      2
Element           2
Unit              1
Years            59
Value          8374
```

```
Warning message in freq_logic(data = data, input = input[i], plot, na.rm, path_out = path
_out):
“Skipping plot for variable 'Area' (more than 100 categories)”
```

	Area	frequency	percentage
1	Afghanistan	1416	0.41
2	Africa	1416	0.41
3	Albania	1416	0.41
4	Algeria	1416	0.41
5	Americas	1416	0.41
6	Andorra	1416	0.41
7	Angola	1416	0.41
8	Anguilla	1416	0.41
9	Annex I countries	1416	0.41
10	Antarctica	1416	0.41
11	Argentina	1416	0.41
12	Asia	1416	0.41
13	Australia	1416	0.41
14	Australia and New Zealand	1416	0.41
15	Austria	1416	0.41
16	Bahamas	1416	0.41
17	Bahrain	1416	0.41
18	Bangladesh	1416	0.41
19	Belize	1416	0.41
20	Benin	1416	0.41
21	Bhutan	1416	0.41
22	Bolivia (Plurinational State of)	1416	0.41
23	Botswana	1416	0.41
24	Brazil	1416	0.41
25	British Virgin Islands	1416	0.41
26	Brunei Darussalam	1416	0.41
27	Bulgaria	1416	0.41
28	Burkina Faso	1416	0.41
29	Cambodia	1416	0.41
30	Cameroon	1416	0.41
31	Canada	1416	0.41
32	Caribbean	1416	0.41
33	Central America	1416	0.41
34	Chad	1416	0.41
35	Channel Islands	1416	0.41
36	Chile	1416	0.41
37	China	1416	0.41
38	China, Hong Kong SAR	1416	0.41
39	China, Macao SAR	1416	0.41
40	China, mainland	1416	0.41
41	China, Taiwan Province of	1416	0.41
42	Colombia	1416	0.41
43	Côte d'Ivoire	1416	0.41
44	Cuba	1416	0.41
45	Cyprus	1416	0.41
46	Democratic People's Republic of Korea	1416	0.41
47	Democratic Republic of the Congo	1416	0.41

48	Denmark	1416	0.41
49	Dominican Republic	1416	0.41
50	Eastern Africa	1416	0.41
51	Eastern Asia	1416	0.41
52	Eastern Europe	1416	0.41
53	Ecuador	1416	0.41
54	Egypt	1416	0.41
55	El Salvador	1416	0.41
56	Europe	1416	0.41
57	European Union	1416	0.41
58	Faroe Islands	1416	0.41
59	Fiji	1416	0.41
60	Finland	1416	0.41
61	France	1416	0.41
62	French Guiana	1416	0.41
63	French Polynesia	1416	0.41
64	Gambia	1416	0.41
65	Germany	1416	0.41
66	Ghana	1416	0.41
67	Gibraltar	1416	0.41
68	Greece	1416	0.41
69	Greenland	1416	0.41
70	Grenada	1416	0.41
71	Guadeloupe	1416	0.41
72	Guatemala	1416	0.41
73	Guinea	1416	0.41
74	Guinea-Bissau	1416	0.41
75	Haiti	1416	0.41
76	Holy See	1416	0.41
77	Honduras	1416	0.41
78	Hungary	1416	0.41
79	Iceland	1416	0.41
80	India	1416	0.41
81	Indonesia	1416	0.41
82	Iran (Islamic Republic of)	1416	0.41
83	Iraq	1416	0.41
84	Ireland	1416	0.41
85	Isle of Man	1416	0.41
86	Israel	1416	0.41
87	Italy	1416	0.41
88	Japan	1416	0.41
89	Jordan	1416	0.41
90	Kenya	1416	0.41
91	Kuwait	1416	0.41
92	Land Locked Developing Countries	1416	0.41
93	Lao People's Democratic Republic	1416	0.41
94	Least Developed Countries	1416	0.41
95	Lebanon	1416	0.41
96	Lesotho	1416	0.41
97	Libya	1416	0.41
98	Liechtenstein	1416	0.41
99	Low Income Food Deficit Countries	1416	0.41
100	Malaysia	1416	0.41
101	Mali	1416	0.41
102	Malta	1416	0.41
103	Mauritania	1416	0.41
104	Mauritius	1416	0.41
105	Melanesia	1416	0.41
106	Mexico	1416	0.41
107	Micronesia	1416	0.41
108	Middle Africa	1416	0.41

109	Monaco	1416	0.41
110	Mongolia	1416	0.41
111	Morocco	1416	0.41
112	Mozambique	1416	0.41
113	Myanmar	1416	0.41
114	Namibia	1416	0.41
115	Nepal	1416	0.41
116	Net Food Importing Developing Countries	1416	0.41
117	Netherlands	1416	0.41
118	Netherlands Antilles (former)	1416	0.41
119	New Caledonia	1416	0.41
120	New Zealand	1416	0.41
121	Nicaragua	1416	0.41
122	Niger	1416	0.41
123	Nigeria	1416	0.41
124	Non-Annex I countries	1416	0.41
125	Northern Africa	1416	0.41
126	Northern America	1416	0.41
127	Northern Europe	1416	0.41
128	Norway	1416	0.41
129	Oceania	1416	0.41
130	OECD	1416	0.41
131	Pakistan	1416	0.41
132	Palestine	1416	0.41
133	Papua New Guinea	1416	0.41
134	Paraguay	1416	0.41
135	Peru	1416	0.41
136	Philippines	1416	0.41
137	Poland	1416	0.41
138	Polynesia	1416	0.41
139	Portugal	1416	0.41
140	Puerto Rico	1416	0.41
141	Qatar	1416	0.41
142	Republic of Korea	1416	0.41
143	Romania	1416	0.41
144	Saint Helena, Ascension and Tristan da Cunha	1416	0.41
145	Saint Lucia	1416	0.41
146	Saint Pierre and Miquelon	1416	0.41
147	Saint Vincent and the Grenadines	1416	0.41
148	San Marino	1416	0.41
149	Saudi Arabia	1416	0.41
150	Senegal	1416	0.41
151	Seychelles	1416	0.41
152	Small Island Developing States	1416	0.41
153	South Africa	1416	0.41
154	South America	1416	0.41
155	South-Eastern Asia	1416	0.41
156	Southern Africa	1416	0.41
157	Southern Asia	1416	0.41
158	Southern Europe	1416	0.41
159	Spain	1416	0.41
160	Sri Lanka	1416	0.41
161	Suriname	1416	0.41
162	Svalbard and Jan Mayen Islands	1416	0.41
163	Sweden	1416	0.41
164	Switzerland	1416	0.41
165	Syrian Arab Republic	1416	0.41
166	Thailand	1416	0.41
167	Togo	1416	0.41
168	Tonga	1416	0.41
169	Tunisia	1416	0.41

170	Turkey	1416	0.41
171	Uganda	1416	0.41
172	United Arab Emirates	1416	0.41
173	United Kingdom	1416	0.41
174	United Republic of Tanzania	1416	0.41
175	United States of America	1416	0.41
176	United States Virgin Islands	1416	0.41
177	Uruguay	1416	0.41
178	Venezuela (Bolivarian Republic of)	1416	0.41
179	Viet Nam	1416	0.41
180	Wallis and Futuna Islands	1416	0.41
181	Western Africa	1416	0.41
182	Western Asia	1416	0.41
183	Western Europe	1416	0.41
184	Western Sahara	1416	0.41
185	World	1416	0.41
186	Zimbabwe	1416	0.41
187	Cocos (Keeling) Islands	1414	0.41
188	Guyana	1414	0.41
189	Martinique	1414	0.41
190	Somalia	1414	0.41
191	Zambia	1414	0.41
192	Central African Republic	1410	0.41
193	Dominica	1410	0.41
194	Oman	1410	0.41
195	Eswatini	1408	0.41
196	Madagascar	1408	0.41
197	Gabon	1404	0.40
198	Malawi	1404	0.40
199	Congo	1402	0.40
200	Tuvalu	1402	0.40
201	Liberia	1400	0.40
202	Vanuatu	1400	0.40
203	Réunion	1386	0.40
204	Sierra Leone	1384	0.40
205	Comoros	1380	0.40
206	French Southern and Antarctic Territories	1374	0.40
207	Equatorial Guinea	1372	0.40
208	Mayotte	1354	0.39
209	Antigua and Barbuda	1352	0.39
210	Montserrat	1352	0.39
211	Saint Kitts and Nevis	1352	0.39
212	Djibouti	1350	0.39
213	Jamaica	1350	0.39
214	Cook Islands	1348	0.39
215	Samoa	1346	0.39
216	Kiribati	1344	0.39
217	Barbados	1328	0.38
218	Trinidad and Tobago	1316	0.38
219	Norfolk Island	1310	0.38
220	Cabo Verde	1308	0.38
221	Aruba	1306	0.38
222	Turks and Caicos Islands	1306	0.38
223	Sao Tome and Principe	1300	0.37
224	Solomon Islands	1290	0.37
225	American Samoa	1280	0.37
226	Maldives	1266	0.36
227	Cayman Islands	1230	0.35
228	South Georgia and the South Sandwich Islands	1222	0.35
229	Sudan (former)	1200	0.35
230	Pitcairn Islands	1132	0.33

231	Timor-Leste	1122	0.32	
232	Tokelau	942	0.27	
233	Belgium-Luxembourg	936	0.27	
234	Burundi	892	0.26	
235	Rwanda	892	0.26	
236	Yemen	792	0.23	
237	Czechoslovakia	768	0.22	
238	Ethiopia PDR	756	0.22	
239	USSR	744	0.21	
240	Yugoslav SFR	744	0.21	
241	Pacific Islands Trust Territory	712	0.21	
242	Niue	676	0.19	
243	Singapore	674	0.19	
244	Panama	661	0.19	
245	Costa Rica	608	0.18	
246	Falkland Islands (Malvinas)	508	0.15	
247	Wake Island	496	0.14	
248	Christmas Island	487	0.14	
249	Midway Island	382	0.11	
250	Marshall Islands	348	0.10	
251	Micronesia (Federated States of)	348	0.10	
252	Armenia	336	0.10	
253	Azerbaijan	336	0.10	
254	Belarus	336	0.10	
255	Bosnia and Herzegovina	336	0.10	
256	Central Asia	336	0.10	
257	Croatia	336	0.10	
258	Estonia	336	0.10	
259	Georgia	336	0.10	
260	Kazakhstan	336	0.10	
261	Kyrgyzstan	336	0.10	
262	Latvia	336	0.10	
263	Lithuania	336	0.10	
264	North Macedonia	336	0.10	
265	Republic of Moldova	336	0.10	
266	Russian Federation	336	0.10	
267	Slovenia	336	0.10	
268	Tajikistan	336	0.10	
269	Turkmenistan	336	0.10	
270	Ukraine	336	0.10	
271	Uzbekistan	336	0.10	
272	Czechia	324	0.09	
273	Ethiopia	324	0.09	
274	Slovakia	324	0.09	
275	Eritrea	302	0.09	
276	Palau	281	0.08	
277	Belgium	240	0.07	
278	Luxembourg	240	0.07	
279	Nauru	228	0.07	
280	Montenegro	168	0.05	
281	Serbia	168	0.05	
282	Serbia and Montenegro	168	0.05	
283	South Sudan	108	0.03	
284	Sudan	108	0.03	

	cumulative_perc
1	0.41
2	0.82
3	1.23
4	1.64
5	2.05
6	2.46

7	2.87
8	3.28
9	3.69
10	4.10
11	4.51
12	4.92
13	5.33
14	5.74
15	6.15
16	6.56
17	6.97
18	7.38
19	7.79
20	8.20
21	8.61
22	9.02
23	9.43
24	9.84
25	10.25
26	10.66
27	11.07
28	11.48
29	11.89
30	12.30
31	12.71
32	13.12
33	13.53
34	13.94
35	14.35
36	14.76
37	15.17
38	15.58
39	15.99
40	16.40
41	16.81
42	17.22
43	17.63
44	18.04
45	18.45
46	18.86
47	19.27
48	19.68
49	20.09
50	20.50
51	20.91
52	21.32
53	21.73
54	22.14
55	22.55
56	22.96
57	23.37
58	23.78
59	24.19
60	24.60
61	25.01
62	25.42
63	25.83
64	26.24
65	26.65
66	27.06
67	27.47

```
68          27.88
69          28.29
70          28.70
71          29.11
72          29.52
73          29.93
74          30.34
75          30.75
76          31.16
77          31.57
78          31.98
79          32.39
80          32.80
81          33.21
82          33.62
83          34.03
84          34.44
85          34.85
86          35.26
87          35.67
88          36.08
89          36.49
90          36.90
91          37.31
92          37.72
93          38.13
94          38.54
95          38.95
96          39.36
97          39.77
98          40.18
99          40.59
100         41.00
101         41.41
102         41.82
103         42.23
104         42.64
105         43.05
106         43.46
107         43.87
108         44.28
109         44.69
110         45.10
111         45.51
112         45.92
113         46.33
114         46.74
115         47.15
116         47.56
117         47.97
118         48.38
119         48.79
120         49.20
121         49.61
122         50.02
123         50.43
124         50.84
125         51.25
126         51.66
127         52.07
128         52.48
```

```
129          52.89
130          53.30
131          53.71
132          54.12
133          54.53
134          54.94
135          55.35
136          55.76
137          56.17
138          56.58
139          56.99
140          57.40
141          57.81
142          58.22
143          58.63
144          59.04
145          59.45
146          59.86
147          60.27
148          60.68
149          61.09
150          61.50
151          61.91
152          62.32
153          62.73
154          63.14
155          63.55
156          63.96
157          64.37
158          64.78
159          65.19
160          65.60
161          66.01
162          66.42
163          66.83
164          67.24
165          67.65
166          68.06
167          68.47
168          68.88
169          69.29
170          69.70
171          70.11
172          70.52
173          70.93
174          71.34
175          71.75
176          72.16
177          72.57
178          72.98
179          73.39
180          73.80
181          74.21
182          74.62
183          75.03
184          75.44
185          75.85
186          76.26
187          76.67
188          77.08
189          77.49
```

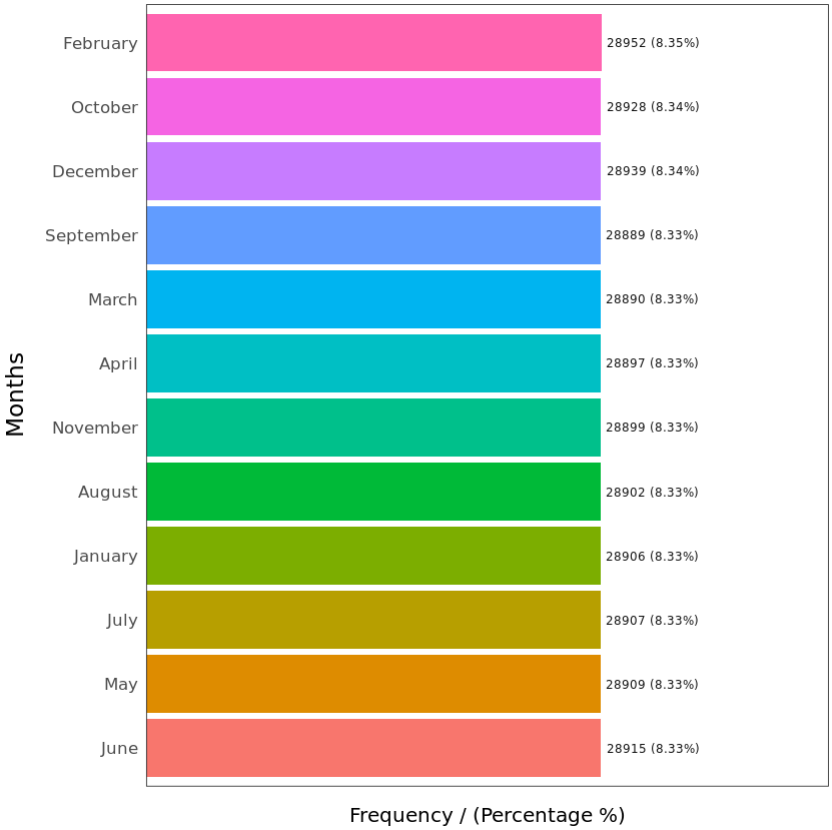
```
190          77.90
191          78.31
192          78.72
193          79.13
194          79.54
195          79.95
196          80.36
197          80.76
198          81.16
199          81.56
200          81.96
201          82.36
202          82.76
203          83.16
204          83.56
205          83.96
206          84.36
207          84.76
208          85.15
209          85.54
210          85.93
211          86.32
212          86.71
213          87.10
214          87.49
215          87.88
216          88.27
217          88.65
218          89.03
219          89.41
220          89.79
221          90.17
222          90.55
223          90.92
224          91.29
225          91.66
226          92.02
227          92.37
228          92.72
229          93.07
230          93.40
231          93.72
232          93.99
233          94.26
234          94.52
235          94.78
236          95.01
237          95.23
238          95.45
239          95.66
240          95.87
241          96.08
242          96.27
243          96.46
244          96.65
245          96.83
246          96.98
247          97.12
248          97.26
249          97.37
250          97.47
```

```
251           97.57
252           97.67
253           97.77
254           97.87
255           97.97
256           98.07
257           98.17
258           98.27
259           98.37
260           98.47
261           98.57
262           98.67
263           98.77
264           98.87
265           98.97
266           99.07
267           99.17
268           99.27
269           99.37
270           99.47
271           99.57
272           99.66
273           99.75
274           99.84
275           99.93
276          100.01
277          100.08
278          100.15
279          100.22
280          100.27
281          100.32
282          100.37
283          100.40
284          100.00
```

```
Warning message:
“`guides(<scale> = FALSE)` is deprecated. Please use `guides(<scale> = "none")` instead.”
      Months frequency percentage cumulative_perc
1   February     28952       8.35            8.35
2   December     28939       8.34           16.69
3    October     28928       8.34           25.03
4       June     28915       8.33           33.36
5        May     28909       8.33           41.69
6       July     28907       8.33           50.02
7    January     28906       8.33           58.35
8     August     28902       8.33           66.68
9   November     28899       8.33           75.01
10     April     28897       8.33           83.34
11     March     28890       8.33           91.67
12 September     28889       8.33          100.00
```

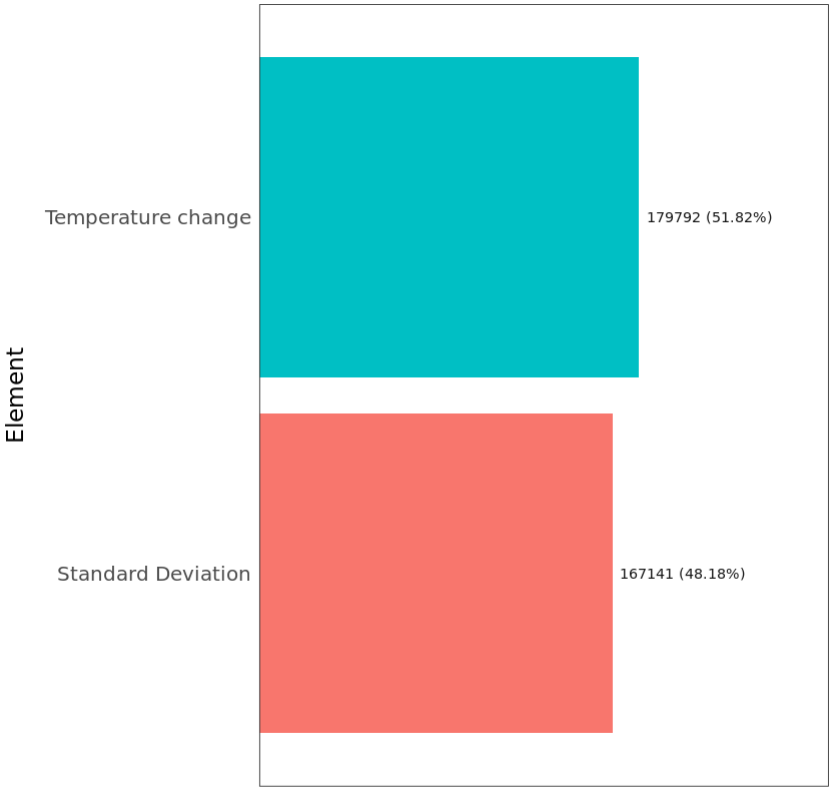
```
Warning message:
“`guides(<scale> = FALSE)` is deprecated. Please use `guides(<scale> = "none")` instead.”
             Element frequency percentage cumulative_perc
1 Temperature change    179792      51.82           51.82
2 Standard Deviation    167141      48.18          100.00
```

```
Warning message:
“`guides(<scale> = FALSE)` is deprecated. Please use `guides(<scale> = "none")` instead.”
```




```
  Unit frequency percentage cumulative_perc
1   °C    346933        100             100
```

```
Warning message:
“`guides(<scale> = FALSE)` is deprecated. Please use `guides(<scale> = "none")` instead.”
```



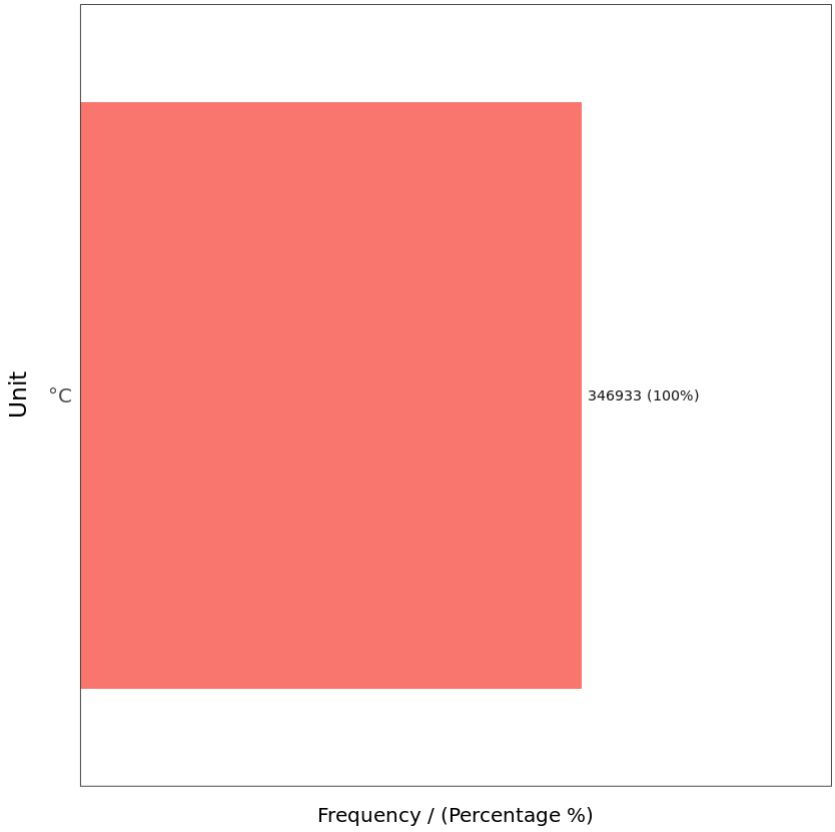

```
   Years frequency percentage cumulative_perc
1   2007      6020       1.74            1.74
```

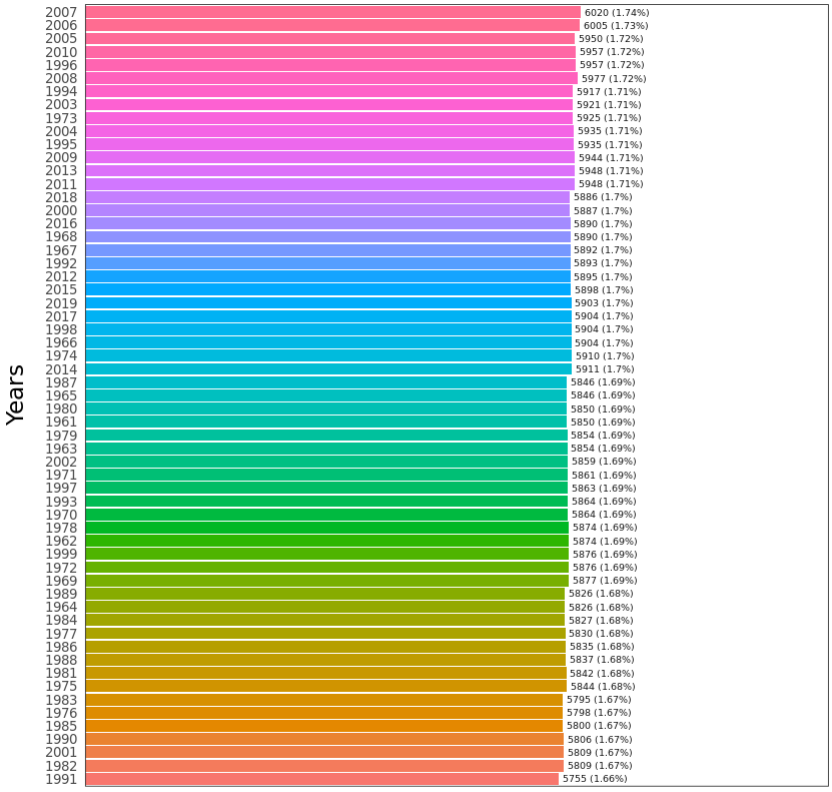
2	2006	6005	1.73	3.47
3	2008	5977	1.72	5.19
4	1996	5957	1.72	6.91
5	2010	5957	1.72	8.63
6	2005	5950	1.72	10.35
7	2011	5948	1.71	12.06
8	2013	5948	1.71	13.77
9	2009	5944	1.71	15.48
10	1995	5935	1.71	17.19
11	2004	5935	1.71	18.90
12	1973	5925	1.71	20.61
13	2003	5921	1.71	22.32
14	1994	5917	1.71	24.03
15	2014	5911	1.70	25.73
16	1974	5910	1.70	27.43
17	1966	5904	1.70	29.13
18	1998	5904	1.70	30.83
19	2017	5904	1.70	32.53
20	2019	5903	1.70	34.23
21	2015	5898	1.70	35.93
22	2012	5895	1.70	37.63
23	1992	5893	1.70	39.33
24	1967	5892	1.70	41.03
25	1968	5890	1.70	42.73
26	2016	5890	1.70	44.43
27	2000	5887	1.70	46.13
28	2018	5886	1.70	47.83
29	1969	5877	1.69	49.52
30	1972	5876	1.69	51.21
31	1999	5876	1.69	52.90
32	1962	5874	1.69	54.59
33	1978	5874	1.69	56.28
34	1970	5864	1.69	57.97
35	1993	5864	1.69	59.66
36	1997	5863	1.69	61.35
37	1971	5861	1.69	63.04
38	2002	5859	1.69	64.73
39	1963	5854	1.69	66.42
40	1979	5854	1.69	68.11
41	1961	5850	1.69	69.80
42	1980	5850	1.69	71.49
43	1965	5846	1.69	73.18
44	1987	5846	1.69	74.87
45	1975	5844	1.68	76.55
46	1981	5842	1.68	78.23
47	1988	5837	1.68	79.91
48	1986	5835	1.68	81.59
49	1977	5830	1.68	83.27
50	1984	5827	1.68	84.95
51	1964	5826	1.68	86.63
52	1989	5826	1.68	88.31
53	1982	5809	1.67	89.98
54	2001	5809	1.67	91.65
55	1990	5806	1.67	93.32
56	1985	5800	1.67	94.99
57	1976	5798	1.67	96.66
58	1983	5795	1.67	98.33
59	1991	5755	1.66	100.00

	variable	mean	std_dev	variation_coef	p_01	p_05
1	Area.Code	911.1922187	1880.6577760	2.0639528493	4.000	14.0000

```
2  Months.Code 7006.5001196    3.4524634   0.0004927515 7001.000 7001.0000
3 Element.Code 6696.2515241  596.1041398   0.0890205718 6078.000 6078.0000
4        Value    0.6043788    0.8588866   1.4211062839   -1.791   -0.6274
      p_25     p_50     p_75     p_95     p_99      skewness  kurtosis      iqr
1   74.000  150.000  226.000 5501.000 5848.000  1.990080e+00  4.995620  152.000
2 7003.000 7006.000 7010.000 7012.000 7012.000  4.597675e-05  1.783000    7.000
3 6078.000 7271.000 7271.000 7271.000 7271.000 -7.297904e-02  1.005326 1193.000
4    0.271    0.518    0.977    1.984    3.243  2.373642e-01 10.793893    0.706
         range_98        range_80
1       [4, 5848]      [28, 5207]
2    [7001, 7012]    [7002, 7011]
3    [6078, 7271]    [6078, 7271]
4 [-1.791, 3.243] [-0.239, 1.499]
```

```
Warning message:
“`guides(<scale> = FALSE)` is deprecated. Please use `guides(<scale> = "none")` instead.”
```






```
data04

 9  Variables      346933  Observations
--------------------------------------------------------------------------------
Area.Code
       n  missing distinct     Info     Mean      Gmd      .05      .10
  346933        0      284        1    911.2     1403       14       28
     .25      .50      .75      .90      .95
      74      150      226     5207     5501

lowest :    1    2    3    4    5, highest: 5815 5817 5848 5849 5873

Value          0    50   100   150   200   250   300   350  5000  5100  5200
Frequency  30484 57165 58164 55021 59173 32566  1632  1416  1416  8496  7080
Proportion 0.088 0.165 0.168 0.159 0.171 0.094 0.005 0.004 0.004 0.024 0.020

Value       5300  5400  5500  5700  5800  5850
Frequency   7416  7080  7080  1416  7080  4248
Proportion 0.021 0.020 0.020 0.004 0.020 0.012

For the frequency table, variable is rounded to the nearest 50
--------------------------------------------------------------------------------
Area
       n  missing distinct
  346933        0      284

lowest : Afghanistan    Africa         Albania        Algeria        American Samoa
highest: World          Yemen          Yugoslav SFR   Zambia         Zimbabwe
--------------------------------------------------------------------------------
Months.Code
       n  missing distinct     Info     Mean      Gmd      .05      .10
  346933        0       12    0.993     7007    3.973     7001     7002
     .25      .50      .75      .90      .95
    7003     7006     7010     7011     7012
```

```
lowest : 7001 7002 7003 7004 7005, highest: 7008 7009 7010 7011 7012

Value       7001  7002  7003  7004  7005  7006  7007  7008  7009  7010  7011
Frequency  28906 28952 28890 28897 28909 28915 28907 28902 28889 28928 28899
Proportion 0.083 0.083 0.083 0.083 0.083 0.083 0.083 0.083 0.083 0.083 0.083

Value       7012
Frequency  28939
Proportion 0.083
---------------------------------------------------------------------------
Months
       n  missing distinct
  346933        0       12

lowest : April     August    December  February  January
highest: March     May       November  October   September

Value          April    August  December  February   January      July
Frequency      28897     28902     28939     28952     28906     28907
Proportion     0.083     0.083     0.083     0.083     0.083     0.083

Value           June     March       May  November   October September
Frequency      28915     28890     28909     28899     28928     28889
Proportion     0.083     0.083     0.083     0.083     0.083     0.083
---------------------------------------------------------------------------
Element.Code
       n  missing distinct     Info     Mean      Gmd
  346933        0        2    0.749     6696    595.7

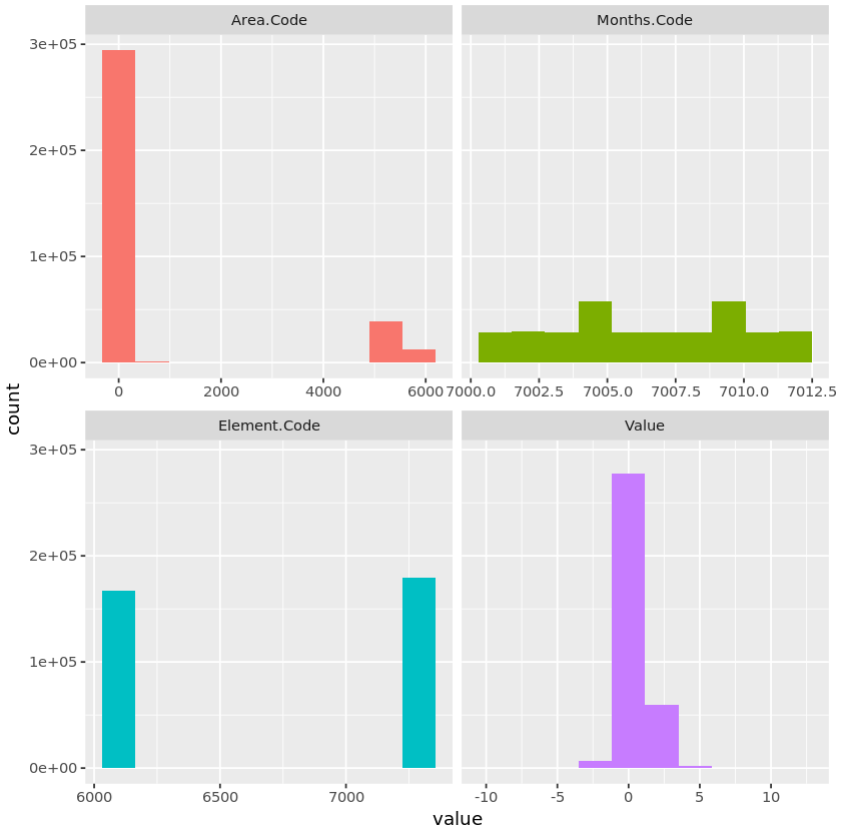
Value        6078   7271
Frequency  167141 179792
Proportion  0.482  0.518
---------------------------------------------------------------------------
Element
       n  missing distinct
  346933        0        2

Value      Standard Deviation Temperature change
Frequency              167141              179792
Proportion              0.482               0.518
---------------------------------------------------------------------------
Unit
       n  missing distinct    value
  346933        0        1       °C

Value          °C
Frequency  346933
Proportion      1
---------------------------------------------------------------------------
Years
       n  missing distinct
  346933        0       59

lowest : 1961 1962 1963 1964 1965, highest: 2015 2016 2017 2018 2019
---------------------------------------------------------------------------
Value
       n  missing distinct     Info     Mean      Gmd      .05      .10
  346933        0     8374        1   0.6044    0.861  -0.6274  -0.2390
     .25      .50      .75      .90      .95
  0.2710   0.5180   0.9770   1.4990   1.9840
```

```
lowest : -9.334 -9.154 -8.963 -8.750 -8.483, highest: 10.049 10.478 10.826 11.331 11.759
--------------------------------------------------------------------------------
```



In [21]:

```
data04$Years <- as.integer(data04$Years)
data04$Value <- as.numeric(data04$Value)
head(data04)
```

A data.frame: 6 × 9

	Area.Code	Area	Months.Code	Months	Element.Code	Element	Unit	Years	Value
	<int>	<chr>	<int>	<chr>	<int>	<chr>	<chr>	<int>	<dbl>
1	2	Afghanistan	7001	January	7271	Temperature change	°C	1961	0
2	2	Afghanistan	7001	January	6078	Standard Deviation	°C	1961	1
3	2	Afghanistan	7002	February	7271	Temperature change	°C	1961	-1
4	2	Afghanistan	7002	February	6078	Standard Deviation	°C	1961	2
5	2	Afghanistan	7003	March	7271	Temperature change	°C	1961	0
6	2	Afghanistan	7003	March	6078	Standard Deviation	°C	1961	1

In [34]:

```
data04$Area <- as.factor(data04$Area)
data04$Months <- as.factor(data04$Months)
```

```
data04$Element <- as.factor(data04$Element)
str(data04)
```

```
'data.frame':   346933 obs. of  9 variables:
 $ Area.Code   : int  2 2 2 2 2 2 2 2 2 2 ...
 $ Area        : Factor w/ 284 levels "Afghanistan",..: 1 1 1 1 1 1 1 1 1 1 ...
 $ Months.Code : int  7001 7001 7002 7002 7003 7003 7004 7004 7005 7005 ...
 $ Months      : Factor w/ 12 levels "April","August",..: 5 5 4 4 8 8 1 1 9 9 ...
 $ Element.Code: int  7271 6078 7271 6078 7271 6078 7271 6078 7271 6078 ...
 $ Element     : Factor w/ 2 levels "Standard Deviation",..: 2 1 2 1 2 1 2 1 2 1 ...
 $ Unit        : chr  "°C" "°C" "°C" "°C" ...
 $ Years       : int  1961 1961 1961 1961 1961 1961 1961 1961 1961 1961 ...
 $ Value       : num  0 1 -1 2 0 1 -1 1 1 1 ...
 - attr(*, "na.action")= 'omit' Named int [1:55211] 241 242 243 244 245 246 247 248 249 2
50 ...
  ..- attr(*, "names")= chr [1:55211] "241" "242" "243" "244" ...
```

In [35]:

```
data04_eda <- function(data04)
{
  glimpse(data04)
  print(status(data04))
  freq(data04)
  print(profiling_num(data04))
  plot_num(data04)
  describe(data04)
}
data04_eda(data04)
```

```
Rows: 346,933
Columns: 9
$ Area.Code    <int> 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, …
$ Area         <fct> "Afghanistan", "Afghanistan", "Afghanistan", "Afghanistan…
$ Months.Code  <int> 7001, 7001, 7002, 7002, 7003, 7003, 7004, 7004, 7005, 700…
$ Months       <fct> January, January, February, February, March, March, April…
$ Element.Code <int> 7271, 6078, 7271, 6078, 7271, 6078, 7271, 6078, 7271, 607…
$ Element      <fct> Temperature change, Standard Deviation, Temperature chang…
$ Unit         <chr> "°C", "°C", "°C", "°C", "°C", "°C", "°C", "°C", "°C", "°C…
$ Years        <int> 1961, 1961, 1961, 1961, 1961, 1961, 1961, 1961, 1961, 196…
$ Value        <dbl> 0, 1, -1, 2, 0, 1, -1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 1, 0, -…
                  variable q_zeros   p_zeros q_na p_na q_inf p_inf      type
Area.Code       Area.Code       0 0.0000000    0    0     0     0   integer
Area                 Area       0 0.0000000    0    0     0     0    factor
Months.Code   Months.Code       0 0.0000000    0    0     0     0   integer
Months             Months       0 0.0000000    0    0     0     0    factor
Element.Code Element.Code       0 0.0000000    0    0     0     0   integer
Element           Element       0 0.0000000    0    0     0     0    factor
Unit                 Unit       0 0.0000000    0    0     0     0 character
Years               Years       0 0.0000000    0    0     0     0   integer
Value               Value  253432 0.7304926    0    0     0     0   numeric
             unique
Area.Code       284
Area            284
Months.Code      12
Months           12
Element.Code      2
Element           2
Unit              1
Years            59
Value            21
Warning message in freq_logic(data = data, input = input[i], plot, na.rm, path_out = path
```

```
_out):
“Skipping plot for variable 'Area' (more than 100 categories)”
```

	Area	frequency	percentage
1	Afghanistan	1416	0.41
2	Africa	1416	0.41
3	Albania	1416	0.41
4	Algeria	1416	0.41
5	Americas	1416	0.41
6	Andorra	1416	0.41
7	Angola	1416	0.41
8	Anguilla	1416	0.41
9	Annex I countries	1416	0.41
10	Antarctica	1416	0.41
11	Argentina	1416	0.41
12	Asia	1416	0.41
13	Australia	1416	0.41
14	Australia and New Zealand	1416	0.41
15	Austria	1416	0.41
16	Bahamas	1416	0.41
17	Bahrain	1416	0.41
18	Bangladesh	1416	0.41
19	Belize	1416	0.41
20	Benin	1416	0.41
21	Bhutan	1416	0.41
22	Bolivia (Plurinational State of)	1416	0.41
23	Botswana	1416	0.41
24	Brazil	1416	0.41
25	British Virgin Islands	1416	0.41
26	Brunei Darussalam	1416	0.41
27	Bulgaria	1416	0.41
28	Burkina Faso	1416	0.41
29	Cambodia	1416	0.41
30	Cameroon	1416	0.41
31	Canada	1416	0.41
32	Caribbean	1416	0.41
33	Central America	1416	0.41
34	Chad	1416	0.41
35	Channel Islands	1416	0.41
36	Chile	1416	0.41
37	China	1416	0.41
38	China, Hong Kong SAR	1416	0.41
39	China, Macao SAR	1416	0.41
40	China, mainland	1416	0.41
41	China, Taiwan Province of	1416	0.41
42	Colombia	1416	0.41
43	Côte d'Ivoire	1416	0.41
44	Cuba	1416	0.41
45	Cyprus	1416	0.41
46	Democratic People's Republic of Korea	1416	0.41
47	Democratic Republic of the Congo	1416	0.41
48	Denmark	1416	0.41
49	Dominican Republic	1416	0.41
50	Eastern Africa	1416	0.41
51	Eastern Asia	1416	0.41
52	Eastern Europe	1416	0.41
53	Ecuador	1416	0.41
54	Egypt	1416	0.41
55	El Salvador	1416	0.41
56	Europe	1416	0.41
57	European Union	1416	0.41
58	Faroe Islands	1416	0.41

59	Fiji	1416	0.41
60	Finland	1416	0.41
61	France	1416	0.41
62	French Guiana	1416	0.41
63	French Polynesia	1416	0.41
64	Gambia	1416	0.41
65	Germany	1416	0.41
66	Ghana	1416	0.41
67	Gibraltar	1416	0.41
68	Greece	1416	0.41
69	Greenland	1416	0.41
70	Grenada	1416	0.41
71	Guadeloupe	1416	0.41
72	Guatemala	1416	0.41
73	Guinea	1416	0.41
74	Guinea-Bissau	1416	0.41
75	Haiti	1416	0.41
76	Holy See	1416	0.41
77	Honduras	1416	0.41
78	Hungary	1416	0.41
79	Iceland	1416	0.41
80	India	1416	0.41
81	Indonesia	1416	0.41
82	Iran (Islamic Republic of)	1416	0.41
83	Iraq	1416	0.41
84	Ireland	1416	0.41
85	Isle of Man	1416	0.41
86	Israel	1416	0.41
87	Italy	1416	0.41
88	Japan	1416	0.41
89	Jordan	1416	0.41
90	Kenya	1416	0.41
91	Kuwait	1416	0.41
92	Land Locked Developing Countries	1416	0.41
93	Lao People's Democratic Republic	1416	0.41
94	Least Developed Countries	1416	0.41
95	Lebanon	1416	0.41
96	Lesotho	1416	0.41
97	Libya	1416	0.41
98	Liechtenstein	1416	0.41
99	Low Income Food Deficit Countries	1416	0.41
100	Malaysia	1416	0.41
101	Mali	1416	0.41
102	Malta	1416	0.41
103	Mauritania	1416	0.41
104	Mauritius	1416	0.41
105	Melanesia	1416	0.41
106	Mexico	1416	0.41
107	Micronesia	1416	0.41
108	Middle Africa	1416	0.41
109	Monaco	1416	0.41
110	Mongolia	1416	0.41
111	Morocco	1416	0.41
112	Mozambique	1416	0.41
113	Myanmar	1416	0.41
114	Namibia	1416	0.41
115	Nepal	1416	0.41
116	Net Food Importing Developing Countries	1416	0.41
117	Netherlands	1416	0.41
118	Netherlands Antilles (former)	1416	0.41
119	New Caledonia	1416	0.41

120	New Zealand	1416	0.41
121	Nicaragua	1416	0.41
122	Niger	1416	0.41
123	Nigeria	1416	0.41
124	Non-Annex I countries	1416	0.41
125	Northern Africa	1416	0.41
126	Northern America	1416	0.41
127	Northern Europe	1416	0.41
128	Norway	1416	0.41
129	Oceania	1416	0.41
130	OECD	1416	0.41
131	Pakistan	1416	0.41
132	Palestine	1416	0.41
133	Papua New Guinea	1416	0.41
134	Paraguay	1416	0.41
135	Peru	1416	0.41
136	Philippines	1416	0.41
137	Poland	1416	0.41
138	Polynesia	1416	0.41
139	Portugal	1416	0.41
140	Puerto Rico	1416	0.41
141	Qatar	1416	0.41
142	Republic of Korea	1416	0.41
143	Romania	1416	0.41
144	Saint Helena, Ascension and Tristan da Cunha	1416	0.41
145	Saint Lucia	1416	0.41
146	Saint Pierre and Miquelon	1416	0.41
147	Saint Vincent and the Grenadines	1416	0.41
148	San Marino	1416	0.41
149	Saudi Arabia	1416	0.41
150	Senegal	1416	0.41
151	Seychelles	1416	0.41
152	Small Island Developing States	1416	0.41
153	South Africa	1416	0.41
154	South America	1416	0.41
155	South-Eastern Asia	1416	0.41
156	Southern Africa	1416	0.41
157	Southern Asia	1416	0.41
158	Southern Europe	1416	0.41
159	Spain	1416	0.41
160	Sri Lanka	1416	0.41
161	Suriname	1416	0.41
162	Svalbard and Jan Mayen Islands	1416	0.41
163	Sweden	1416	0.41
164	Switzerland	1416	0.41
165	Syrian Arab Republic	1416	0.41
166	Thailand	1416	0.41
167	Togo	1416	0.41
168	Tonga	1416	0.41
169	Tunisia	1416	0.41
170	Turkey	1416	0.41
171	Uganda	1416	0.41
172	United Arab Emirates	1416	0.41
173	United Kingdom	1416	0.41
174	United Republic of Tanzania	1416	0.41
175	United States of America	1416	0.41
176	United States Virgin Islands	1416	0.41
177	Uruguay	1416	0.41
178	Venezuela (Bolivarian Republic of)	1416	0.41
179	Viet Nam	1416	0.41
180	Wallis and Futuna Islands	1416	0.41

181	Western Africa	1416	0.41
182	Western Asia	1416	0.41
183	Western Europe	1416	0.41
184	Western Sahara	1416	0.41
185	World	1416	0.41
186	Zimbabwe	1416	0.41
187	Cocos (Keeling) Islands	1414	0.41
188	Guyana	1414	0.41
189	Martinique	1414	0.41
190	Somalia	1414	0.41
191	Zambia	1414	0.41
192	Central African Republic	1410	0.41
193	Dominica	1410	0.41
194	Oman	1410	0.41
195	Eswatini	1408	0.41
196	Madagascar	1408	0.41
197	Gabon	1404	0.40
198	Malawi	1404	0.40
199	Congo	1402	0.40
200	Tuvalu	1402	0.40
201	Liberia	1400	0.40
202	Vanuatu	1400	0.40
203	Réunion	1386	0.40
204	Sierra Leone	1384	0.40
205	Comoros	1380	0.40
206	French Southern and Antarctic Territories	1374	0.40
207	Equatorial Guinea	1372	0.40
208	Mayotte	1354	0.39
209	Antigua and Barbuda	1352	0.39
210	Montserrat	1352	0.39
211	Saint Kitts and Nevis	1352	0.39
212	Djibouti	1350	0.39
213	Jamaica	1350	0.39
214	Cook Islands	1348	0.39
215	Samoa	1346	0.39
216	Kiribati	1344	0.39
217	Barbados	1328	0.38
218	Trinidad and Tobago	1316	0.38
219	Norfolk Island	1310	0.38
220	Cabo Verde	1308	0.38
221	Aruba	1306	0.38
222	Turks and Caicos Islands	1306	0.38
223	Sao Tome and Principe	1300	0.37
224	Solomon Islands	1290	0.37
225	American Samoa	1280	0.37
226	Maldives	1266	0.36
227	Cayman Islands	1230	0.35
228	South Georgia and the South Sandwich Islands	1222	0.35
229	Sudan (former)	1200	0.35
230	Pitcairn Islands	1132	0.33
231	Timor-Leste	1122	0.32
232	Tokelau	942	0.27
233	Belgium-Luxembourg	936	0.27
234	Burundi	892	0.26
235	Rwanda	892	0.26
236	Yemen	792	0.23
237	Czechoslovakia	768	0.22
238	Ethiopia PDR	756	0.22
239	USSR	744	0.21
240	Yugoslav SFR	744	0.21
241	Pacific Islands Trust Territory	712	0.21

242		Niue	676	0.19
243		Singapore	674	0.19
244		Panama	661	0.19
245		Costa Rica	608	0.18
246		Falkland Islands (Malvinas)	508	0.15
247		Wake Island	496	0.14
248		Christmas Island	487	0.14
249		Midway Island	382	0.11
250		Marshall Islands	348	0.10
251		Micronesia (Federated States of)	348	0.10
252		Armenia	336	0.10
253		Azerbaijan	336	0.10
254		Belarus	336	0.10
255		Bosnia and Herzegovina	336	0.10
256		Central Asia	336	0.10
257		Croatia	336	0.10
258		Estonia	336	0.10
259		Georgia	336	0.10
260		Kazakhstan	336	0.10
261		Kyrgyzstan	336	0.10
262		Latvia	336	0.10
263		Lithuania	336	0.10
264		North Macedonia	336	0.10
265		Republic of Moldova	336	0.10
266		Russian Federation	336	0.10
267		Slovenia	336	0.10
268		Tajikistan	336	0.10
269		Turkmenistan	336	0.10
270		Ukraine	336	0.10
271		Uzbekistan	336	0.10
272		Czechia	324	0.09
273		Ethiopia	324	0.09
274		Slovakia	324	0.09
275		Eritrea	302	0.09
276		Palau	281	0.08
277		Belgium	240	0.07
278		Luxembourg	240	0.07
279		Nauru	228	0.07
280		Montenegro	168	0.05
281		Serbia	168	0.05
282		Serbia and Montenegro	168	0.05
283		South Sudan	108	0.03
284		Sudan	108	0.03

	cumulative_perc
1	0.41
2	0.82
3	1.23
4	1.64
5	2.05
6	2.46
7	2.87
8	3.28
9	3.69
10	4.10
11	4.51
12	4.92
13	5.33
14	5.74
15	6.15
16	6.56
17	6.97

18	7.38
19	7.79
20	8.20
21	8.61
22	9.02
23	9.43
24	9.84
25	10.25
26	10.66
27	11.07
28	11.48
29	11.89
30	12.30
31	12.71
32	13.12
33	13.53
34	13.94
35	14.35
36	14.76
37	15.17
38	15.58
39	15.99
40	16.40
41	16.81
42	17.22
43	17.63
44	18.04
45	18.45
46	18.86
47	19.27
48	19.68
49	20.09
50	20.50
51	20.91
52	21.32
53	21.73
54	22.14
55	22.55
56	22.96
57	23.37
58	23.78
59	24.19
60	24.60
61	25.01
62	25.42
63	25.83
64	26.24
65	26.65
66	27.06
67	27.47
68	27.88
69	28.29
70	28.70
71	29.11
72	29.52
73	29.93
74	30.34
75	30.75
76	31.16
77	31.57
78	31.98

```
79          32.39
80          32.80
81          33.21
82          33.62
83          34.03
84          34.44
85          34.85
86          35.26
87          35.67
88          36.08
89          36.49
90          36.90
91          37.31
92          37.72
93          38.13
94          38.54
95          38.95
96          39.36
97          39.77
98          40.18
99          40.59
100         41.00
101         41.41
102         41.82
103         42.23
104         42.64
105         43.05
106         43.46
107         43.87
108         44.28
109         44.69
110         45.10
111         45.51
112         45.92
113         46.33
114         46.74
115         47.15
116         47.56
117         47.97
118         48.38
119         48.79
120         49.20
121         49.61
122         50.02
123         50.43
124         50.84
125         51.25
126         51.66
127         52.07
128         52.48
129         52.89
130         53.30
131         53.71
132         54.12
133         54.53
134         54.94
135         55.35
136         55.76
137         56.17
138         56.58
139         56.99
```

```
140         57.40
141         57.81
142         58.22
143         58.63
144         59.04
145         59.45
146         59.86
147         60.27
148         60.68
149         61.09
150         61.50
151         61.91
152         62.32
153         62.73
154         63.14
155         63.55
156         63.96
157         64.37
158         64.78
159         65.19
160         65.60
161         66.01
162         66.42
163         66.83
164         67.24
165         67.65
166         68.06
167         68.47
168         68.88
169         69.29
170         69.70
171         70.11
172         70.52
173         70.93
174         71.34
175         71.75
176         72.16
177         72.57
178         72.98
179         73.39
180         73.80
181         74.21
182         74.62
183         75.03
184         75.44
185         75.85
186         76.26
187         76.67
188         77.08
189         77.49
190         77.90
191         78.31
192         78.72
193         79.13
194         79.54
195         79.95
196         80.36
197         80.76
198         81.16
199         81.56
200         81.96
```

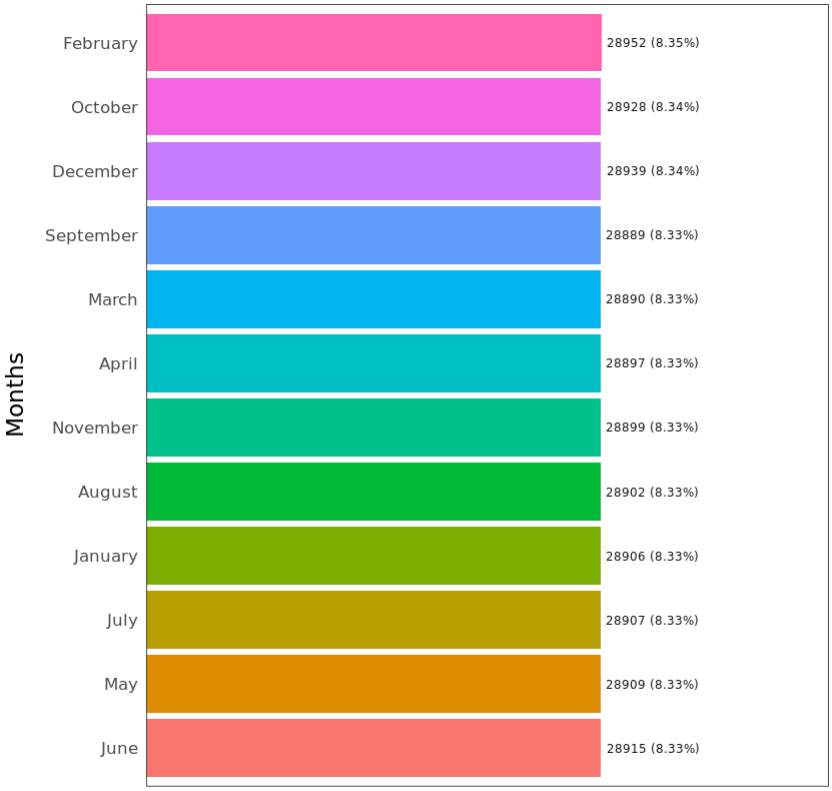
```
201         82.36
202         82.76
203         83.16
204         83.56
205         83.96
206         84.36
207         84.76
208         85.15
209         85.54
210         85.93
211         86.32
212         86.71
213         87.10
214         87.49
215         87.88
216         88.27
217         88.65
218         89.03
219         89.41
220         89.79
221         90.17
222         90.55
223         90.92
224         91.29
225         91.66
226         92.02
227         92.37
228         92.72
229         93.07
230         93.40
231         93.72
232         93.99
233         94.26
234         94.52
235         94.78
236         95.01
237         95.23
238         95.45
239         95.66
240         95.87
241         96.08
242         96.27
243         96.46
244         96.65
245         96.83
246         96.98
247         97.12
248         97.26
249         97.37
250         97.47
251         97.57
252         97.67
253         97.77
254         97.87
255         97.97
256         98.07
257         98.17
258         98.27
259         98.37
260         98.47
261         98.57
```

```
262           98.67
263           98.77
264           98.87
265           98.97
266           99.07
267           99.17
268           99.27
269           99.37
270           99.47
271           99.57
272           99.66
273           99.75
274           99.84
275           99.93
276          100.01
277          100.08
278          100.15
279          100.22
280          100.27
281          100.32
282          100.37
283          100.40
284          100.00
```

```
Warning message:
“`guides(<scale> = FALSE)` is deprecated. Please use `guides(<scale> = "none")` instead.”
      Months frequency percentage cumulative_perc
1   February     28952       8.35            8.35
2   December     28939       8.34           16.69
3    October     28928       8.34           25.03
4       June     28915       8.33           33.36
5        May     28909       8.33           41.69
6       July     28907       8.33           50.02
7    January     28906       8.33           58.35
8     August     28902       8.33           66.68
9   November     28899       8.33           75.01
10     April     28897       8.33           83.34
11     March     28890       8.33           91.67
12 September     28889       8.33          100.00
```

```
Warning message:
“`guides(<scale> = FALSE)` is deprecated. Please use `guides(<scale> = "none")` instead.”
             Element frequency percentage cumulative_perc
1 Temperature change    179792      51.82           51.82
2 Standard Deviation    167141      48.18          100.00
```

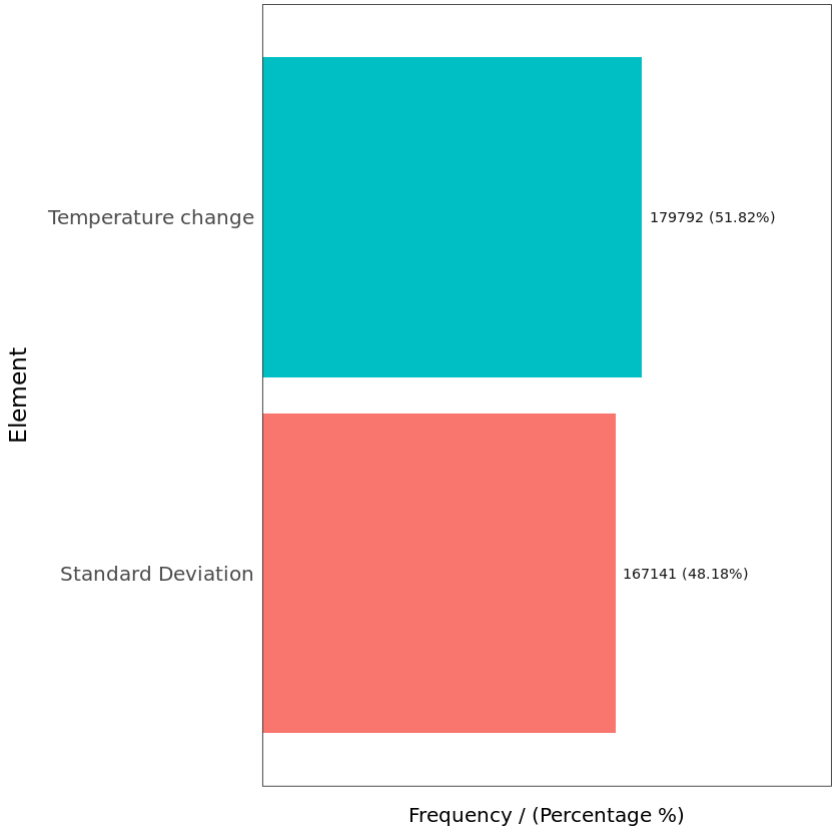
```
Warning message:
“`guides(<scale> = FALSE)` is deprecated. Please use `guides(<scale> = "none")` instead.”
```

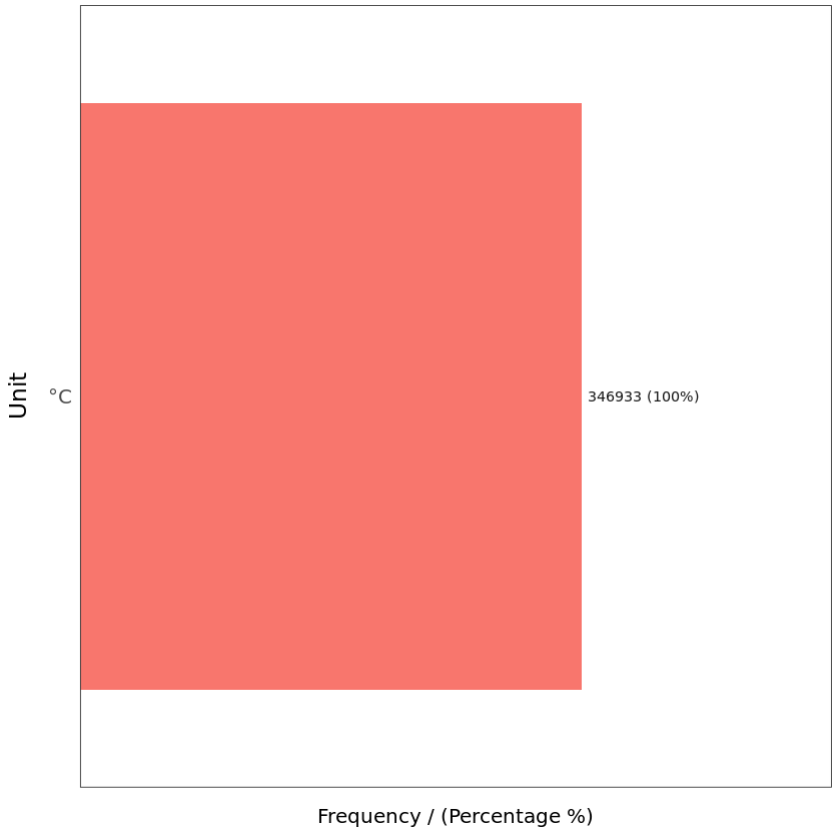



```
  Unit frequency percentage cumulative_perc
1   °C    346933        100             100
```

```
      variable         mean     std_dev variation_coef p_01 p_05 p_25 p_50 p_75
1    Area.Code  911.1922187 1880.657776   2.0639528493    4   14   74  150  226
2  Months.Code 7006.5001196    3.452463   0.0004927515 7001 7001 7003 7006 7010
3 Element.Code 6696.2515241  596.104140   0.0890205718 6078 6078 6078 7271 7271
4        Years 1990.0733283   17.046060   0.0085655439 1961 1963 1975 1990 2005
5        Value    0.2708246    0.714862   2.6395753610   -1    0    0    0    0
  p_95 p_99      skewness  kurtosis  iqr     range_98     range_80
1 5501 5848  1.990080e+00  4.995620  152    [4, 5848]   [28, 5207]
2 7012 7012  4.597675e-05  1.783000    7 [7001, 7012] [7002, 7011]
3 7271 7271 -7.297904e-02  1.005326 1193 [6078, 7271] [6078, 7271]
4 2017 2019 -7.227213e-03  1.794807   30 [1961, 2019] [1966, 2014]
5    1    3  1.360666e+00 15.121142    0      [-1, 3]       [0, 1]
```

```
Warning message:
“`guides(<scale> = FALSE)` is deprecated. Please use `guides(<scale> = "none")` instead.”
```






```
data04

 9  Variables      346933  Observations
--------------------------------------------------------------------------------
Area.Code
       n  missing distinct     Info     Mean      Gmd      .05      .10
  346933        0      284        1    911.2     1403       14       28
     .25      .50      .75      .90      .95
```

```
      74      150      226     5207     5501

lowest :    1    2    3    4    5, highest: 5815 5817 5848 5849 5873

Value          0    50   100   150   200   250   300   350  5000  5100  5200
Frequency  30484 57165 58164 55021 59173 32566  1632  1416  1416  8496  7080
Proportion 0.088 0.165 0.168 0.159 0.171 0.094 0.005 0.004 0.004 0.024 0.020

Value       5300  5400  5500  5700  5800  5850
Frequency   7416  7080  7080  1416  7080  4248
Proportion 0.021 0.020 0.020 0.004 0.020 0.012

For the frequency table, variable is rounded to the nearest 50
------------------------------------------------------------------------------
Area
       n  missing distinct
  346933        0      284

lowest : Afghanistan    Africa         Albania        Algeria        American Samoa
highest: World          Yemen          Yugoslav SFR   Zambia         Zimbabwe
------------------------------------------------------------------------------
Months.Code
       n  missing distinct     Info     Mean      Gmd      .05      .10
  346933        0       12    0.993     7007    3.973     7001     7002
     .25      .50      .75      .90      .95
    7003     7006     7010     7011     7012

lowest : 7001 7002 7003 7004 7005, highest: 7008 7009 7010 7011 7012

Value       7001  7002  7003  7004  7005  7006  7007  7008  7009  7010  7011
Frequency  28906 28952 28890 28897 28909 28915 28907 28902 28889 28928 28899
Proportion 0.083 0.083 0.083 0.083 0.083 0.083 0.083 0.083 0.083 0.083 0.083

Value       7012
Frequency  28939
Proportion 0.083
------------------------------------------------------------------------------
Months
       n  missing distinct
  346933        0       12

lowest : April     August    December  February  January
highest: March     May       November  October   September

Value          April    August  December  February   January      July
Frequency      28897     28902     28939     28952     28906     28907
Proportion     0.083     0.083     0.083     0.083     0.083     0.083

Value           June     March       May  November   October September
Frequency      28915     28890     28909     28899     28928     28889
Proportion     0.083     0.083     0.083     0.083     0.083     0.083
------------------------------------------------------------------------------
Element.Code
       n  missing distinct     Info     Mean      Gmd
  346933        0        2    0.749     6696    595.7

Value        6078   7271
Frequency  167141 179792
Proportion  0.482  0.518
------------------------------------------------------------------------------
Element
```

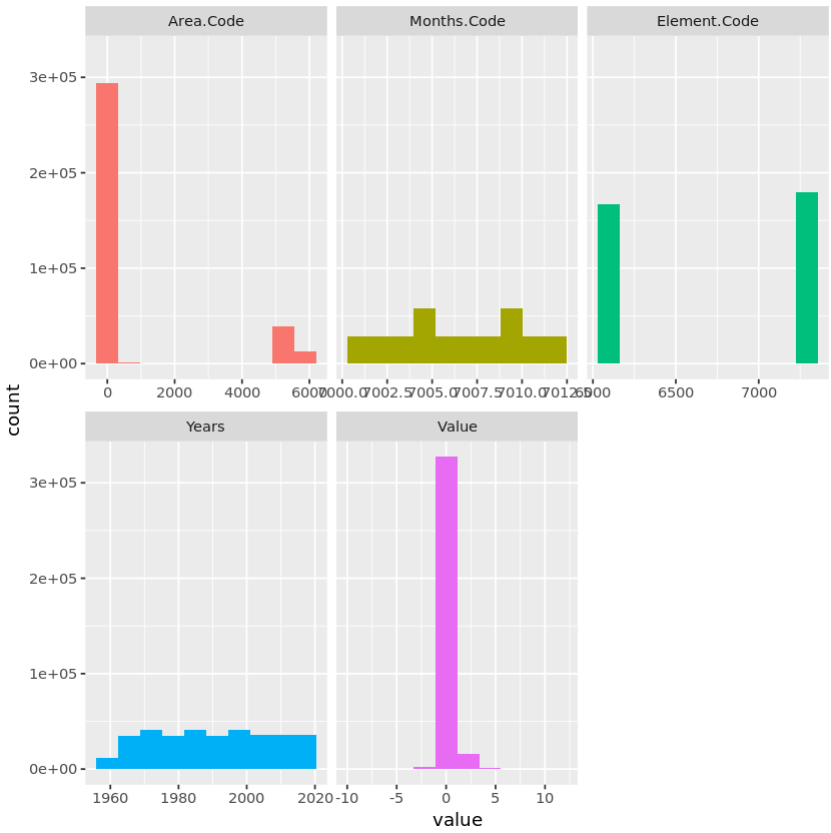
```
       n  missing distinct
  346933        0        2

Value      Standard Deviation Temperature change
Frequency                167141              179792
Proportion                0.482               0.518
--------------------------------------------------------------------------------
Unit
       n  missing distinct    value
  346933        0        1       °C

Value          °C
Frequency  346933
Proportion      1
--------------------------------------------------------------------------------
Years
       n  missing distinct     Info     Mean      Gmd      .05      .10
  346933        0       59        1     1990    19.68     1963     1966
     .25      .50      .75      .90      .95
    1975     1990     2005     2014     2017

lowest : 1961 1962 1963 1964 1965, highest: 2015 2016 2017 2018 2019
--------------------------------------------------------------------------------
Value
       n  missing distinct     Info     Mean      Gmd      .05      .10
  346933        0       21    0.603   0.2708   0.5768        0        0
     .25      .50      .75      .90      .95
       0        0        0        1        1

lowest : -9 -8 -7 -6 -5, highest:  7  8  9 10 11
--------------------------------------------------------------------------------
```



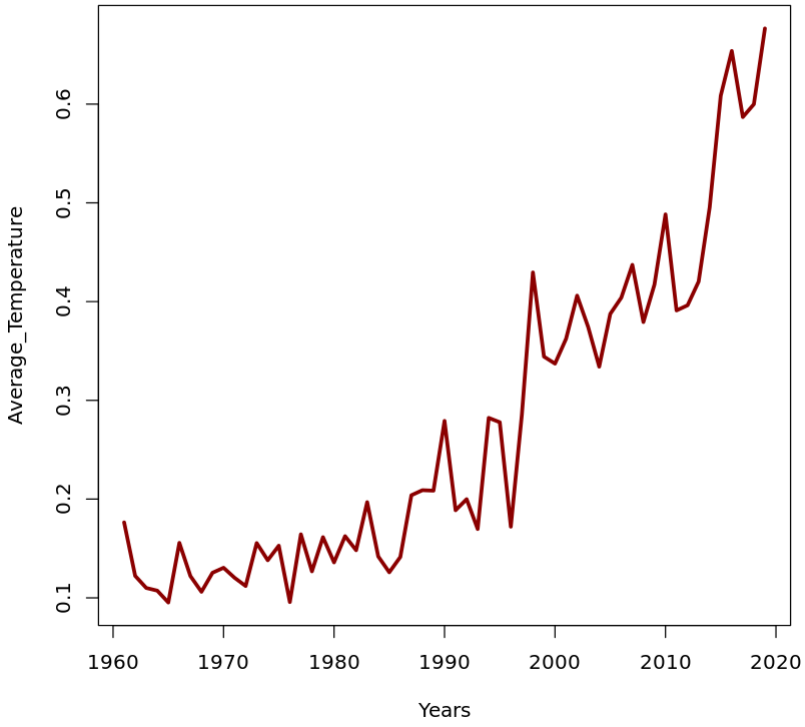
In [36]:

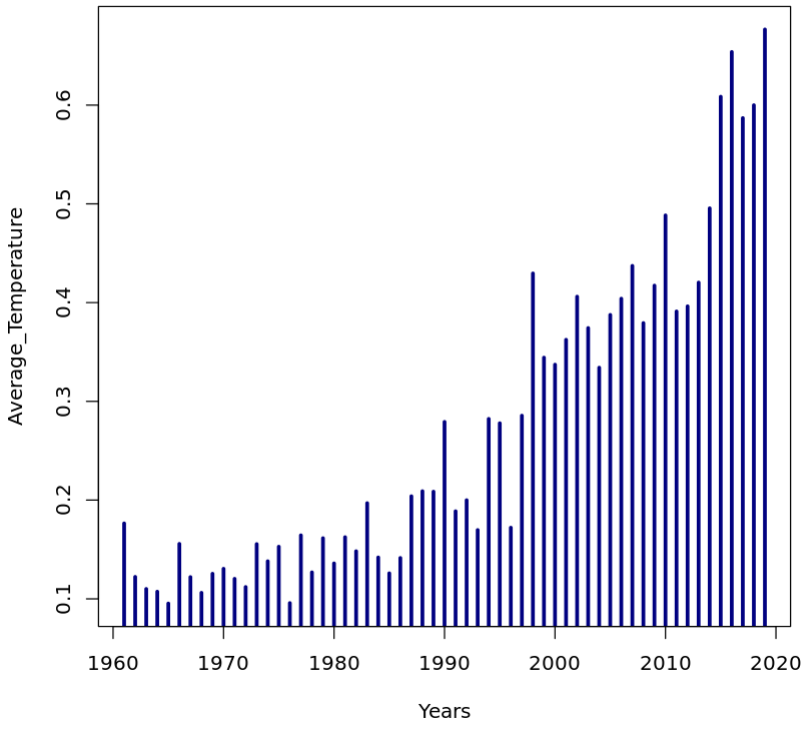
```
df1 <- data04 %>%
  group_by(Years) %>%
```

```
  dplyr::summarize(Average_Temperature = mean(Value, na.rm = TRUE))
```

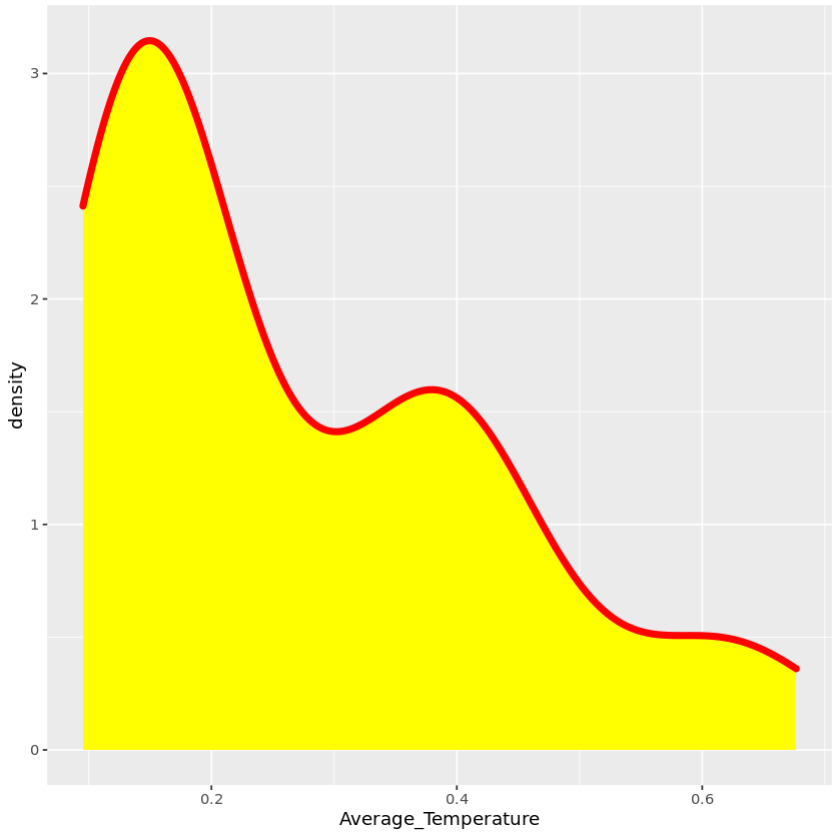
In [37]:

```
plot(Average_Temperature ~ Years, data=df1, type = 'l', col = 'darkred', lwd =3)
plot(Average_Temperature ~ Years, data=df1, type = 'h', col = 'navy', lwd =3)
```





In [38]:
```
ggplot(df1, aes(x=Average_Temperature, color=Years)) +
  geom_density(color="red", fill="yellow", lwd=2)
```



In [39]:
```
status(data04)
```

A data.frame: 9 × 9

	variable	q_zeros	p_zeros	q_na	p_na	q_inf	p_inf	type	unique
	<chr>	<int>	<dbl>	<int>	<dbl>	<int>	<dbl>	<chr>	<int>
Area.Code	Area.Code	0	0.0000000	0	0	0	0	integer	284
Area	Area	0	0.0000000	0	0	0	0	factor	284
Months.Code	Months.Code	0	0.0000000	0	0	0	0	integer	12
Months	Months	0	0.0000000	0	0	0	0	factor	12
Element.Code	Element.Code	0	0.0000000	0	0	0	0	integer	2
Element	Element	0	0.0000000	0	0	0	0	factor	2
Unit	Unit	0	0.0000000	0	0	0	0	character	1
Years	Years	0	0.0000000	0	0	0	0	integer	59
Value	Value	253432	0.7304926	0	0	0	0	numeric	21

In [40]:
```
dim(data04)
```

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In [48]:

```
str(data04)
```

```
'data.frame':   346933 obs. of  9 variables:
 $ Area.Code   : int  2 2 2 2 2 2 2 2 2 2 ...
 $ Area        : Factor w/ 284 levels "Afghanistan",..: 1 1 1 1 1 1 1 1 1 1 ...
 $ Months.Code : int  7001 7001 7002 7002 7003 7003 7004 7004 7005 7005 ...
 $ Months      : Factor w/ 12 levels "April","August",..: 5 5 4 4 8 8 1 1 9 9 ...
 $ Element.Code: int  7271 6078 7271 6078 7271 6078 7271 6078 7271 6078 ...
 $ Element     : Factor w/ 2 levels "Standard Deviation",..: 2 1 2 1 2 1 2 1 2 1 ...
 $ Unit        : chr  "°C" "°C" "°C" "°C" ...
 $ Years       : int  1961 1961 1961 1961 1961 1961 1961 1961 1961 1961 ...
 $ Value       : num  0 1 -1 2 0 1 -1 1 1 1 ...
 - attr(*, "na.action")= 'omit' Named int [1:55211] 241 242 243 244 245 246 247 248 249 2
50 ...
  ..- attr(*, "names")= chr [1:55211] "241" "242" "243" "244" ...
```

In [46]:

```
head(model.matrix(Element ~ Area.Code + Area + Months.Code + Months + Years, data = data0
```

	(Intercept)	Area.Code	AreaAfrica	AreaAlbania	AreaAlgeria	AreaAmerican Samoa	AreaAmericas	AreaAndor
1	1	2	0	0	0	0	0	
2	1	2	0	0	0	0	0	
3	1	2	0	0	0	0	0	
4	1	2	0	0	0	0	0	
5	1	2	0	0	0	0	0	
6	1	2	0	0	0	0	0	

In [47]:

```
data04_dm <- dummyVars(Element ~ Area.Code + Area + Months.Code + Months + Years , data =
head(predict(data04_dm, newdata = data04))
```

```
Warning message in model.frame.default(Terms, newdata, na.action = na.action, xlev = obje
ct$lvls):
“variable 'Element' is not a factor”
```

	Area.Code	Area.Afghanistan	Area.Africa	Area.Albania	Area.Algeria	Area.American Samoa	Area.Americas	Ar
1	2	1	0	0	0	0	0	
2	2	1	0	0	0	0	0	
3	2	1	0	0	0	0	0	
4	2	1	0	0	0	0	0	
5	2	1	0	0	0	0	0	
6	2	1	0	0	0	0	0	

In [50]:

```
head(data04)
```

A data.frame: 6 × 9

	Area.Code	Area	Months.Code	Months	Element.Code	Element	Unit	Years	Value
	<int>	<fct>	<int>	<fct>	<int>	<fct>	<chr>	<int>	<dbl>
1	2	Afghanistan	7001	January	7271	Temperature change	°C	1961	0
2	2	Afghanistan	7001	January	6078	Standard Deviation	°C	1961	1
3	2	Afghanistan	7002	February	7271	Temperature change	°C	1961	-1
4	2	Afghanistan	7002	February	6078	Standard Deviation	°C	1961	2
5	2	Afghanistan	7003	March	7271	Temperature change	°C	1961	0
6	2	Afghanistan	7003	March	6078	Standard Deviation	°C	1961	1

In [83]:
```
df2 <- data04[ ,c("Area.Code", "Months.Code", "Element.Code", "Years", "Value")]
# Checking the dim
dim(df2)
```

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In [84]:
```
# Identifying Correlated Predictors
descrCor <-  cor(df2)
```

In [85]:
```
highCorr <- sum(abs(descrCor[upper.tri(descrCor)]) > .999)
```

In [86]:
```
descrCor
```

A matrix: 5 × 5 of type dbl

	Area.Code	Months.Code	Element.Code	Years	Value
Area.Code	1.000000e+00	-2.009126e-05	-0.0121269952	8.226822e-04	-0.050355269
Months.Code	-2.009126e-05	1.000000e+00	0.0000258875	-1.014059e-05	-0.060309284
Element.Code	-1.212700e-02	2.588750e-05	1.0000000000	2.879039e-02	0.009876368
Years	8.226822e-04	-1.014059e-05	0.0287903936	1.000000e+00	0.201347021
Value	-5.035527e-02	-6.030928e-02	0.0098763676	2.013470e-01	1.000000000

In [57]:
```
library(corrplot)
```

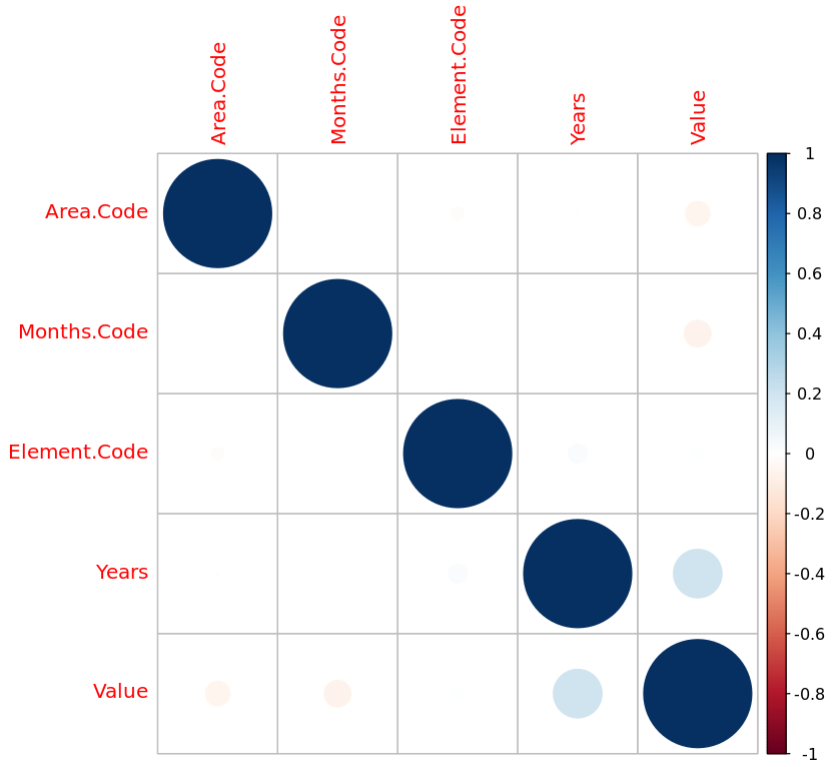
```
corrplot 0.90 loaded


Attaching package: ‘corrplot’
```

```
The following object is masked from ‘package:pls’:

    corrplot
```

In [87]:
```
corrplot(descrCor)
```



In [88]:
```
df3 <- data04[ ,c("Area.Code", "Months.Code", "Months", "Element.Code", "Element", "Years
# Checking the dim
dim(df3)
```

346933 · 7

In [90]:
```
d04_comboInfo <- findLinearCombos(df2)
d04_comboInfo
```

$linearCombos

$remove

NULL

In [91]:
```
head(df3)
```

A data.frame: 6 × 7

Area.Code	Months.Code	Months	Element.Code	Element	Years	Value
<int>	<int>	<fct>	<int>	<fct>	<int>	<dbl>

	Area.Code	Months.Code	Months	Element.Code	Element	Years	Value
	<int>	<int>	<fct>	<int>	<fct>	<int>	<dbl>
1	2	7001	January	7271	Temperature change	1961	0
2	2	7001	January	6078	Standard Deviation	1961	1
3	2	7002	February	7271	Temperature change	1961	-1
4	2	7002	February	6078	Standard Deviation	1961	2
5	2	7003	March	7271	Temperature change	1961	0
6	2	7003	March	6078	Standard Deviation	1961	1

In [92]:

```
df3_pp_hpc <- preProcess(df3[, -8],
                         method = c("center", "scale", "YeoJohnson"))
df3_pp_hpc
```

```
Created from 346933 samples and 7 variables

Pre-processing:
  - centered (5)
  - ignored (2)
  - scaled (5)
  - Yeo-Johnson transformation (4)

Lambda estimates for Yeo-Johnson transformation:
-0.13, 0.68, 1.28, 0.73
```

In [93]:

```
df3_transformed <- predict(df3_pp_hpc, newdata = df3[, -8])
head(df3_transformed)
```

A data.frame: 6 × 7

	Area.Code	Months.Code	Months	Element.Code	Element	Years	Value
	<dbl>	<dbl>	<fct>	<dbl>	<fct>	<dbl>	<dbl>
1	-3.273346	-1.593220	January	0.9641746	Temperature change	-1.703316	-0.3395317
2	-3.273346	-1.593220	January	-1.0371535	Standard Deviation	-1.703316	1.0330477
3	-3.273346	-1.303506	February	0.9641746	Temperature change	-1.703316	-2.0315188
4	-3.273346	-1.303506	February	-1.0371535	Standard Deviation	-1.703316	2.2231639
5	-3.273346	-1.013806	March	0.9641746	Temperature change	-1.703316	-0.3395317
6	-3.273346	-1.013806	March	-1.0371535	Standard Deviation	-1.703316	1.0330477

In [94]:

```
set.seed(3456)
trainIndex <- createDataPartition(df3$Element.Code, p = .8,
                                  list = FALSE,
                                  times = 1)
head(trainIndex)
```

A matrix: 6 ×

1 of type int

Resample1

Resample1
1
2
4
5
7
8

In [95]:
```
df3_Train <- df3[ trainIndex,]
df3_Test  <- df3[-trainIndex,]
```

In [74]:
```
#install.packages('gbm')
library(gbm)
```

```
Installing package into ‘/home/mladenoffj/R_libs’
(as ‘lib’ is unspecified)

Loaded gbm 2.1.8
```

In [96]:
```
fitControl <- trainControl(## 10-fold CV
                           method = "repeatedcv",
                           number = 10,
                           ## repeated ten times
                           repeats = 10)
```

In [99]:
```
#install.packages('e1071')
library(e1071)
```

```
Installing package into ‘/home/mladenoffj/R_libs’
(as ‘lib’ is unspecified)

also installing the dependency ‘proxy’



Attaching package: ‘e1071’


The following object is masked from ‘package:Hmisc’:

    impute
```

In [100]:
```
gbmFit1 <- train(Element ~ ., data = df3_Train,
                 method = "gbm",
                 trControl = fitControl,
                 ## This last option is actually one
                 ## for gbm() that passes through
```

```
                    verbose = FALSE)
gbmFit1
```

```
Stochastic Gradient Boosting

277547 samples
     6 predictor
     2 classes: 'Standard Deviation', 'Temperature change'

No pre-processing
Resampling: Cross-Validated (10 fold, repeated 10 times)
Summary of sample sizes: 249793, 249792, 249792, 249792, 249792, 249792, ...
Resampling results across tuning parameters:

  interaction.depth  n.trees  Accuracy  Kappa
  1                   50      1         1
  1                  100      1         1
  1                  150      1         1
  2                   50      1         1
  2                  100      1         1
  2                  150      1         1
  3                   50      1         1
  3                  100      1         1
  3                  150      1         1

Tuning parameter 'shrinkage' was held constant at a value of 0.1

Tuning parameter 'n.minobsinnode' was held constant at a value of 10
Accuracy was used to select the optimal model using the largest value.
The final values used for the model were n.trees = 50, interaction.depth =
 1, shrinkage = 0.1 and n.minobsinnode = 10.
```

In [ ]:

In [ ]: