Homework 5

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library(gridExtra) ## Exercise 1 The value of the "here" package? - Using the here::here package overrides the default behaivour of .R files that make the default working directory the top level of the project file. The here package lets you specify what level of the project file you are working in. A;sp, Here() let's you see where you are working. The package allows for easier file sharing between users because it specifies file locations therefore helps reproducibility.

```
library(here)
```

```
## here() starts at /Users/sallyinnis/Documents/Term 1 2019/R Coding Course/STAT545-participation
here()
```

```
## [1] "/Users/sallyinnis/Documents/Term 1 2019/R Coding Course/STAT545-participation"
```

Exercise 2

Choose one dataset to explore by: I have chosen Gapminder as the dataset and country as the factor 1. Drop factor / levels

Then explore the effects by 1) Comparing the results of arrange on the original and re-leveled factor and 2) Plotting a figure of before/after re-leveling the factor.

Exploration of Factor:

```
gapminder$country %>%
  str()
```

```
##  Factor w/ 142 levels "Afghanistan",..: 1 1 1 1 1 1 1 1 1 1 ...
nrow(gapminder)
```

```
## [1] 1704
nlevels(gapminder$country)
```

```
## [1] 142
levels(gapminder$country)
```

```
##    [1] "Afghanistan"             "Albania"
##    [3] "Algeria"                 "Angola"
##    [5] "Argentina"               "Australia"
##    [7] "Austria"                 "Bahrain"
##    [9] "Bangladesh"              "Belgium"
##   [11] "Benin"                   "Bolivia"
##   [13] "Bosnia and Herzegovina"  "Botswana"
##   [15] "Brazil"                  "Bulgaria"
##   [17] "Burkina Faso"            "Burundi"
##   [19] "Cambodia"                "Cameroon"
##   [21] "Canada"                  "Central African Republic"
##   [23] "Chad"                    "Chile"
##   [25] "China"                   "Colombia"
##   [27] "Comoros"                 "Congo, Dem. Rep."
##   [29] "Congo, Rep."             "Costa Rica"
```

```
##  [31] "Cote d'Ivoire"          "Croatia"
##  [33] "Cuba"                    "Czech Republic"
##  [35] "Denmark"                 "Djibouti"
##  [37] "Dominican Republic"      "Ecuador"
##  [39] "Egypt"                   "El Salvador"
##  [41] "Equatorial Guinea"       "Eritrea"
##  [43] "Ethiopia"                "Finland"
##  [45] "France"                  "Gabon"
##  [47] "Gambia"                  "Germany"
##  [49] "Ghana"                   "Greece"
##  [51] "Guatemala"               "Guinea"
##  [53] "Guinea-Bissau"           "Haiti"
##  [55] "Honduras"                "Hong Kong, China"
##  [57] "Hungary"                 "Iceland"
##  [59] "India"                   "Indonesia"
##  [61] "Iran"                    "Iraq"
##  [63] "Ireland"                 "Israel"
##  [65] "Italy"                   "Jamaica"
##  [67] "Japan"                   "Jordan"
##  [69] "Kenya"                   "Korea, Dem. Rep."
##  [71] "Korea, Rep."             "Kuwait"
##  [73] "Lebanon"                 "Lesotho"
##  [75] "Liberia"                 "Libya"
##  [77] "Madagascar"              "Malawi"
##  [79] "Malaysia"                "Mali"
##  [81] "Mauritania"              "Mauritius"
##  [83] "Mexico"                  "Mongolia"
##  [85] "Montenegro"              "Morocco"
##  [87] "Mozambique"              "Myanmar"
##  [89] "Namibia"                 "Nepal"
##  [91] "Netherlands"             "New Zealand"
##  [93] "Nicaragua"               "Niger"
##  [95] "Nigeria"                 "Norway"
##  [97] "Oman"                    "Pakistan"
##  [99] "Panama"                  "Paraguay"
## [101] "Peru"                    "Philippines"
## [103] "Poland"                  "Portugal"
## [105] "Puerto Rico"             "Reunion"
## [107] "Romania"                 "Rwanda"
## [109] "Sao Tome and Principe"   "Saudi Arabia"
## [111] "Senegal"                 "Serbia"
## [113] "Sierra Leone"            "Singapore"
## [115] "Slovak Republic"         "Slovenia"
## [117] "Somalia"                 "South Africa"
## [119] "Spain"                   "Sri Lanka"
## [121] "Sudan"                   "Swaziland"
## [123] "Sweden"                  "Switzerland"
## [125] "Syria"                   "Taiwan"
## [127] "Tanzania"                "Thailand"
## [129] "Togo"                    "Trinidad and Tobago"
## [131] "Tunisia"                 "Turkey"
## [133] "Uganda"                  "United Kingdom"
## [135] "United States"          "Uruguay"
## [137] "Venezuela"               "Vietnam"
```

```
## [139] "West Bank and Gaza"        "Yemen, Rep."
## [141] "Zambia"                     "Zimbabwe"
```

Remove Observations associated with Oceania:

```r
newgapminder <- gapminder %>%
  filter(continent != "Oceania")
nlevels(newgapminder$country)
```

```
## [1] 142
```

```r
nrow(newgapminder)
```

```
## [1] 1680
```

```r
nooceaniagapminder <- newgapminder %>%
  droplevels()
nlevels(nooceaniagapminder$country)
```

```
## [1] 140
```

```r
levels(nooceaniagapminder$country)
```

```
##   [1] "Afghanistan"              "Albania"
##   [3] "Algeria"                  "Angola"
##   [5] "Argentina"                "Austria"
##   [7] "Bahrain"                  "Bangladesh"
##   [9] "Belgium"                  "Benin"
##  [11] "Bolivia"                  "Bosnia and Herzegovina"
##  [13] "Botswana"                 "Brazil"
##  [15] "Bulgaria"                 "Burkina Faso"
##  [17] "Burundi"                  "Cambodia"
##  [19] "Cameroon"                 "Canada"
##  [21] "Central African Republic" "Chad"
##  [23] "Chile"                    "China"
##  [25] "Colombia"                 "Comoros"
##  [27] "Congo, Dem. Rep."         "Congo, Rep."
##  [29] "Costa Rica"               "Cote d'Ivoire"
##  [31] "Croatia"                  "Cuba"
##  [33] "Czech Republic"           "Denmark"
##  [35] "Djibouti"                 "Dominican Republic"
##  [37] "Ecuador"                  "Egypt"
##  [39] "El Salvador"              "Equatorial Guinea"
##  [41] "Eritrea"                  "Ethiopia"
##  [43] "Finland"                  "France"
##  [45] "Gabon"                    "Gambia"
##  [47] "Germany"                  "Ghana"
##  [49] "Greece"                   "Guatemala"
##  [51] "Guinea"                   "Guinea-Bissau"
##  [53] "Haiti"                    "Honduras"
##  [55] "Hong Kong, China"         "Hungary"
##  [57] "Iceland"                  "India"
##  [59] "Indonesia"                "Iran"
##  [61] "Iraq"                     "Ireland"
##  [63] "Israel"                   "Italy"
##  [65] "Jamaica"                  "Japan"
##  [67] "Jordan"                   "Kenya"
```

```
##   [69] "Korea, Dem. Rep."        "Korea, Rep."
##   [71] "Kuwait"                  "Lebanon"
##   [73] "Lesotho"                 "Liberia"
##   [75] "Libya"                   "Madagascar"
##   [77] "Malawi"                  "Malaysia"
##   [79] "Mali"                    "Mauritania"
##   [81] "Mauritius"               "Mexico"
##   [83] "Mongolia"                "Montenegro"
##   [85] "Morocco"                 "Mozambique"
##   [87] "Myanmar"                 "Namibia"
##   [89] "Nepal"                   "Netherlands"
##   [91] "Nicaragua"               "Niger"
##   [93] "Nigeria"                 "Norway"
##   [95] "Oman"                    "Pakistan"
##   [97] "Panama"                  "Paraguay"
##   [99] "Peru"                    "Philippines"
##  [101] "Poland"                  "Portugal"
##  [103] "Puerto Rico"             "Reunion"
##  [105] "Romania"                 "Rwanda"
##  [107] "Sao Tome and Principe"   "Saudi Arabia"
##  [109] "Senegal"                 "Serbia"
##  [111] "Sierra Leone"            "Singapore"
##  [113] "Slovak Republic"         "Slovenia"
##  [115] "Somalia"                 "South Africa"
##  [117] "Spain"                   "Sri Lanka"
##  [119] "Sudan"                   "Swaziland"
##  [121] "Sweden"                  "Switzerland"
##  [123] "Syria"                   "Taiwan"
##  [125] "Tanzania"                "Thailand"
##  [127] "Togo"                    "Trinidad and Tobago"
##  [129] "Tunisia"                 "Turkey"
##  [131] "Uganda"                  "United Kingdom"
##  [133] "United States"           "Uruguay"
##  [135] "Venezuela"               "Vietnam"
##  [137] "West Bank and Gaza"      "Yemen, Rep."
##  [139] "Zambia"                  "Zimbabwe"
```
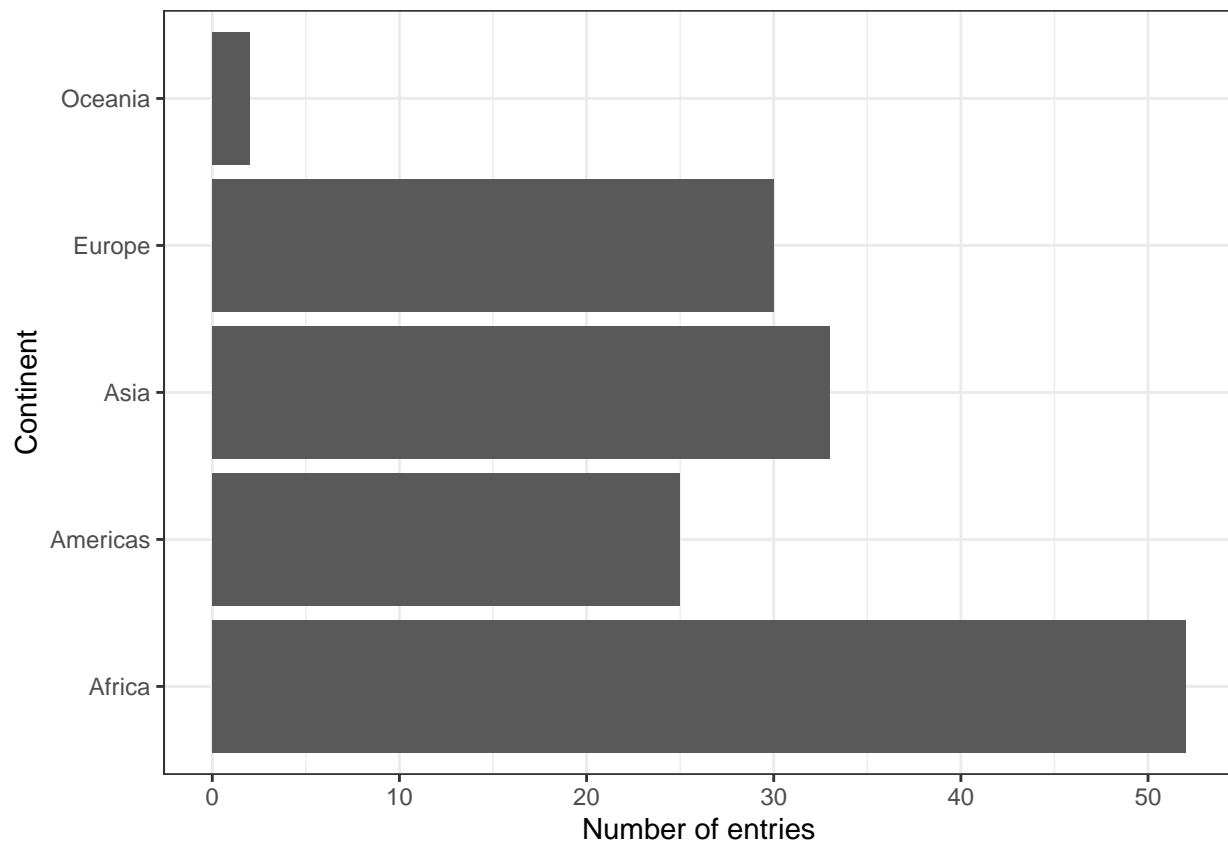
There are 2 less countries included in the evaluation of gapminder countries due to the dropping of Oceania as a continent.
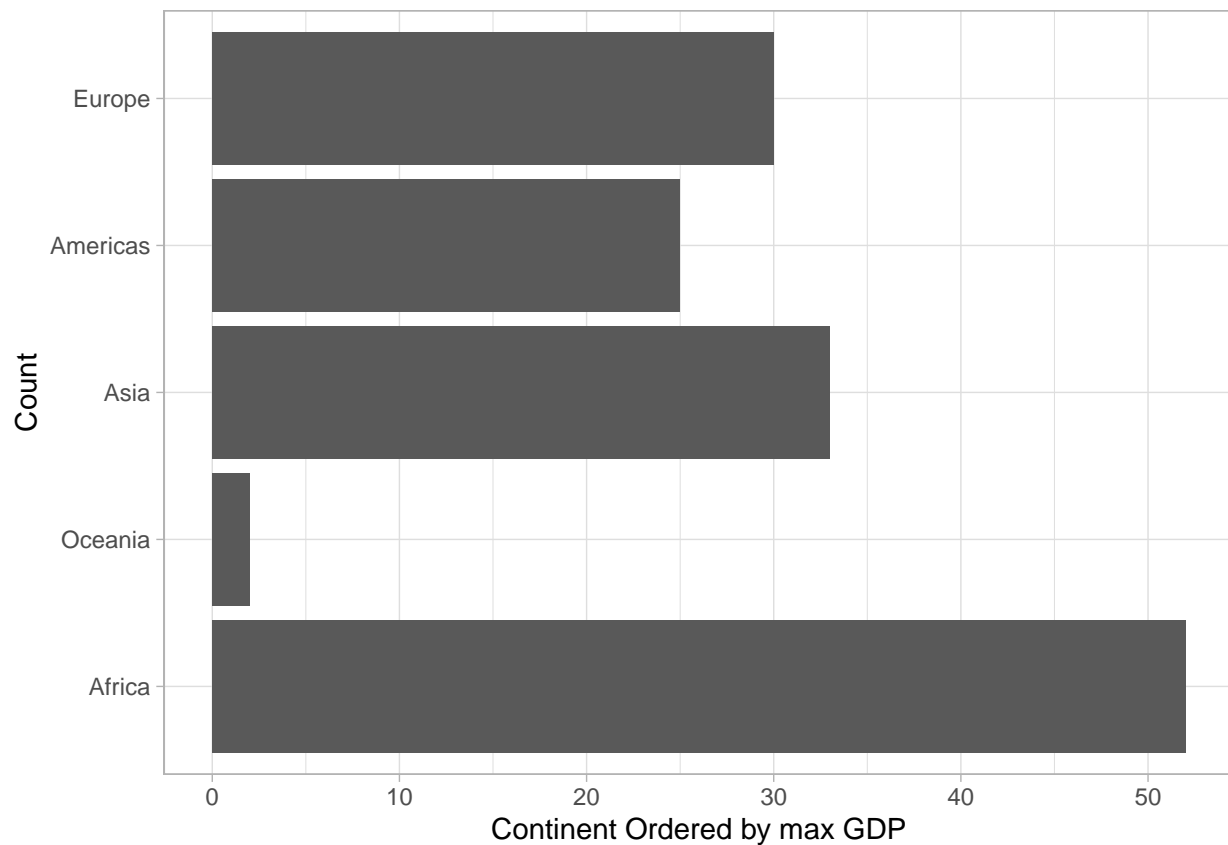
###2. Reorder levels based on knowledge from data.

Unordered plot of gapminder # of continents in 2002, as seen the plot has listed the continents in alphabetical order.

```
gapminder%>%
  filter(year == 2002) %>%
  ggplot() +
  geom_bar(aes(continent)) +
  coord_flip() +
  theme_bw() +
  ylab("Number of entries") + xlab("Continent")
```

I have chosen to reorder the gapminder dataset to display the continents in the order of maximum GDP in 2002 with Europe having the highest GDP at the top of the graph and Africa with the lowest GDP at the bottom.

```
gapminder %>%
  filter(year == 2002) %>%
  ggplot(aes(fct_reorder(continent, gdpPercap, max))) +
  geom_bar() +
  coord_flip()+
  xlab("Count") + ylab("Continent Ordered by max GDP") +
  theme_light()
```

Exploration of forcats package:

Fct_lump "lumps" all other continents together except for the numbers specified by n.

```
gapminder %>%
  filter(year == 2002) %>%
  ggplot(aes(fct_lump(continent, n = 1))) +
  geom_bar() +
  coord_flip()+
  xlab("Continent") + ylab("Count") +
  theme_light()
```