World Maps

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```
world = map_data("world")
head(world)
```

```
##        long      lat group order region subregion
## 1 -69.89912 12.45200     1     1  Aruba      <NA>
## 2 -69.89571 12.42300     1     2  Aruba      <NA>
## 3 -69.94219 12.43853     1     3  Aruba      <NA>
## 4 -70.00415 12.50049     1     4  Aruba      <NA>
## 5 -70.06612 12.54697     1     5  Aruba      <NA>
## 6 -70.05088 12.59707     1     6  Aruba      <NA>
```

```
head(HappyPlanetIndex)
```

```
##     Country Region Happiness LifeExpectancy Footprint  HLY   HPI HPIRank
## 1   Albania      7       5.5           76.2       2.2 41.7 47.91      54
## 2   Algeria      3       5.6           71.7       1.7 40.1 51.23      40
## 3    Angola      4       4.3           41.7       0.9 17.8 26.78     130
## 4 Argentina      1       7.1           74.8       2.5 53.4 58.95      15
## 5   Armenia      7       5.0           71.7       1.4 36.1 48.28      48
## 6 Australia      2       7.9           80.9       7.8 63.7 36.64     102
##   GDPperCapita   HDI Population
## 1         5316 0.801       3.15
## 2         7062 0.733      32.85
## 3         2335 0.446      16.10
## 4        14280 0.869      38.75
## 5         4945 0.775       3.02
## 6        31794 0.962      20.40
```

```
middle_east_countries = subset(world,region=="Israel" | region=="Egypt" | region=="Iran" |
                               region=="Iraq" | region=="Saudi Arabia" | region=="Yemen" |
                               region=="Syria" | region =="Jordan" | region=="United Arab Emirates" |
                               region=="Lebanon" | region=="Palestine" | region=="Oman" |
                               region=="Kuwait" | region=="Qatar" | region=="Bahrain")

# prepare for merge
middle_east_countries = middle_east_countries %>%
  rename(Country=region)
head(middle_east_countries)
```

```
##         long      lat group order              Country    subregion
## 959 53.92783 24.17720    11   959 United Arab Emirates Abu al Abyad
## 960 53.92812 24.14336    11   960 United Arab Emirates Abu al Abyad
## 961 53.82637 24.15313    11   961 United Arab Emirates Abu al Abyad
## 962 53.79912 24.13555    11   962 United Arab Emirates Abu al Abyad
```

```
## 963 53.71582 24.14531    11   963 United Arab Emirates Abu al Abyad
## 964 53.63447 24.16978    11   964 United Arab Emirates Abu al Abyad
```

```
middle_east_combined = left_join(middle_east_countries,HappyPlanetIndex,by="Country")
head(middle_east_combined)
```

```
##       long      lat group order              Country    subregion Region
## 1 53.92783 24.17720    11   959 United Arab Emirates Abu al Abyad      3
## 2 53.92812 24.14336    11   960 United Arab Emirates Abu al Abyad      3
## 3 53.82637 24.15313    11   961 United Arab Emirates Abu al Abyad      3
## 4 53.79912 24.13555    11   962 United Arab Emirates Abu al Abyad      3
## 5 53.71582 24.14531    11   963 United Arab Emirates Abu al Abyad      3
## 6 53.63447 24.16978    11   964 United Arab Emirates Abu al Abyad      3
##   Happiness LifeExpectancy Footprint  HLY   HPI HPIRank GDPperCapita   HDI
## 1       7.2           78.3       9.5 56.2 28.16     123        25514 0.868
## 2       7.2           78.3       9.5 56.2 28.16     123        25514 0.868
## 3       7.2           78.3       9.5 56.2 28.16     123        25514 0.868
## 4       7.2           78.3       9.5 56.2 28.16     123        25514 0.868
## 5       7.2           78.3       9.5 56.2 28.16     123        25514 0.868
## 6       7.2           78.3       9.5 56.2 28.16     123        25514 0.868
##   Population
## 1        4.1
## 2        4.1
## 3        4.1
## 4        4.1
## 5        4.1
## 6        4.1
```

```
# Graph 1
gf_polygon(lat~long,data=middle_east_combined,group=~group,fill=~LifeExpectancy) %>%
  gf_refine(coord_equal())%>%
  gf_labs(title="\n\tIraq has the lowest life expectantcy in the Middle East")
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, : font
## width unknown for character 0x9

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## font width unknown for character 0x9
```

Iraq has the lowest life expectantcy in the Middle East


```
# Graph 2
data("Alcohol")
Alcohol = Alcohol %>%
  rename(region=country)
head(Alcohol)
```

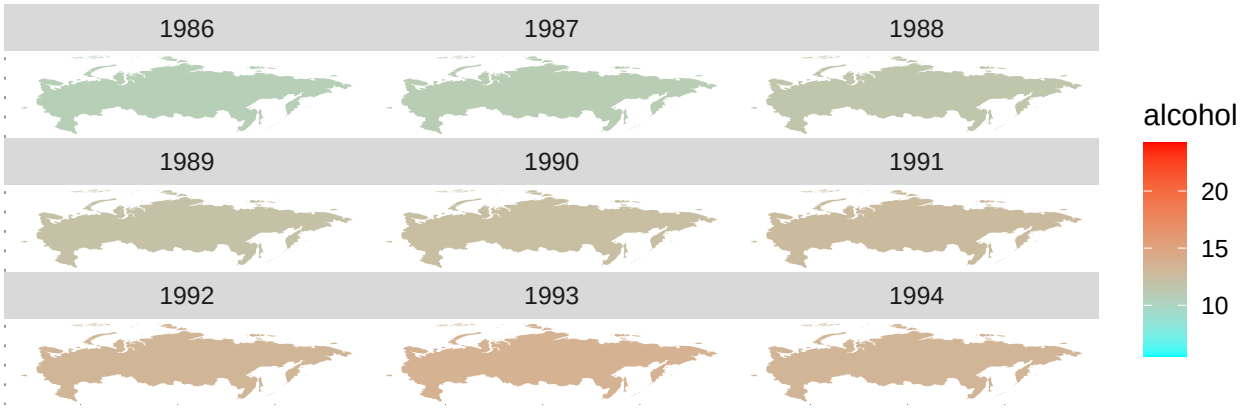
```
##   region year alcohol
## 1 Russia 1985   13.31
## 2 Russia 1986   10.77
## 3 Russia 1987   10.96
## 4 Russia 1988   11.57
## 5 Russia 1989   12.04
## 6  Chile 1990    9.43
```

```
russia_map = subset(world,region=="Russia")
AlcoholSubset = subset(Alcohol, year>1985 & year<=1994)
russia_alcohol_map = full_join(russia_map,AlcoholSubset)
```

```
## Joining, by = "region"
```

```
gf_polygon(lat~long|year, fill=~alcohol, data=russia_alcohol_map, group=~group) %>%
  gf_refine(coord_equal(),scale_fill_gradientn(colors=rev(rainbow(2)))) %>%
  gf_labs(title="Alcohol Consumption has Gradually Increased in Russia in the Late 20th Century")
```

Alcohol Consumption has Gradually Increased in Russia in the Late 20th Century




```
# Graph 3
israel = getData('GADM', country='ISR', level=1)
israel_map = tidy(israel)
```

```
## Regions defined for each Polygons
```

```
head(israel_map)
```

```
## # A tibble: 6 x 7
##    long   lat order hole  piece group    id
##   <dbl> <dbl> <int> <lgl> <fct> <fct>    <chr>
## 1  35.8  32.8     1 FALSE 1     127134.1 127134
## 2  35.8  32.8     2 FALSE 1     127134.1 127134
## 3  35.8  32.7     3 FALSE 1     127134.1 127134
## 4  35.8  32.7     4 FALSE 1     127134.1 127134
## 5  35.8  32.7     5 FALSE 1     127134.1 127134
## 6  35.7  32.7     6 FALSE 1     127134.1 127134
```

```
Earthquake = read_csv("~/CSVs/Earthquake.csv")
```

```
## Rows: 3887 Columns: 39
```

```
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## chr  (1): Location Name
## dbl (37): Year, Mo, Dy, Hr, Mn, Sec, Tsu, Vol, Latitude, Longitude, Focal De...
## lgl  (1): Search Parameters
```

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

```
Earthquake = Earthquake %>%
  rename(LocationName= `Location Name`)
Earthquake$LocationName = tolower(Earthquake$LocationName)
head(Earthquake)
```

```
## # A tibble: 6 x 39
##   `Search Paramete~  Year    Mo    Dy    Hr    Mn   Sec   Tsu   Vol LocationName
##   <lgl>             <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <chr>
## 1 NA                 1900     1    10    NA    NA    NA  5459    NA indonesia: ~
## 2 NA                 1900     1    11     9     7     0    NA    NA japan:  sea~
## 3 NA                 1900     1    14    NA    NA    NA    NA    NA indonesia: ~
```

```
## 4 NA                 1900     1     20     6     33    30     NA     NA mexico
## 5 NA                 1900     5     16    20     12     0     NA     NA mexico:  ne~
## 6 NA                 1900     6      7    22     NA     0     NA     NA venezuela: ~
## # ... with 29 more variables: Latitude <dbl>, Longitude <dbl>,
## #   Focal Depth (km) <dbl>, Mag <dbl>, MMI Int <dbl>, Deaths <dbl>,
## #   Death Description <dbl>, Missing <dbl>, Missing Description <dbl>,
## #   Injuries <dbl>, Injuries Description <dbl>, Damage ($Mil) <dbl>,
## #   Damage Description <dbl>, Houses Destroyed <dbl>,
## #   Houses Destroyed Description <dbl>, Houses Damaged <dbl>,
## #   Houses Damaged Description <dbl>, Total Deaths <dbl>, ...
```

```
 gf_point(Latitude~Longitude,data=subset(Earthquake, grepl("israel",LocationName)), size=1,color="red")
gf_polygon(lat~long,data=israel_map,group=~group,alpha=0.75) %>%
  gf_refine(coord_equal()) %>%
   gf_labs(title="\nMost Earthquakes in the Israel Region\n\tHappen in the West Bank")
```

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Most Earthquakes in the Israel Region
Happen in the West Bank