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Slot: C1

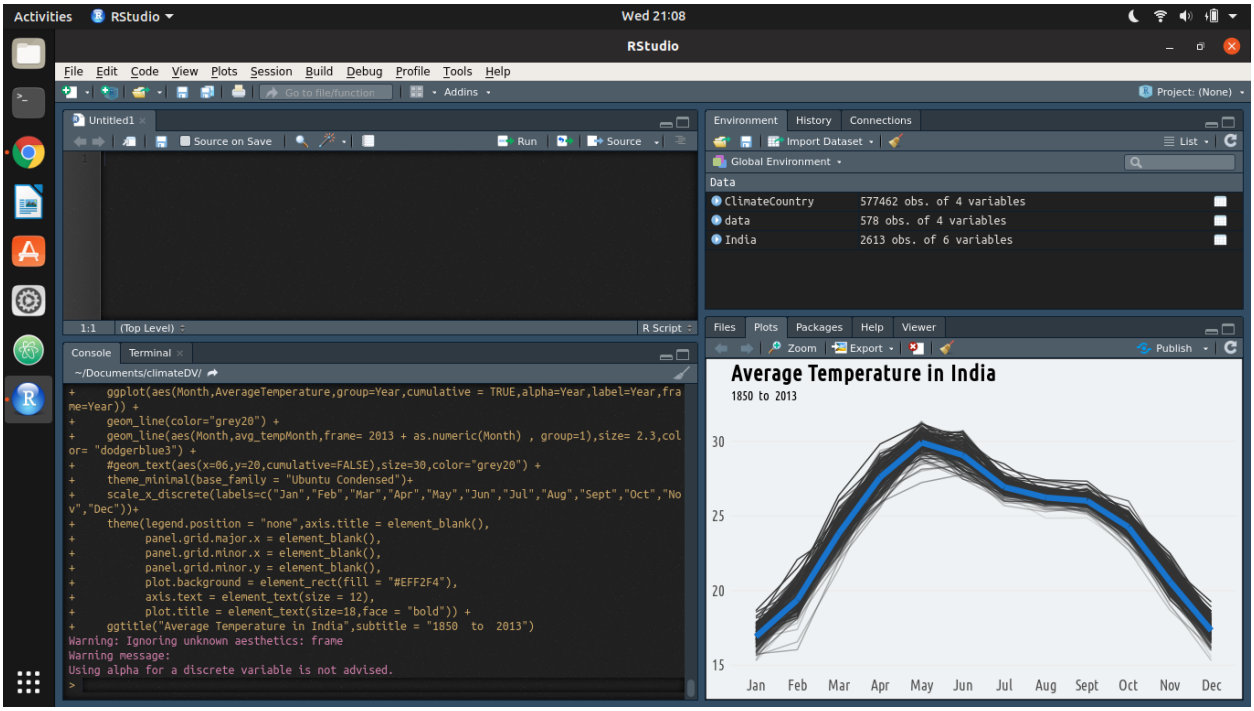
Subject: Data Visualisation (CSE3020)

Review 2

```
library(ggplot2)
library(readr)
library(dplyr)
library(RColorBrewer)
library(gganimate)
India <- ClimateCountry %>% filter(Country=="India")
India$dt <-as.Date(India$dt)
India$Year <- format(India$dt,"%Y")
India$Month <- format(India$dt,"%m")



India %>% filter(!is.na(AverageTemperature))  %>%
  filter(Year > 1850) %>%
  group_by(Year) %>% mutate(no_of_cases= length(Year)) %>%
  group_by(Month) %>%
  mutate(avg_tempMonth= mean(AverageTemperature)) %>%
  filter(no_of_cases==12) %>%
  ggplot(aes(Month,AverageTemperature,group=Year,cumulative =
TRUE,alpha=Year,label=Year,frame=Year)) +
  geom_line(color="grey20") +
```

```
  geom_line(aes(Month,avg_tempMonth,frame= 2013 + as.numeric(Month) , group=1),size=
2.3,color= "dodgerblue3") +

  #geom_text(aes(x=06,y=20,cumulative=FALSE),size=30,color="grey20") +

  theme_minimal(base_family = "Ubuntu Condensed")+


scale_x_discrete(labels=c("Jan","Feb","Mar","Apr","May","Jun","Jul","Aug","Sept","Oct","Nov
","Dec"))+

  theme(legend.position = "none",axis.title = element_blank(),

        panel.grid.major.x = element_blank(),

        panel.grid.minor.x = element_blank(),

        panel.grid.minor.y = element_blank(),

        plot.background = element_rect(fill = "#EFF2F4"),

        axis.text = element_text(size = 12),

        plot.title = element_text(size=18,face = "bold")) +

  ggtitle("Average Temperature in India",subtitle = "1850  to  2013") +

labs(caption= "Vamsi Krishna \t Source: Kaggle")




p<-

  India %>% filter(!is.na(AverageTemperature))  %>%

  filter(Year > 1850) %>%

  group_by(Year) %>% mutate(no_of_cases= length(Year)) %>%

  group_by(Month) %>%

  mutate(avg_tempMonth= mean(AverageTemperature)) %>%

  filter(no_of_cases==12) %>%

  ggplot(aes(Month,AverageTemperature,group=Year,cumulative =
TRUE,alpha=Year,label=Year,frame=Year)) +

  geom_line(color="grey20") +
```

```
  geom_line(aes(Month,avg_tempMonth,frame= 2013 + as.numeric(Month) , group=1),size=
2.3,color= "dodgerblue3") +

  geom_text(aes(x=06,y=20,cumulative=FALSE),size=30,color="grey20") +

  theme_minimal(base_family = "Ubuntu Condensed")+


scale_x_discrete(labels=c("Jan","Feb","Mar","Apr","May","Jun","Jul","Aug","Sept","Oct","Nov
","Dec"))+

  theme(legend.position = "none",axis.title = element_blank(),

        panel.grid.major.x = element_blank(),

        panel.grid.minor.x = element_blank(),

        panel.grid.minor.y = element_blank(),

        plot.background = element_rect(fill = "#EFF2F4"),

        axis.text = element_text(size = 12),

        plot.title = element_text(size=18,face = "bold")) +

  ggtitle("Average Temperature in India",subtitle = "1850 to 2013") +

labs(caption= "Vamsi Krishna \t Source: Kaggle")



gganimate(p,"Output.gif",ani.width=810, ani.height=520, interval=0.1,title_frame = F)
```


Activities
RStudio
Wed 21:08
RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Untitled1
Source on Save
Run
Source
Environment
History
Connections
Import Dataset
Global Environment
Data
ClimateCountry 577462 obs. of 4 variables
data 578 obs. of 4 variables
India 2613 obs. of 6 variables
Console
Terminal
~/Documents/climateDV/
+ ggplot(aes(Month,AverageTemperature,group=Year,cumulative = TRUE,alpha=Year,label=Year,frame=Year)) +
+ geom_line(color="grey20") +
+ geom_line(aes(Month,avg_tempMonth,frame= 2013 + as.numeric(Month) , group=1),size= 2.3,color= "dodgerblue3") +
+ #geom_text(aes(x=06,y=20,cumulative=FALSE),size=30,color="grey20") +
+ theme_minimal(base_family = "Ubuntu Condensed")+
+ scale_x_discrete(labels=c("Jan","Feb","Mar","Apr","May","Jun","Jul","Aug","Sept","Oct","Nov","Dec"))+
+ theme(legend.position = "none",axis.title = element_blank(),
+ panel.grid.major.x = element_blank(),
+ panel.grid.minor.x = element_blank(),
+ panel.grid.minor.y = element_blank(),
+ plot.background = element_rect(fill = "#EFF2F4"),
+ axis.text = element_text(size = 12),
+ plot.title = element_text(size=18,face = "bold")) +
+ ggtitle("Average Temperature in India",subtitle = "1850 to 2013")
Warning: Ignoring unknown aesthetics: frame
Warning message:
Using alpha for a discrete variable is not advised.
Files
Plots
Packages
Help
Viewer
Zoom
Export
Publish
Average Temperature in India
1850 to 2013
30
25
20
15
Jan Feb Mar Apr May Jun Jul Aug Sept Oct Nov Dec


Average Temperature in India
1850 to 2013
30
25
20
15
1851
Jan Feb Mar Apr May Jun Jul Aug Sept Oct Nov Dec

It is a gif.

```
library(sp)
library(maps)
library(raster)
library(gstat)
library(geoR)
library(maptools)
library(GISTools)
library(animation)
#library(readr)

glt$O1 <- substr(glt$Longitude, nchar(glt$Longitude), nchar(glt$Longitude))
glt$O2 <- substr(glt$Latitude, nchar(glt$Latitude), nchar(glt$Latitude))
glt$Longitude <- ifelse(glt$O1 == "W",
                        -as.numeric(substr(glt$Longitude, 1, nchar(glt$Longitude)-1)),
```

```
                as.numeric(substr(glt$Longitude, 1, nchar(glt$Longitude)-1)))


glt$Latitude <- ifelse(glt$O2 == "S",
                -as.numeric(substr(glt$Latitude, 1, nchar(glt$Latitude)-1)),
                as.numeric(substr(glt$Latitude, 1, nchar(glt$Latitude)-1)))


glt$Year <- substr(glt$dt, 1, 4)


glt.continent = data.frame(
Country = c(
"Algeria","Angola","Benin","Botswana","Burkina Faso","Burundi","Cameroon","Central
African Republic","Chad","Congo","Congo (Democratic Republic Of The)","Côte
D'Ivoire","Djibouti","Egypt","Equatorial
Guinea","Eritrea","Ethiopia","Gabon","Gambia","Ghana","Guinea","Guinea
Bissau","Kenya","Lesotho","Liberia","Libya","Madagascar","Malawi","Mali","Mauritania","Ma
uritius","Morocco","Mozambique","Namibia","Niger","Nigeria","Reunion","Rwanda","Senegal"
,"Sierra Leone","Somalia","South
Africa","Sudan","Swaziland","Tanzania","Togo","Tunisia","Uganda","Zambia","Zimbabwe","A
fghanistan","Bahrain","Bangladesh","Burma","Cambodia","China","Hong
Kong","India","Indonesia","Iran","Iraq","Israel","Japan","Jordan","Kazakhstan","Laos","Lebano
n","Malaysia","Mongolia","Nepal","Oman","Pakistan","Philippines","Qatar","Russia","Saudi
Arabia","Singapore","South Korea","Sri
Lanka","Syria","Taiwan","Tajikistan","Thailand","Turkey","Turkmenistan","United Arab
Emirates","Uzbekistan","Vietnam","Yemen","Albania","Armenia","Austria","Azerbaijan","Bela
rus","Belgium","Bosnia And Herzegovina","Bulgaria","Croatia","Cyprus","Czech
Republic","Denmark","Estonia","Finland","France","Georgia","Germany","Greece","Hungary","
Iceland","Ireland","Italy","Latvia","Lithuania","Macedonia","Moldova","Montenegro","Netherla
nds","Norway","Poland","Portugal","Romania","Serbia","Slovakia","Slovenia","Spain","Sweden
","Switzerland","Ukraine",
   #"United Kingdom",
   "UK",
   "Bahamas","Canada","Costa Rica","Cuba","Dominican Republic","El
Salvador","Guatemala","Haiti","Honduras","Jamaica","Mexico","Nicaragua","Panama","Puerto
Rico",
   #"United States",
```

```
    "USA",
    "Australia","New Zealand","Papua New
Guinea","Argentina","Bolivia","Brazil","Chile","Colombia","Ecuador","Guyana","Paraguay","P
eru","Suriname","Uruguay","Venezuela"
),
Continent = c(
"Africa","Africa","Africa","Africa","Africa","Africa","Africa","Africa","Africa","Africa","Afric
a","Africa","Africa","Africa","Africa","Africa","Africa","Africa","Africa","Africa","Africa","Af
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America","North America","North America","North America","North America","North
America","North America","North America","North America","North America","North
America","North America","North America","North
America","Oceania","Oceania","Oceania","South America","South America","South
America","South America","South America","South America","South America","South
America","South America","South America","South America America"
))
glt.y <- aggregate(list(
    AvgTemp    = glt$AverageTemperature,
    AvgTempUnc = glt$AverageTemperatureUncertainty
),
by = list(
    Year      = round(as.numeric(glt$Year) / 2) * 2,
    Latitude  = round(glt$Latitude  / 2) * 2,
    Longitude = round(glt$Longitude / 2) * 2),
FUN = mean, na.rm = TRUE
)
```
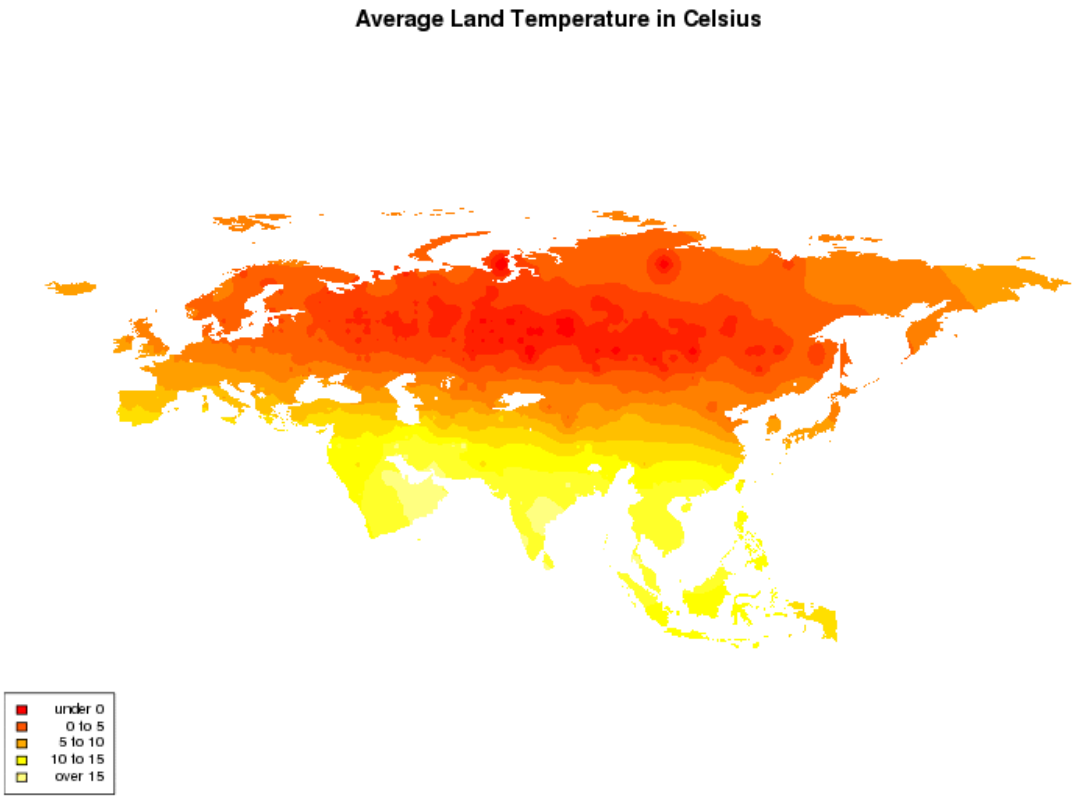
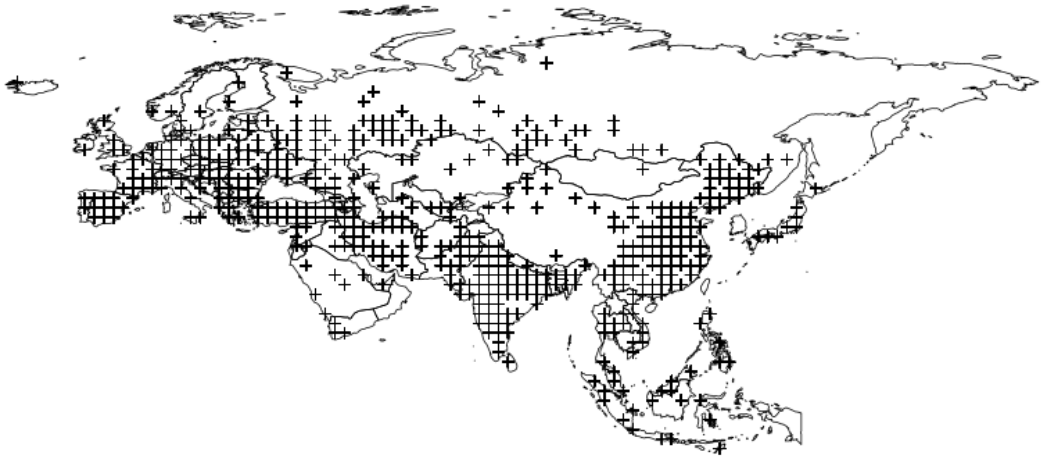

```
glt.y <- subset(glt.y, !is.na(glt.y$AvgTemp))
coordinates(glt.y) <- ~ Longitude + Latitude



get.countries <- function(continents, resolution) {

    countries <- as.character(glt.continent[glt.continent$Continent %in% continents, ]$Country)

    # Chose map
    w <- map("world", fill = TRUE, plot = FALSE)
    IDs <- sapply(strsplit(w$names, ":"), function(x) x[1])
    w <- map2SpatialPolygons(w, IDs = IDs)

    # Subsetting by countries
    w <- w[names(w) %in% countries, ]

    ext.bez  <- extent(w)
    xy       <- abs(apply(as.matrix(bbox(ext.bez)), 1, diff))
    r        <- raster(ext.bez, ncol=xy[1], nrow=xy[2])
    res(r)   <- resolution

    # Rasterize
    ras <-rasterize(w, r)
    ras <- as(ras, "SpatialPixels")

    years <- unique(subset(glt.y@data, !is.na(AvgTemp))$Year)  # No data for 1746?
```

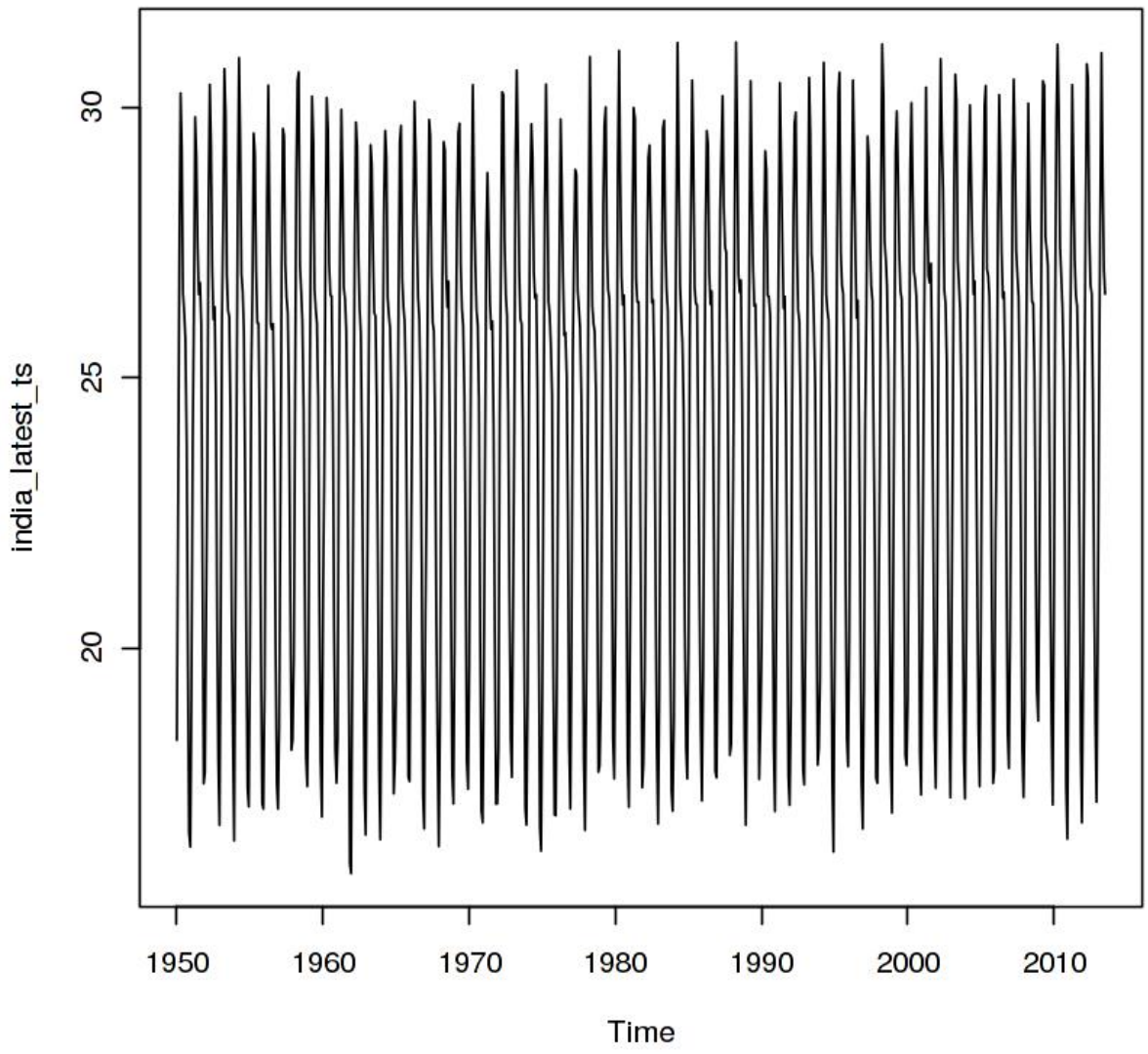
```
    ani.options(interval = 0.1)

    saveGIF( {
        sapply(years, function(x) {

        d <- subset(glt.y, Year==x)
        m <- "Average Land Temperature in Celsius"
        #s <- seq(-5, 30, by=2.5)

        idw <- krige(AvgTemp ~ 1, d, ras, block= c(100))

        image(idw, xlab=x, asp=1, main=m)

        sh <- shading(breaks = seq(0, 15, by=5), cols = heat.colors(5))
        choro.legend(px = "bottomleft", sh = sh, bg = "white", cex = 0.75)

            ani.pause()
        })
    },
    movie.name = paste(paste(continents, collapse="_"), ".gif", sep = ""),
    img.name = "Rplot",
    convert = "convert",
    ani.width = 800,
    ani.height = 600)

    plot(w, main = "The Grid")
    points( glt.y[!is.na(over(glt.y, w)), ], pch=3)
}
```

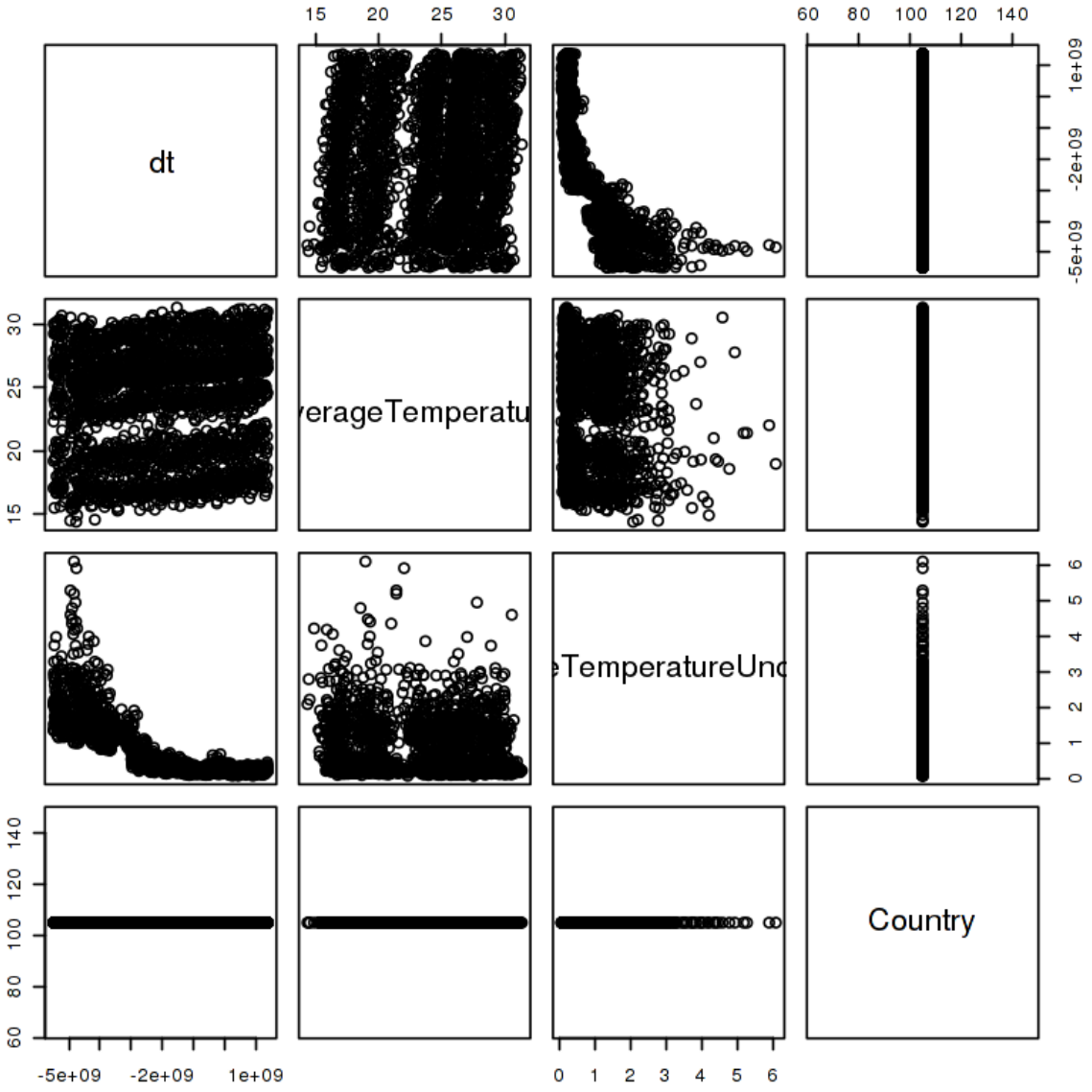
get.countries(c("Europe", "Asia"), 0.3)



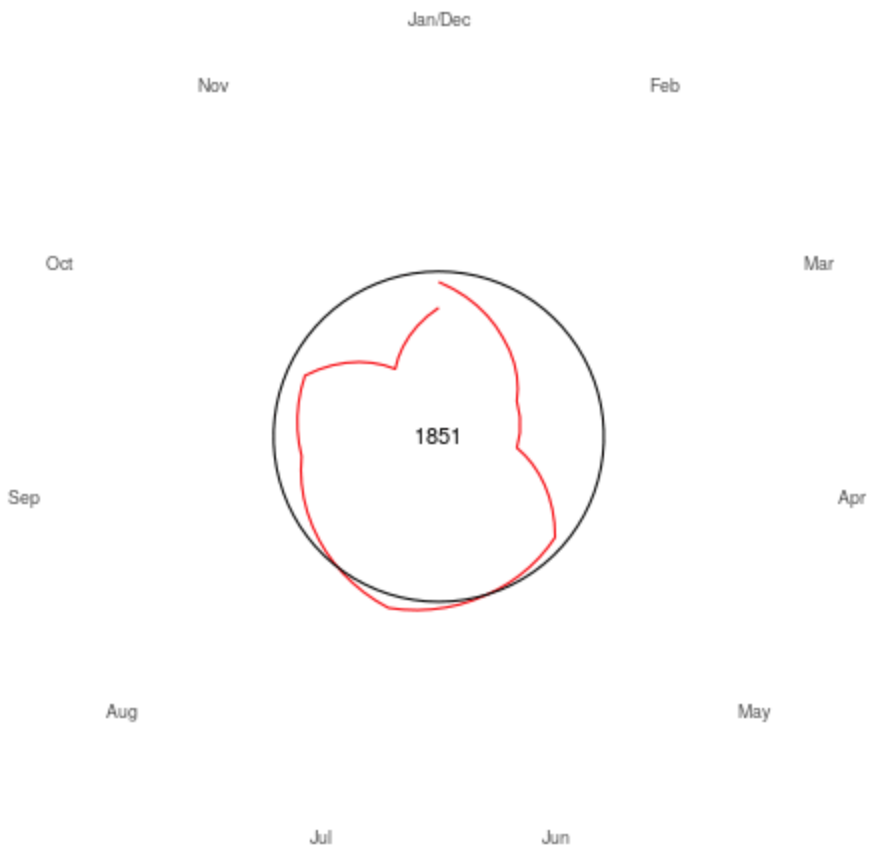
The Grid




india_latest_ts
30
25
20
1950
1960
1970
1980
1990
2000
2010
Time

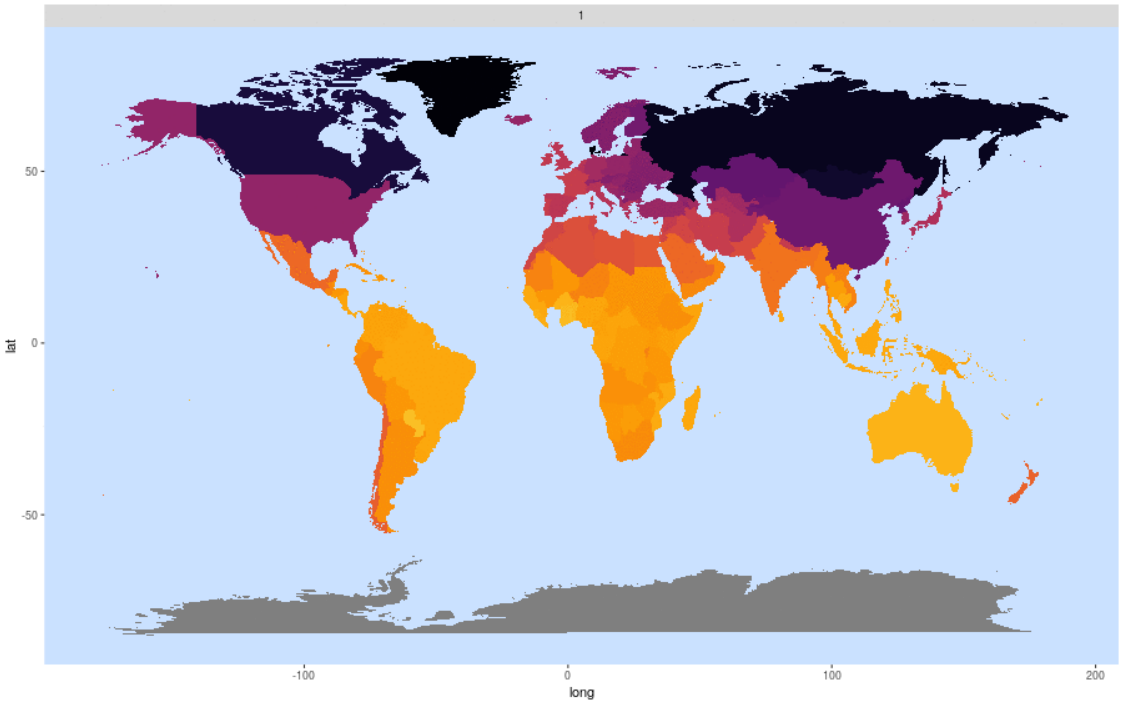

dt
verageTemperatu
TemperatureUnc
Country
15
20
25
30
60
80
100
120
140
1e+09
-2e+09
-5e+09
0
1
2
3
4
5
6

Variation from monthly average temperature



Temperature by country

Year = 2000



Temperature above/below average by country and year. Year = 1900